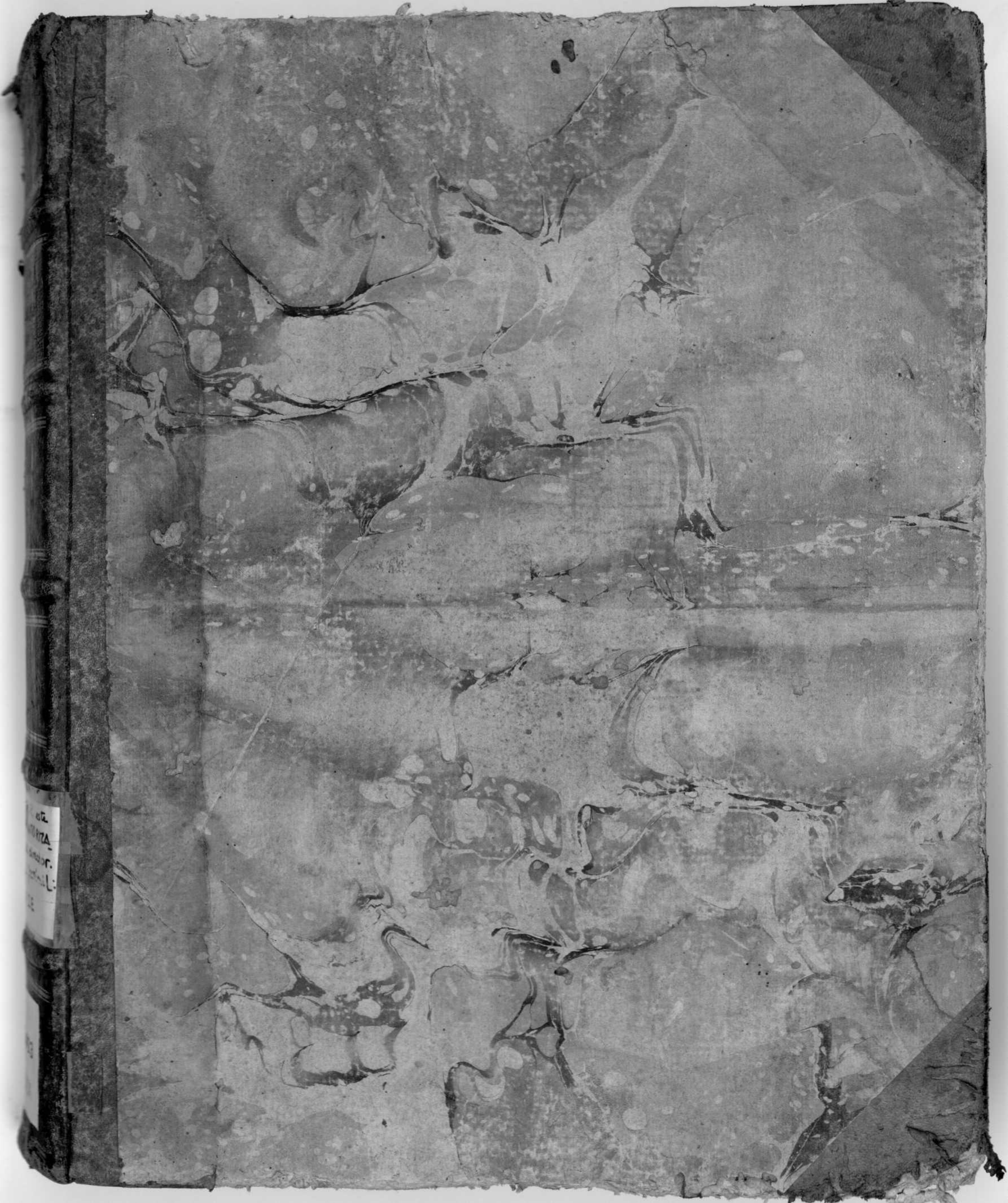
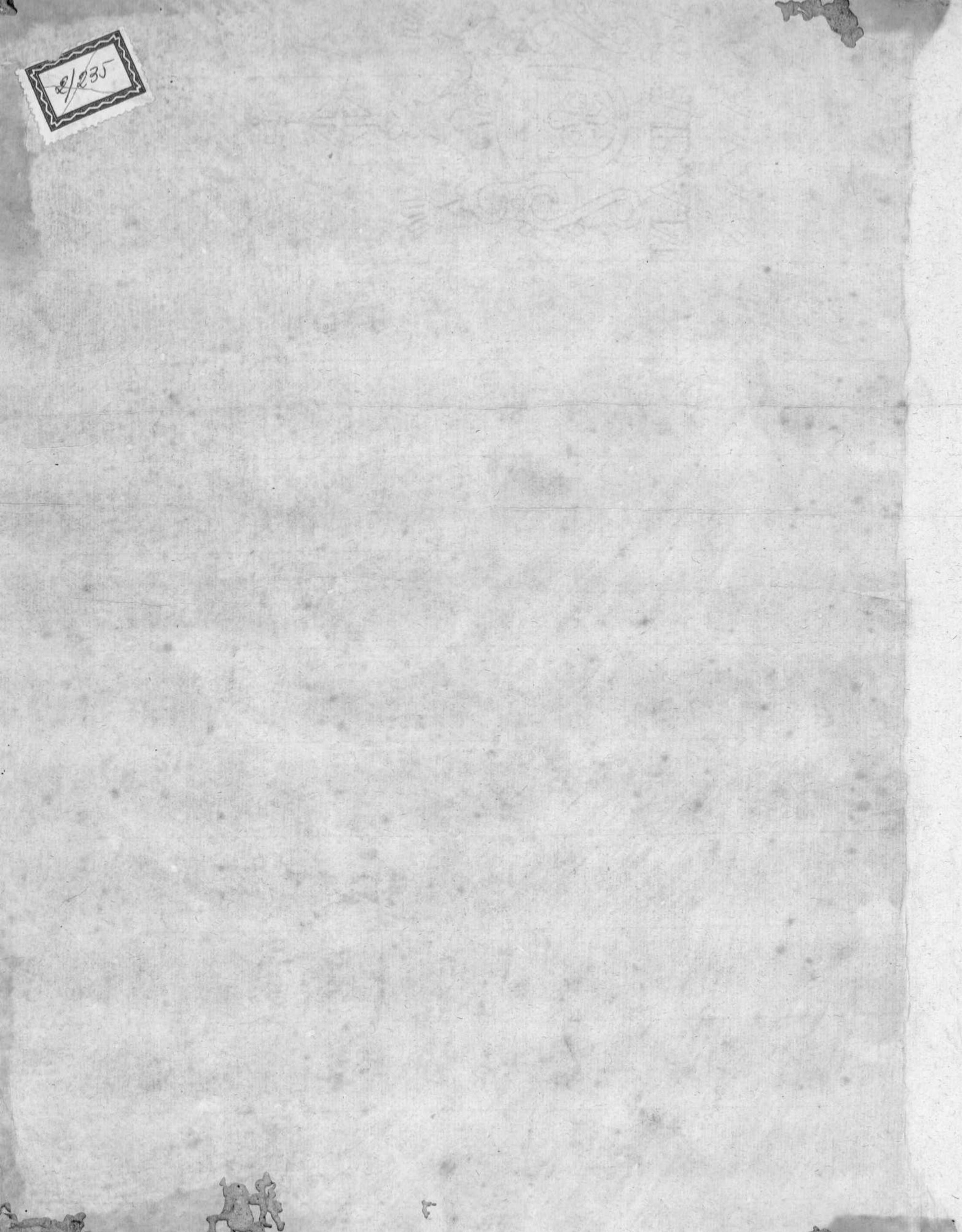






7 AS

39554

2
1934

Sig.: 70403
Tit.: Laminas pertenecientes al Trata
Aut.: Morla, Tomás
Cód.: 51068754



Est. de Imp. de la Real Academia de Ciencias

R-11979

L A M I N A S

PERTENECIENTES

AL TRATADO DE ARTILLERÍA

QUE SE ENSEÑA

EN EL REAL COLEGIO MILITAR

DE SEGOVIA.

ESCRITO

POR EL EXC.^{MO} SR. D. TOMAS DE MORLA, DEL CONSEJO DE ESTADO,
TENIENTE GENERAL DE LOS REALES EJERCITOS &c. &c.

TOMO IV.



CON SUPERIOR PERMISO.

MADRID EN LA IMPRENTA REAL

AÑO DE 1803.



ADVERTENCIA.

El tratado de Artillería, escrito por el Sr. D. Tomas de Morla el año de 1783, se publicó en el de 1792 con solo las láminas pertenecientes al artículo de Minas y á los seis que componen la segunda parte, porque son las únicas que se hallan explicadas en la obra, quedando detenida la publicacion de las restantes, insertas en este tomo, hasta que el autor tuviese tiempo de arreglar las explicaciones y tablas de proporciones y dimensiones que debian acompañarlas, y completar la obra en una nueva edicion, que mejorada con los descubrimientos de la Chímica moderna y mayor ilustracion del autor en sus estudiosos viages, que con este fin hizo por la Europa, habria sin duda satisfecho los vivos deseos con que el público, y en particular el Real Cuerpo de Artillería, la esperaban, como tan útil y singular en su especie por la generalidad con que reúne los principales conocimientos de todos los ramos de la facultad con sencillez, claridad y método; circunstancias muy difíciles de conciliar tratando de una ciencia tan vasta y complicada, pues participa de otras muchas que por sí solas exigen largo estudio y meditacion.

Pero perdida ya del todo la esperanza de que el autor pueda dedicarse á este interesante trabajo, pues los mandos y repetidas comisiones de la mayor importancia que han recaido en tan digno y acreditado General le imposibilitan para la execucion, se da ahora á luz toda la coleccion de láminas, tal qual estaba desde el año de 1792, precedida de un índice que manifiesta las piezas de artillería, carruages, municiones, máquinas, edificios y demas contenido en ellas, para que al menos no carezcan de esta parte tan esencial de la obra los que la tengan.

Se ha de advertir que las doce láminas que faltan correspondientes al artículo 4.º de la obra no se grabáron por ser diseños de montages y carruages que ya no estan en uso, y de consiguiente no hubieran tenido lugar en la nueva edicion.

ÍNDICE

DE LAS MAQUINAS, EDIFICIOS, PIEZAS DE ARTILLERIA, MONTAGES, CARRUAGES, MUNICIONES, INSTRUMENTOS Y DEMAS PERTENECIENTE AL SERVICIO DE ARTILLERIA EN PAZ Y GUERRA, QUE REPRESENTAN LAS LAMINAS INSERTAS EN ESTE TOMO.

PRIMERA PARTE.

Consta de doce artículos contenidos en los tomos primero y segundo de la obra.

ARTICULO I.

Trata de la pólvora, y se refiere á nueve láminas.

- LAMINA 1.^a Representa el plano de un molino de percusion para triturar la pólvora.
2.^a Su elevacion.
3.^a Su perfil.
4.^a El plano de un molino de compresion con muelas verticales sobre yuseras, semejante á uno doble de tabaco.
5.^a Su perfil.
6.^a Representa la vista de una máquina para redondear los granos de pólvora.
7.^a Representa un morterete y probeta para probar la potencia de la pólvora.
8.^a Plano, perfiles y vista de un almacen de pólvora.
9.^a Representa las máquinas del Caballero de Arcy para probar la potencia de la pólvora, y que su inflamacion es progresiva.

ARTICULO II.

Trata de la fundicion de artillería, y se refiere á veinte y dos láminas.

- LAMINA 1.^a Representa el plano, perfil y elevacion de un horno de copela para afinar cobre.
2.^a Plano y vista de un horno con fuelle para afinar de una vez 30 quintales de cobre.
3.^a Plano, perfil y elevacion de un horno para afinar estaño.
4.^a Representa un huso para moldear cañones (*fig. 1*) con su manivela al pie (*fig. 13*): plano de un juego de husos (*fig. 2*) para colocarse sobre caballetes (*fig. 5*) manifestando uno revestido con la trenza de esparto (*fig. 3*): otro embarrado hasta formar las molduras exteriores de un cañon (*fig. 4*) y la tarraja que las forma (*fig. 7*): otro con los primeros herrages (*fig. 8*), un ceston de bronce para el molde de la culata (*fig. 6*) y los instrumentos del taller de moldería (*fig. 9, 10, 11 y 12.*)
5.^a Representa el molde del cuerpo de un cañon con los segundos herrages (*fig. 1*), el perfil de un molde completo para cañon de á 24 (*fig. 3*), y varias vistas y perfiles de la máquina para construir las culatas de los moldes (*fig. 8 y 10.*)
6.^a Perfil de un molde completo para mortero de plancha.
7.^a Plano icnográfico de un horno de fundicion á la altura de las ventosas.
8.^a Plano icnográfico del mismo horno á la altura de los respiraderos.
9.^a Perfil del horno dicho de fundicion cortado por la línea X Z de la lámina 7.
10. Otro perfil del mismo que pasa por la línea G H de la lámina 7.
11. Vista de costado del referido horno de fundicion.

12. Dos vistas del cabriolé doble que se usa en las fundiciones.
13. Vistas de frente y de costado del cabriolé sencillo.
14. Plano de la máquina para barrenar y torneear las piezas de artillería que actualmente está en uso en nuestras fundiciones.
15. Perfil de la misma máquina con su cabriolé correspondiente.
16. Representa las principales barrenas y cuchillas que sirven para barrenar las ánimas y recámaras de las piezas de artillería fundidas en sólido.
17. Representa los cañones de los cinco calibres regulares del nuevo método que actualmente estan en uso.
18. Representa los morteros de á 12 y 9 pulgadas cilíndricos, y los obuses de á 8 y 6.
19. Representa el mortero de plancha y pedrero de á 16 pulgadas.
20. Representa los cañones antiguos de los cinco calibres regulares, y los morteros de á 12 y 9 pulgadas de la antigua Ordenanza.
21. Representa el instrumento, conocido con el nombre de *topo*, para medir la profundidad de los escarabajos y defectos interiores de las piezas de artillería.
22. Representa los instrumentos para el reconocimiento de cañones.

ARTICULO III.

Trata del hierro y de la fundicion y fábrica de las piezas de este metal, refiriéndose á nueve láminas.

- LAMINA 1.^a Plano del horno de municiones de S. Sebastian de la Muga.
- 2.^a Perfiles y vista de dicho horno.
 - 3.^a Plano, perfil y vista de un fuelle de madera para el mismo horno.
 - 4.^a Plano y perfil de un horno de fundicion elíptico.
 - 5.^a Representa los útiles é instrumentos pertenecientes á una fundicion de hierro.
 - 6.^a Planos y perfiles de los modelos de bronce para las bombas, de las caxas para los moldes, del ochete, carro para las caxas y otros instrumentos.
 - 7.^a Representa el modo de torneear los ochetes ó moldes de las ánimas, y los instrumentos propios para esta maniobra.
 - 8.^a Plano y perfil de los modelos y caxas de moldes para fundir balas, y de los instrumentos propios de este trabajo.
 - 9.^a Representa las balas y granadas, bombas con boquilla, con argollas, y los pasabalas.

ARTICULO IV.

Trata de la construccion del carruage, máquinas y útiles para el servicio de la Artillería, y se refiere á quarenta y seis láminas.

- LAMINA 1.^a No se grabó.
- 2.^a Idem.
 - 3.^a Idem.
 - 4.^a Plano, vista y perfil del cuerpo de una cureña de obus de á 6 pulgadas, representándose la cuña de mira con todas sus piezas y el exe; en la inteligencia que las ruedas son iguales á las de las cureñas de campaña del calibre de á 12.
 - 5.^a Piezas de madera que componen la cureña de plaza del calibre de á 24.
 - 6.^a No se grabó.
 - 7.^a Idem.

8.^a Idem.

9.^a Plano, perfil y vista del cuerpo de una cureña de á 12 de campaña del nuevo método, representándose sus herrages, caja de municiones, palanca de maniobra, exe de hierro &c.

10. Abantren ó armon correspondiente á las cureñas de á 12 y 8, y á la de obus de á 6 pulgadas.

11. Plano, vista y perfil del cuerpo de una cureña de á 4 de campaña del nuevo método con sus herrages, rosca de puntería, caja de municiones, palanca de maniobra &c.

12. Abantren ó armon correspondiente á la cureña de á 4.

13. Plano, perfil y vista del cuerpo de una cureña de 24 de campaña del nuevo método.

14. Cubo, rueda y exe correspondiente á la anterior.

15. Armon de varas correspondiente á la cureña de á 24 de campaña.

16. Plano y vistas de la cureña de plaza llamada de Griveauval para tirar sobre parapetos con su explanada movable y cuña de mira.

17. Plano de dicha explanada movable.

18. Plano y vistas de una explanada propia para las baterías de costa con su cureña.

19. Caxones para los carros de municiones de nuevo método. *Figuras 1 y 2* plano y perfil de un caxon para cartuchos de cañon de á 12. *Figuras 3 y 4* plano y perfil de un caxon para cartuchos de cañon de á 8. *Figuras 5 y 6* plano y perfil de un caxon para cartuchos de fusil. *Fig. 7* perfil de un caxon dividido por mitad para cartuchos de fusil y granadas de á 6. Las letras A, B y C indican en las antecedentes figuras las tres separaciones superior, de en medio é inferior con sus puertas: D es una caja ó separacion para estopines y piedras de chispa. *Figuras 8 y 9* plano y perfil de un caxon para municiones de obus de á 6 pulgadas.

20. Plano y vistas de un carro de municiones para cañon de á 4.

21. Perfil y vistas del caxon de municiones para el cañon de á 4.

22. No se grabó.

23. Idem.

24. Afustes para morteros de Ordenanza.

25. No se grabó.

26. Idem.

27. Cabria con molinete de dos diferentes diámetros.

28. No se grabó.

29. Idem.

30. Vistas de la escaleta con sus herrages y plano del tablon inferior.

31. Vistas de un kric y varias de sus piezas sueltas.

32. Representa la cureña de marina con todas sus piezas y herrages.

33. Vista superior del cuerpo de un carro fuerte sin herrages.

34. Elevacion del cuerpo de un carro fuerte y sus piezas de madera sin herrages.

35. Plano de un carro fuerte con herrages sin brancales y vistas del exe y cabezal de testera.

36. Vista del carro fuerte y del exe y cabezal delantero con sus herrages.

37. Herrages del carro fuerte.

38. Plano del cuerpo de una galera y sus piezas de madera sin herrages.

39. Elevacion del mismo sin herrages.

40. Plano de la galera sin herrages.

41. Elevacion de la misma con herrages.
42. Herrages de la galera.
43. Plano y vista del carro balero.
44. Planos y elevaciones del carro capuchino ó de municiones.
45. Plano y elevacion de la fragua de campaña y de su fuelle.
46. Plano y elevacion del trinquibal de mula y del de mano con sus herrages.

ARTICULO V.

Trata de puentes militares, y se refiere á nueve láminas.

LAMINA 1.^a Plano y perfiles de una barca.

2.^a Plano, perfil y vistas de un ponton.

3.^a Plano, perfil y vistas de una lancha para el servicio de un puente.

4.^a Plano y vistas de un carro para conducir barcas de puentes.

5.^a Plano y vistas de un carro para conducir pontones.

6.^a Plano y vistas de un carro para la lancha.

7.^a Cabrestante horizontal, vertical y varios útiles, como áncoras, remos, vicheros &c. para manejo de las barcas, lanchas y pontones.

8.^a Plano de un puente de barcas y otro de pontones.

9.^a Representa la balsa del Caballero Folard para pasar rios de agua mansa, y un puente de balsas con ruedas para rios poco profundos.

ARTICULO VI.

Trata del cordage y cuerda mecha, y no hace referencia á láminas.

ARTICULO VII.

Trata de los inventarios de artillería y pertrechos, y de su colocacion en los almacenes, refiriéndose á dos láminas.

LAMINA 1.^a Representa la máquina para echar granos con todas sus piezas y barrenas.

2.^a Representa las pilas de balas triangular, quadrada y oblonga.

ARTICULO VIII.

Trata de las armas de fuego, punta y corte, y se refiere á seis láminas.

LAMINA 1.^a Plano y perfiles de la máquina para barrenar cañones de fusil horizontalmente, y vista de una barrena vertical.

2.^a Vista de la llave del fusil de municion con sus piezas.

3.^a Vista de las llaves de carabina y pistola, chapas, abrazaderas y gatillos de ellas y del de fusil de municion.

4.^a Fusil de Infantería, carabina y pistola de Caballería.

5.^a Espada de Caballería y la pica del Marques de Santa Cruz.

6.^a Espada de Dragones y la de Infantería.

ARTICULO IX.

Trata de fuegos artificiales refiriéndose á quatro láminas.

LAMINA 1.^a Representa una espoleta, cartuchos de bala rasa, de metralla de racimo, de balas de hierro batido y de balas de fusil: una pollada y tenaza para bala roxa.

2.^a Representa un petardo, una carcasa de hierro, una bala de iluminacion, una bomba carcasa, aguja y molde para hacer cohetes.

3.^a Representa un cohete de carton, cohetes errantes, truenos, percha para dispararlos, máquinas para taladrarlos quando se hacen en sólido, mesa de artificios con sus moletas, un plato cóncavo y bala para moler ingredientes, un banco para cargar espoletas, y prensa para cargar lanzafuegos.

4.^a Plano y perfil de un horno con su caldera para los artificios, y vista de una máquina para arrancar espoletas.

ARTICULO X.

Trata de las escuelas prácticas de Artillería, y hace referencia á dos láminas.

LAMINA 1.^a Representa el alza de puntería y juegos de armas para cañon y mortero.

2.^a Juegos de armas para obuses y morteros.

ARTICULO XI.

Trata de los alcances y cargas de las armas de fuego, y diferencias que resultan de tener distintas dimensiones las piezas de un mismo calibre, se refiere á una lámina.

LAMINA ÚNICA. Representa dos modos de medir la velocidad inicial de las balas.

ARTICULO XII.

Trata de minas refiriéndose á seis láminas, cuya explicacion y dimensiones constan en el mismo tratado.

LAMINA 1.^a Representa varias minas y excavaciones.

2.^a Varias figuras de la esfera de actividad en las tierras.

3.^a Diversidad de excavaciones que resultan de la particular colocacion de los hornillos.

4.^a Representa el sistema de minas del Señor de la Febure.

5.^a Varias figuras en que se manifiesta la disposicion de las minas respecto á las contraminas.

6.^a Representa el encofrado de galerías.

PARTE SEGUNDA.

Consta de seis artículos contenidos en el tercer tomo de la obra, y se refiere á quince láminas.

ARTICULO I.

Trata de los trenes de campaña, y se refiere á la primera y segunda láminas.

LAMINA 1.^a Representa el orden y disposicion de campar un tren de campaña.

2.^a Manifiesta el campamento de un ejército, y su formacion de batalla al frente de él con la disposicion de la artillería en uno y otro caso.

ARTICULO II.

Trata del uso de la artillería de campaña con referencia á la tercera y quarta láminas.

LAMINA 3.^a Representa dos órdenes de batalla de un ejército: el primitivo y habitual y el defensivo y ofensivo á un tiempo.

4.^a Manifiesta el despliegue de cinco columnas formando un orden de batalla obliquo por su derecha.

ARTICULO III.

Trata de los trenes de batir, y se refiere á las láminas quinta y sexta.

LAMINA 5.^a Representa el parque de un tren de batir.

6.^a Disposicion de un parque provisional de trinchera, y varios instrumentos, faginas &c. para la construccion de baterías.

ARTICULO IV.

Trata del ataque de las plazas con referencia á las láminas séptima y octava.

LAMINA 7.^a Manifiesta la disposicion de las tropas, parques y depósitos embestida una plaza, representándose la de Rívol.

8.^a Representa la primera paralela y sus baterías de rebote.

9.^a Plano y perfiles de las baterías de nivel, enterradas, elevadas y de rebote. (*Véase tambien la lámina 13.*)

10. Manifiesta la segunda y tercera paralela del ataque de la derecha, planos y perfiles del reducto de trinchera, y de las diferentes especies de ramales y zapas que se construyen en los sitios.

11. Representa la continuacion de los trabajos anteriores.

12. Continuacion de los ataques y construccion de los caballeros de trinchera.

13. Manifiesta el coronamiento de la cresta de la explanada: en esta misma lámina se representan los perfiles de las baterías horizontal y enterradas con paso por la espalda, y de una de rebote, que demuestra cómo se puede tirar por encima de la segunda paralela.

14. Representa la disposicion de las baterías de brecha, paso del foso de agua con puentes volantes, alojamiento sobre la brecha, fogata y atrincheramiento del sitiado en las obras.

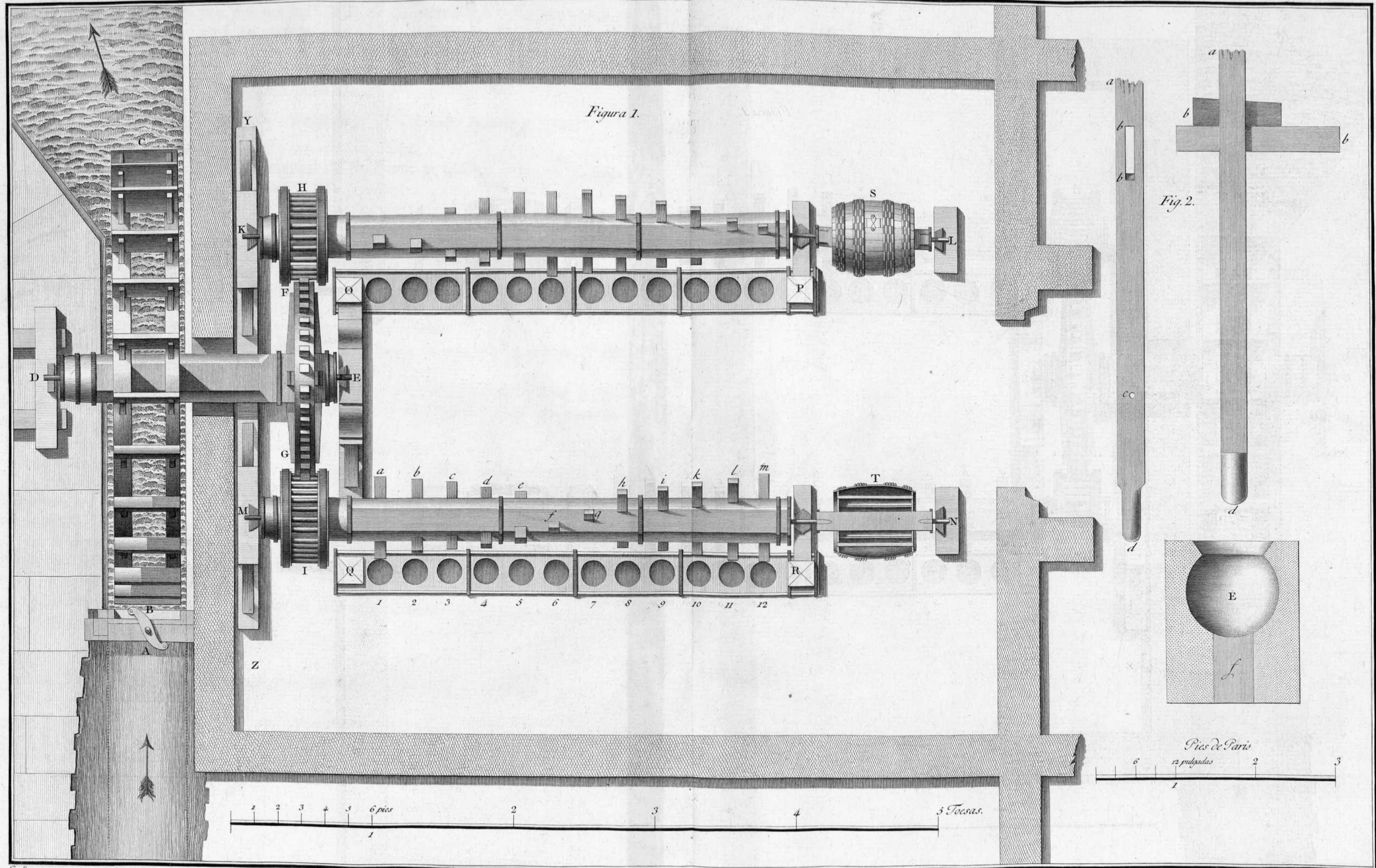
15. Manifiesta varios modos de pasar el foso por el frente del hornabeque.

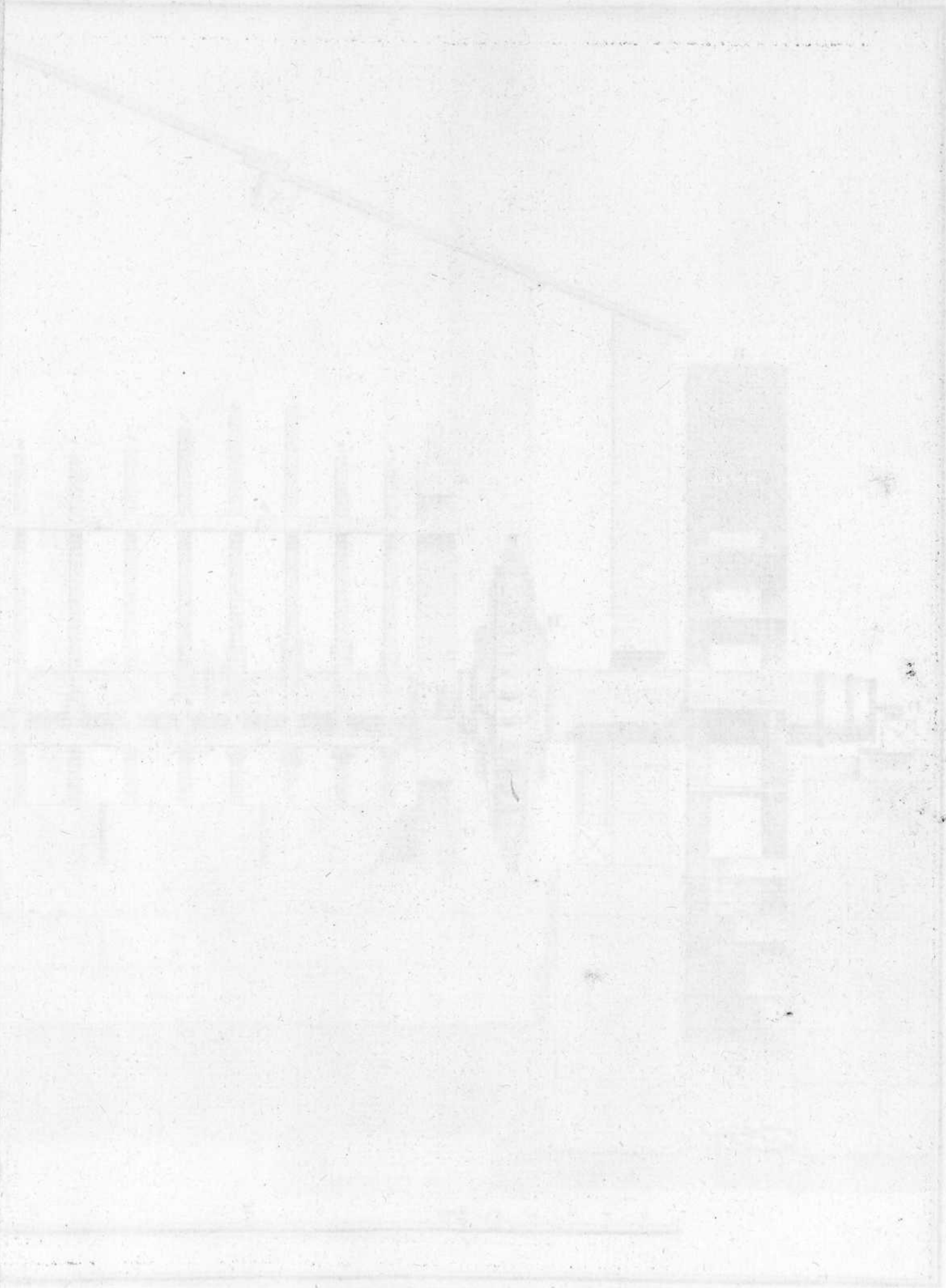
ARTICULO V.

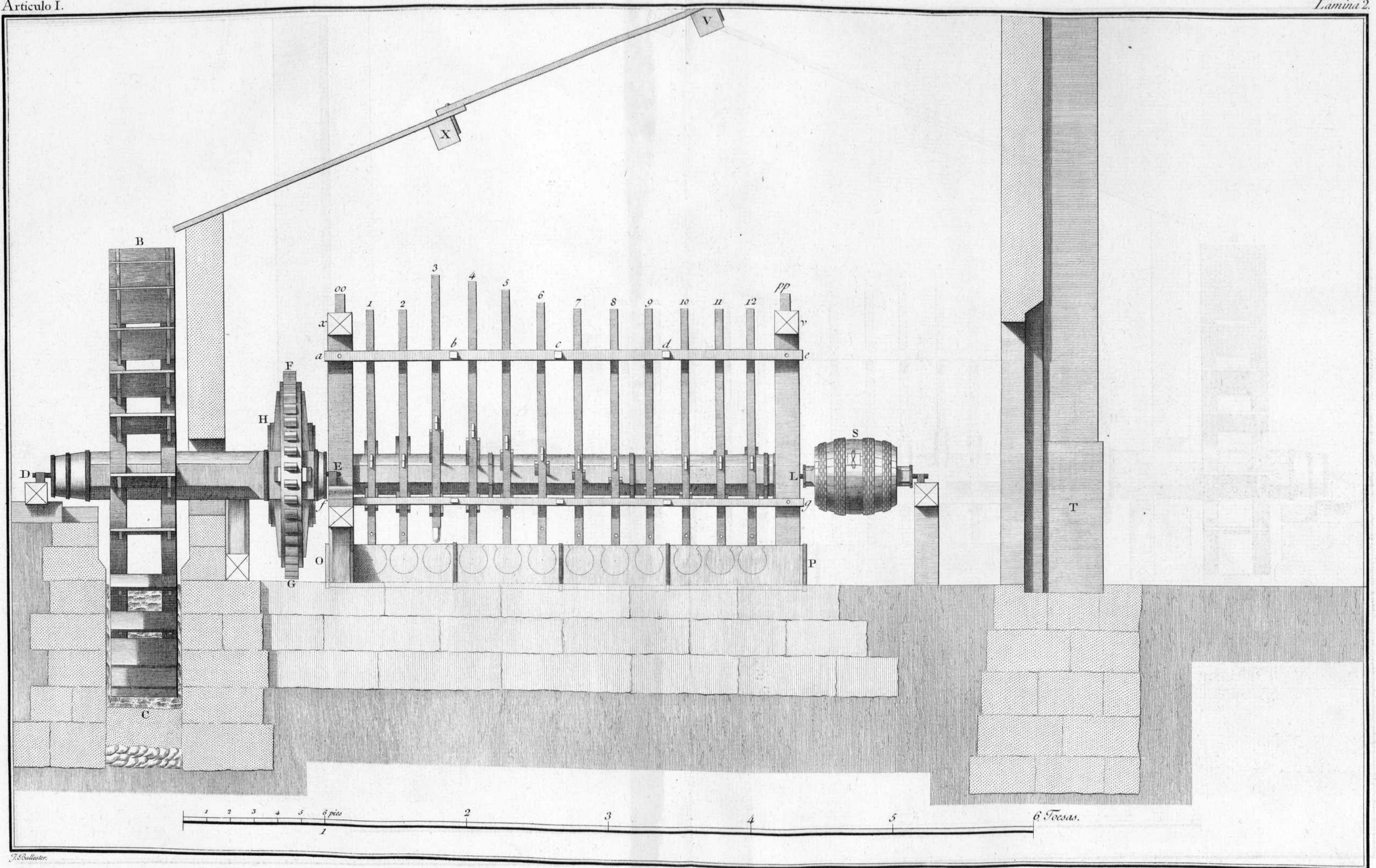
Trata de la dotacion de plazas sin hacer referencia á láminas.

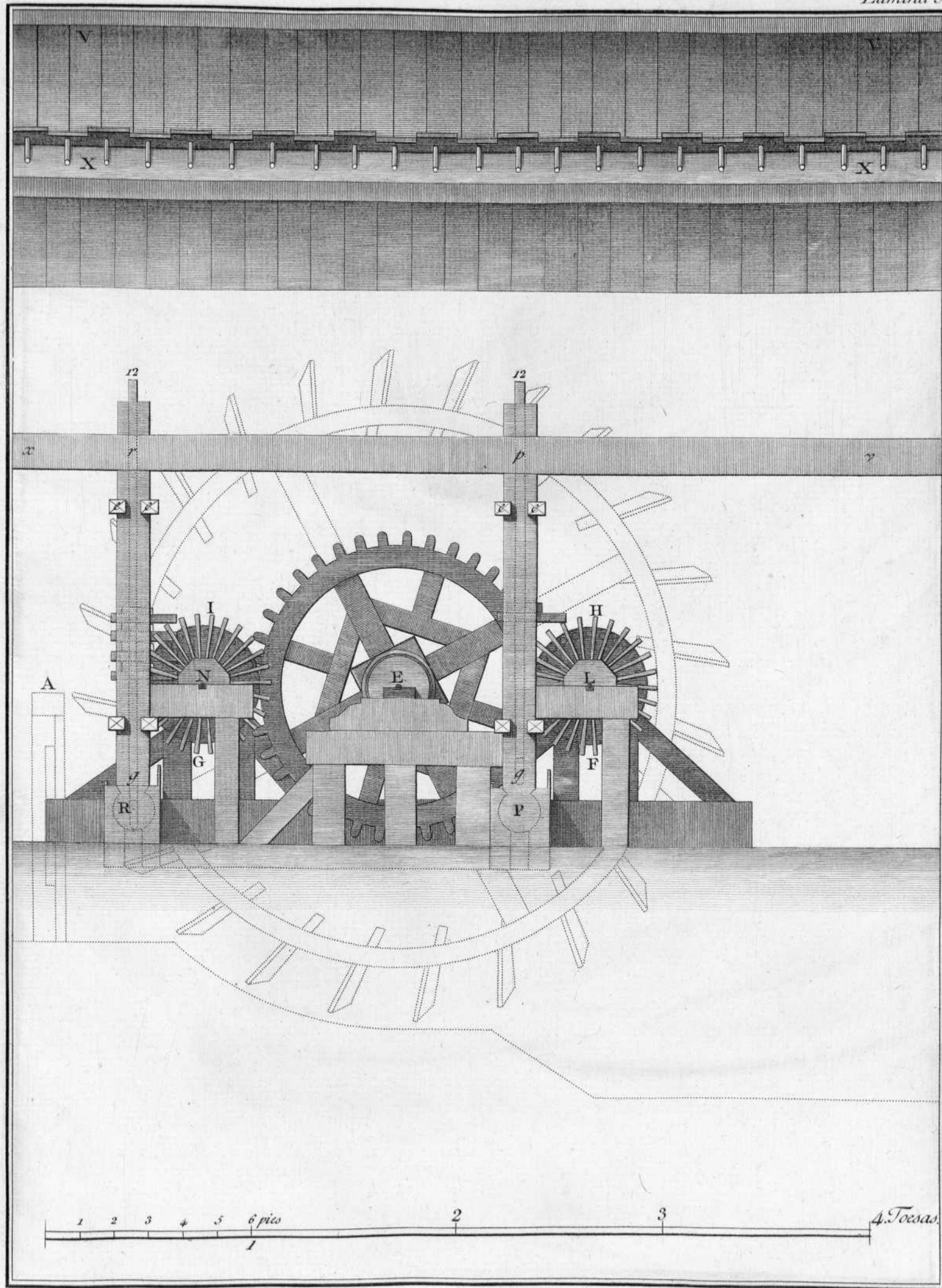
ARTICULO VI.

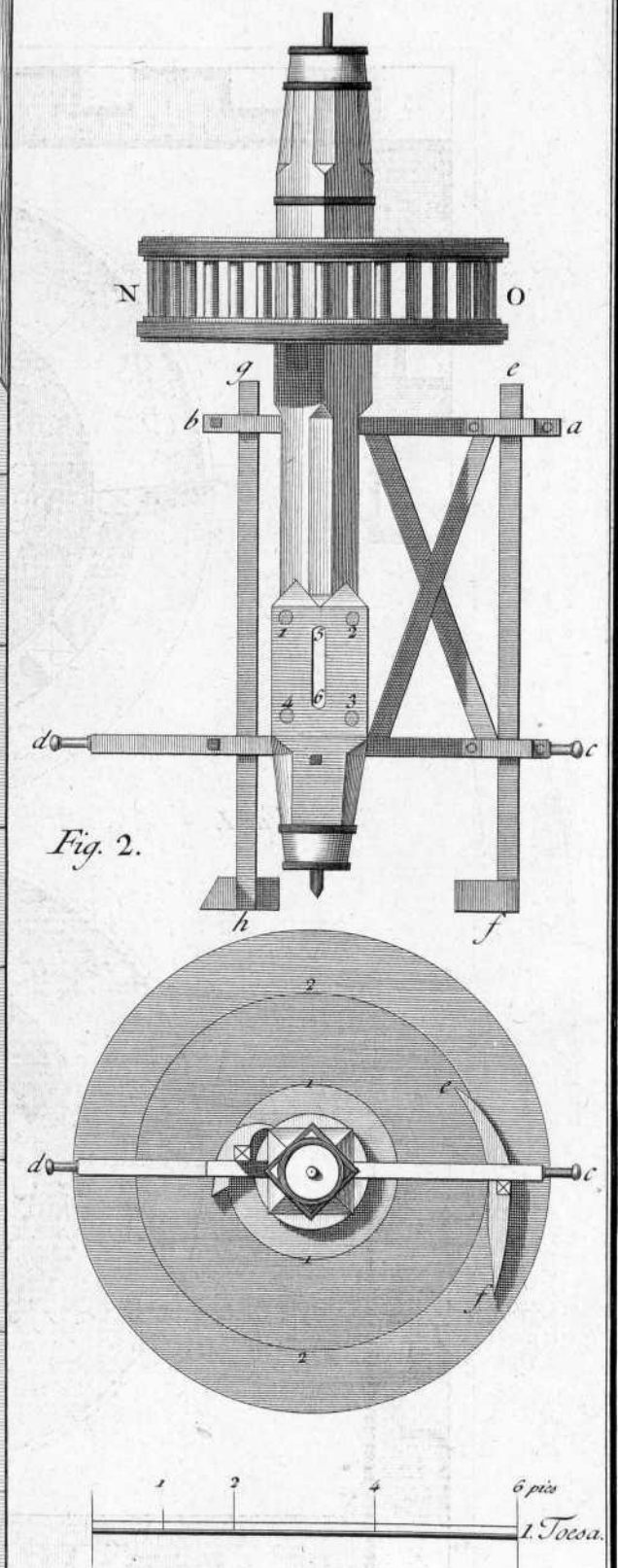
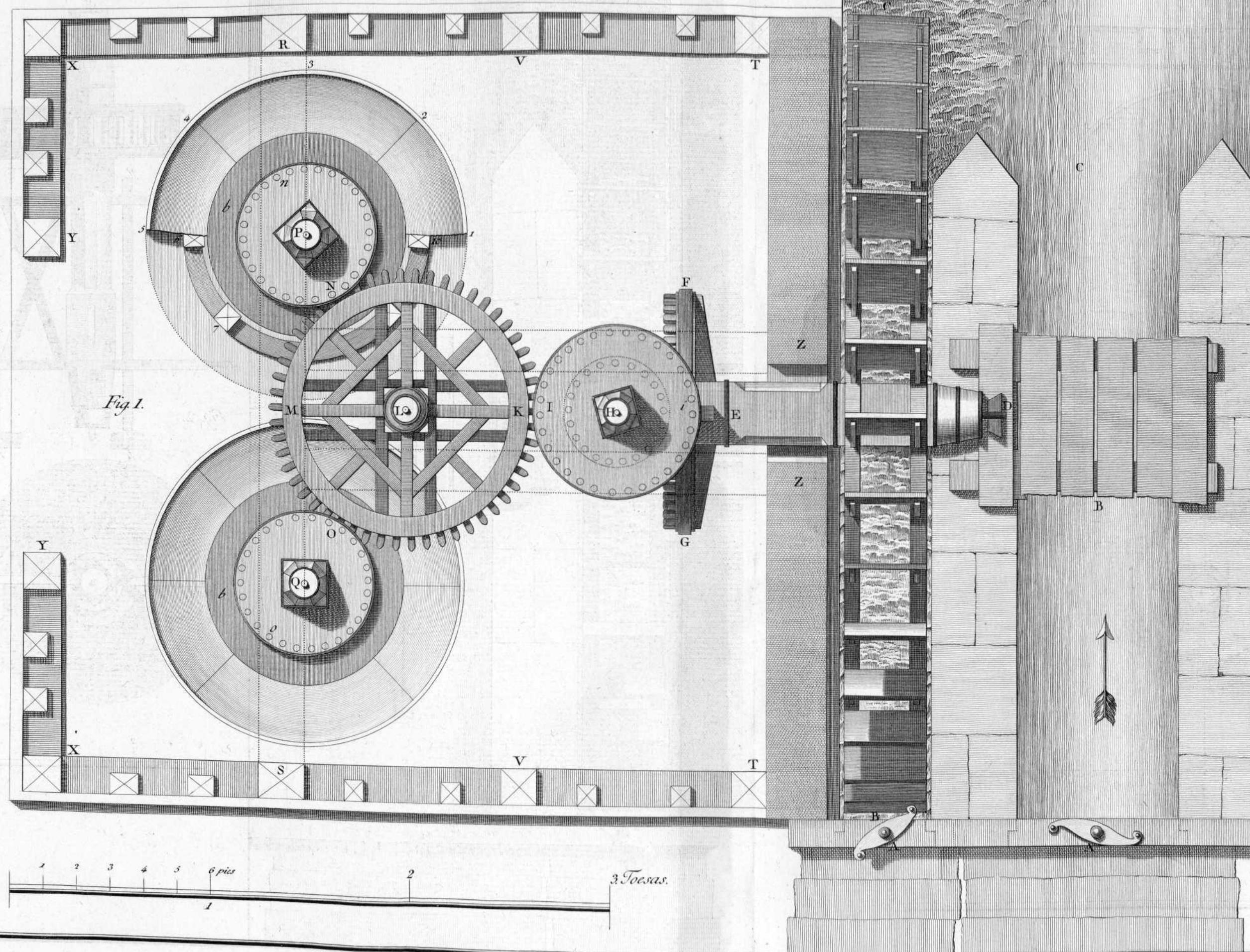
Trata de la defensa de las plazas sin referirse á láminas.

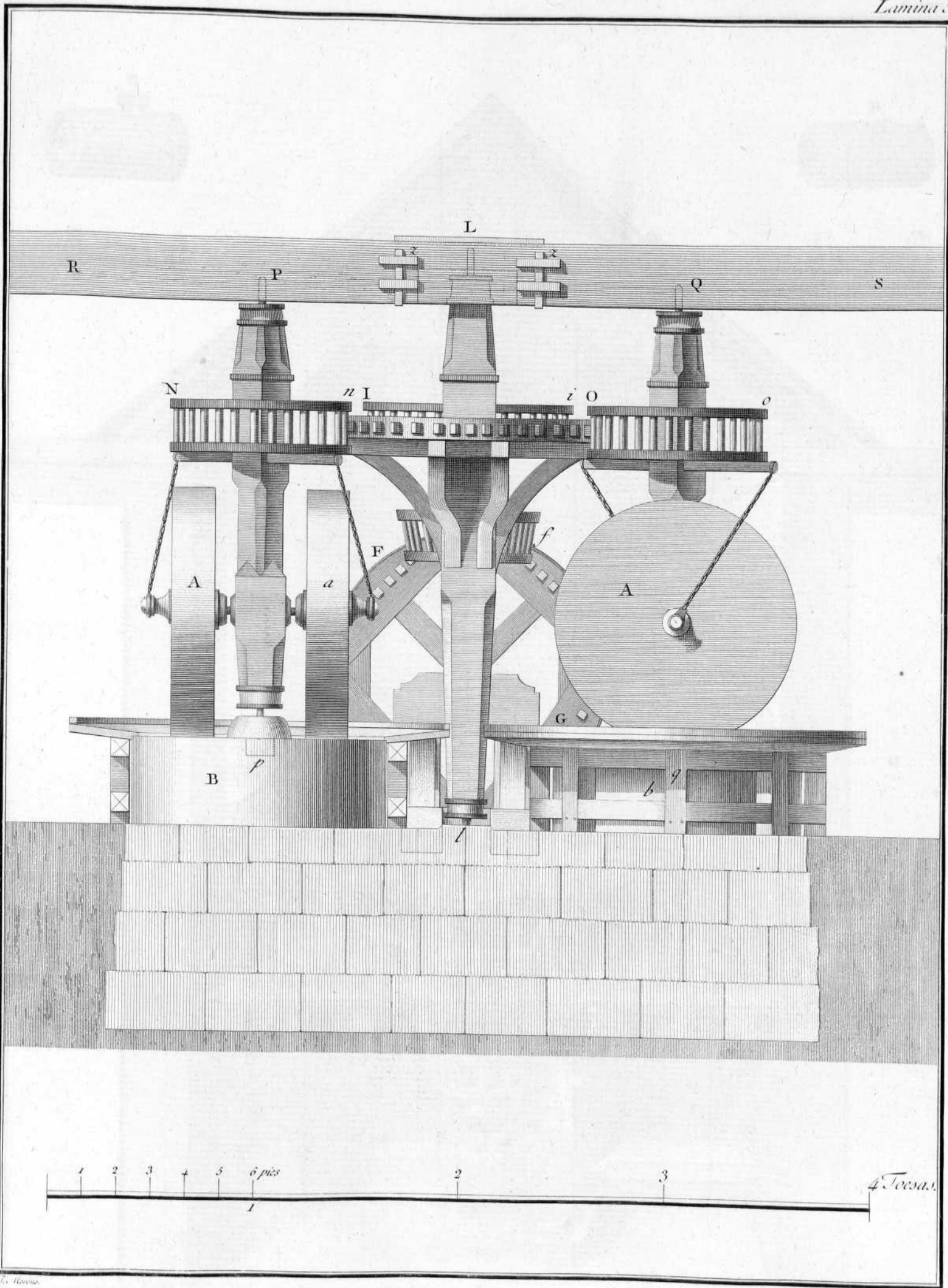


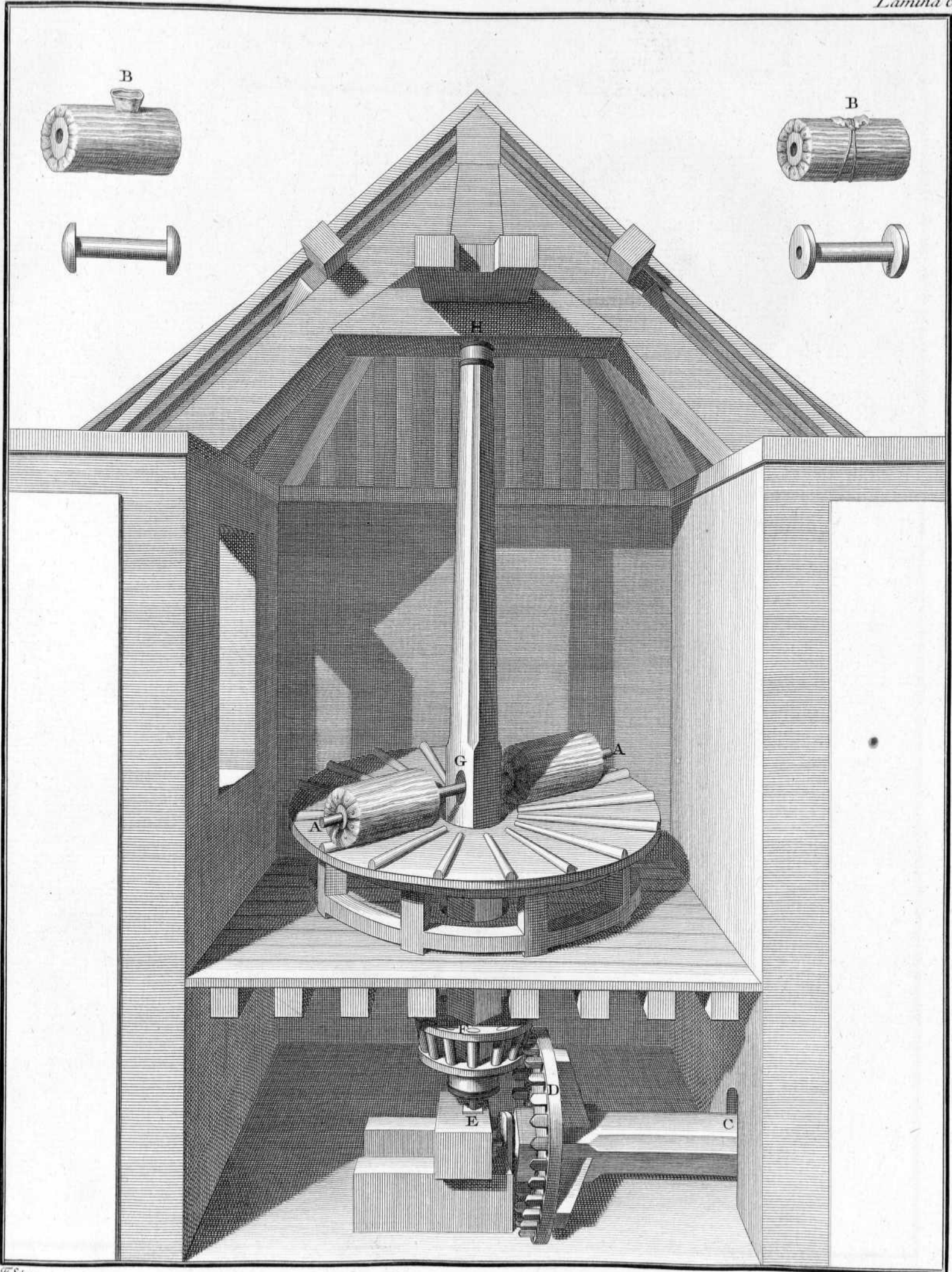














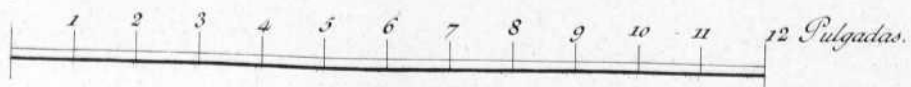


Fig. 1.

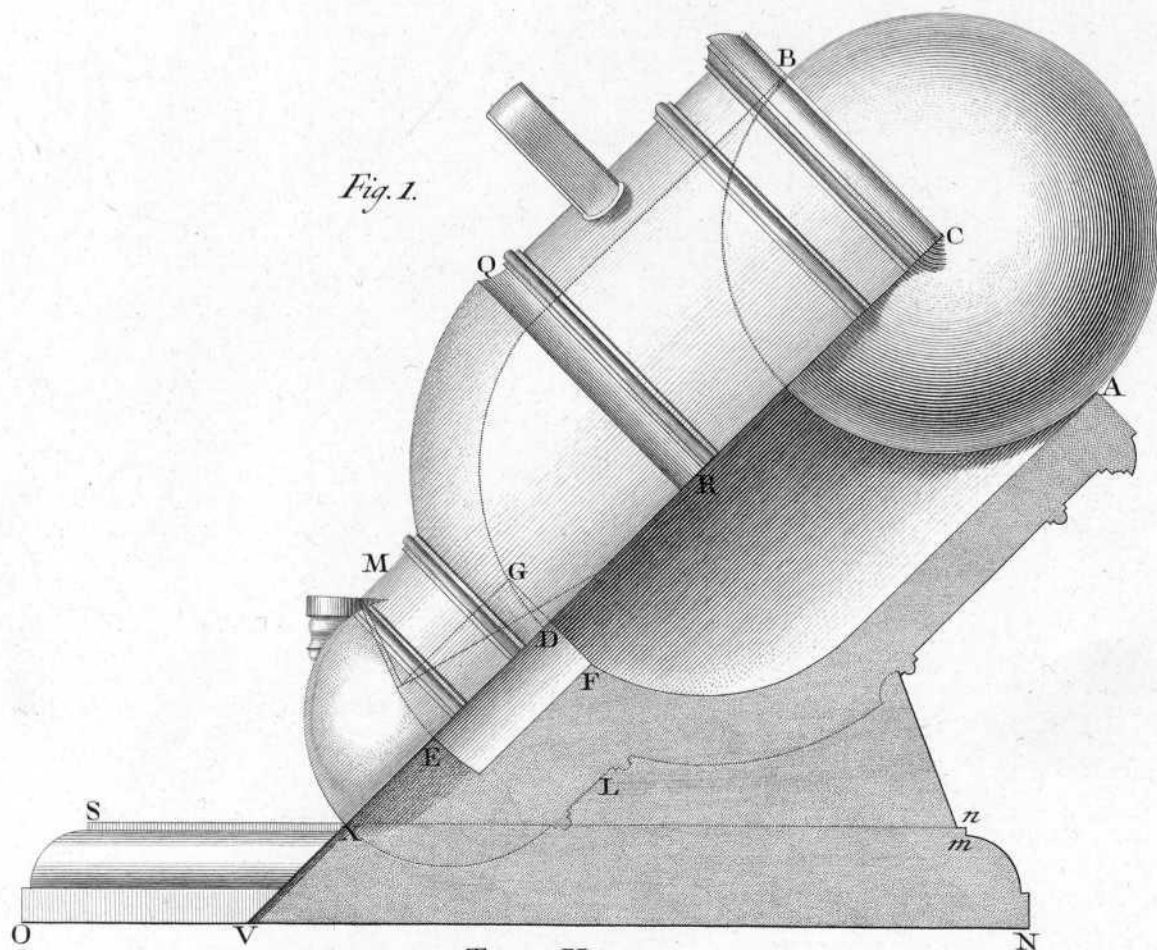


Fig. 2.

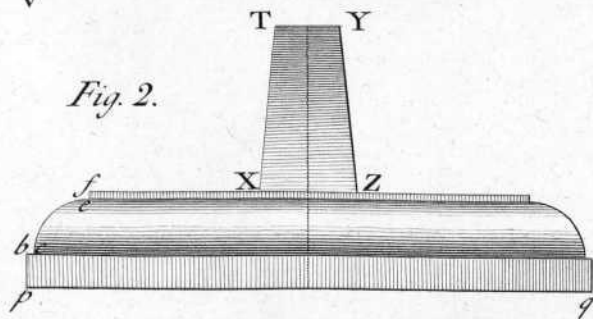


Fig. 3.

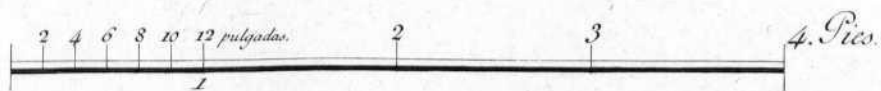
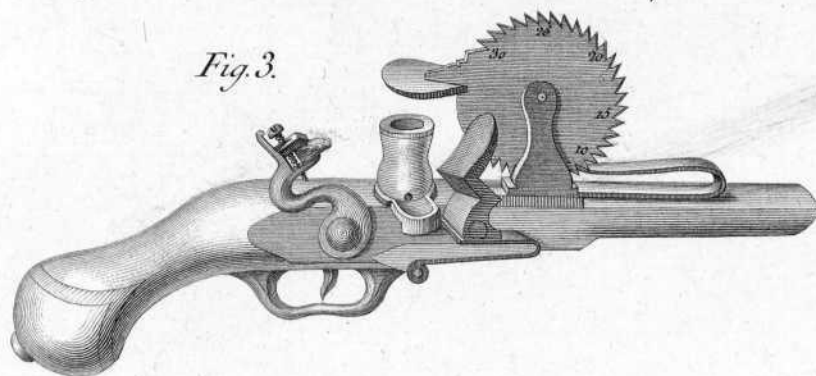


Fig. 3.

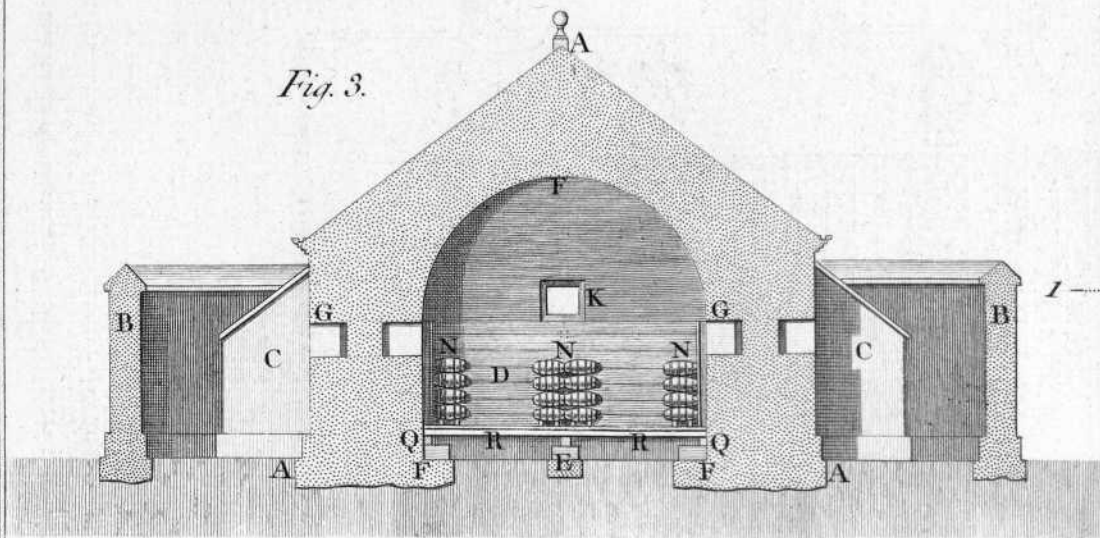


Fig. 4.

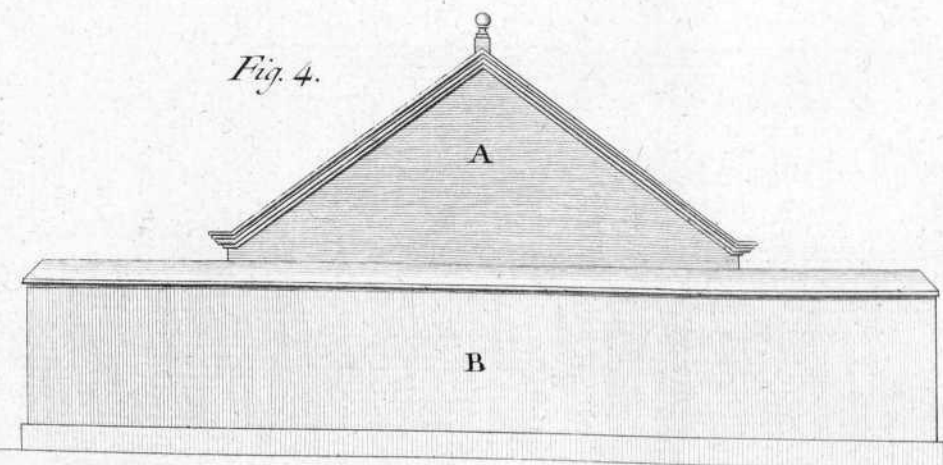


Fig. 1.

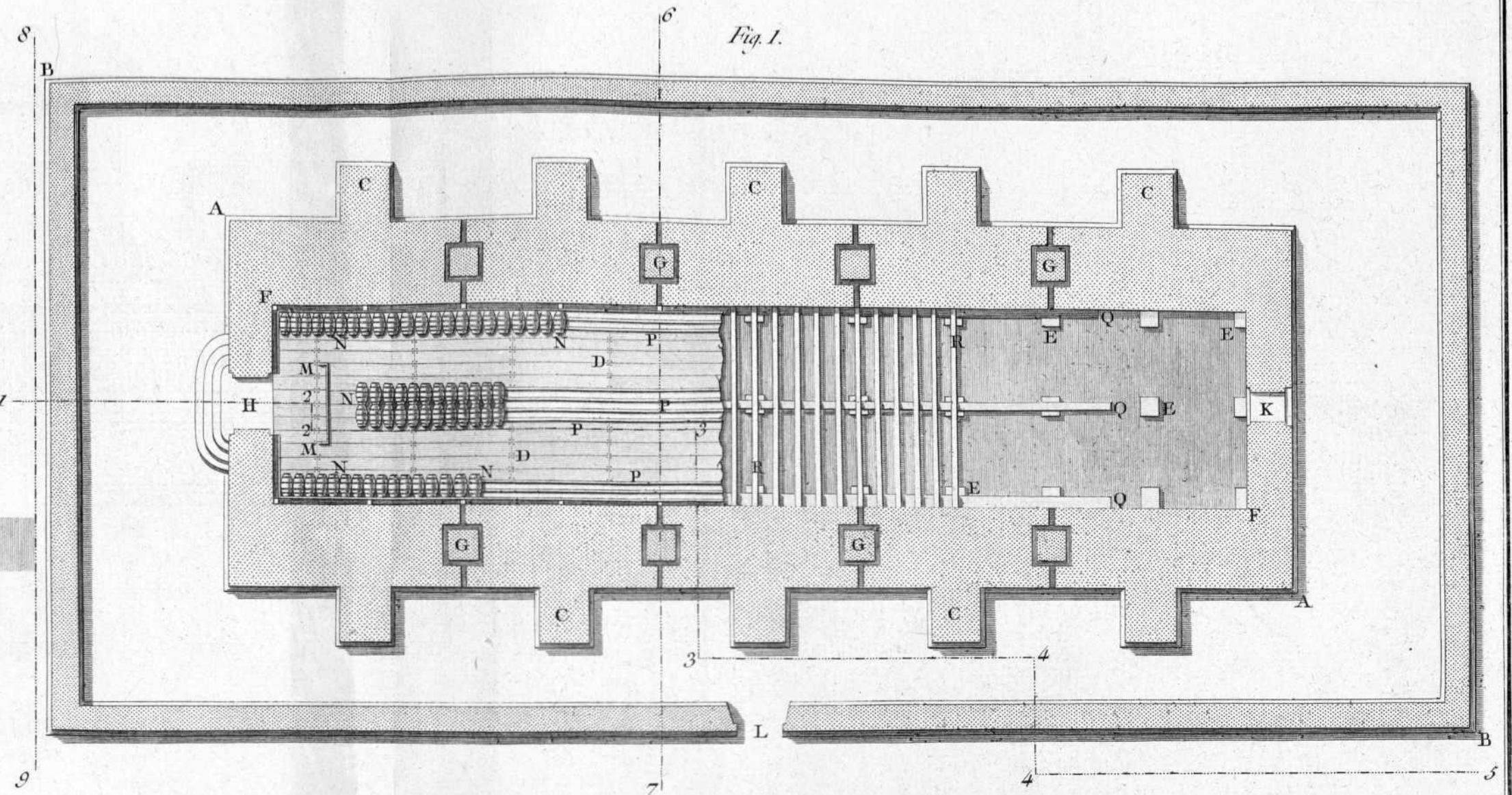
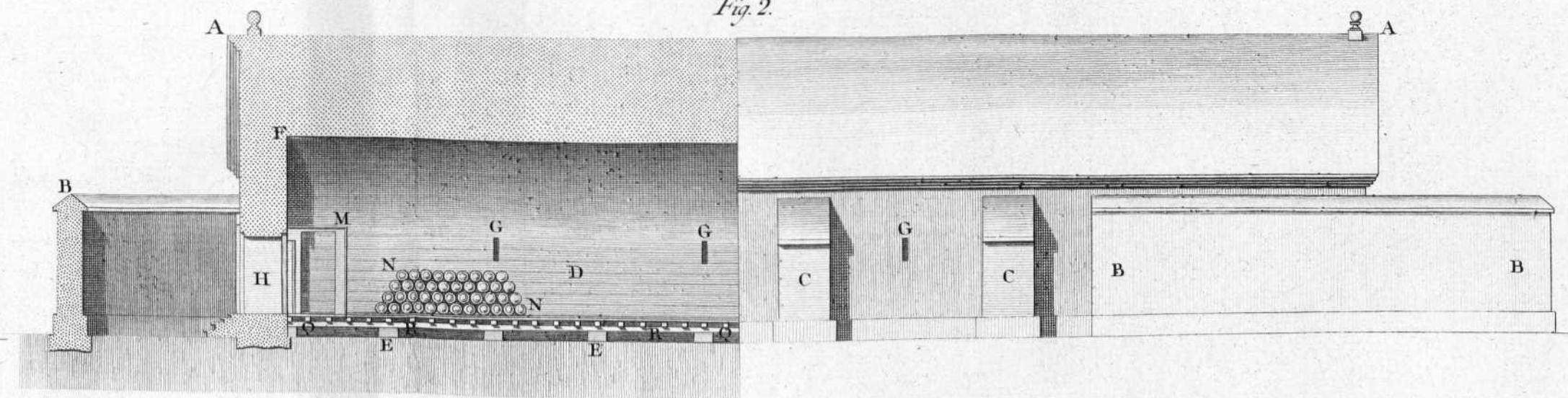
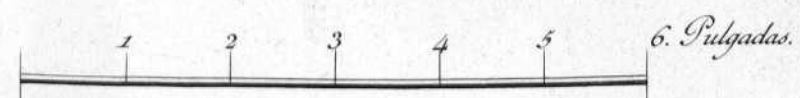
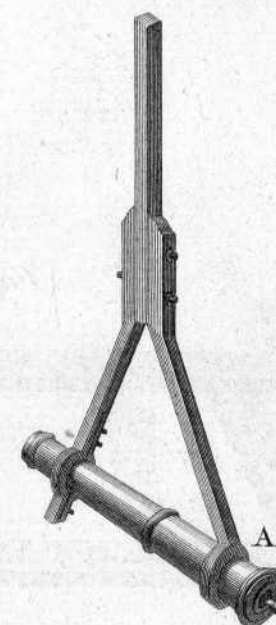
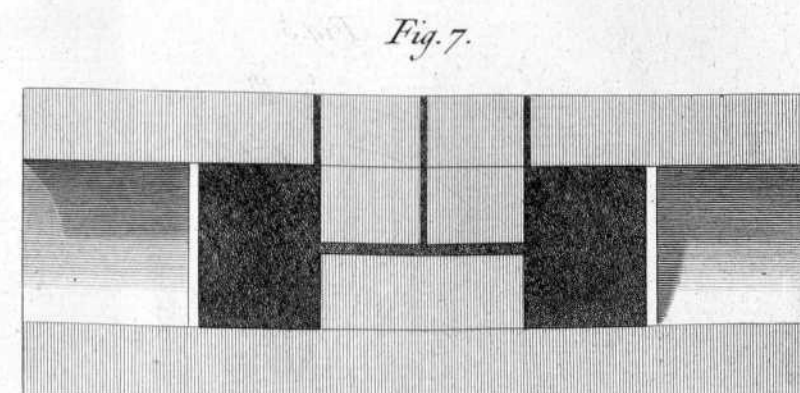
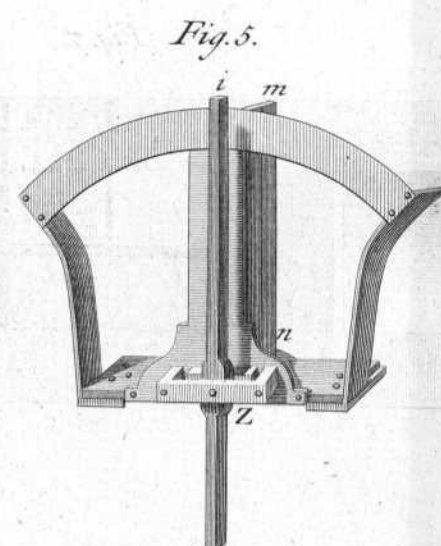
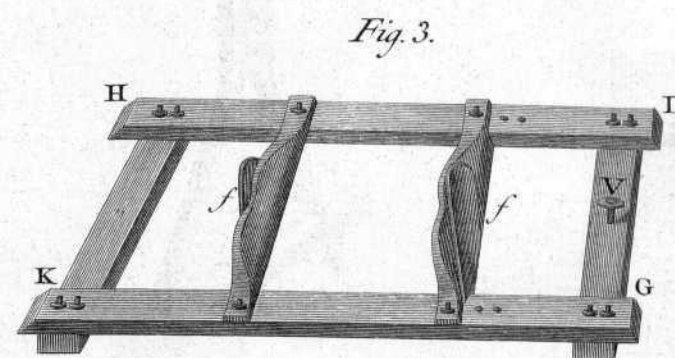
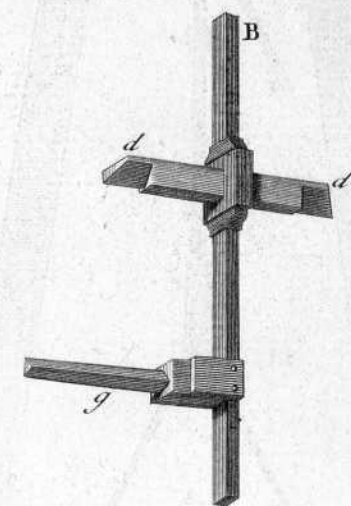
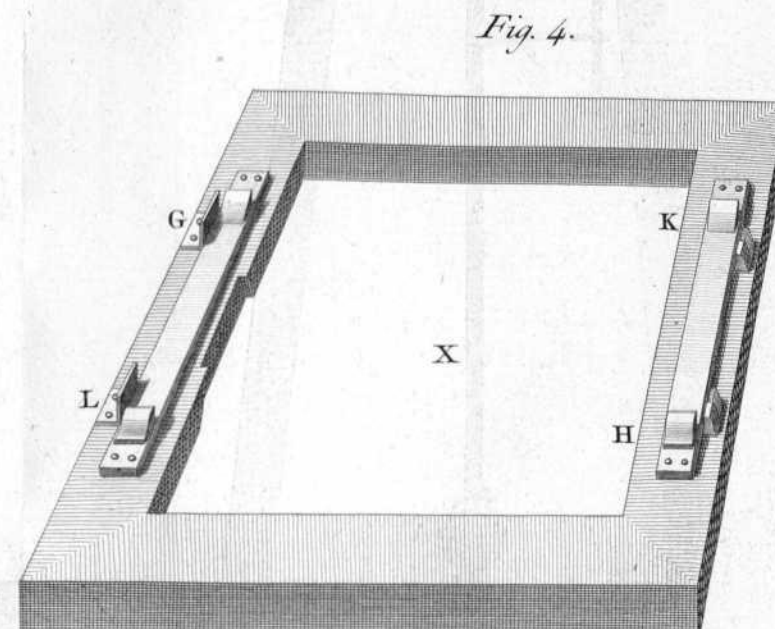
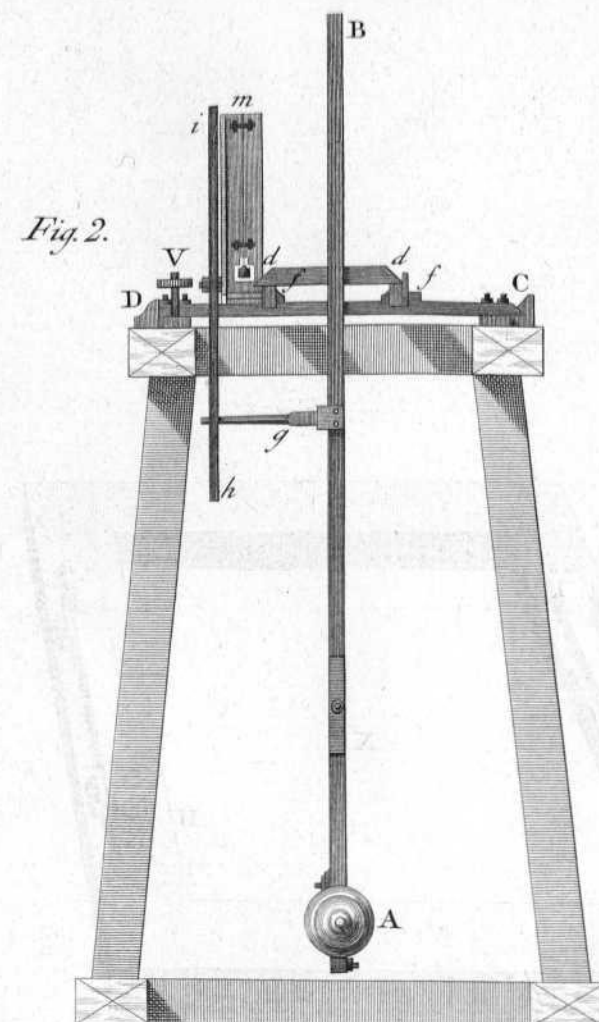
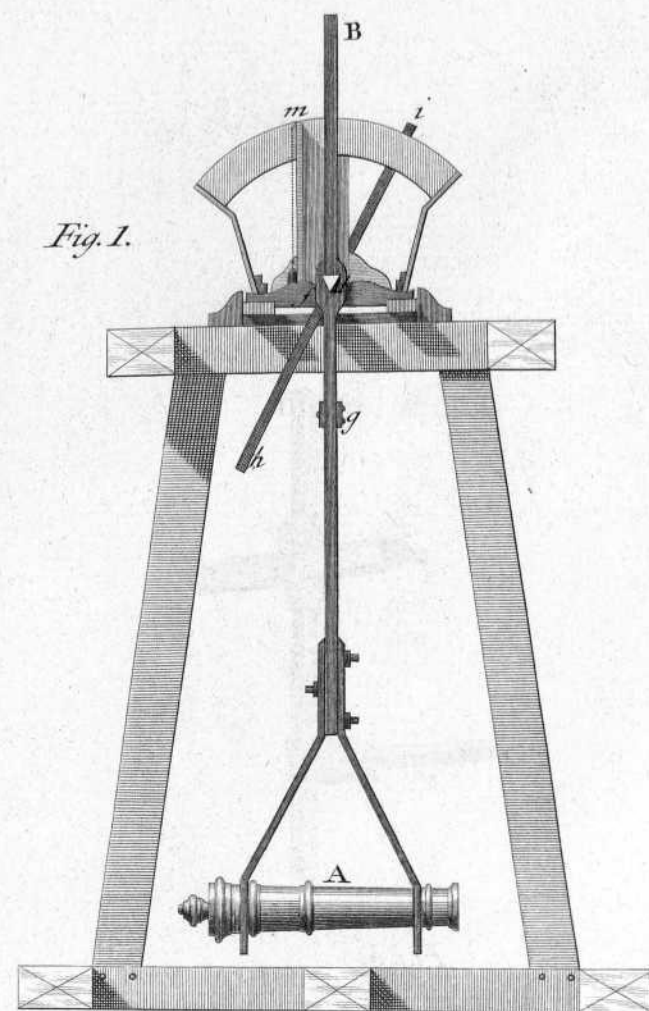
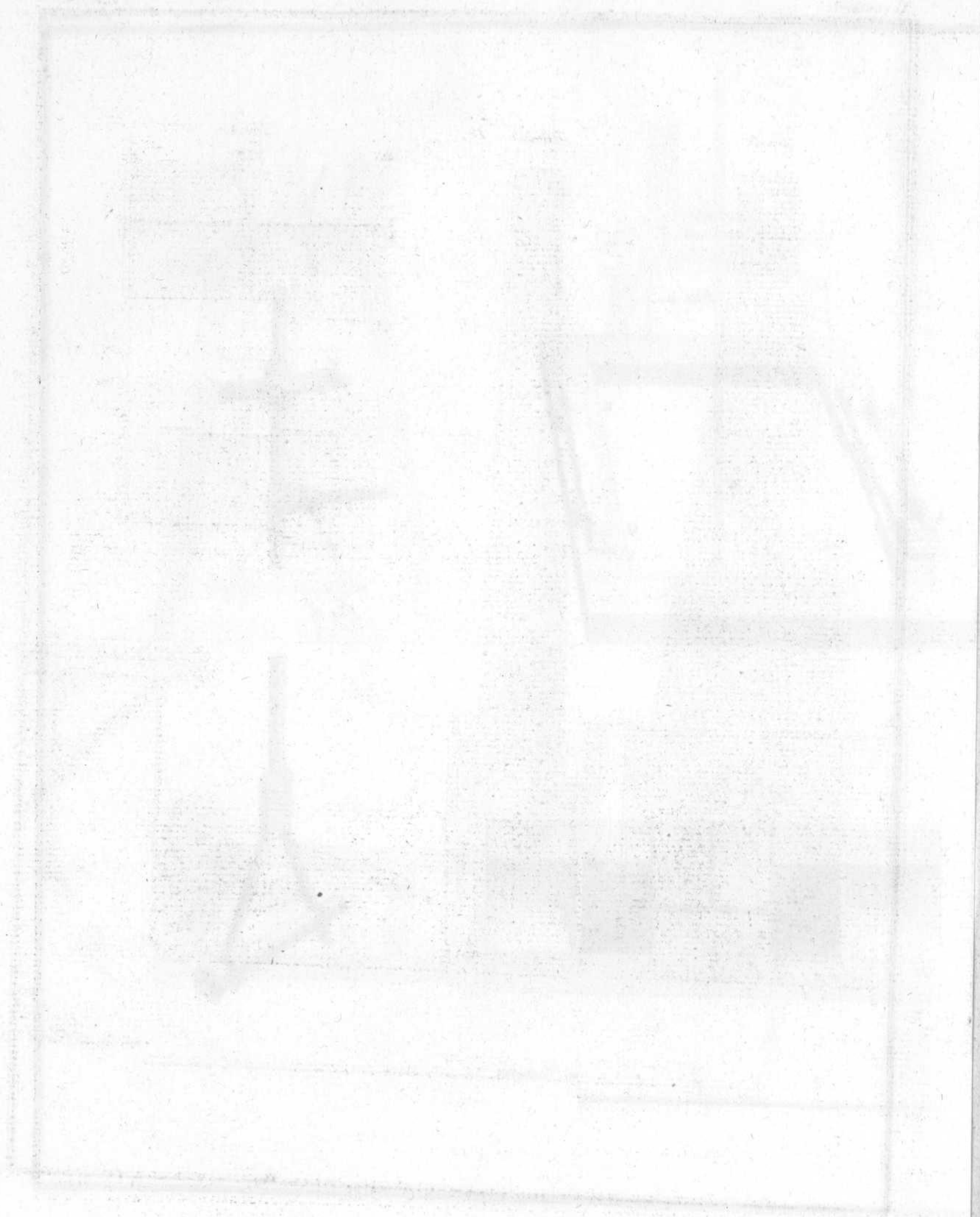


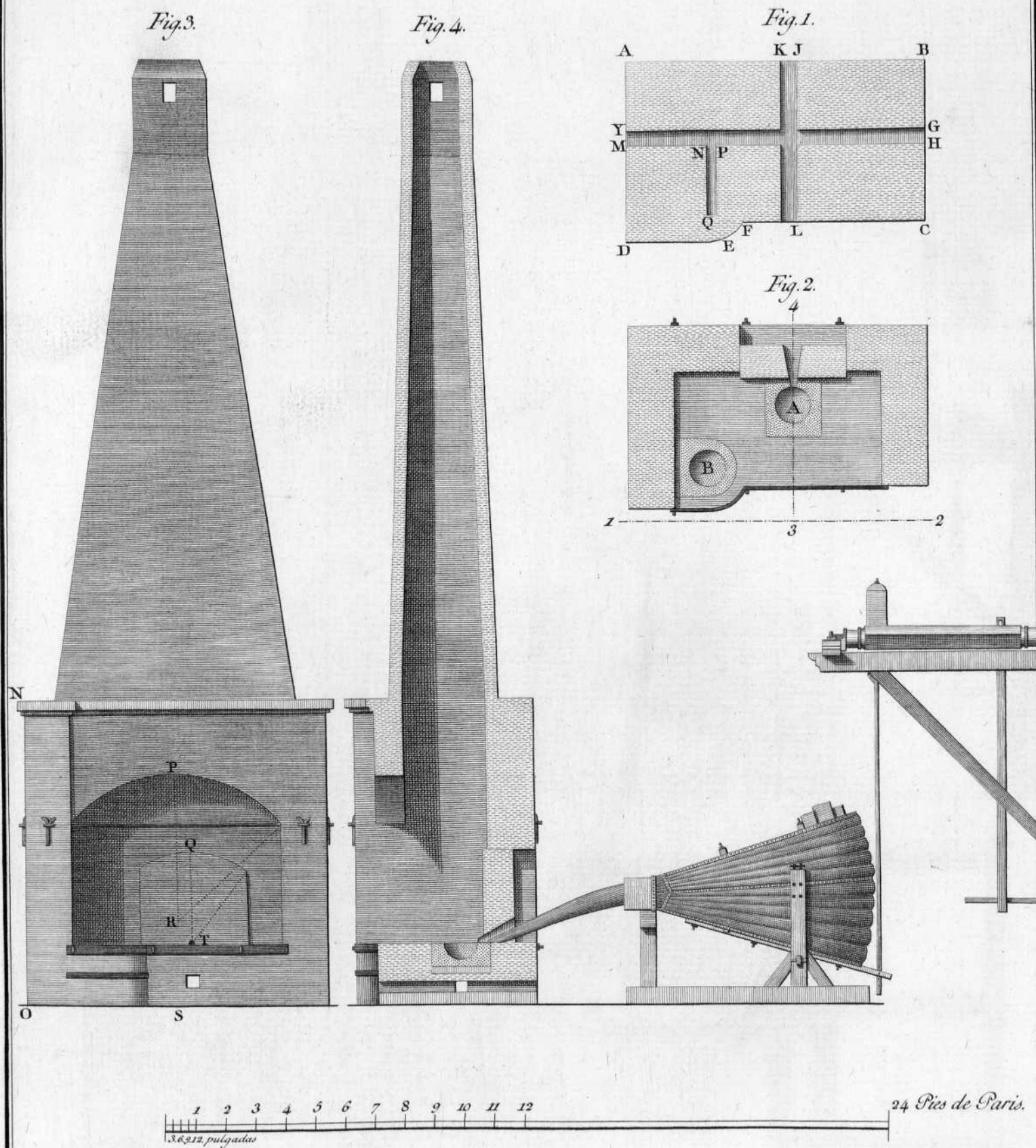
Fig. 2.

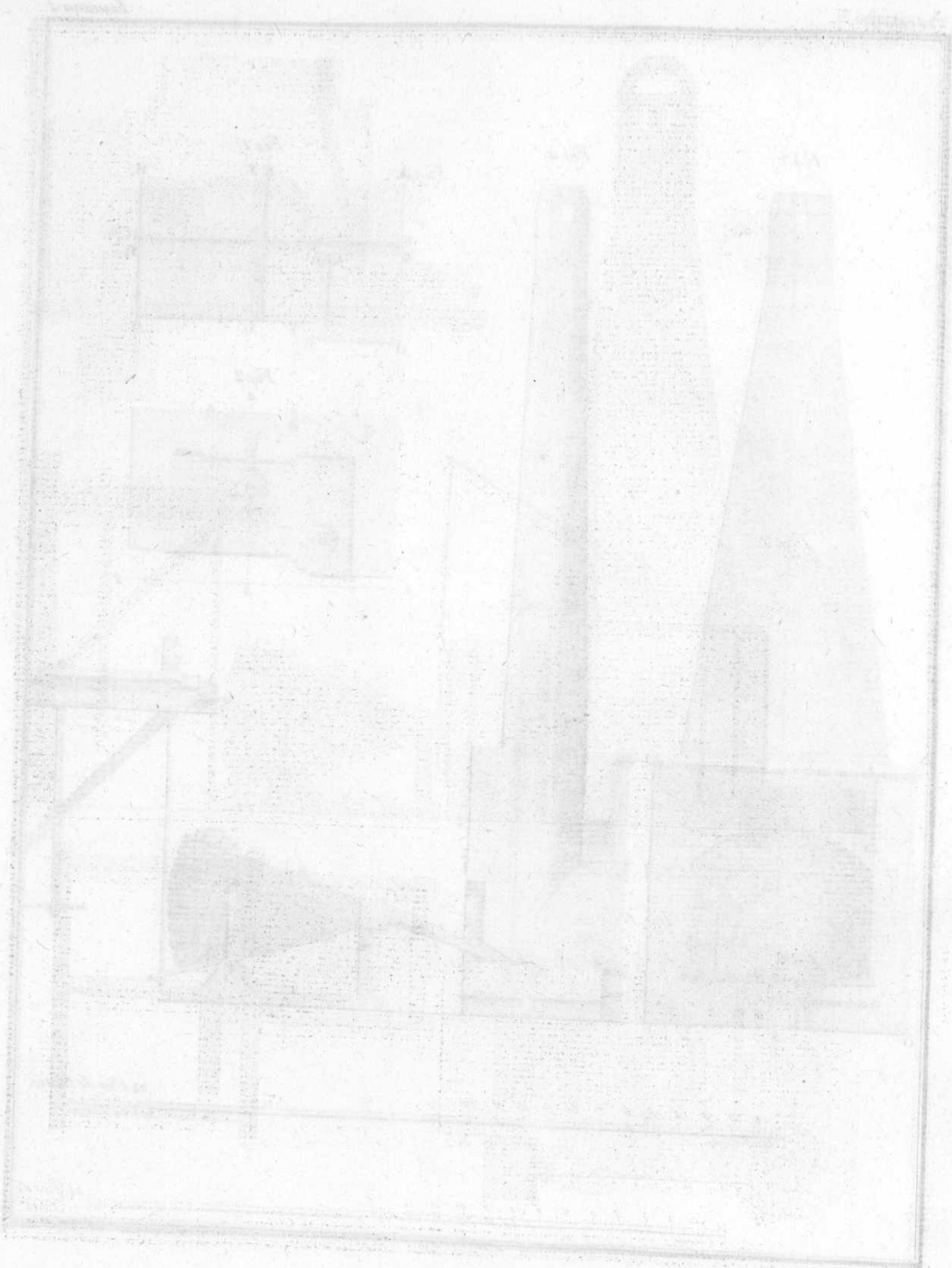


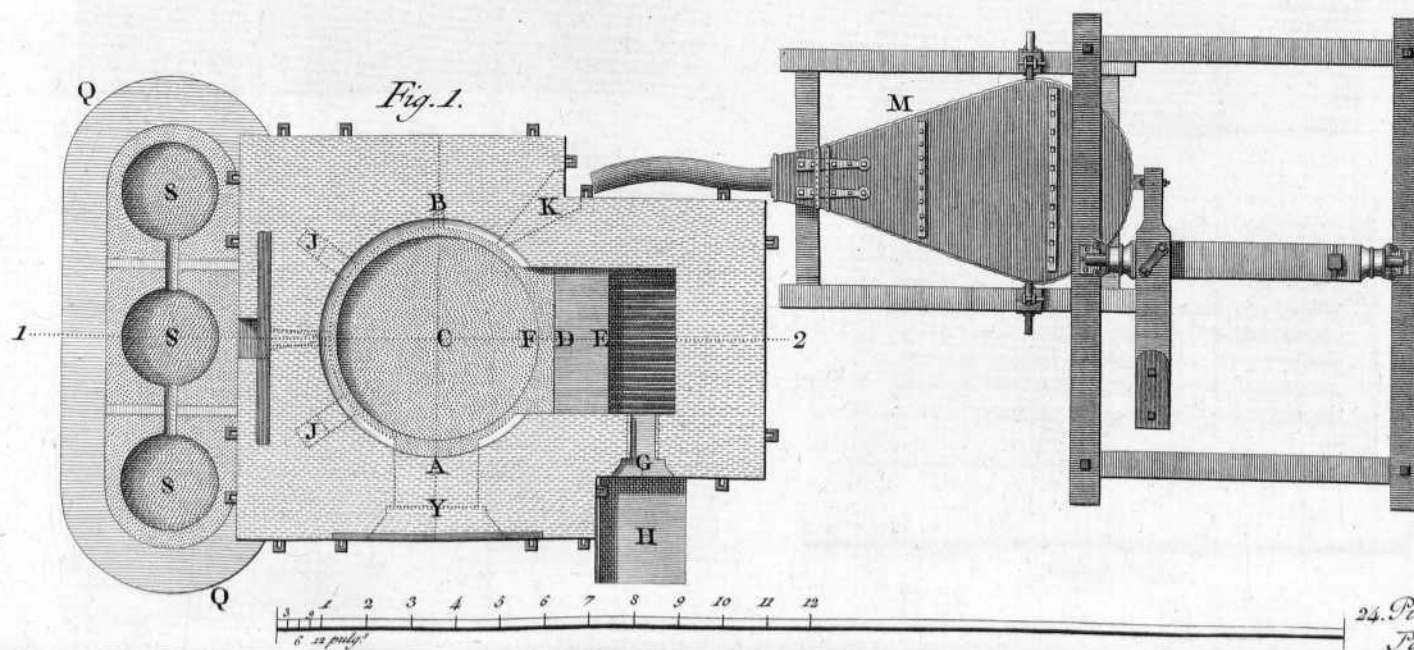
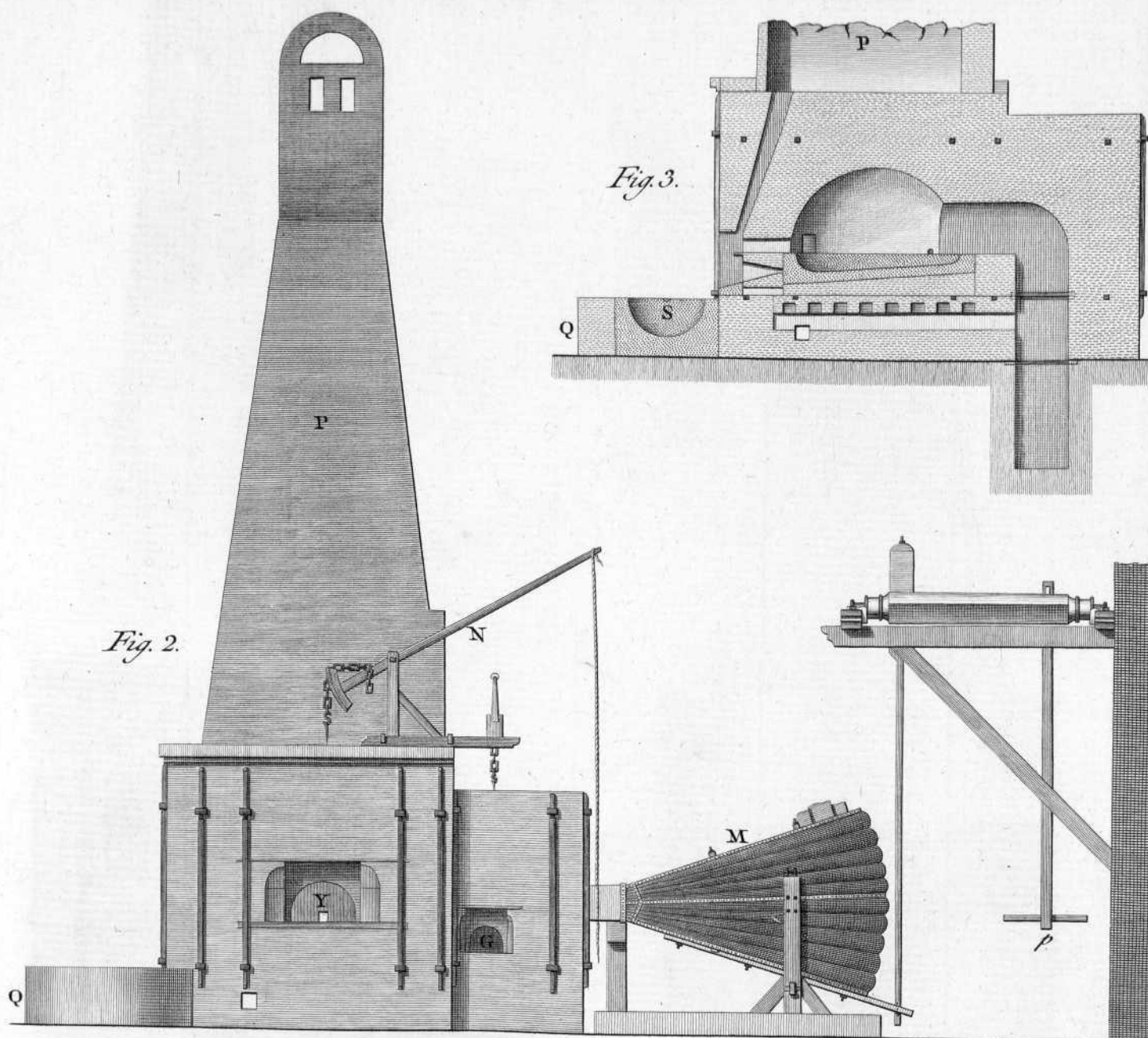
1 2 3 4 5 10 15 20 25 30 35 Varas.

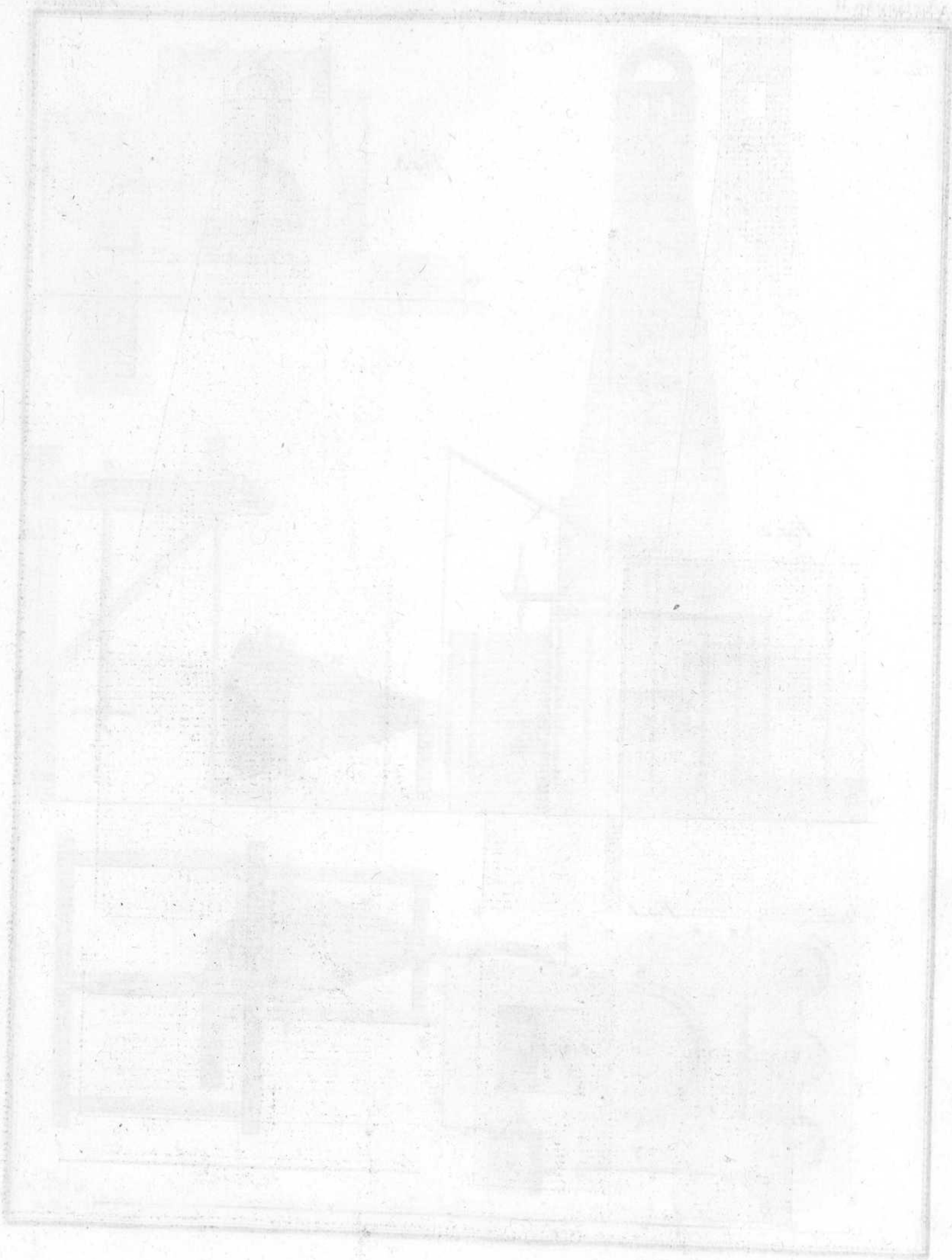












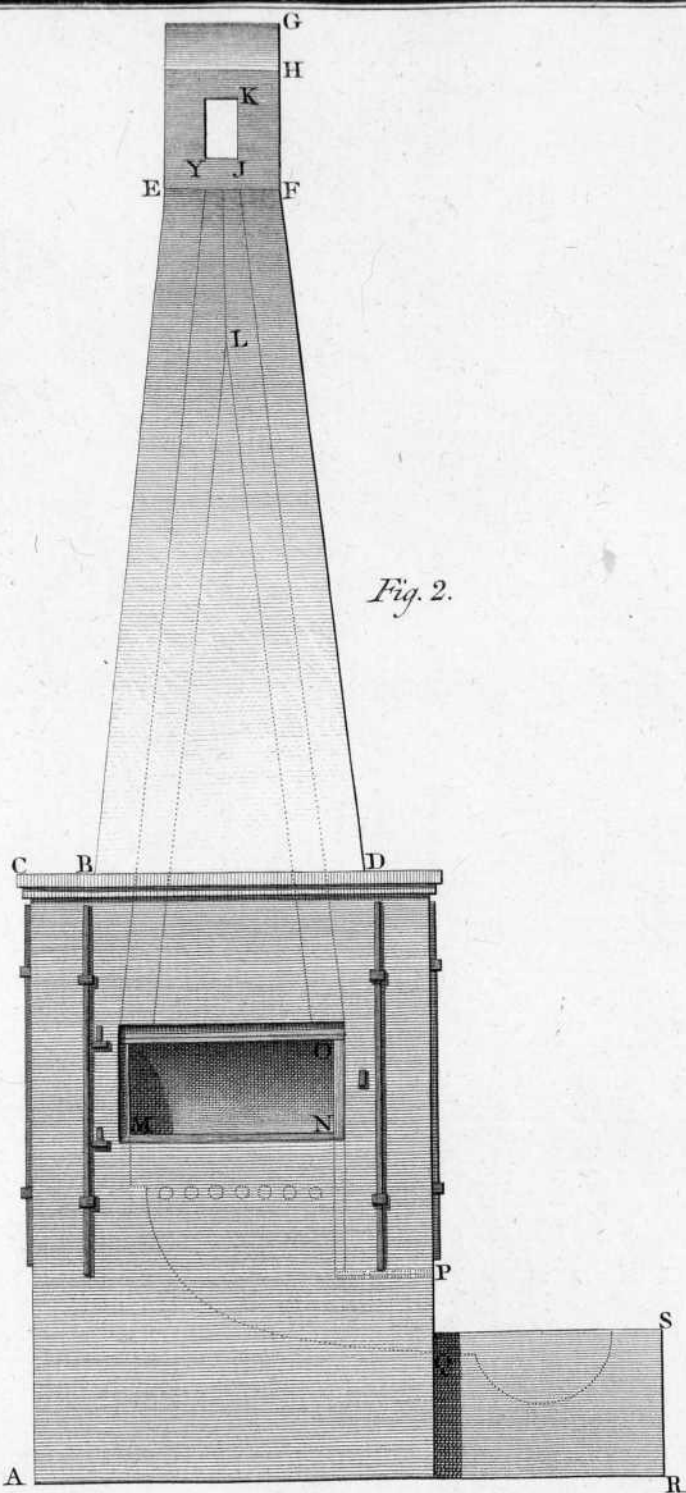


Fig. 2.

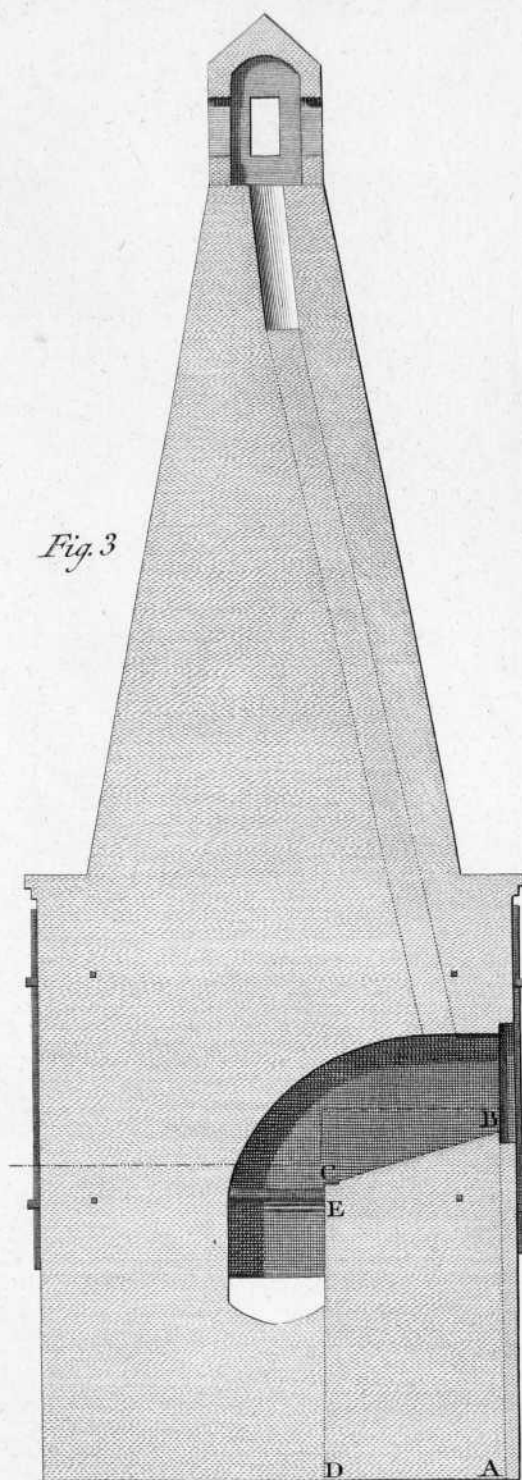


Fig. 3.

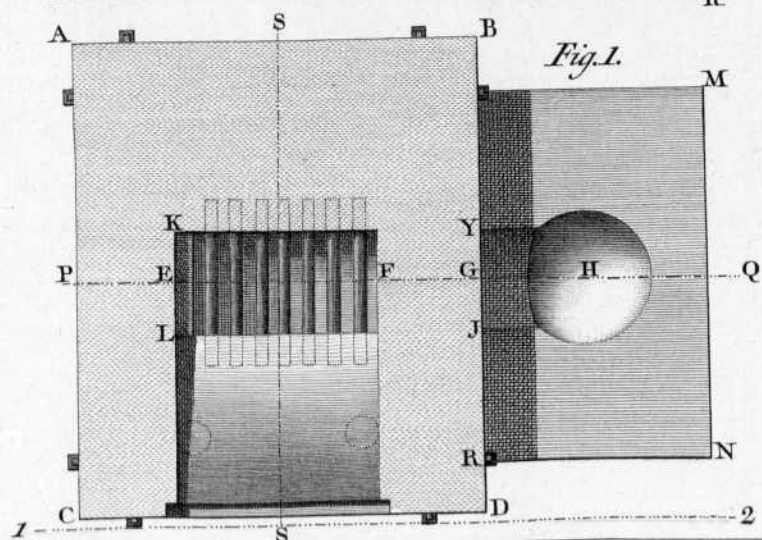


Fig. 1.

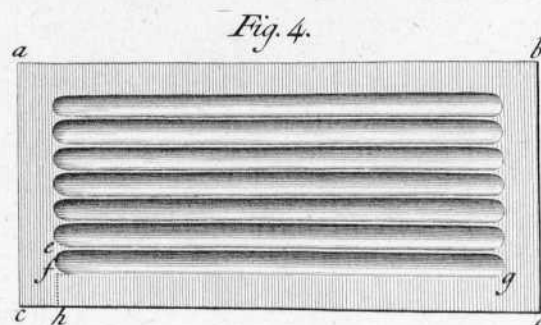


Fig. 4.



Fig. 1.

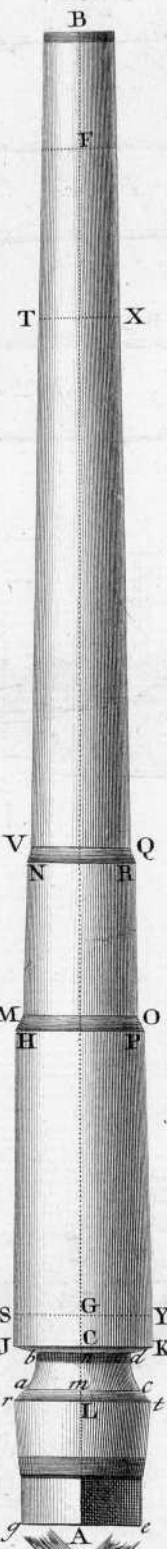


Fig. 13.

Fig. 2.

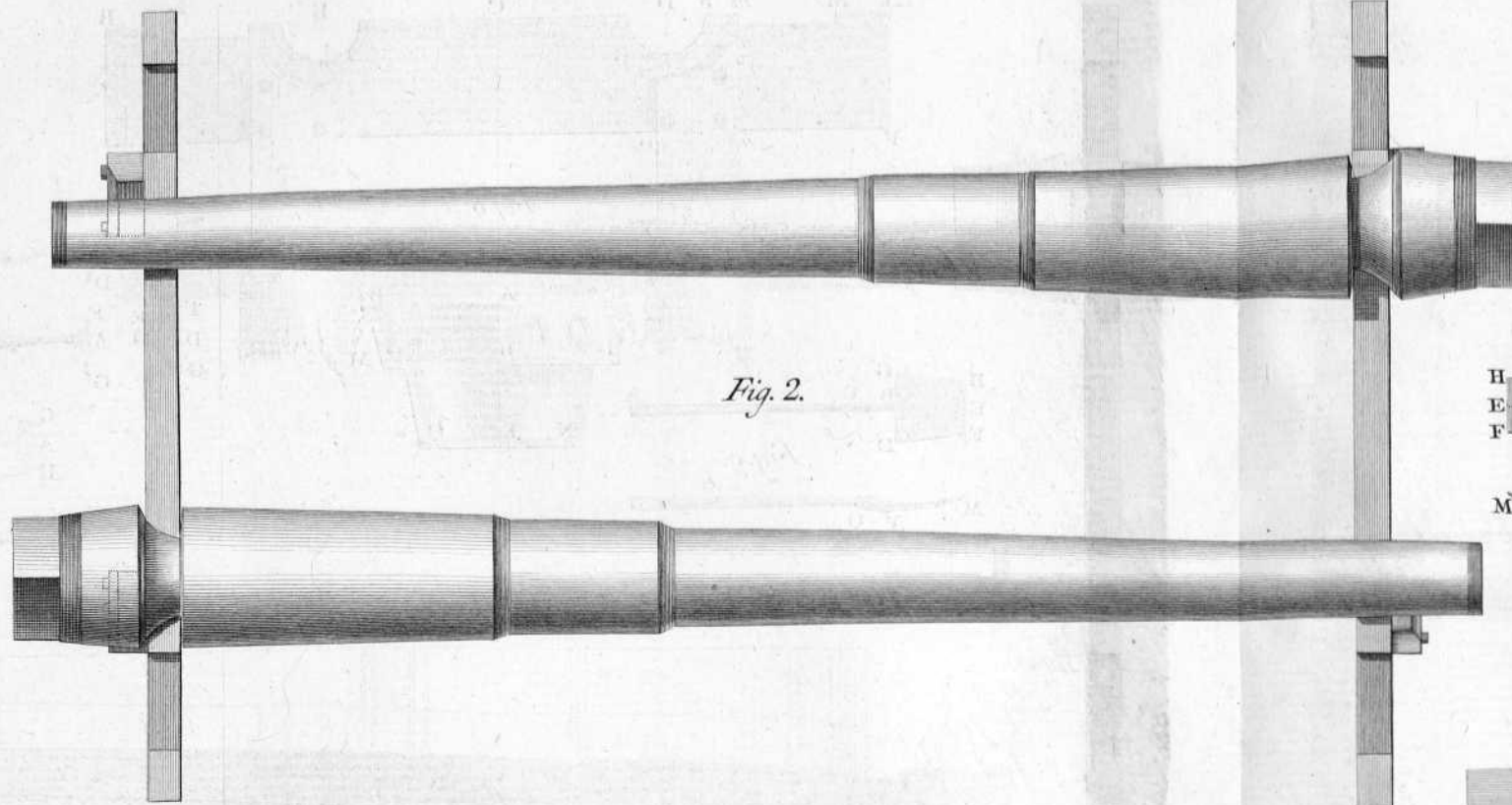


Fig. 3.

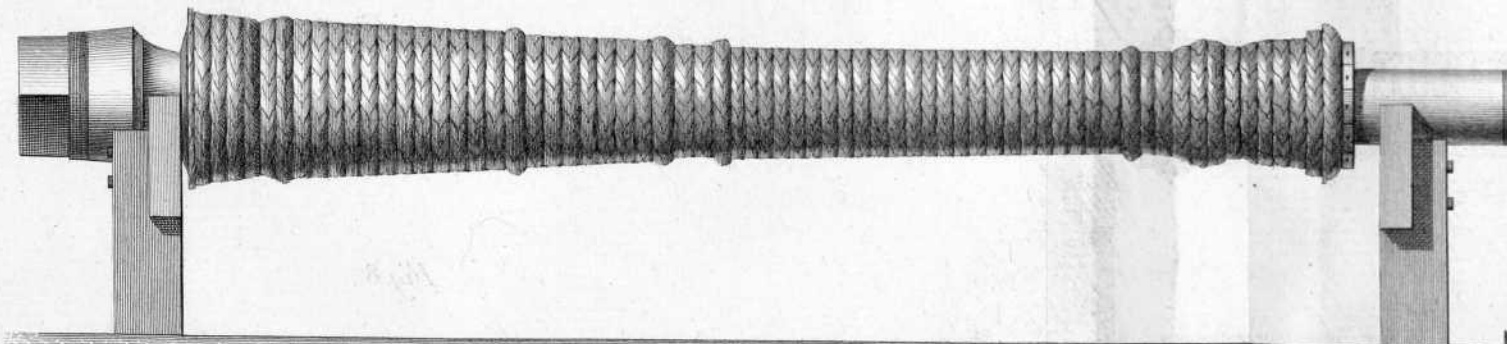


Fig. 4.

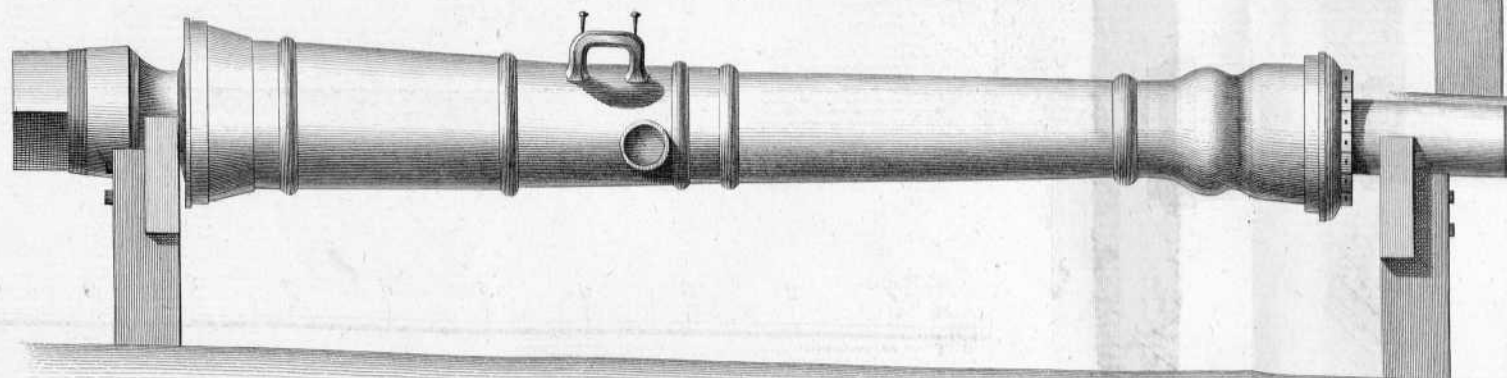


Fig. 5.

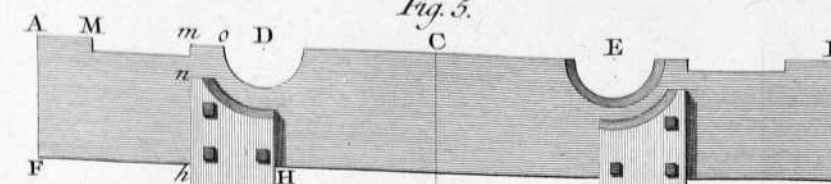


Fig. 6.

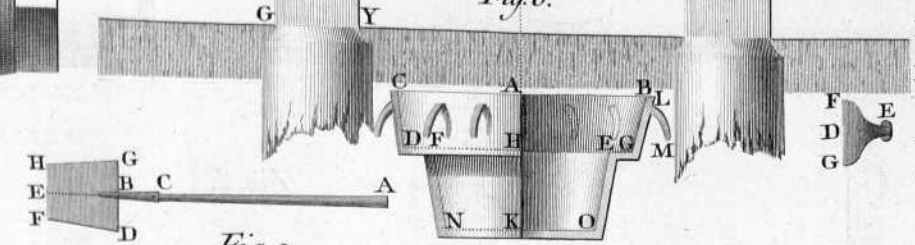


Fig. 9.



Fig. 10.

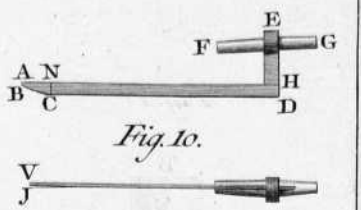


Fig. 11.

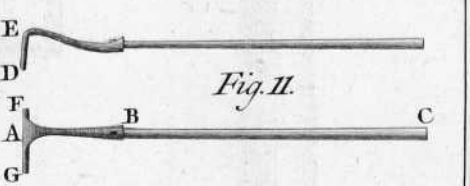


Fig. 12.



Fig. 7.

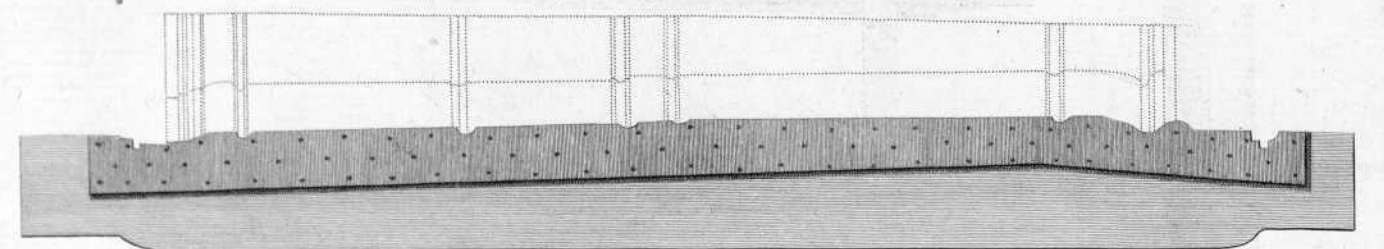


Fig. 8.

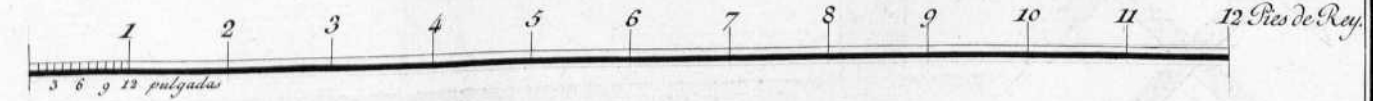
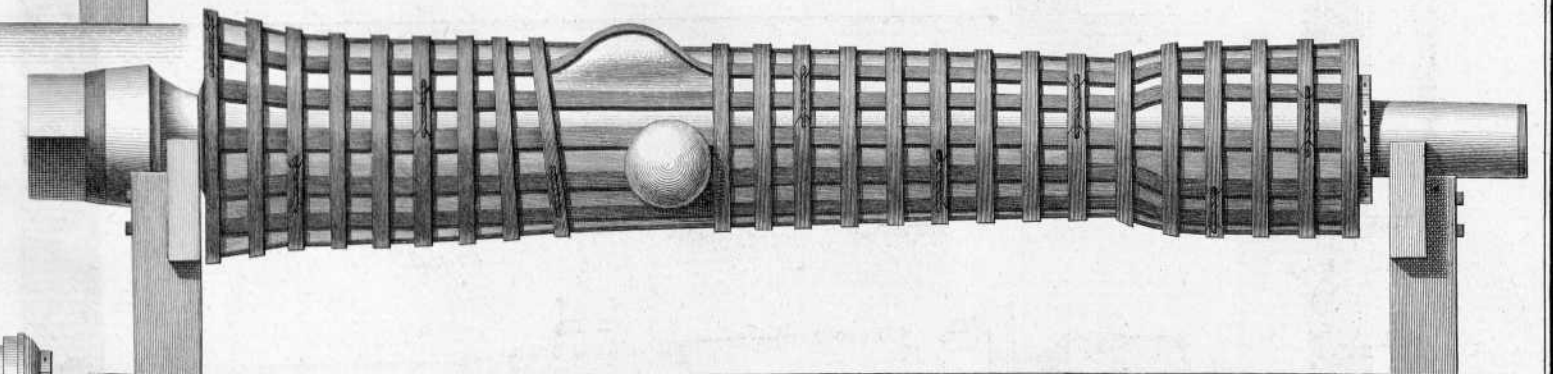


Fig. 1.

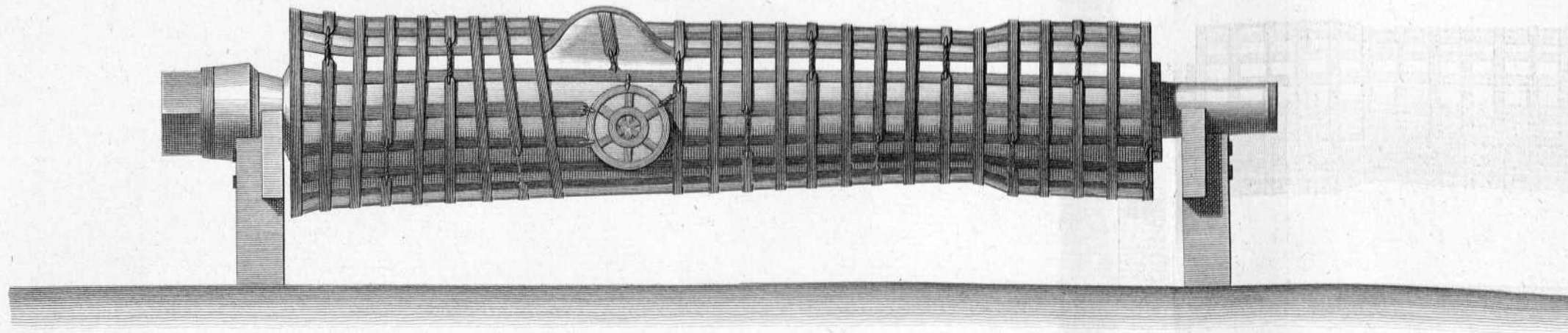


Fig. 2.

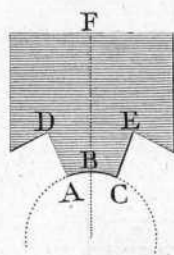


Fig. 3.

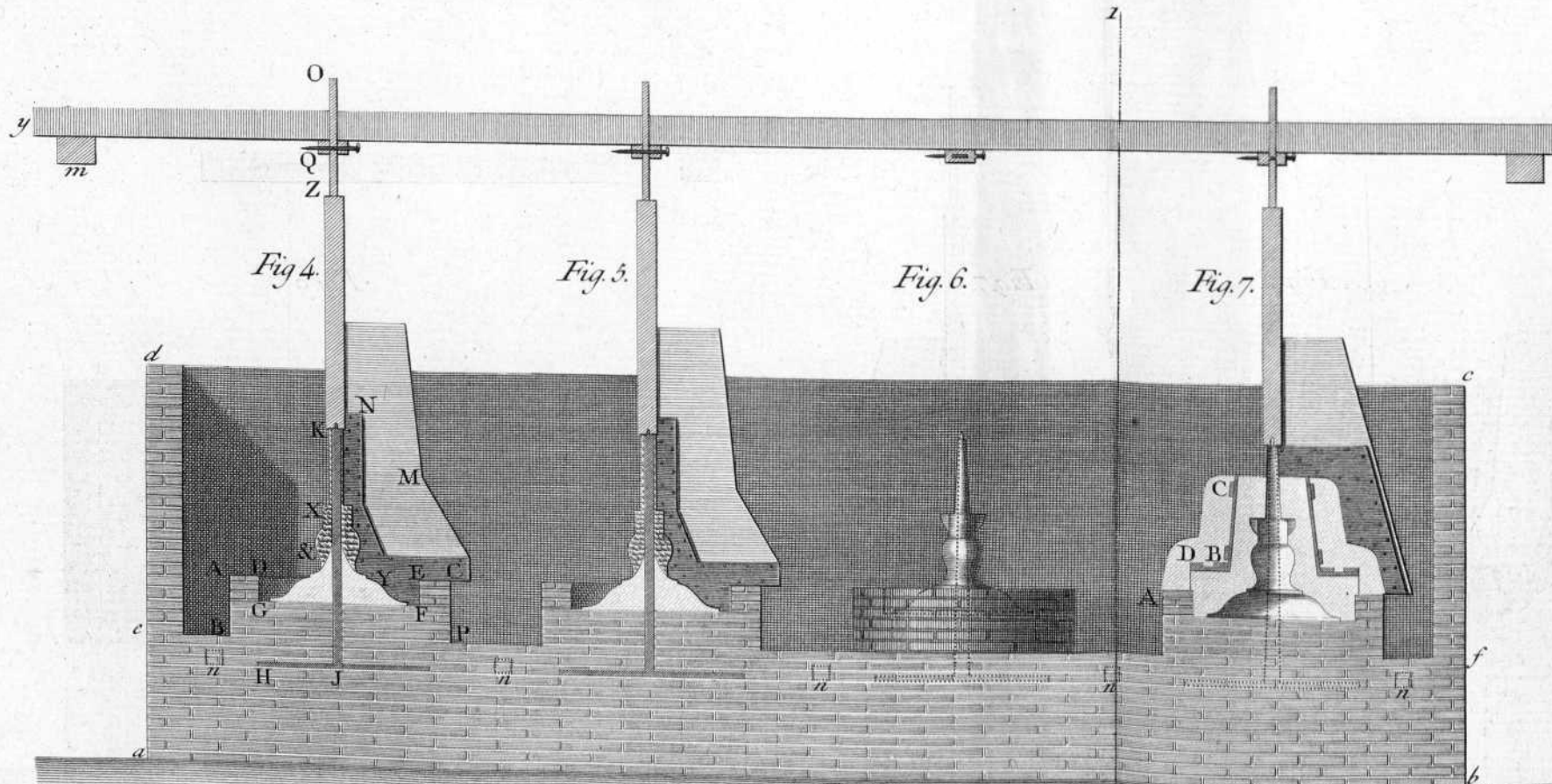
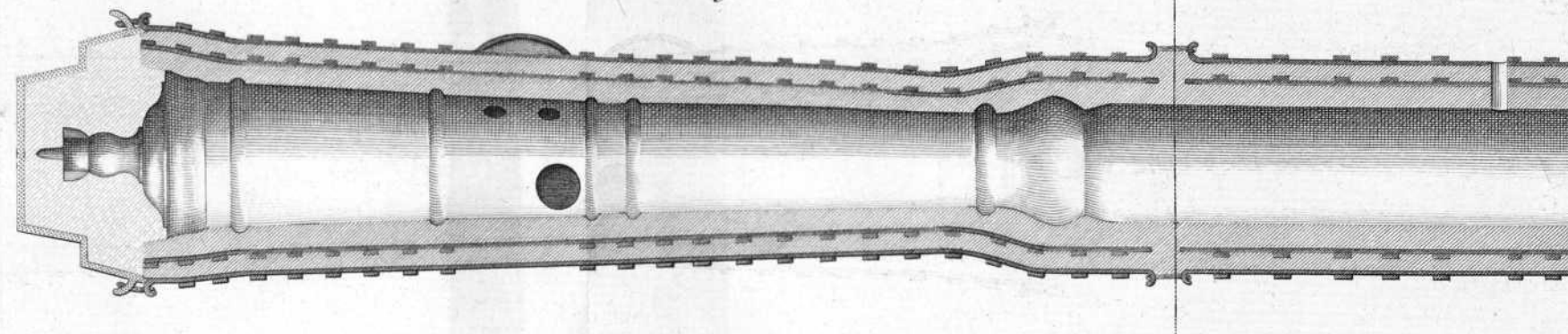


Fig. 9.

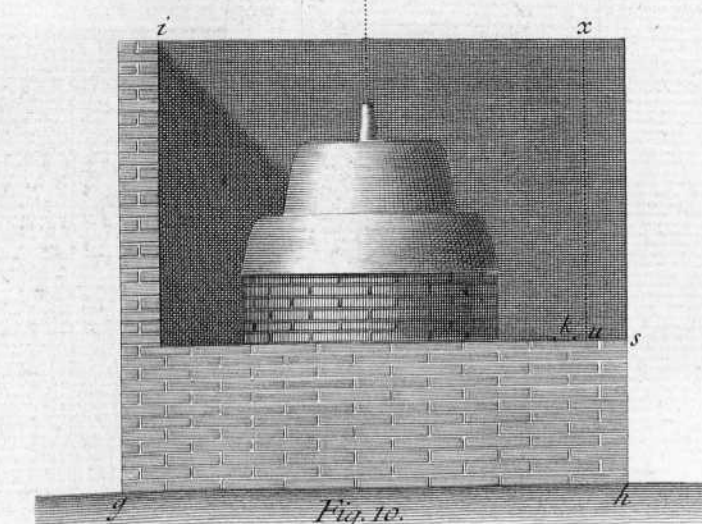
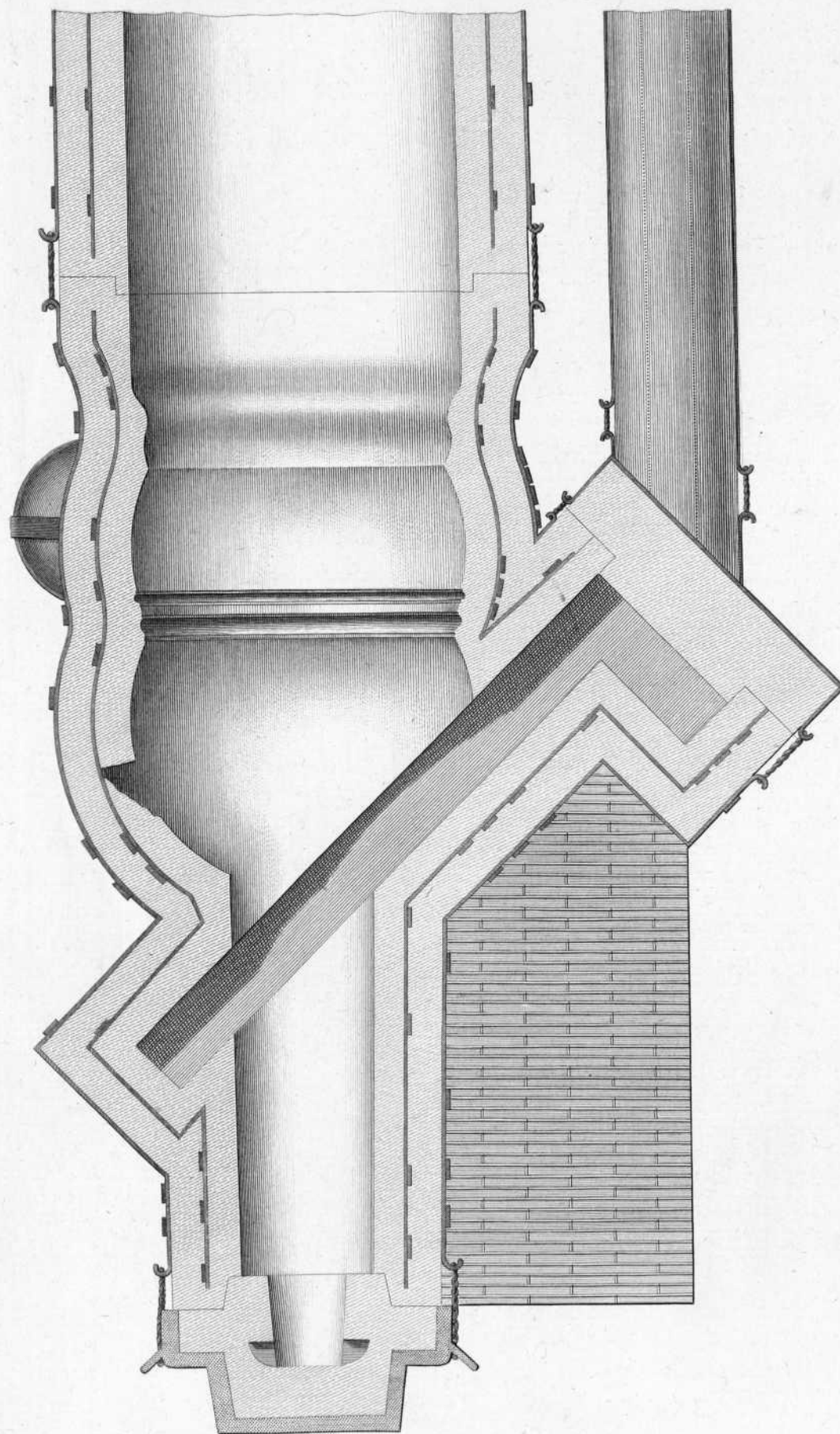


Fig. 10.



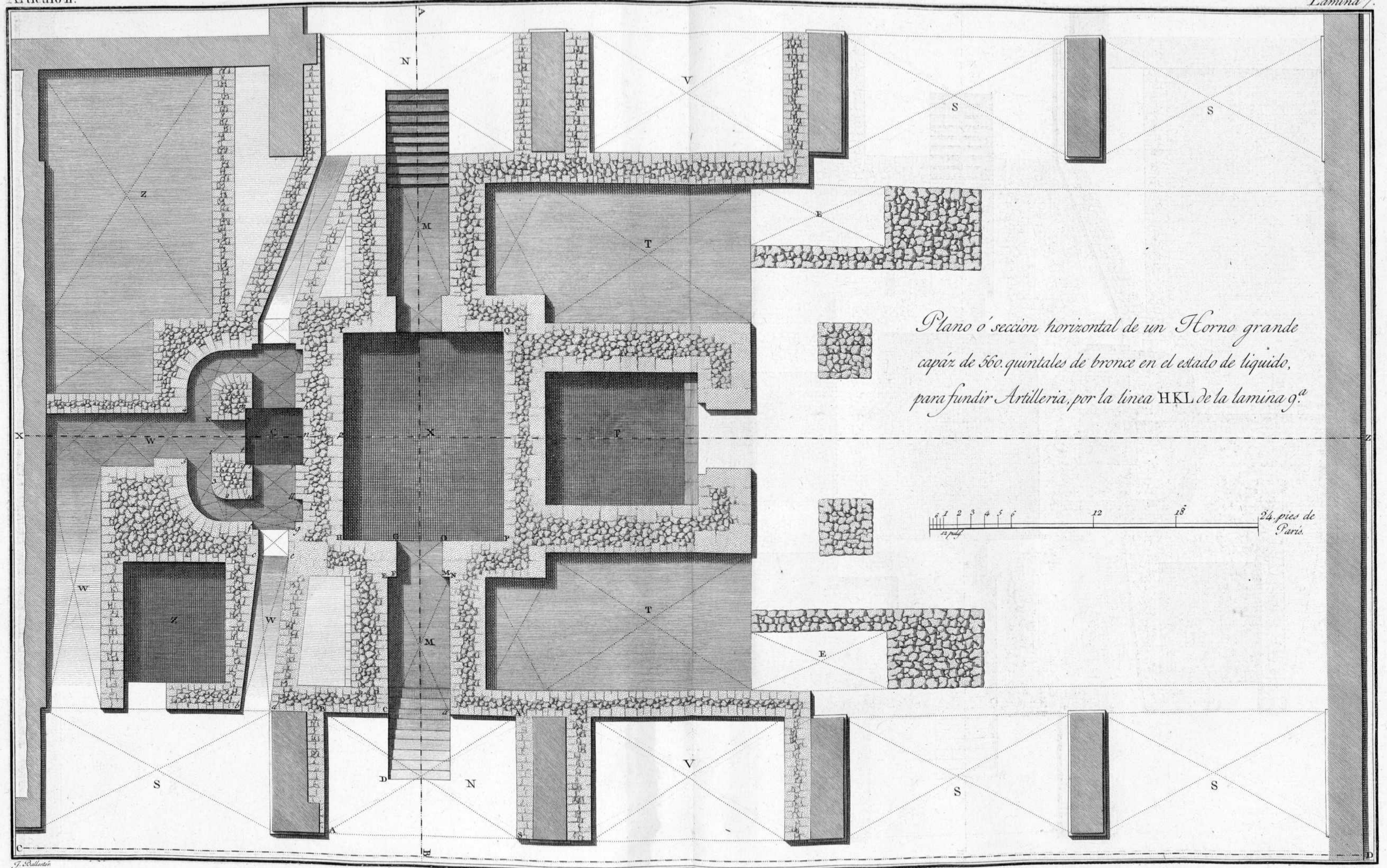
Pies de Rey.

Perfil de todo el Molde de un Mortero de Plancha al tiempo de fundirle.

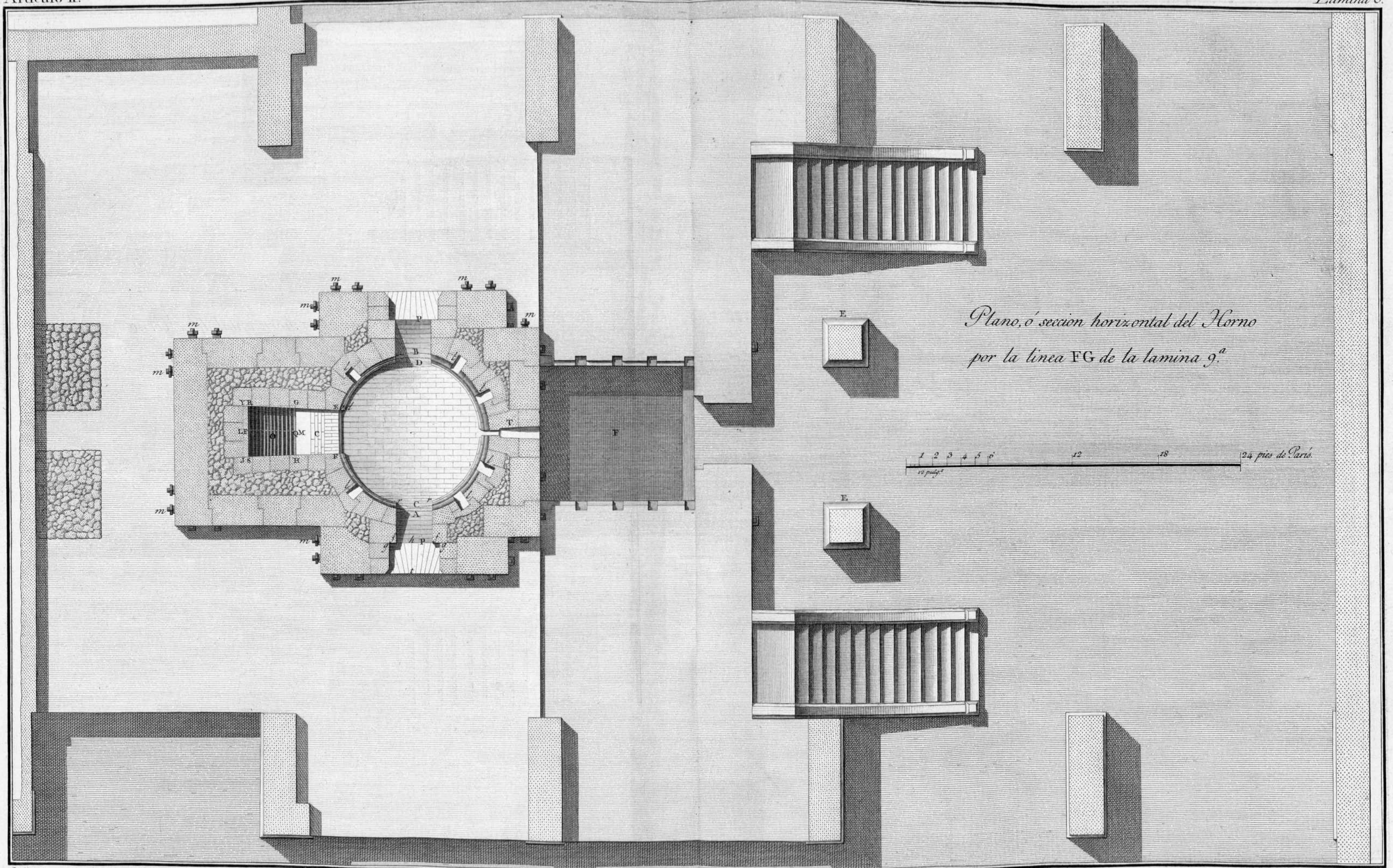


S. Pío de Paris.

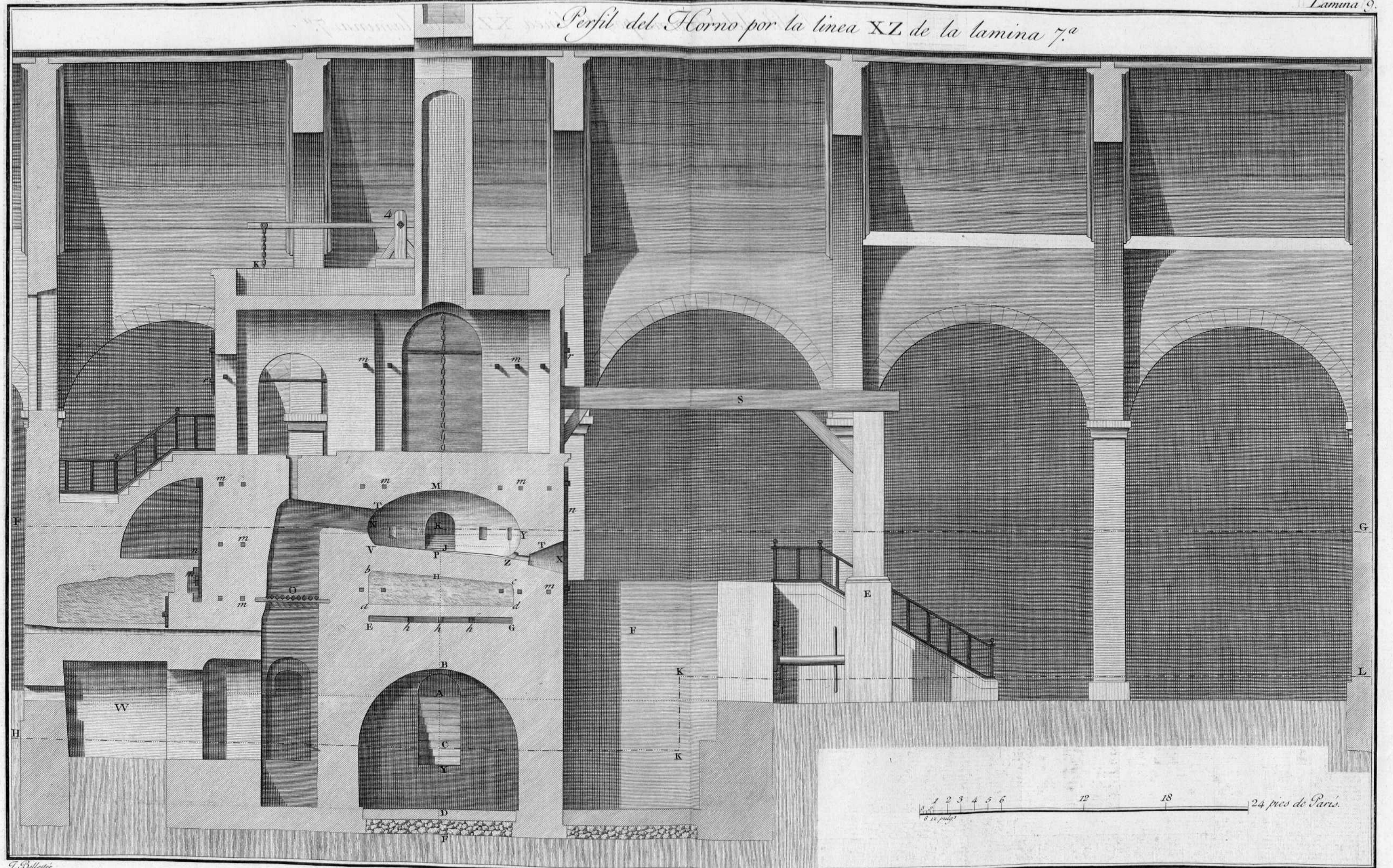








Perfil del Horno por la linea XZ de la lamina 7.^a

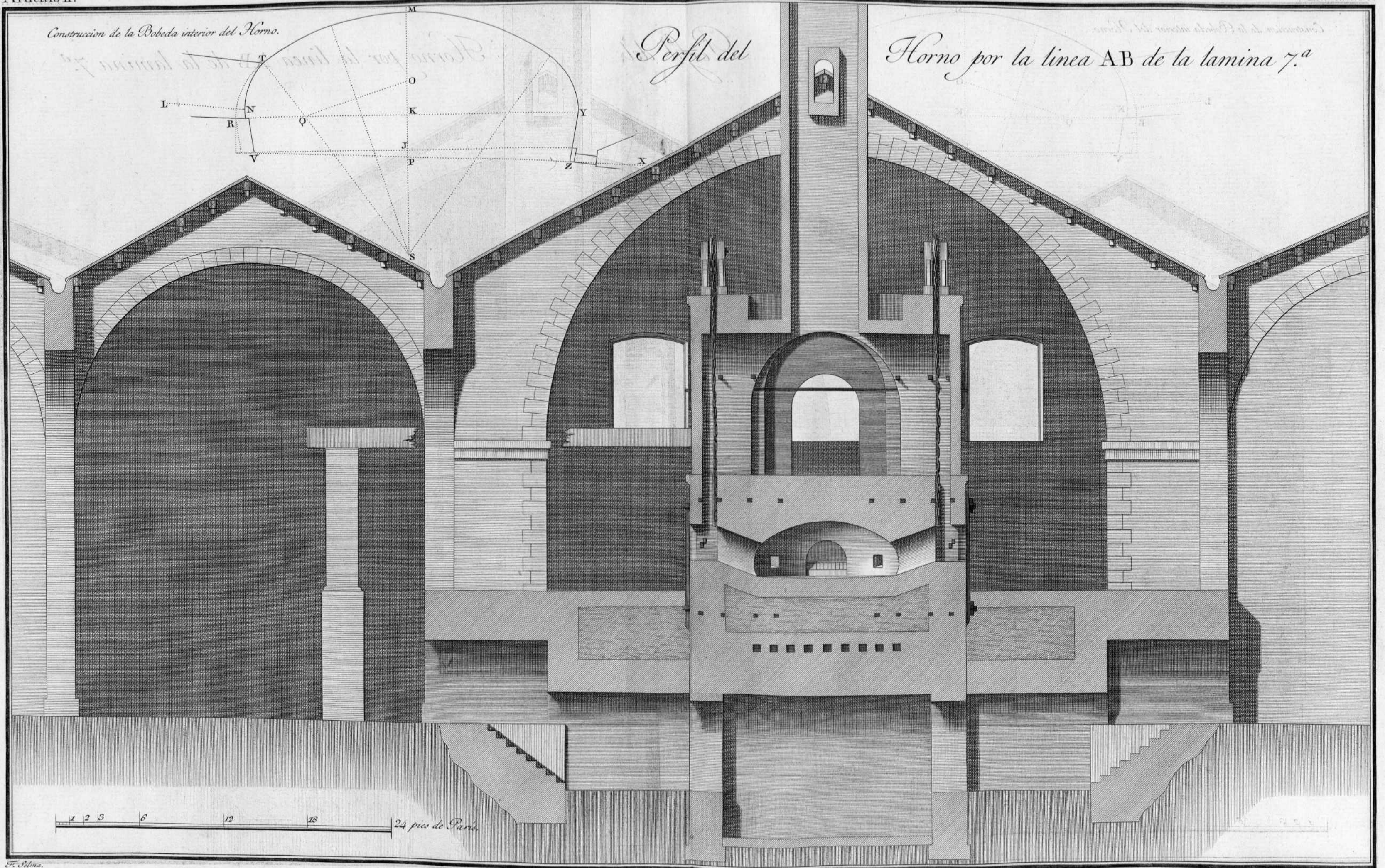




Construcción de la Bobeda interior del Horno.

Perfil del

Horno por la línea AB de la lamina 7.^a





Vista del Horno por la linea C.D. de la lamina 7.^a

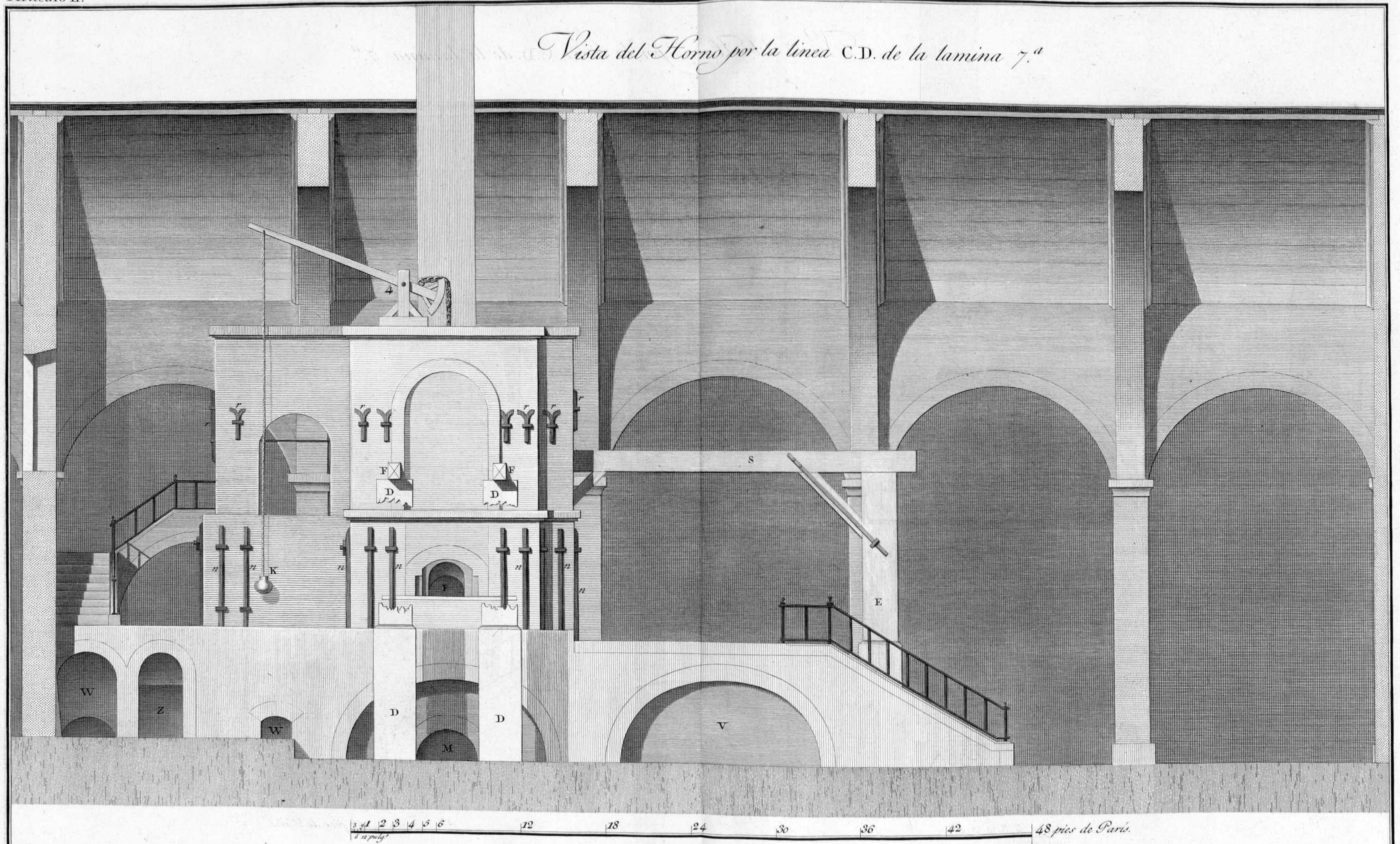




Fig. 1.

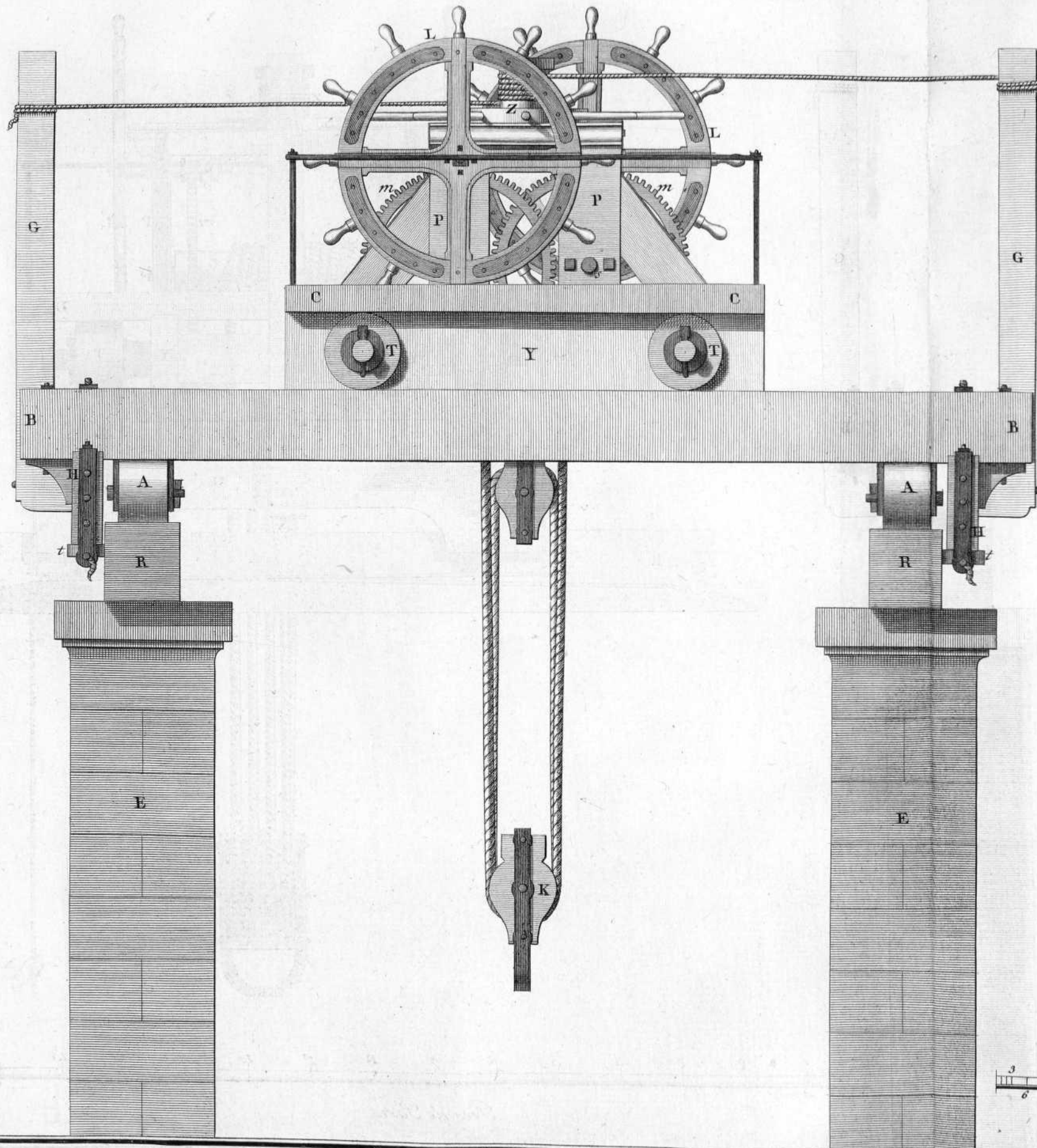
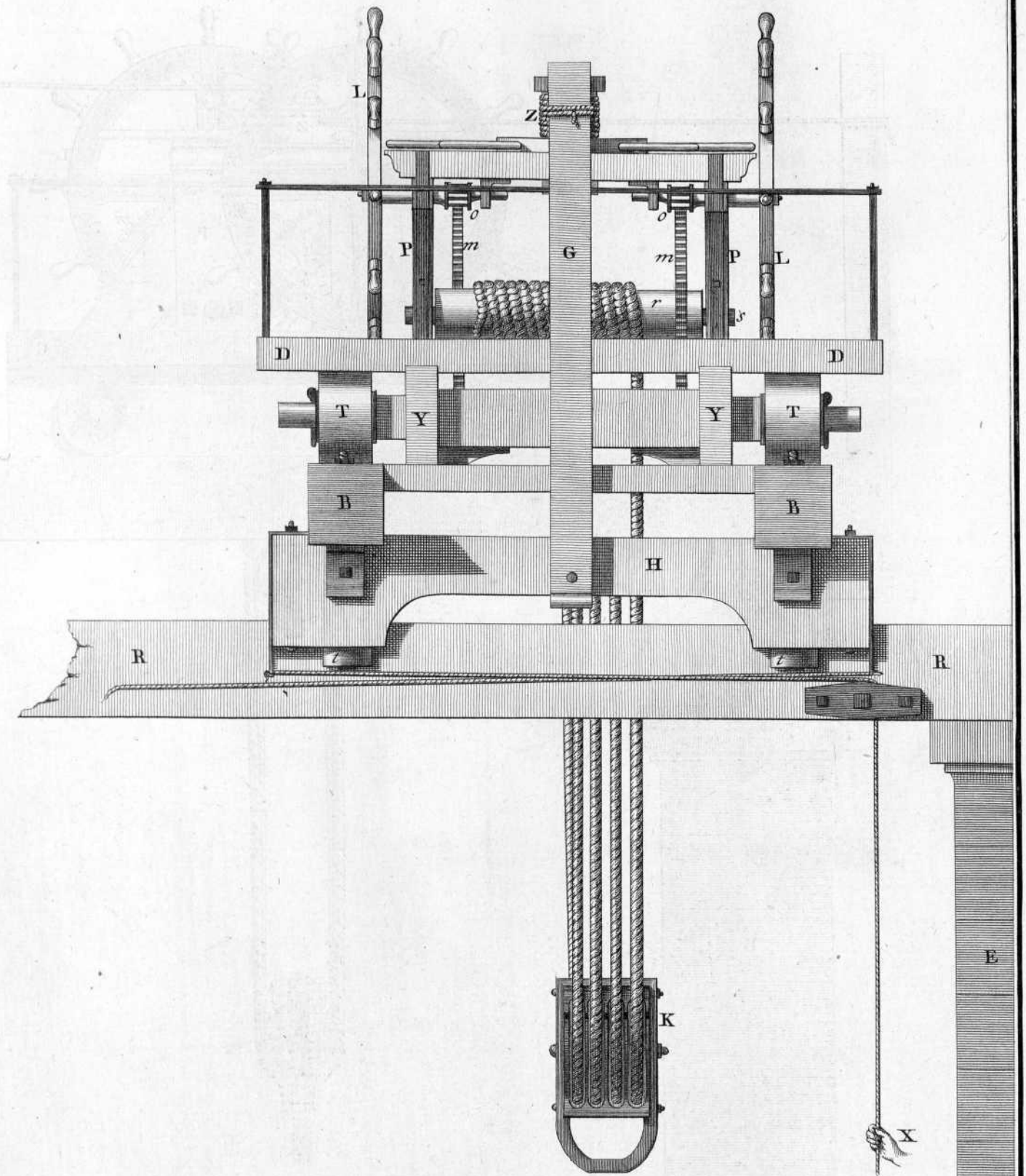
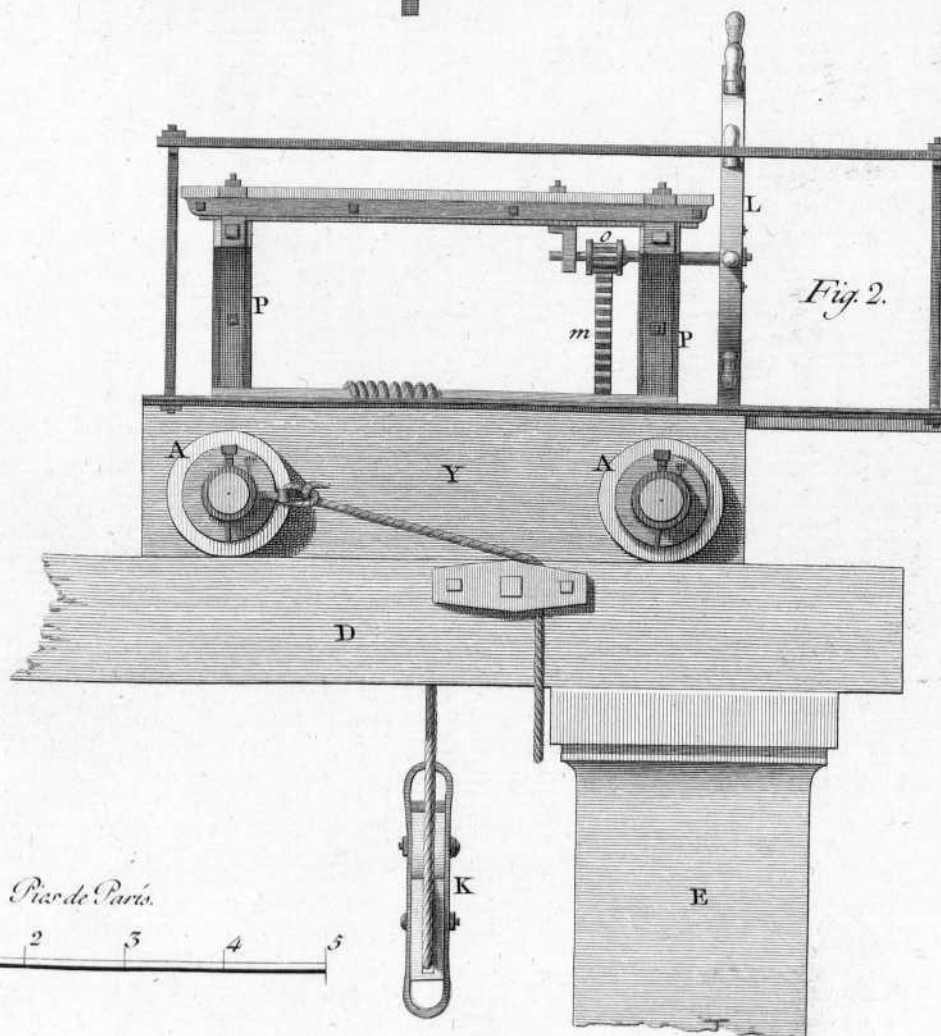
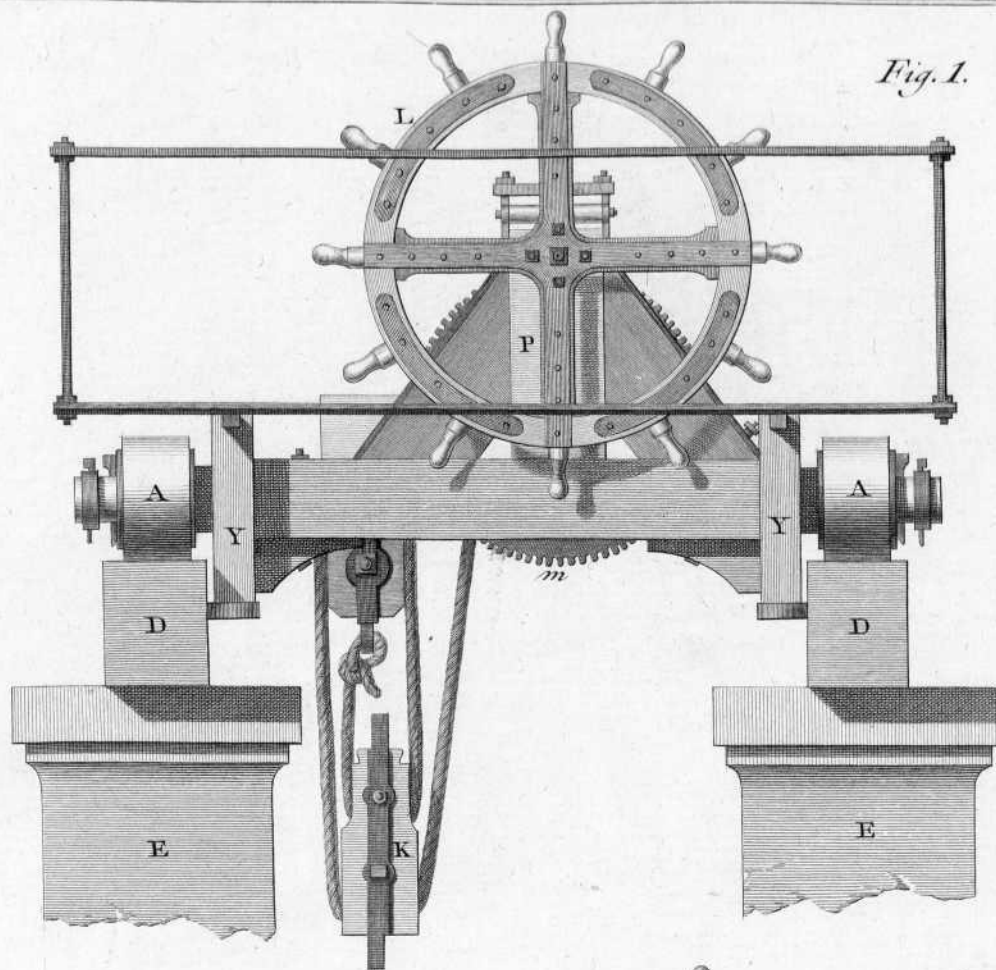


Fig. 2.



3 4 5 6 7 8 9 10 11 12 13 14
6 12 pulg.

Pies de Paris.



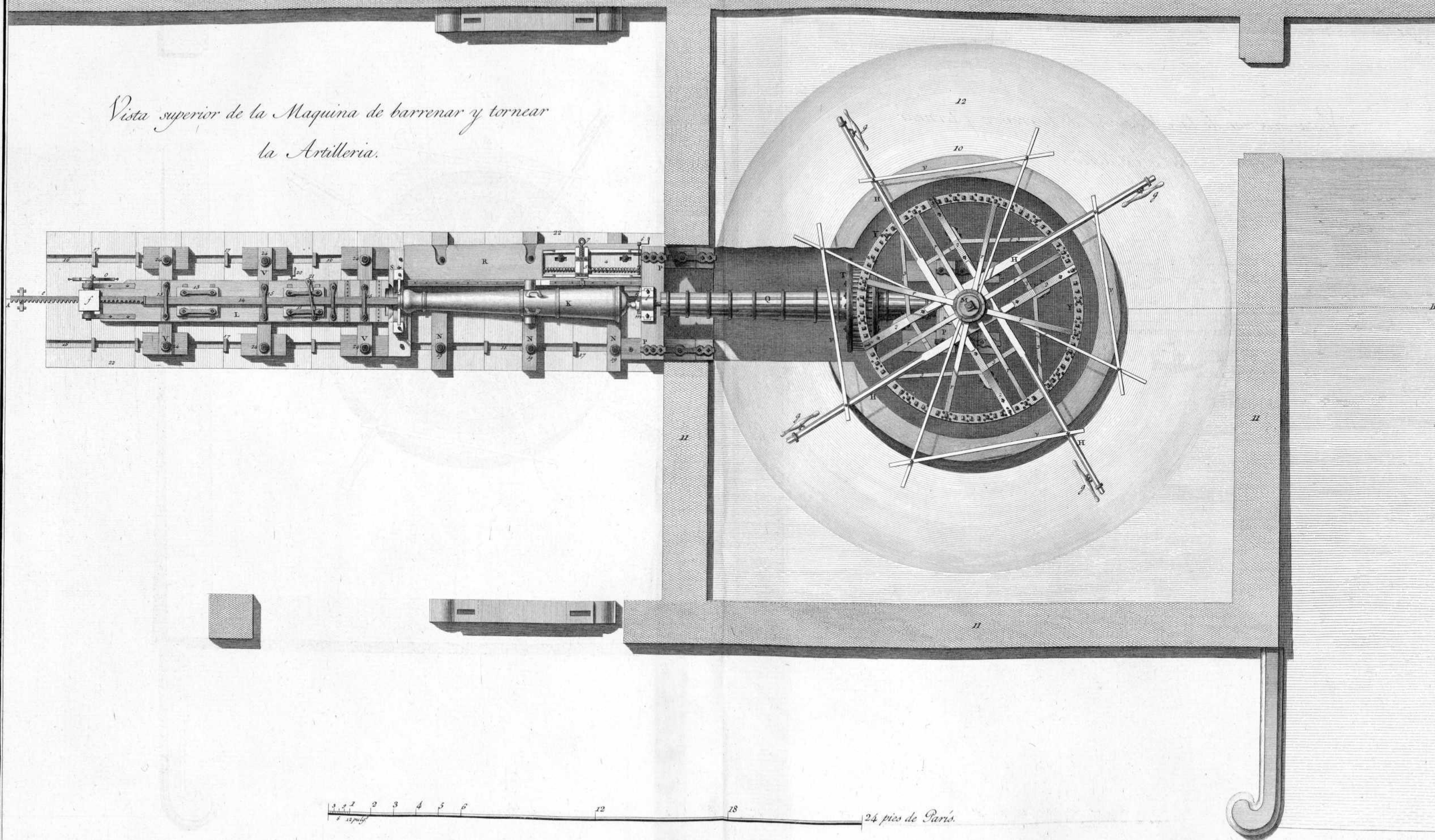
Pied de Paris.

3 6 12 pulg.

1 2 3 4 5

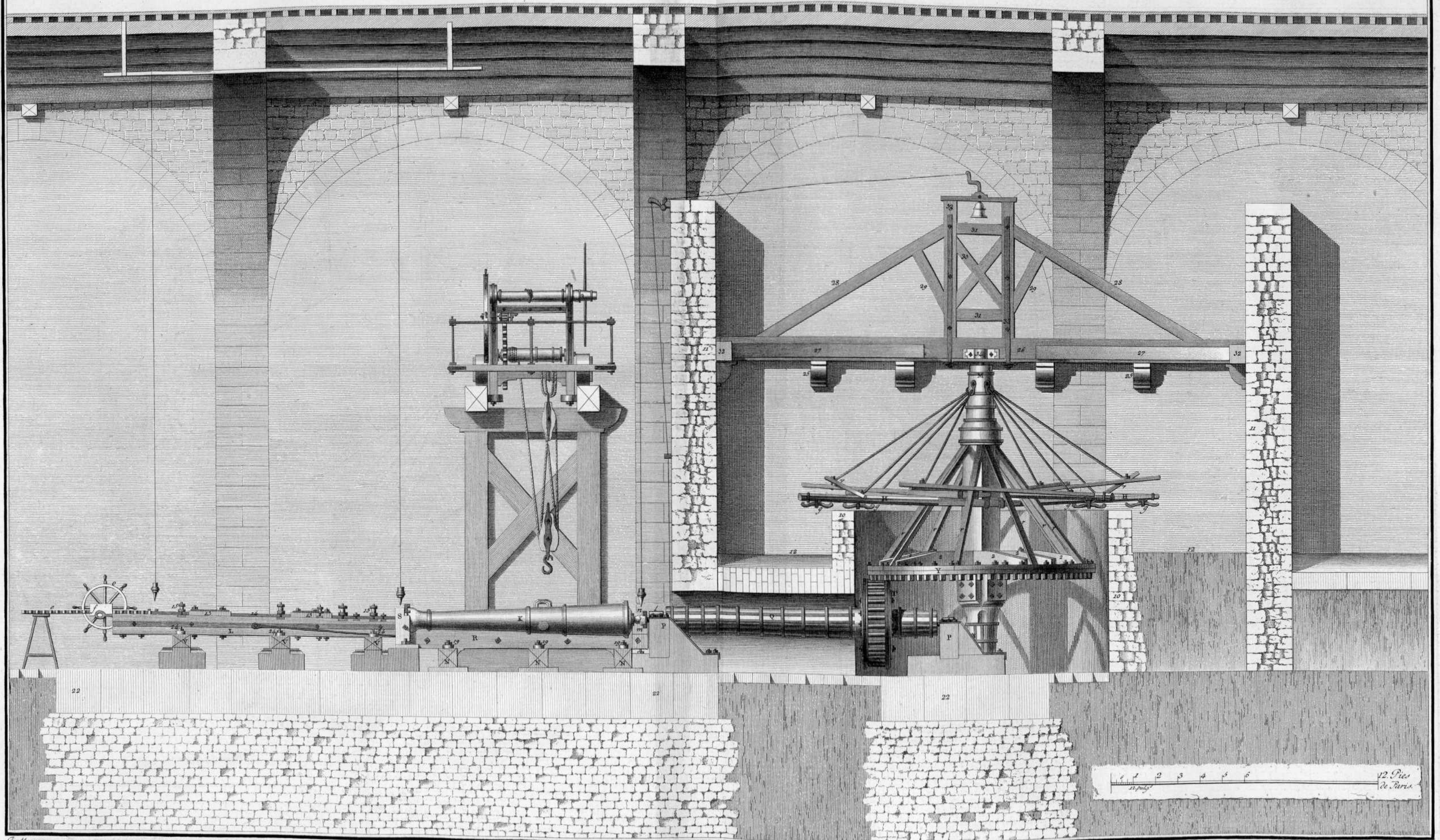


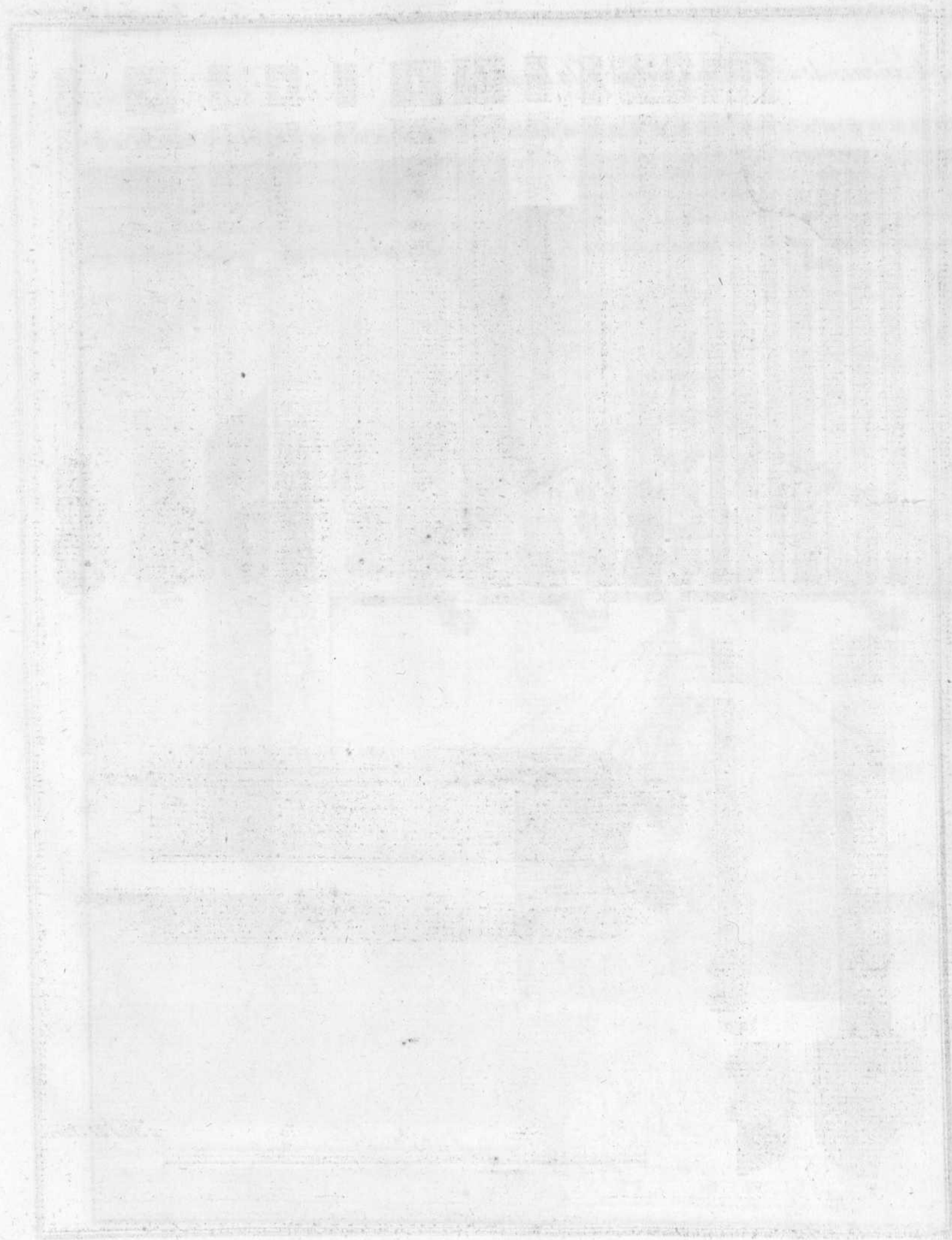
*Vista superior de la Maquina de barrenar y torneear
la Artilleria.*

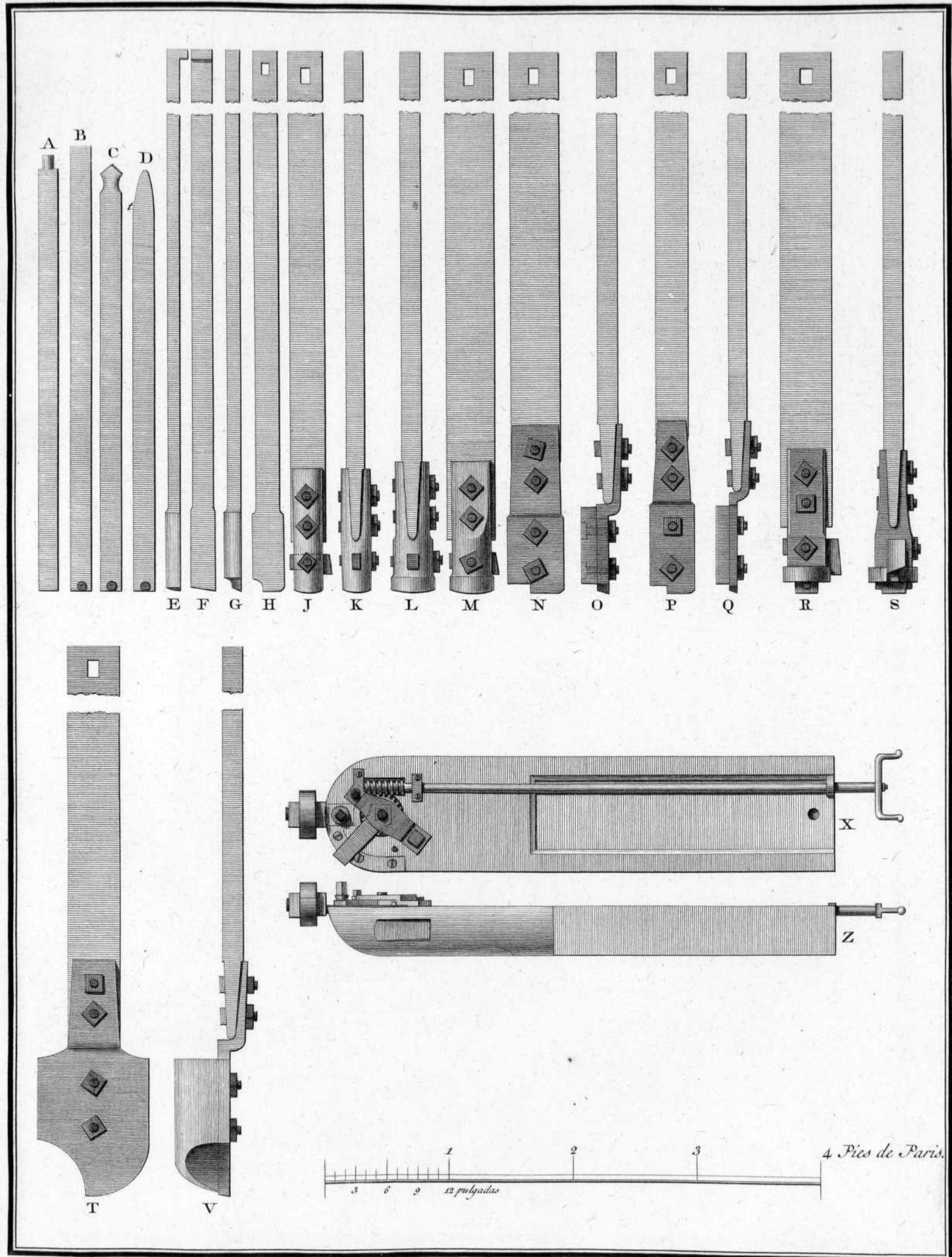


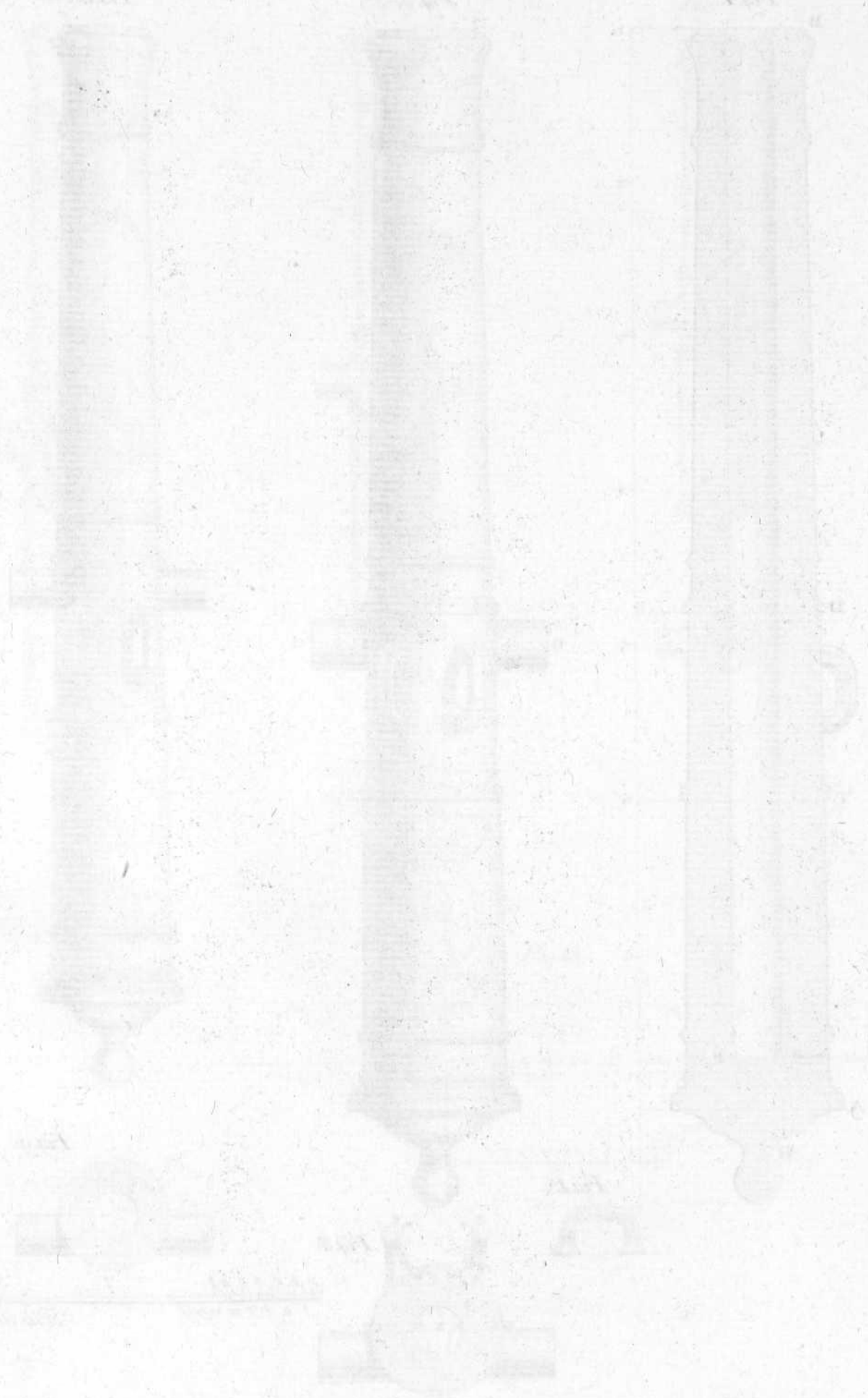


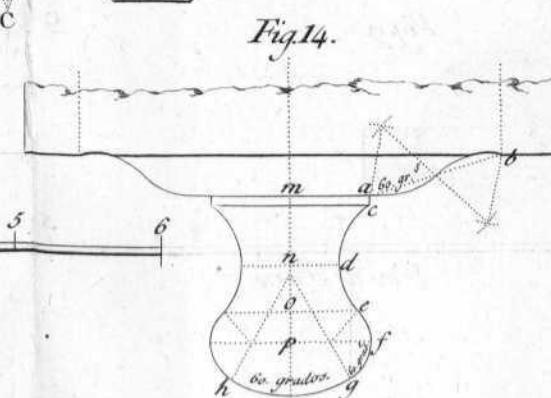
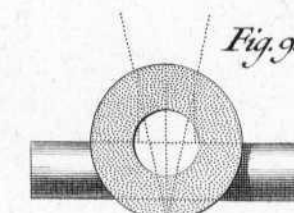
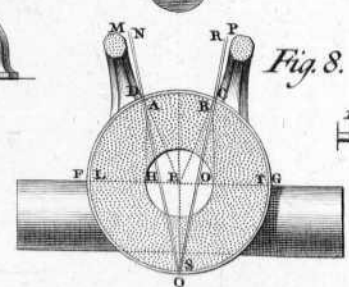
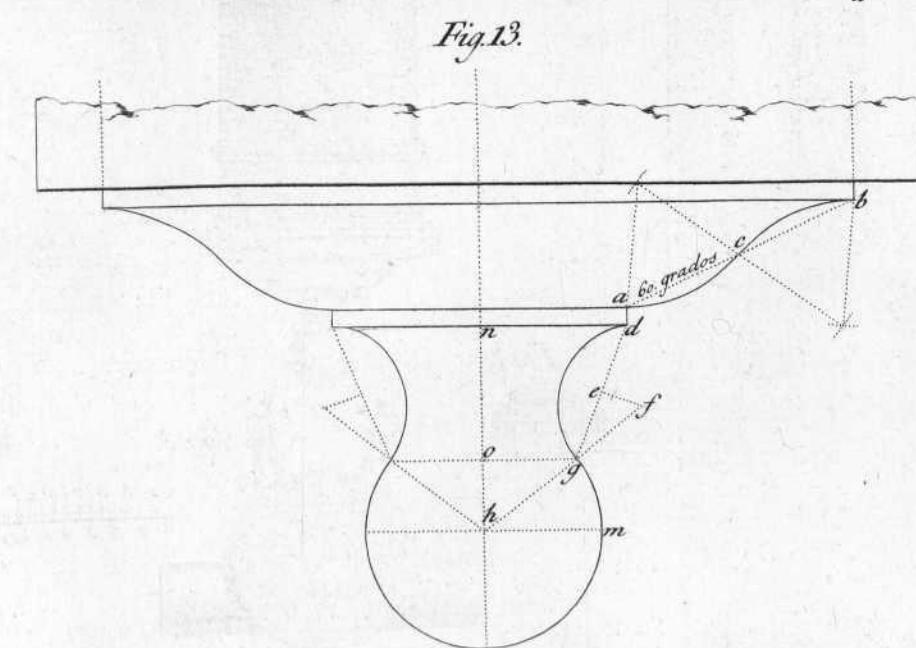
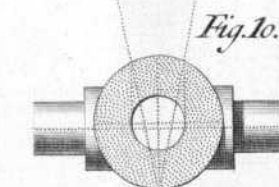
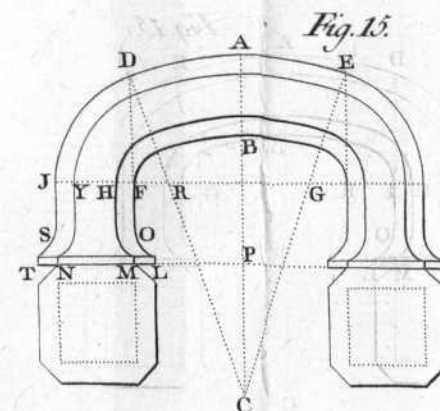
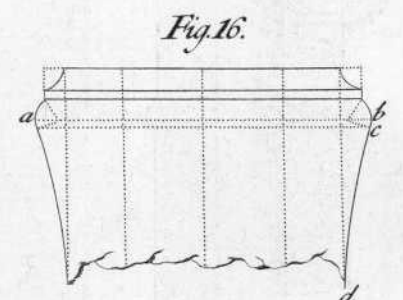
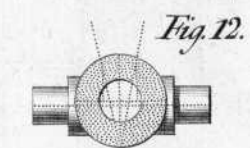
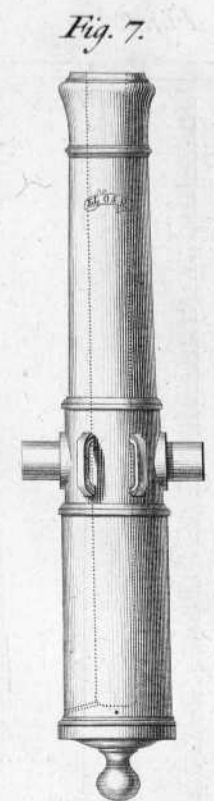
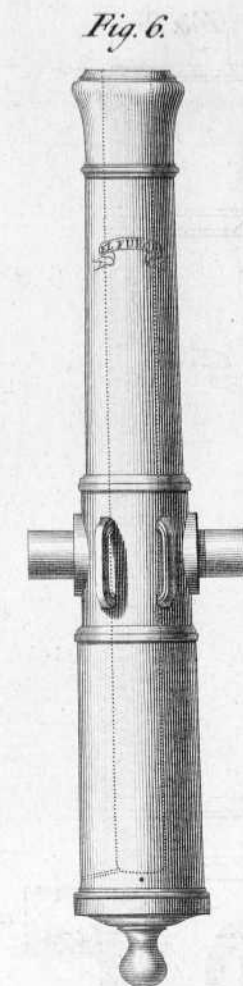
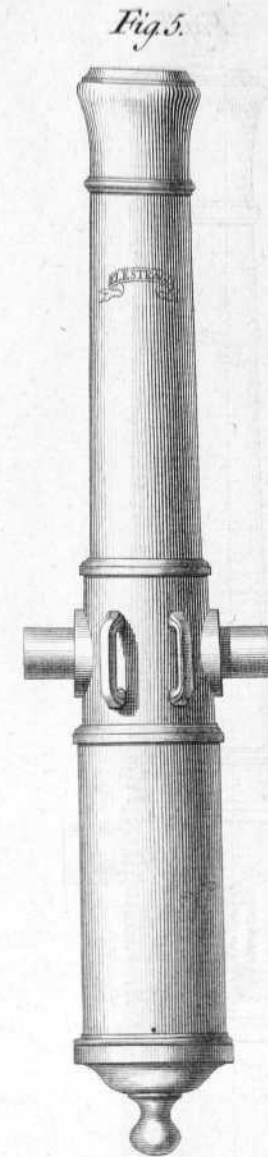
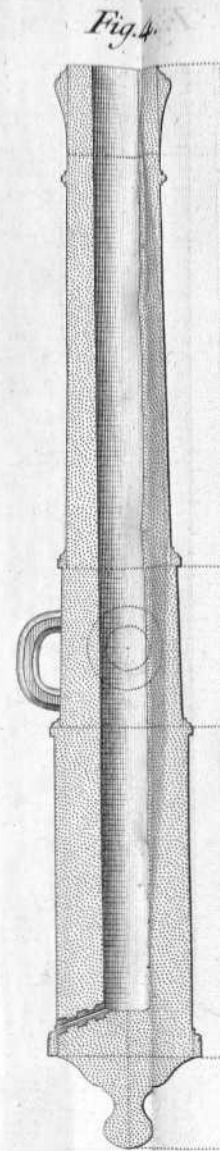
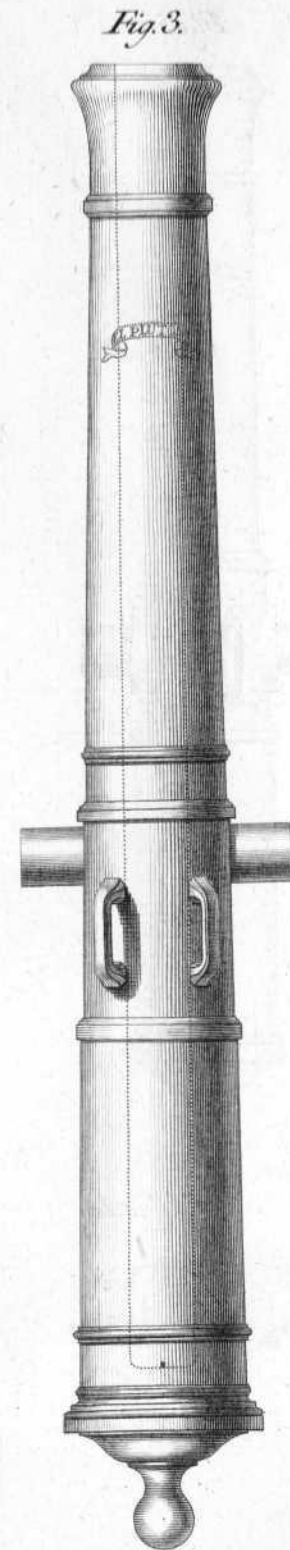
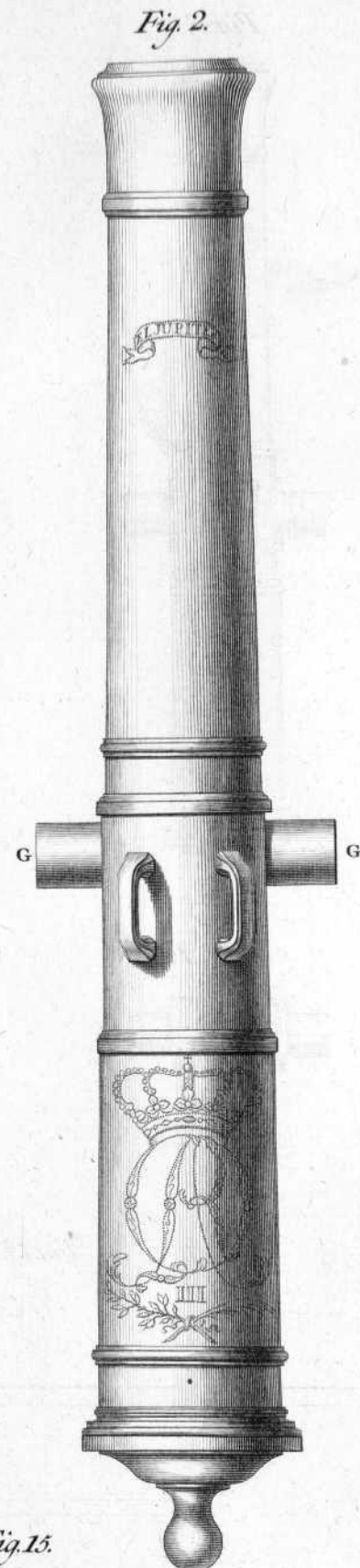
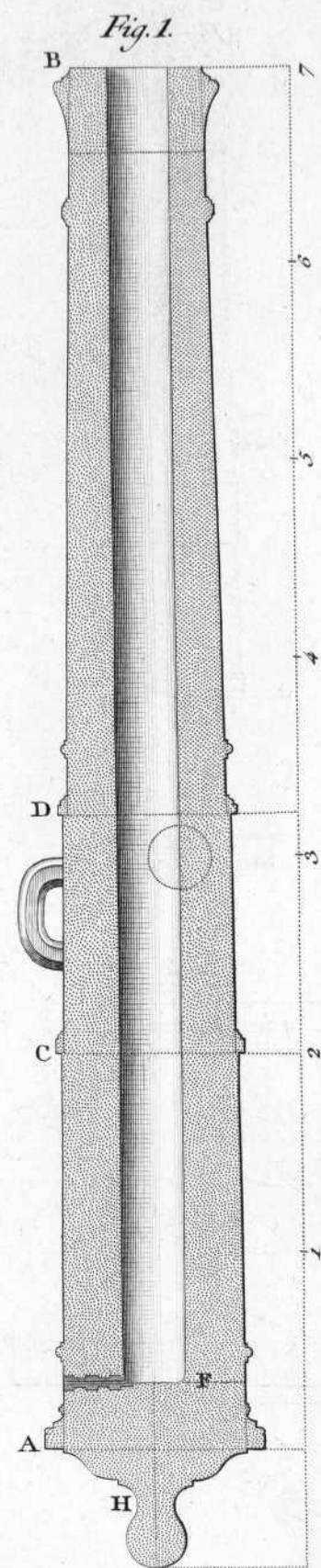
Perfil de la Maquina de barrenar y torneear los Cañones de Artilleria, cortado p.^a la linea AB.











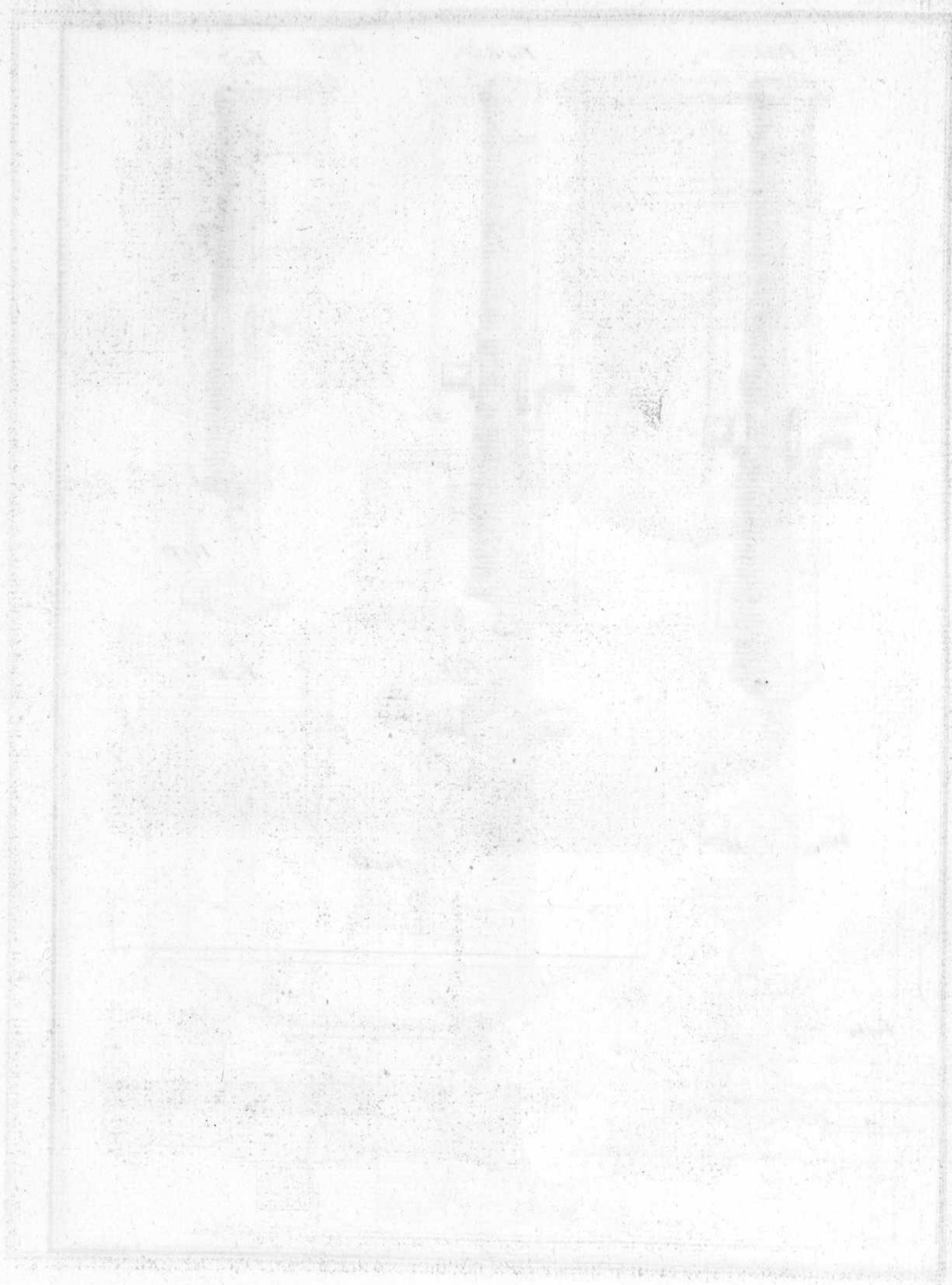


Fig. 1.

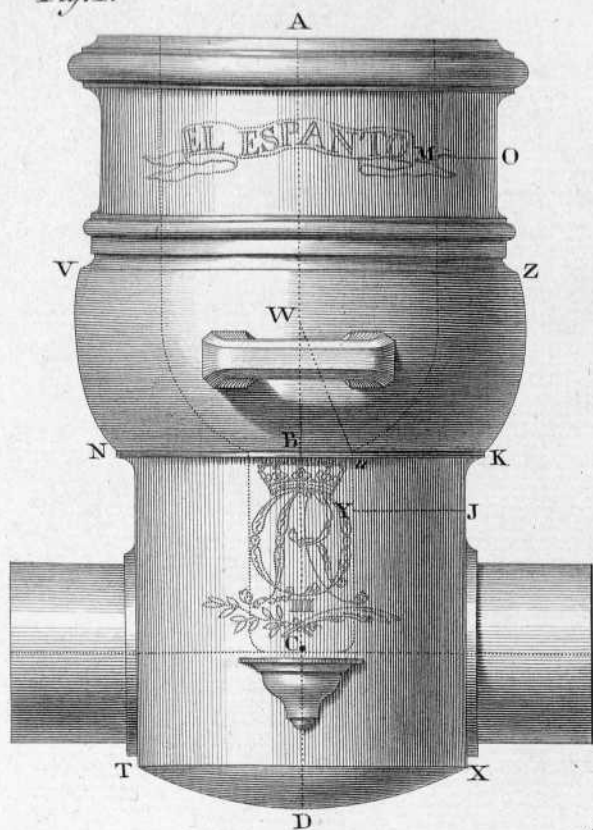


Fig. 2.

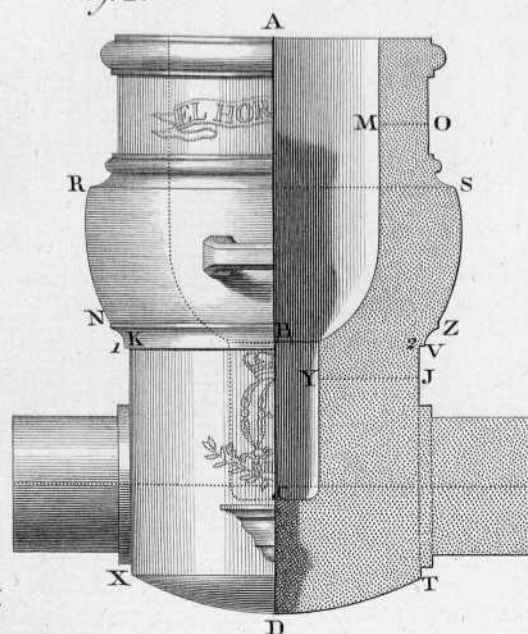


Fig. 5.

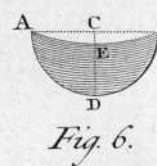
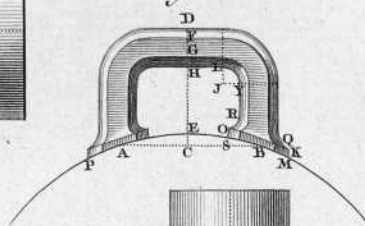


Fig. 7.



Fig. 3.

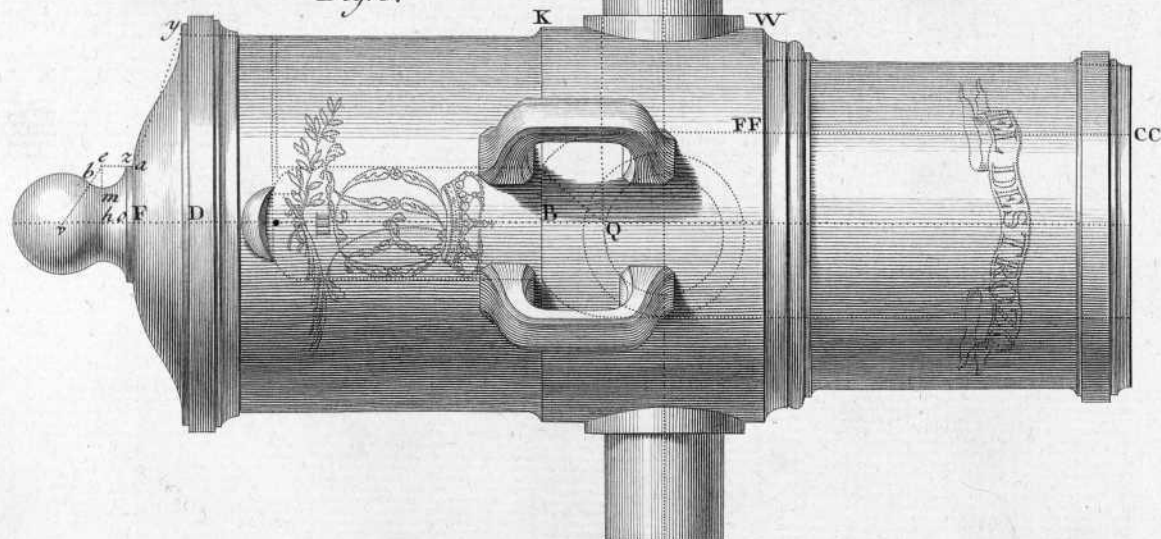


Fig. 8.

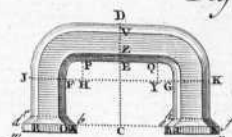


Fig. 9.

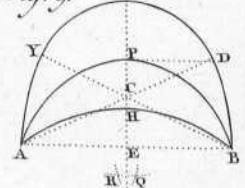


Fig. 10.

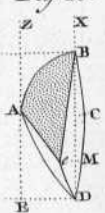
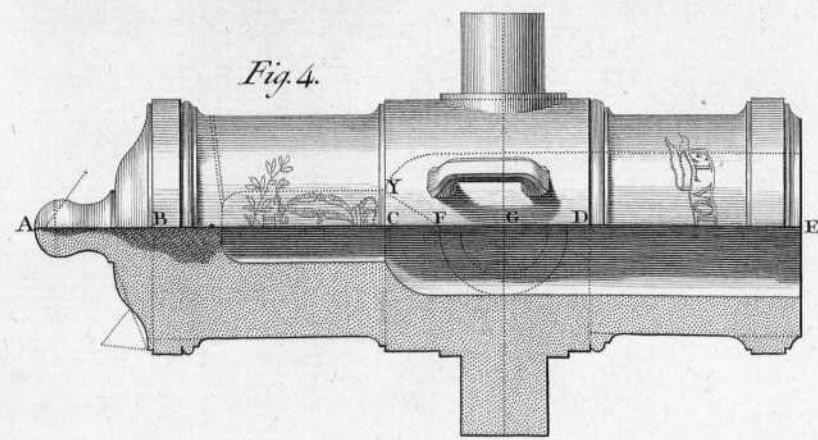


Fig. 4.

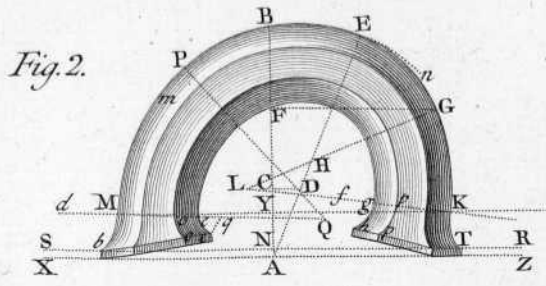


6 pulgadas

1 2 3 4 5 6 7 8 9 10 11 12 pulg.

3 Pies de París.





Escala para Anos y Lineales.
Pulgadas de Paris.

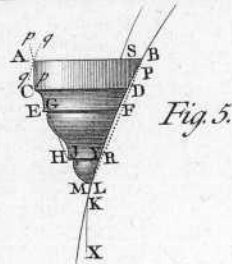
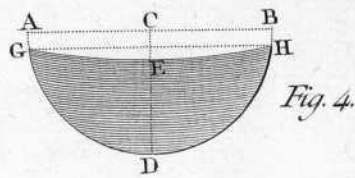
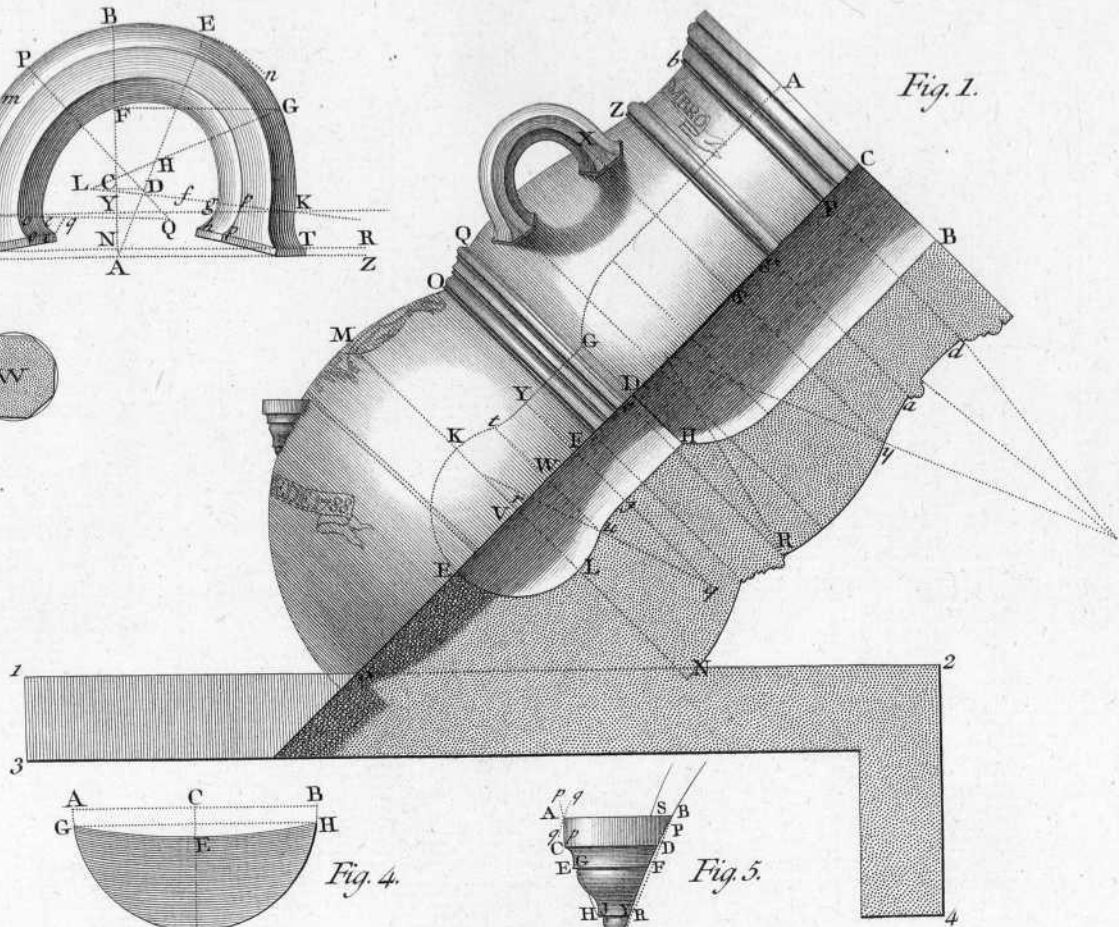


Fig. 6.

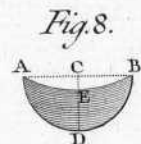
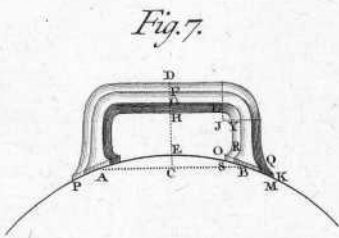
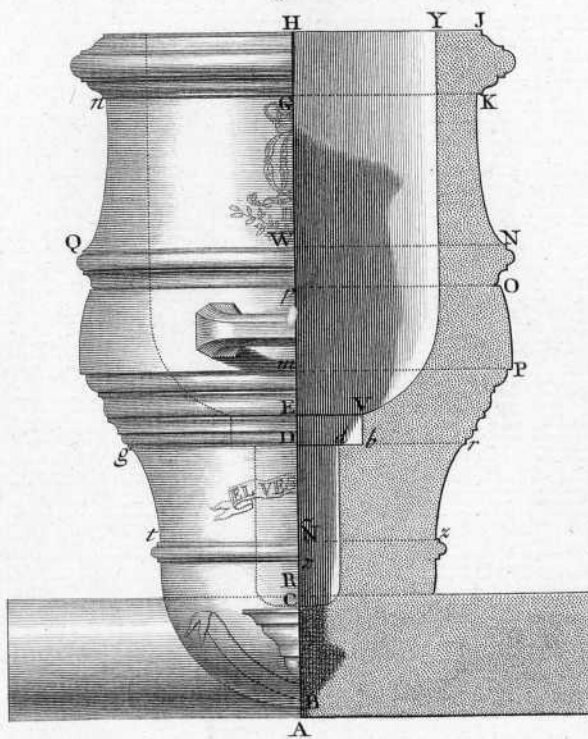
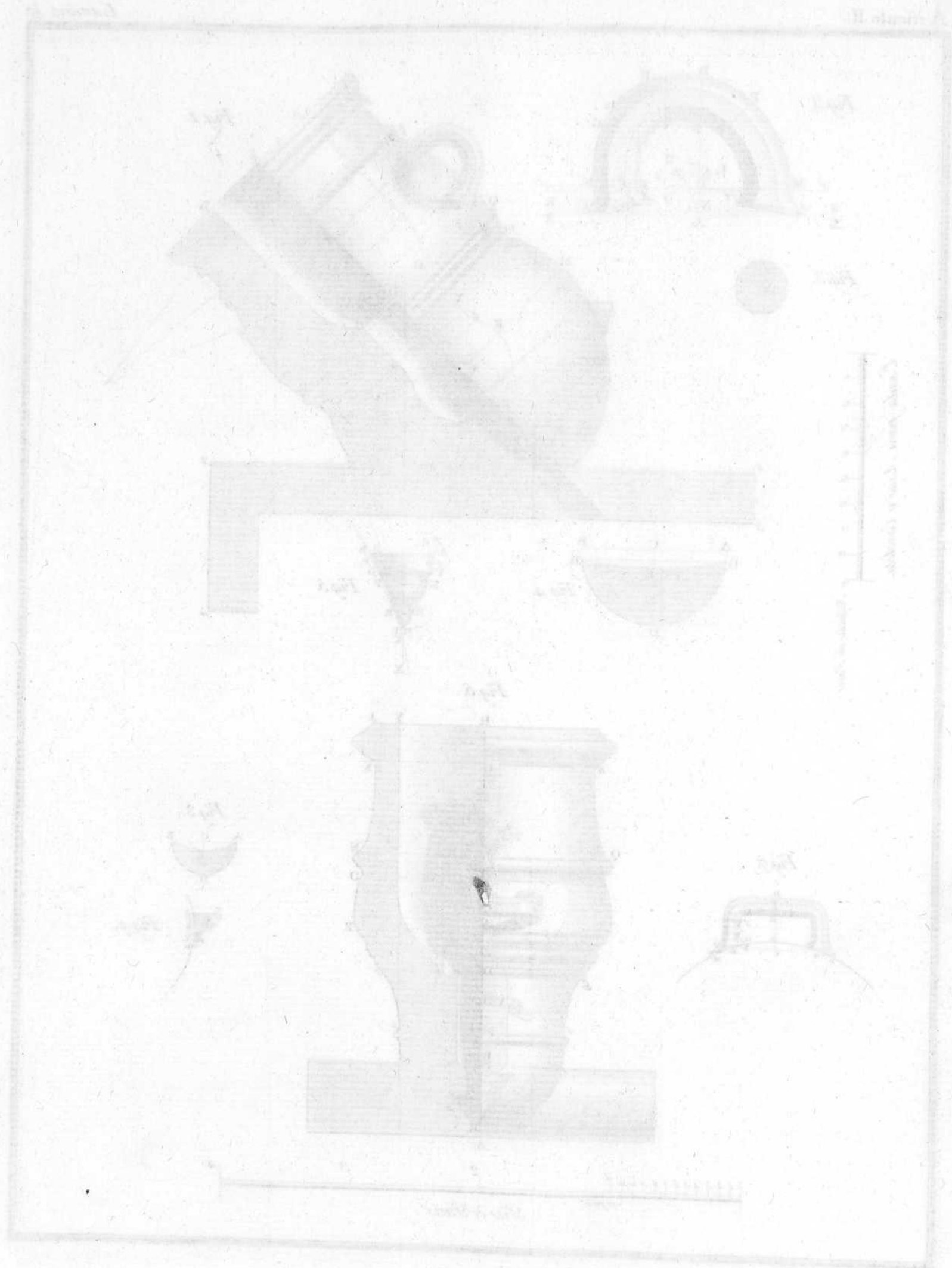
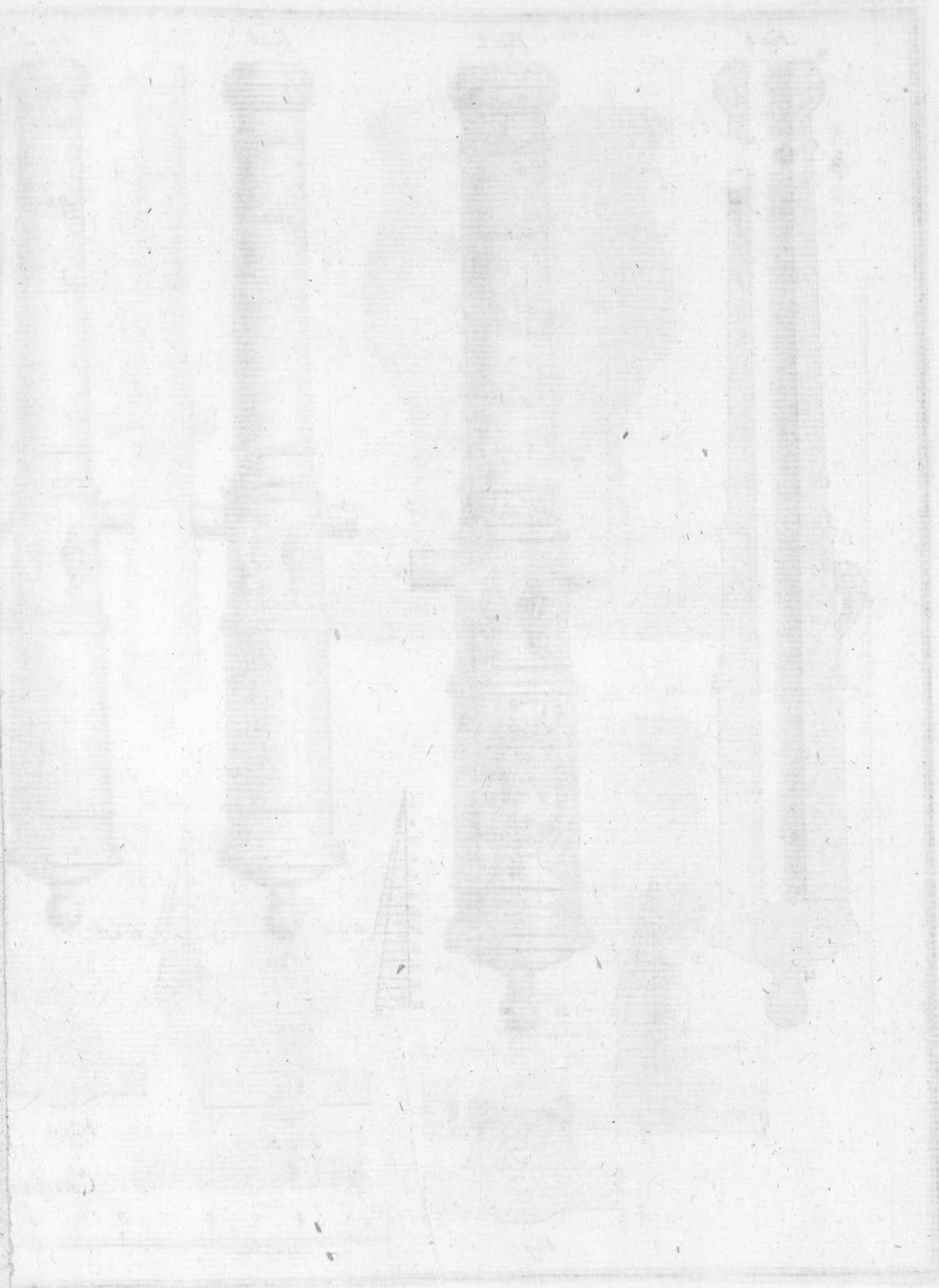


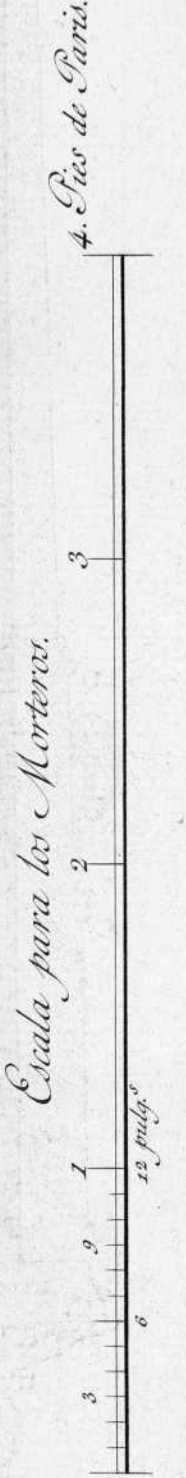
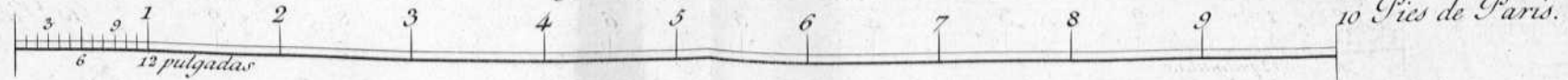
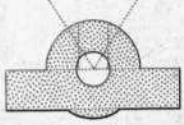
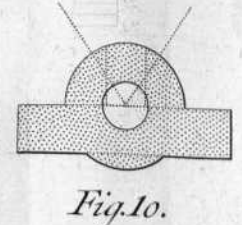
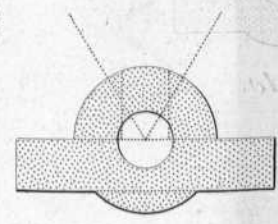
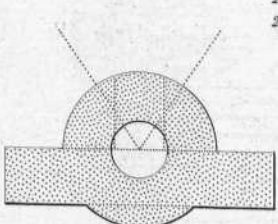
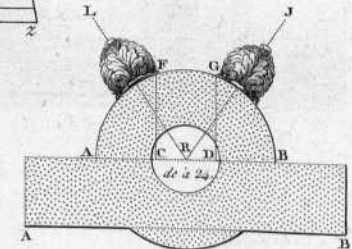
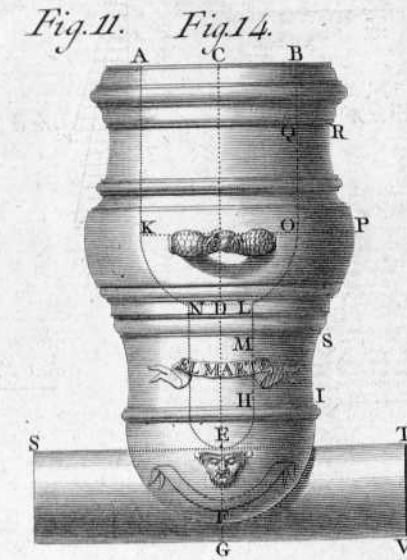
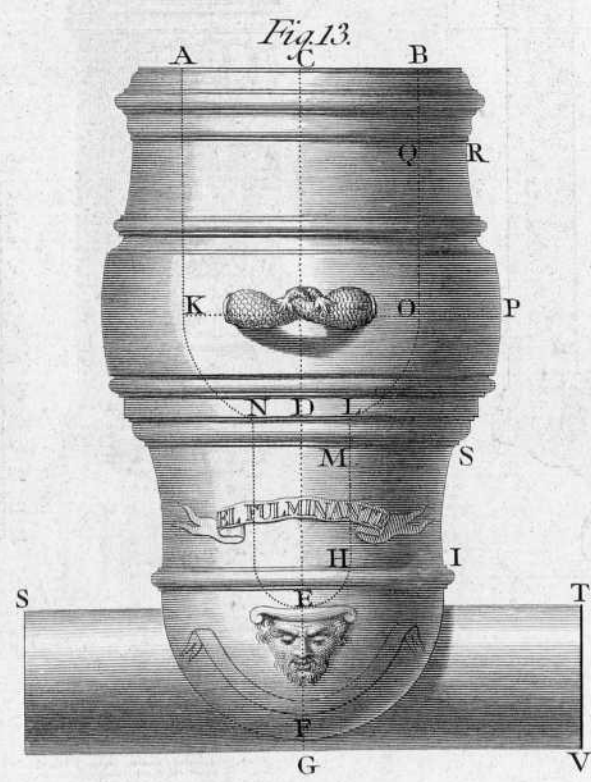
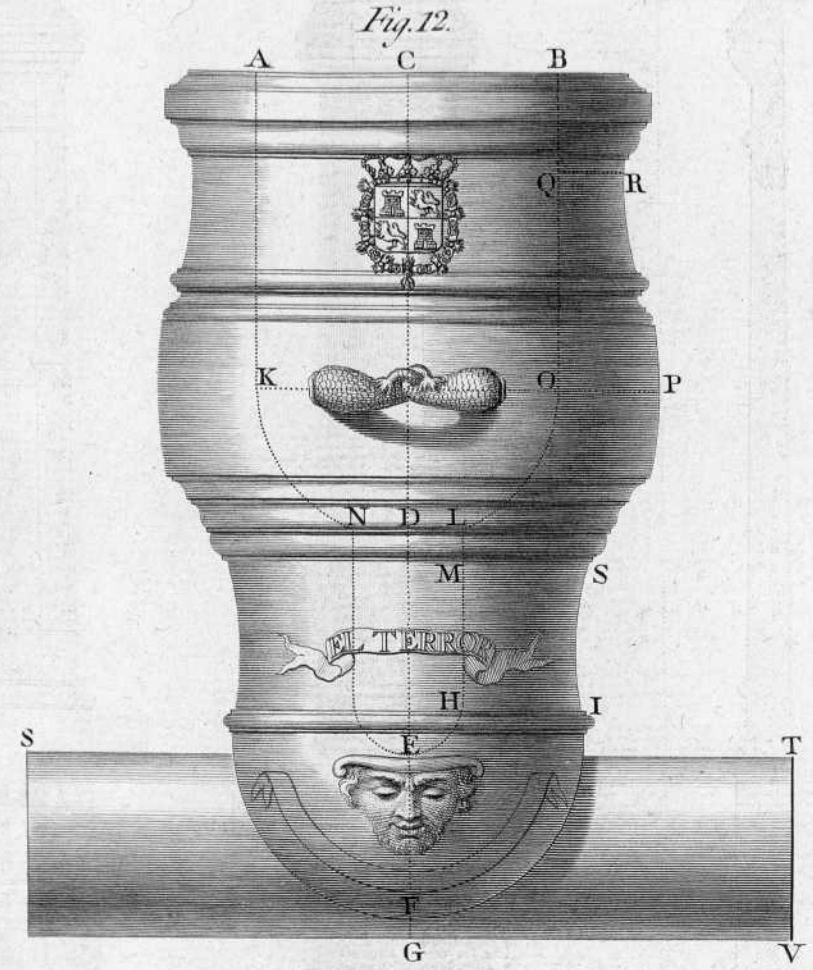
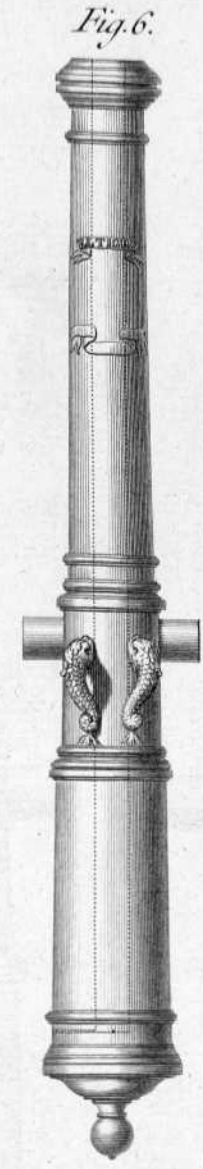
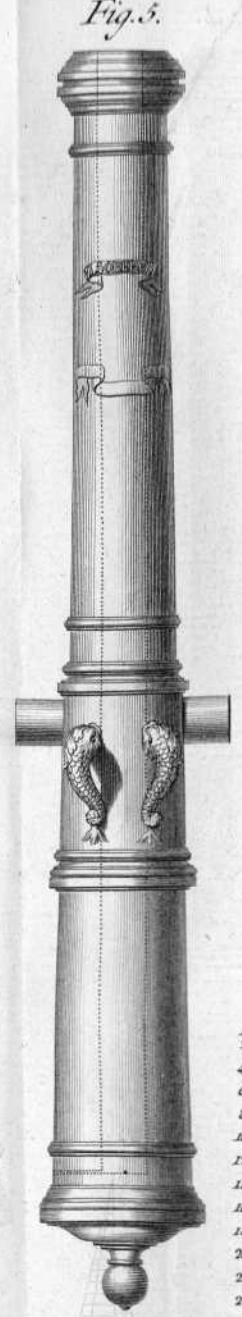
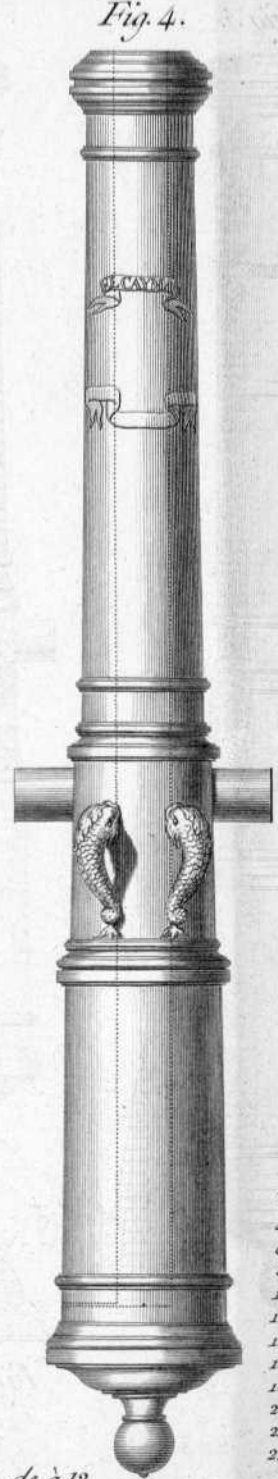
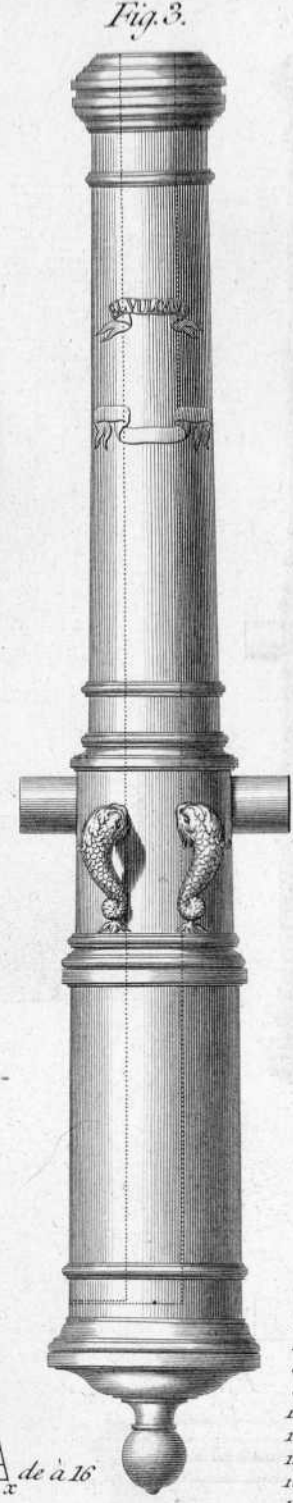
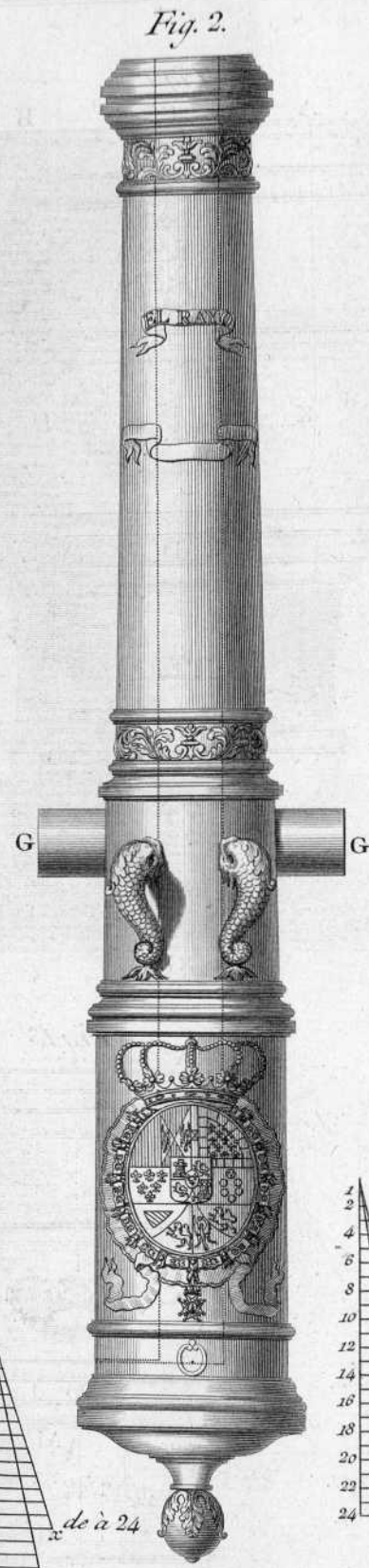
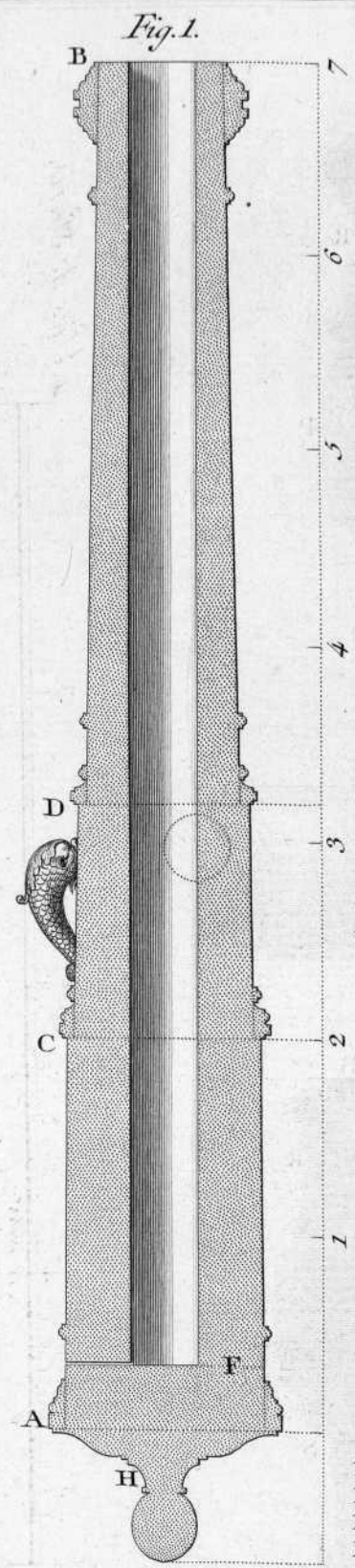
Fig. 9.

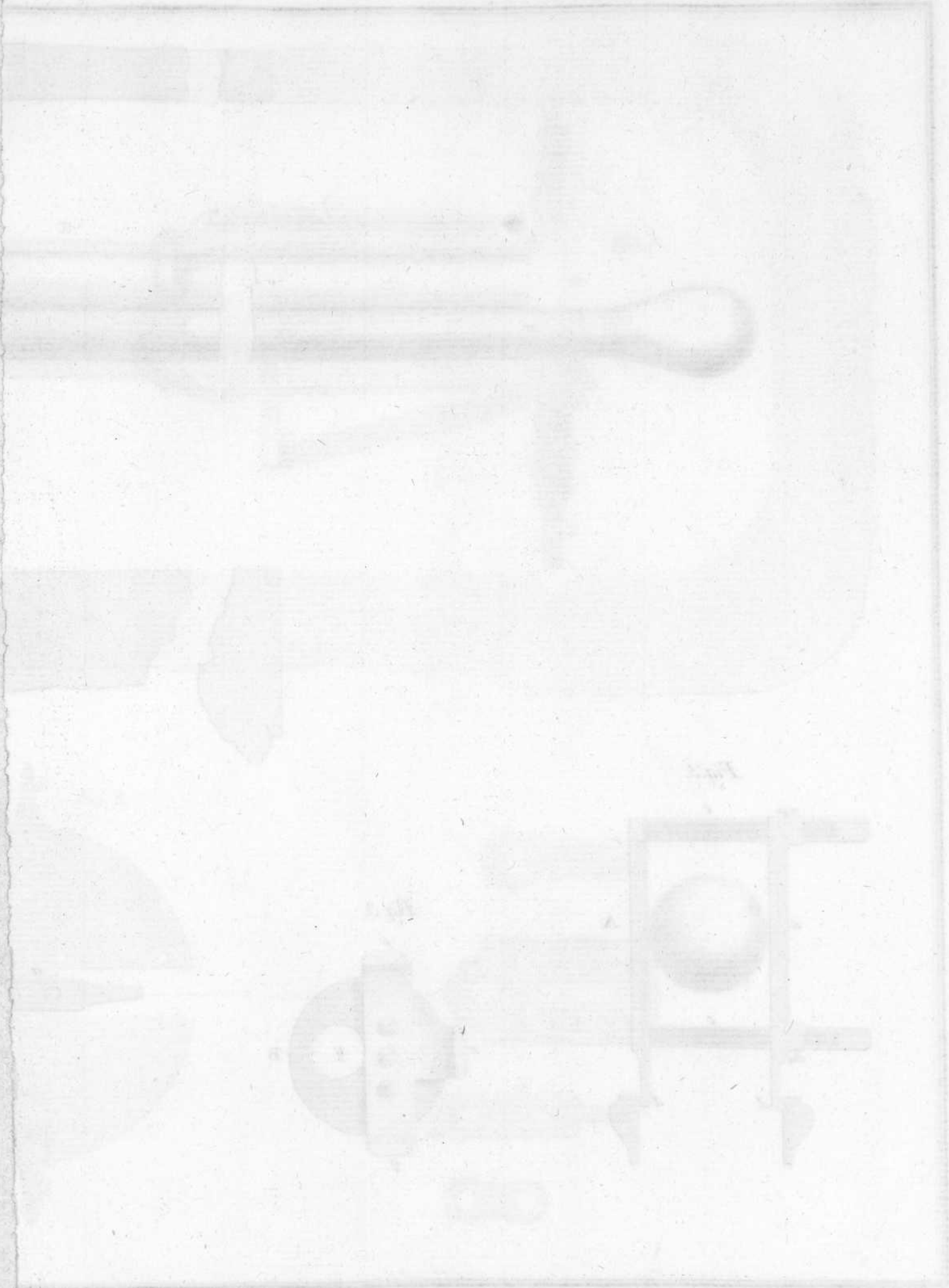


1 2 3 4 5 6 7 8 9 10 11 12 pulg.
Pies de Paris.









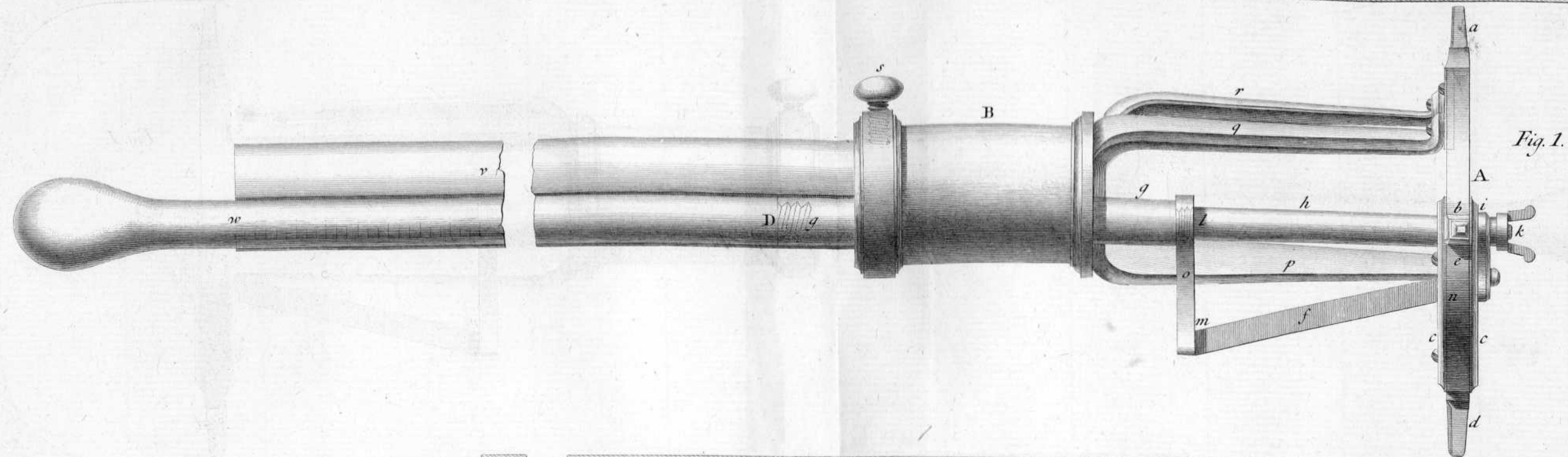


Fig. 1.

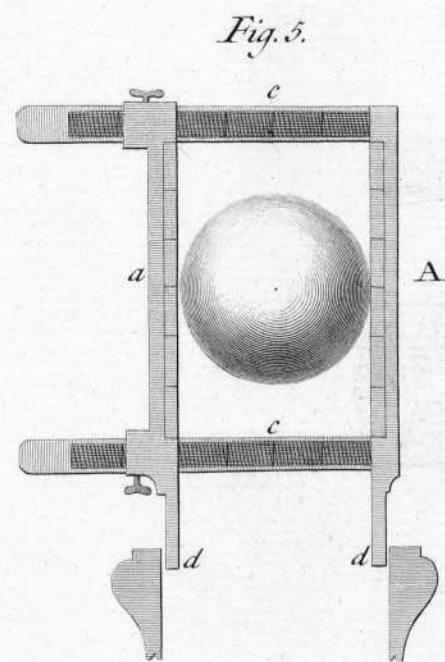


Fig. 5.

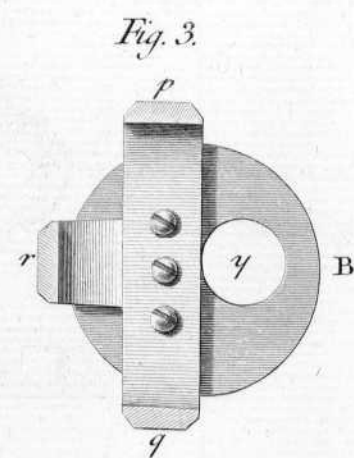


Fig. 3.

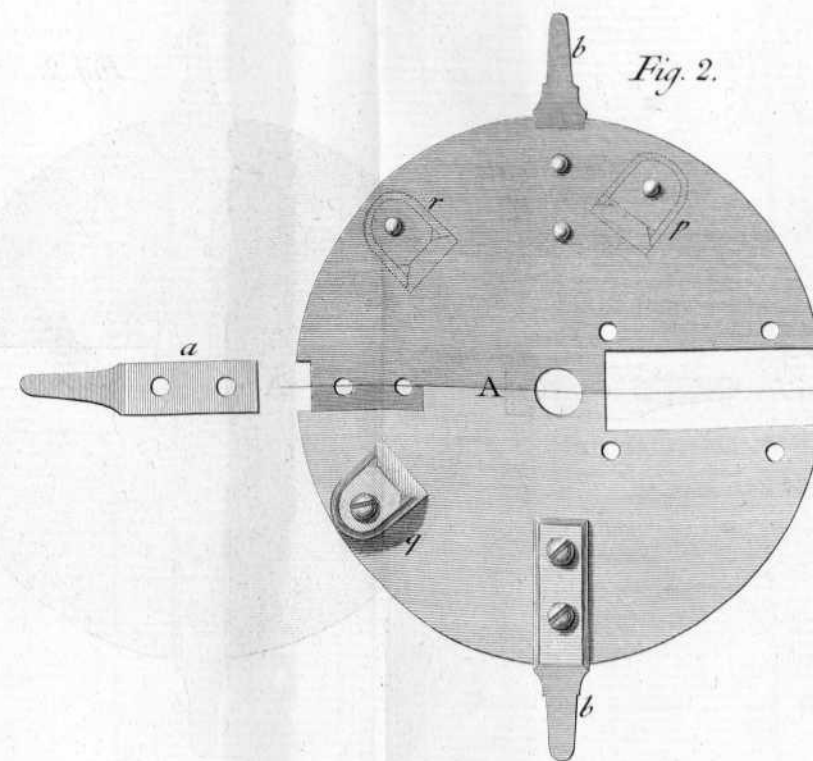


Fig. 2.

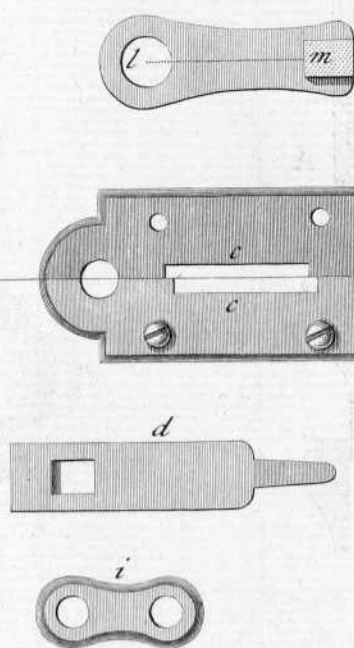
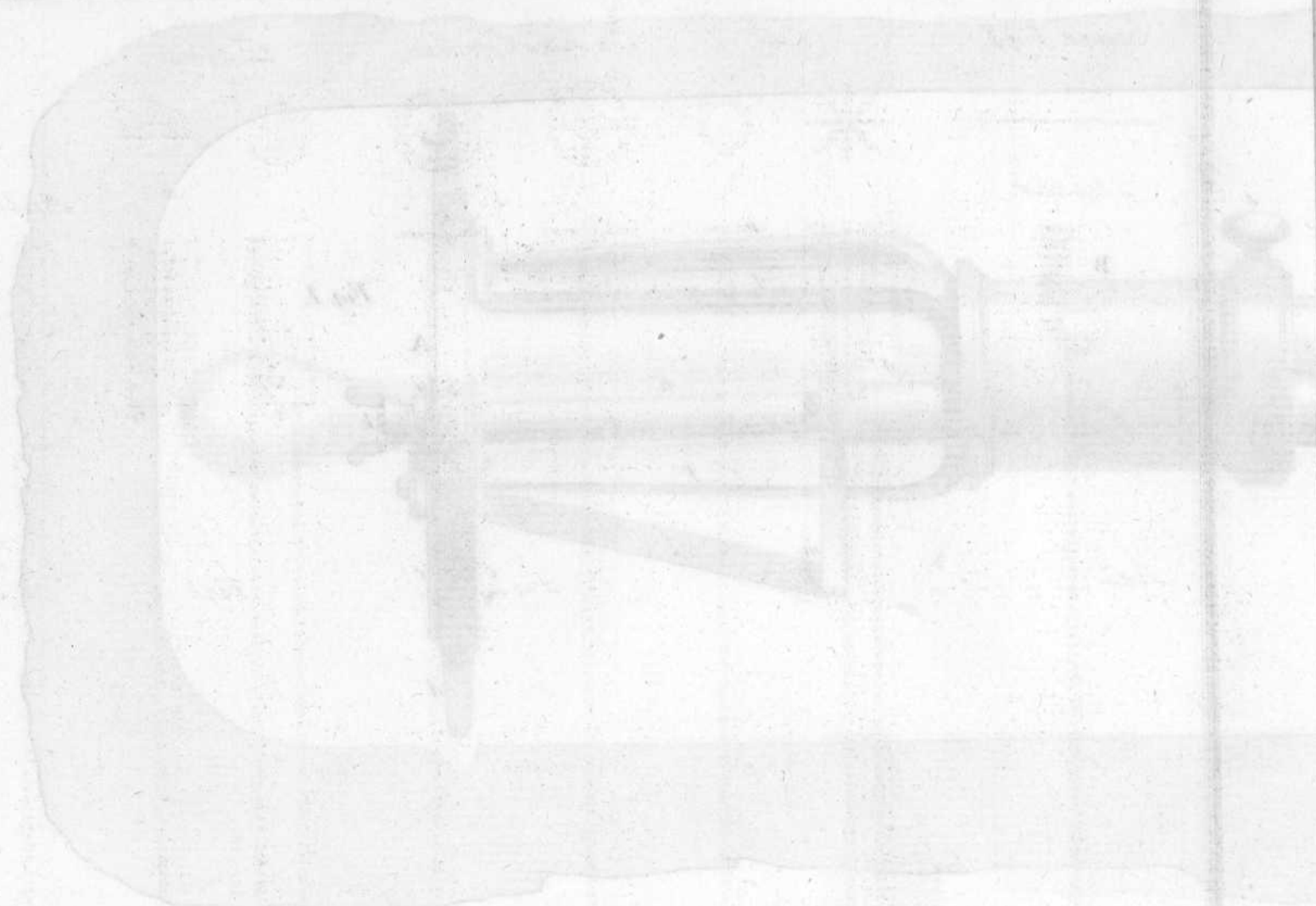


Fig. 4.



Aguja. Fig. 1.



Gato.



Cruzetas, ò Estrellas.



Stampa.



Atacador.



Fig. 2.

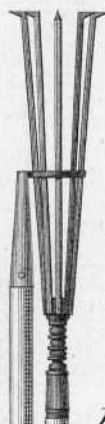


Fig. 3.



Fig. 4.

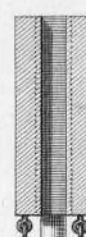
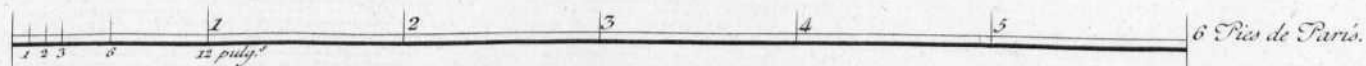


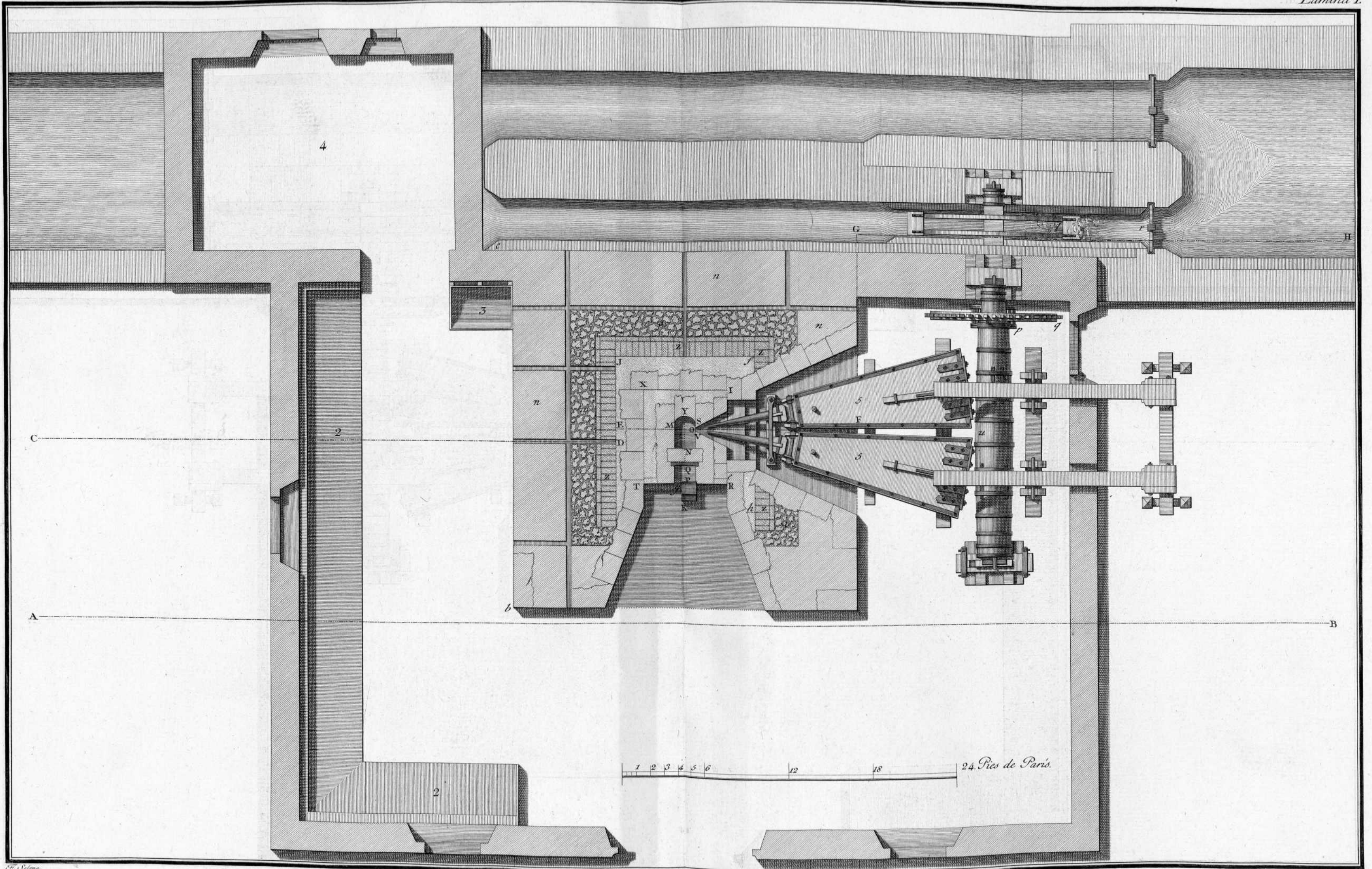
Fig. 5.

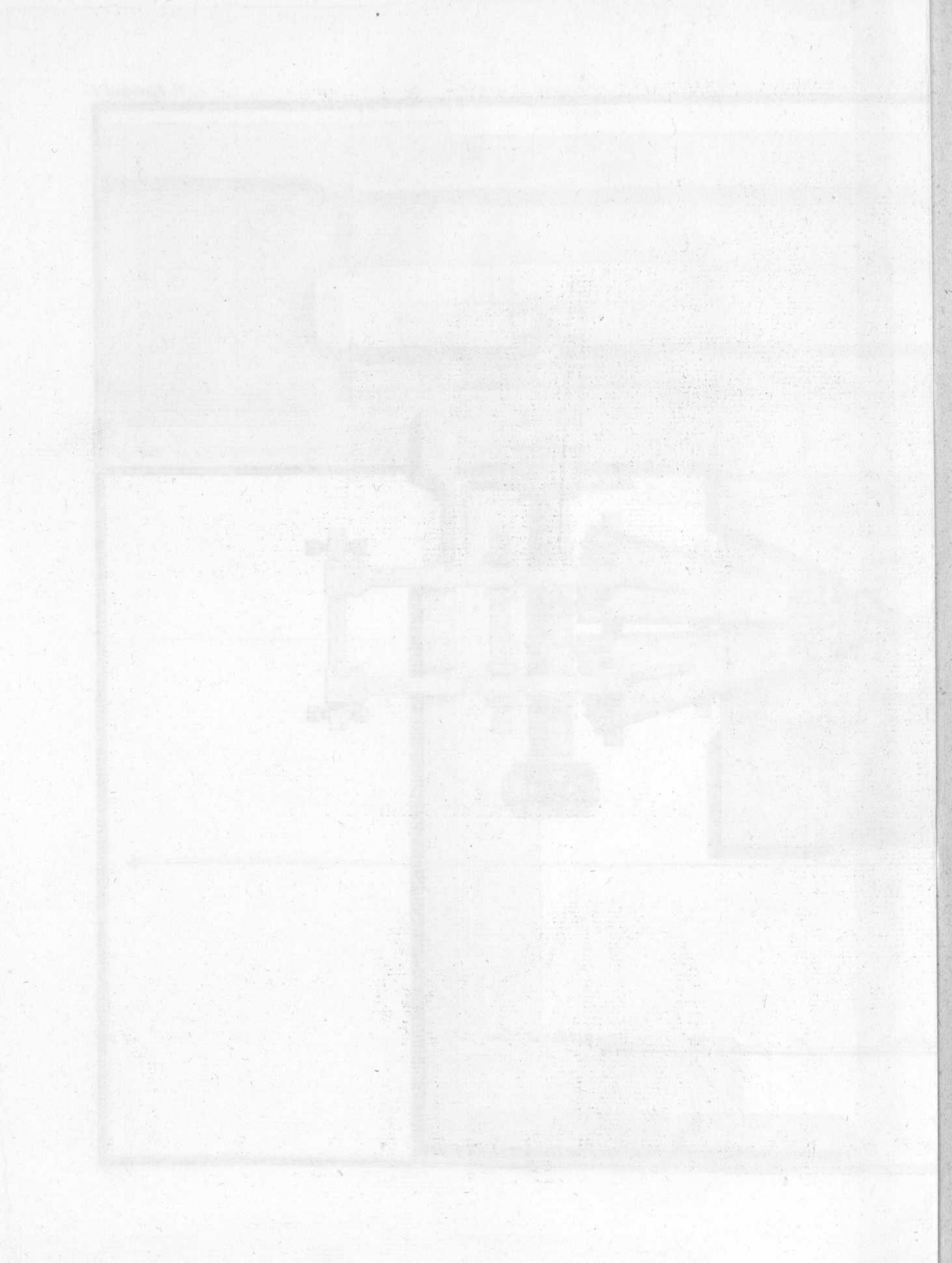
Sonda.

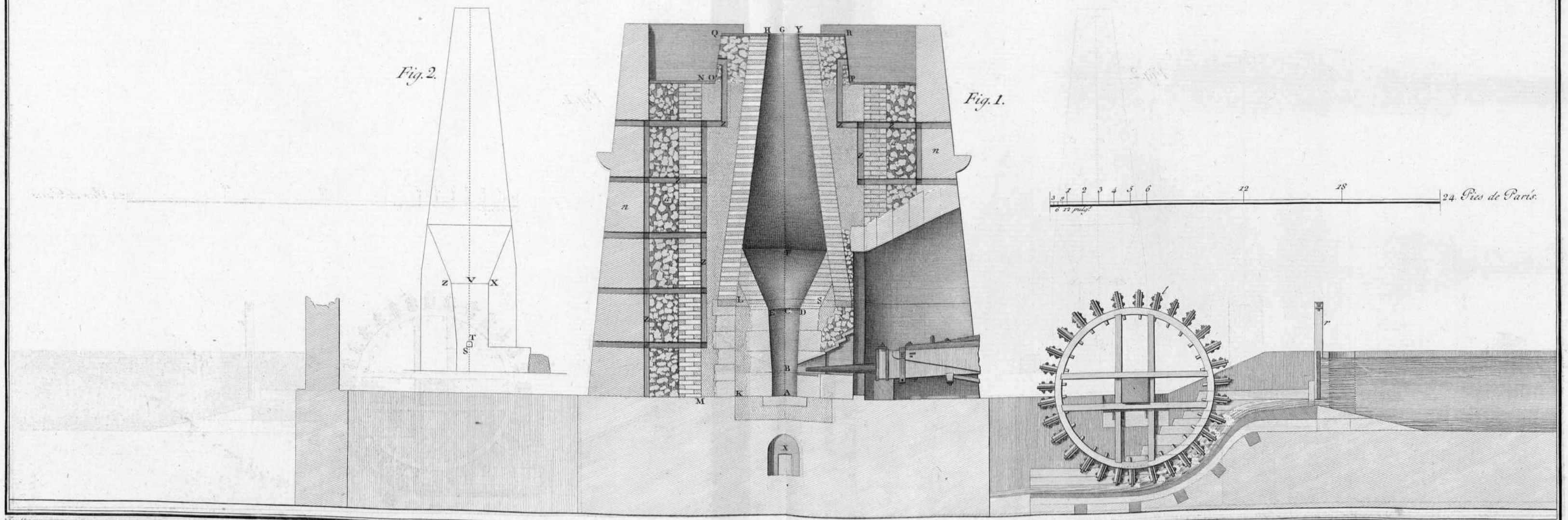


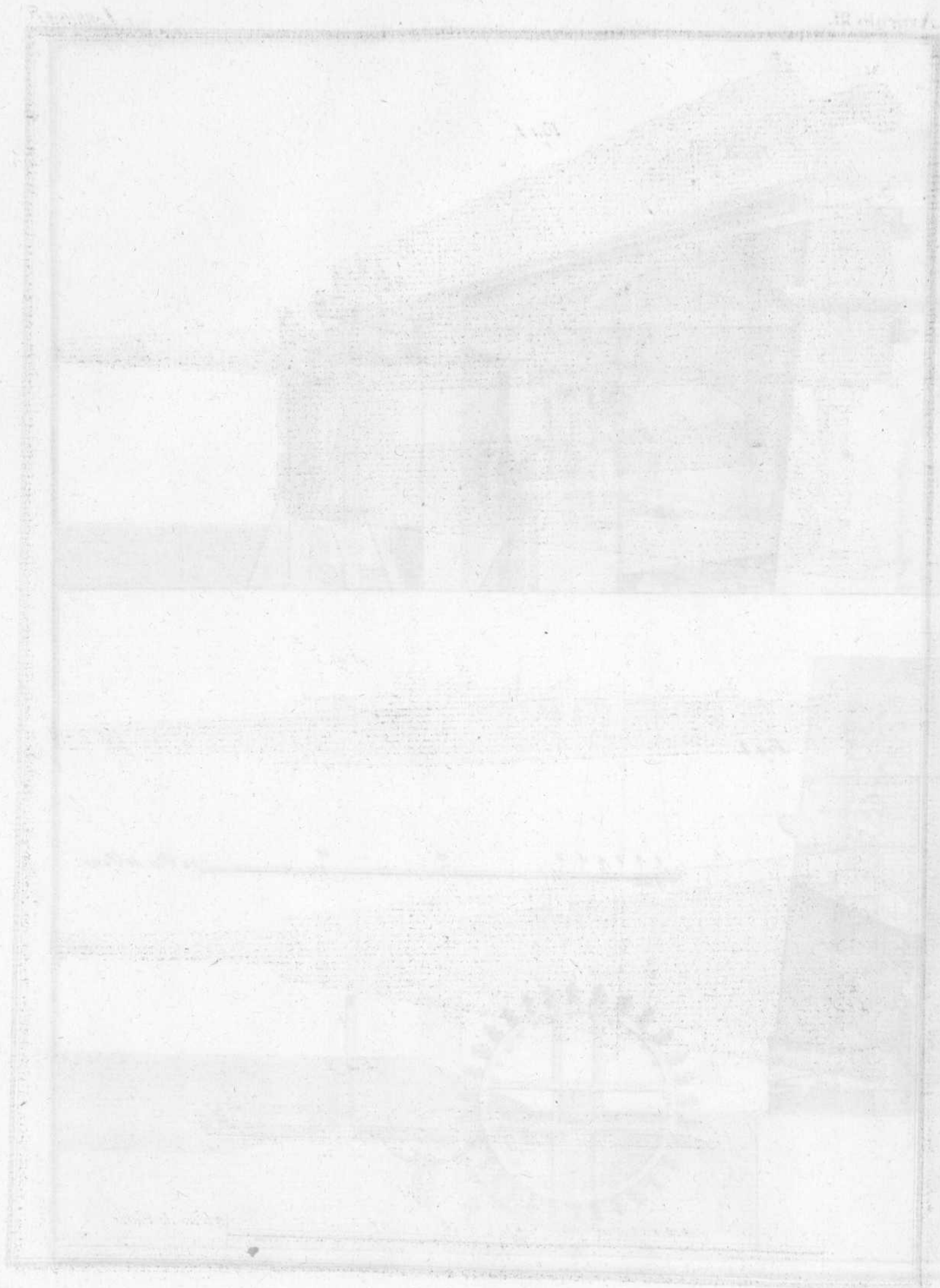
Fig. 6.

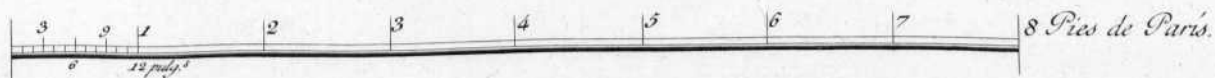
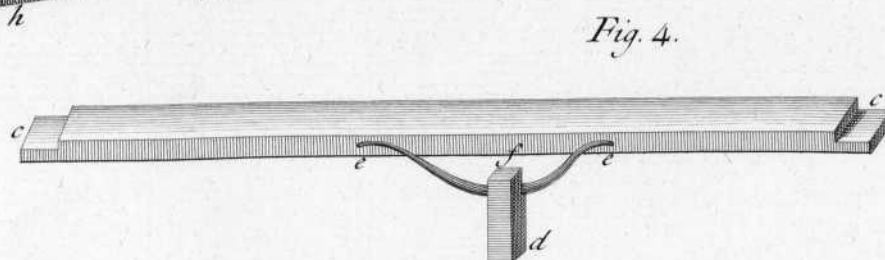
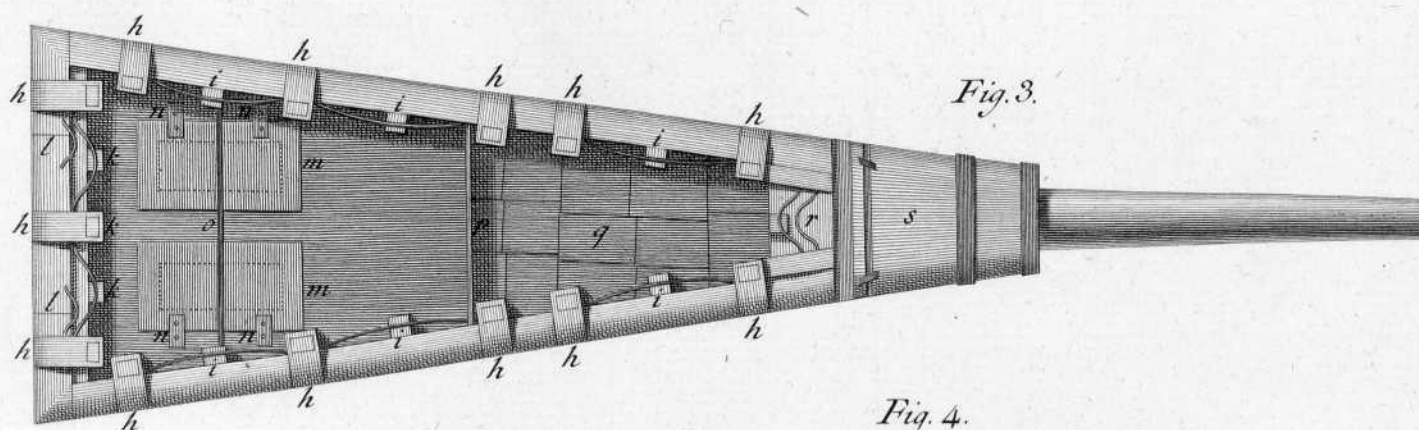
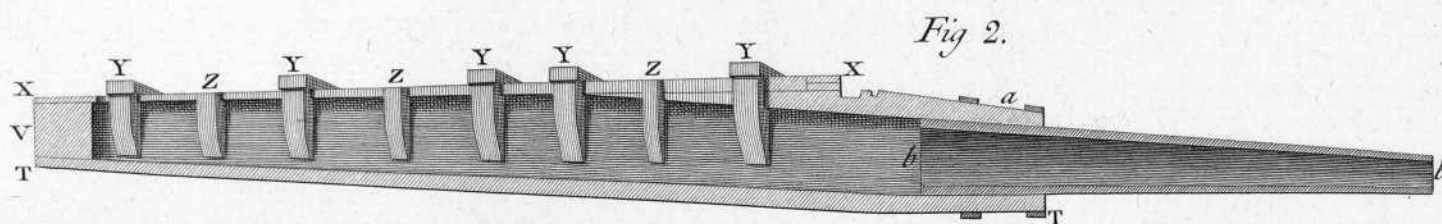
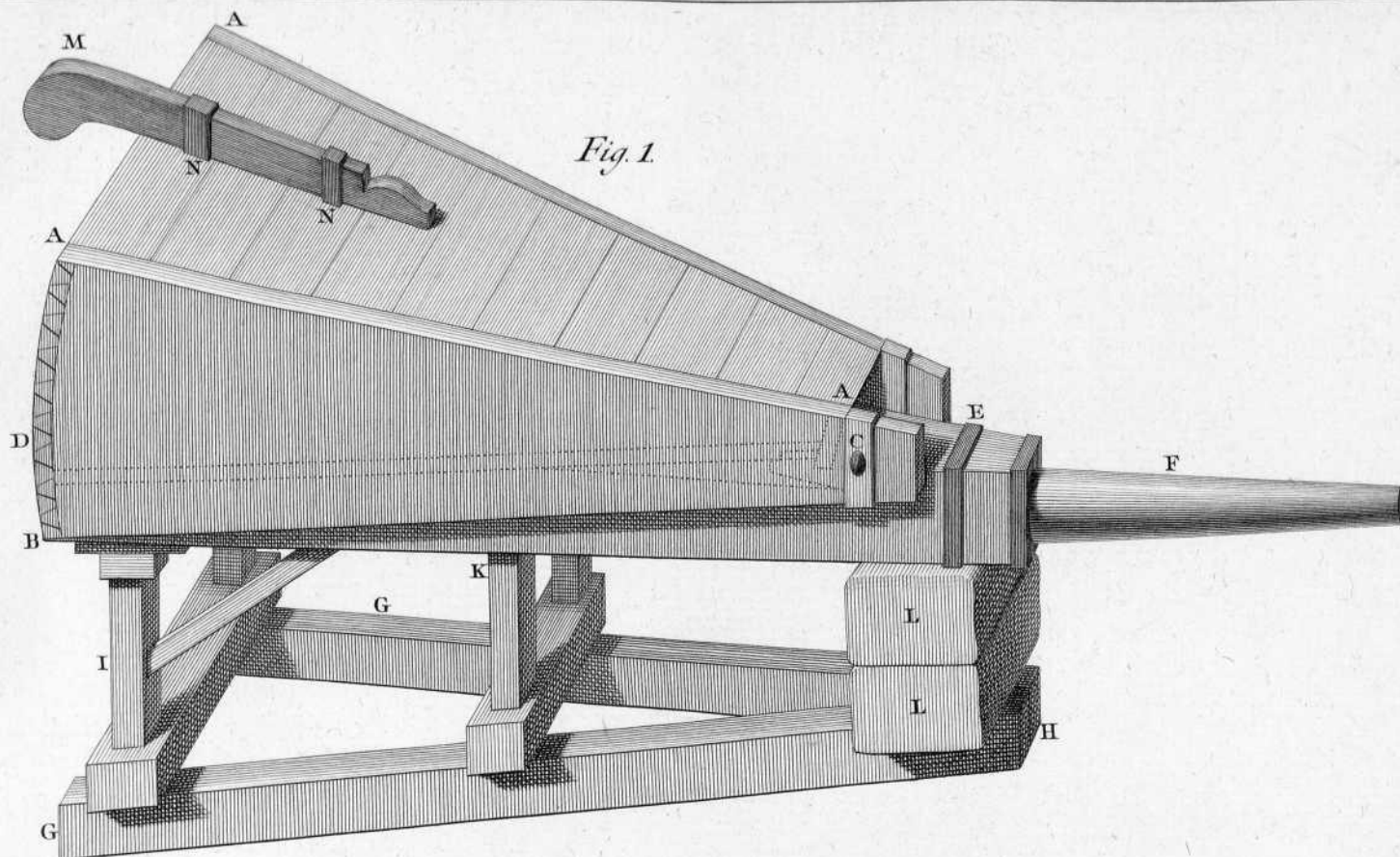


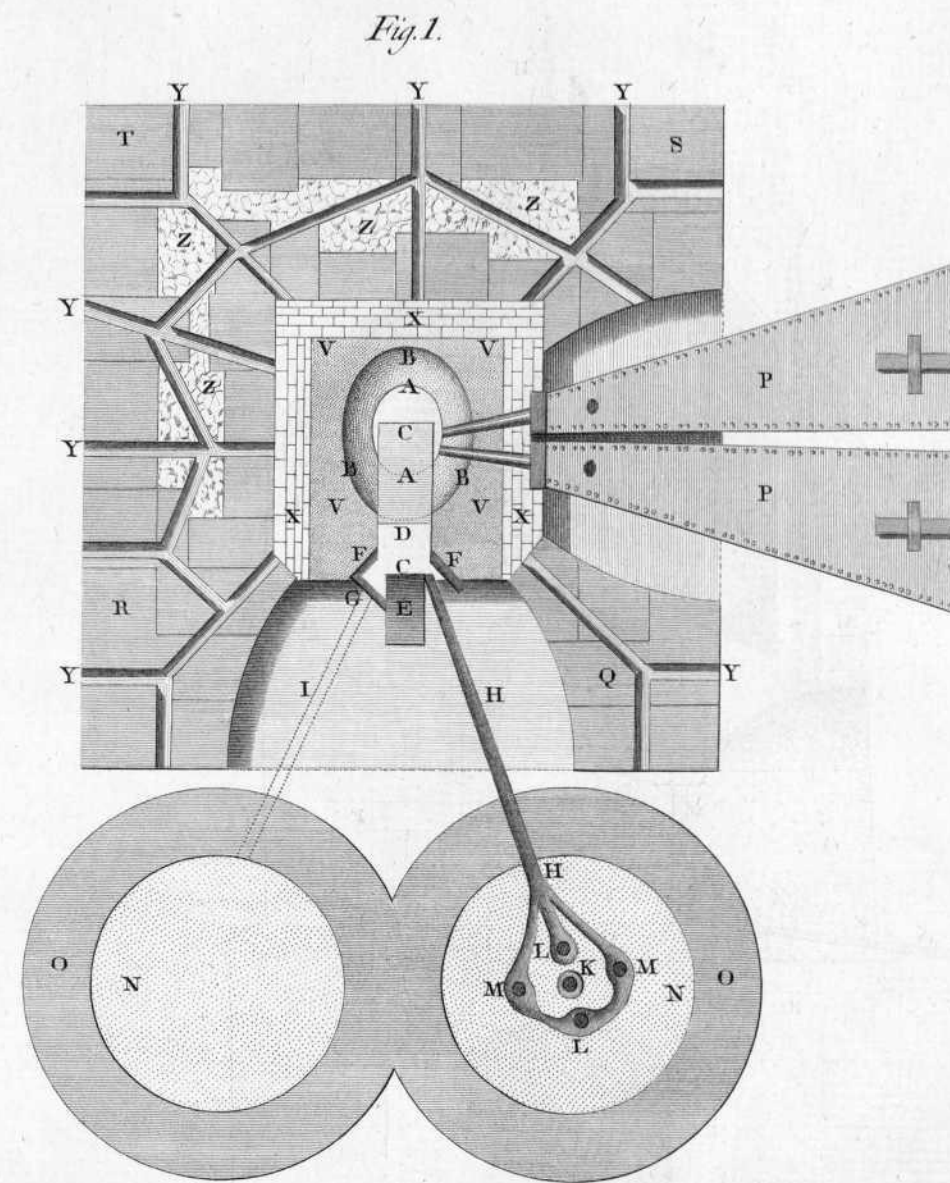




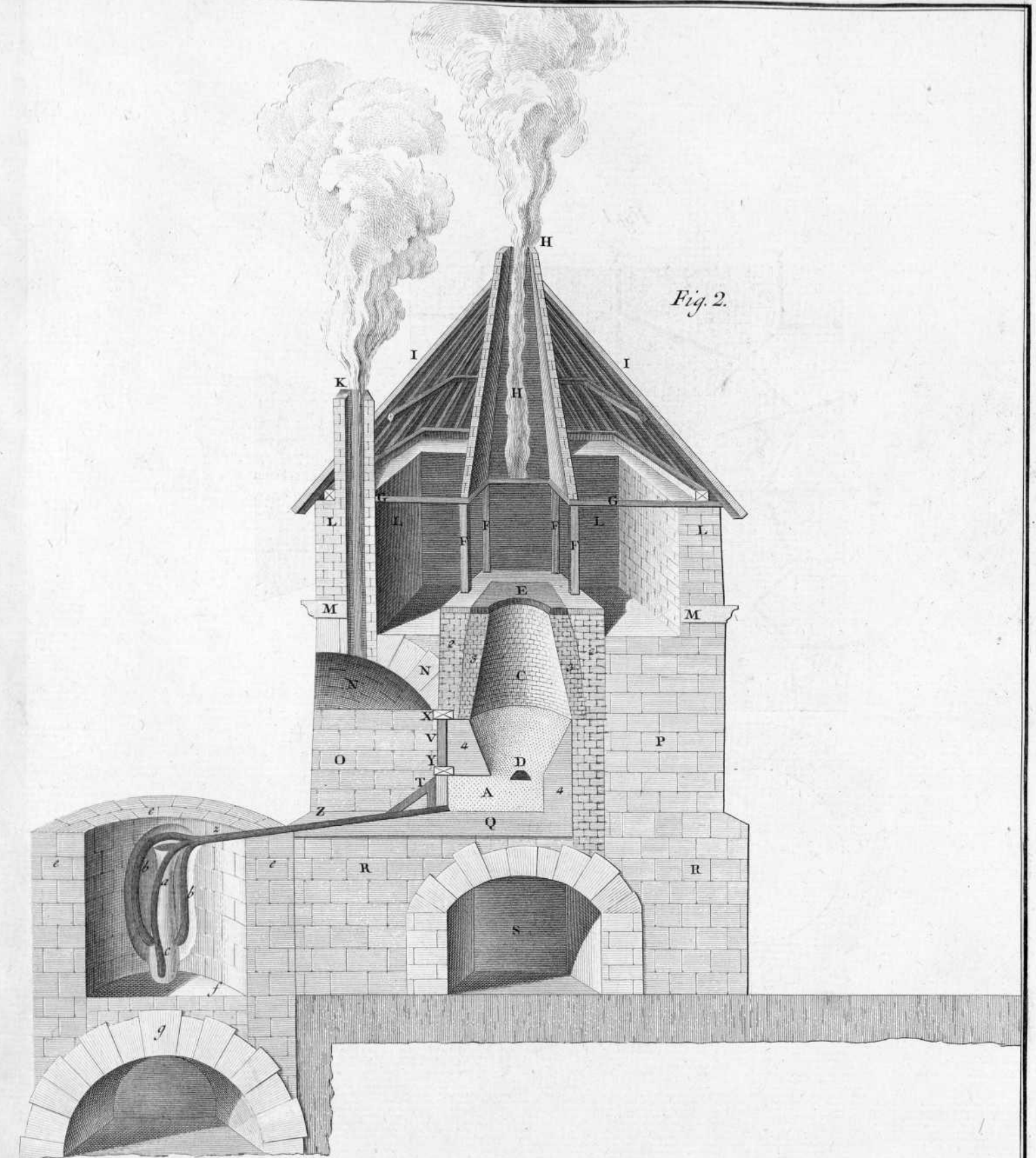


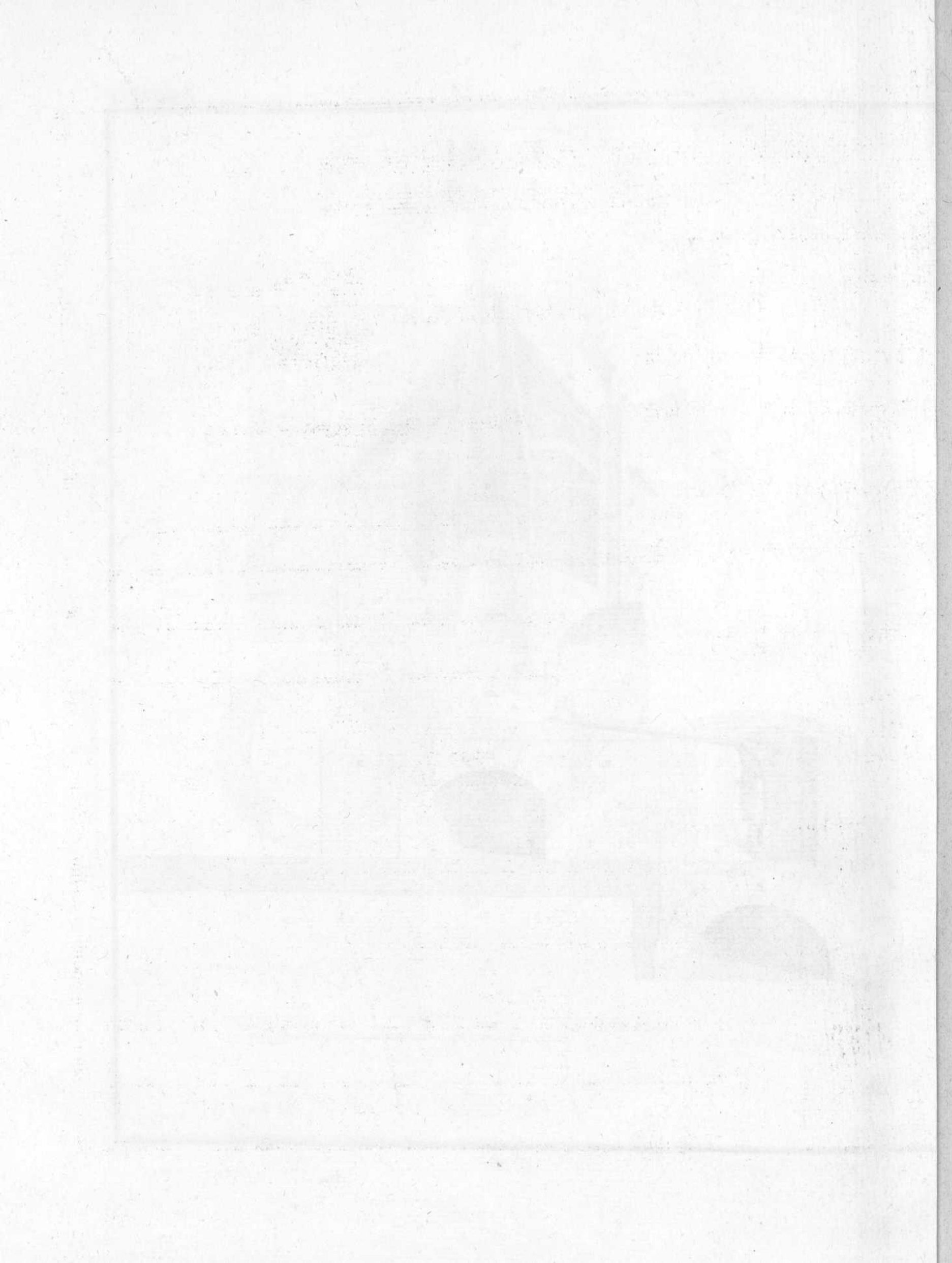






3 1 2 3 4 5 10 15 20. Pies de París.





Instrumentos correspondientes al uso de Fundidores.

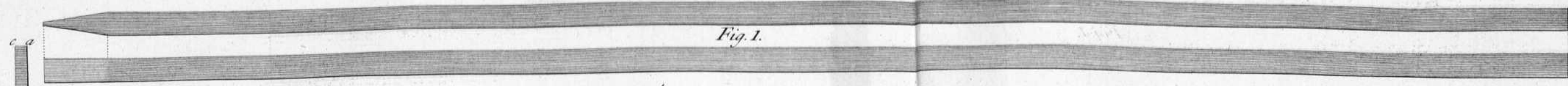


Fig. 1.

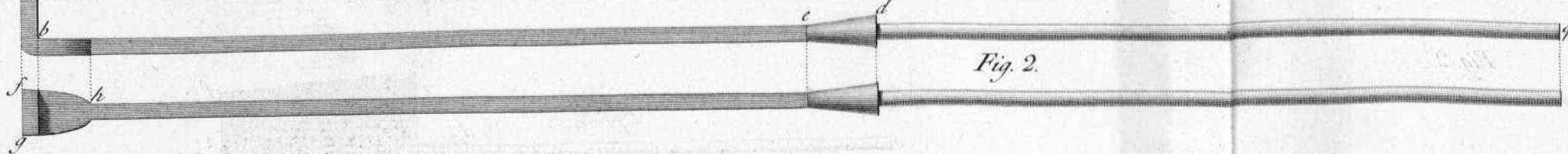


Fig. 2.



Fig. 3.

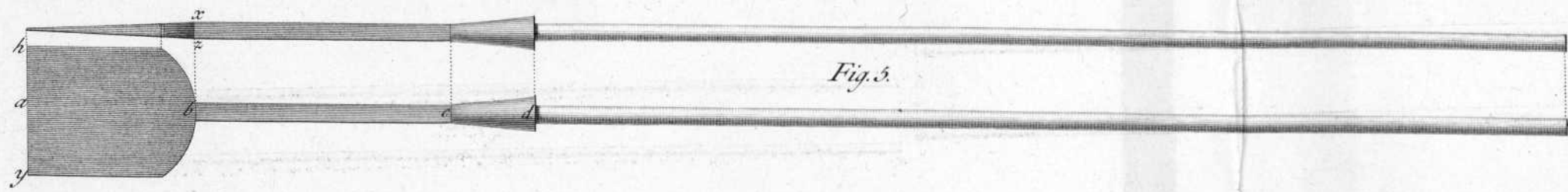


Fig. 5.



Fig. 6.



Fig. 7.

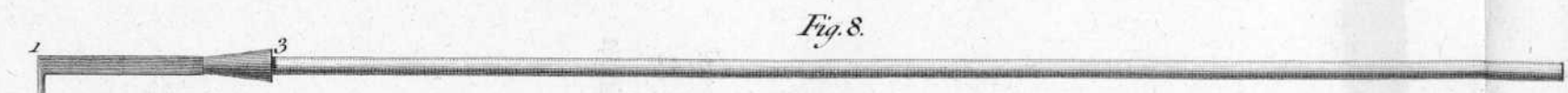


Fig. 8.

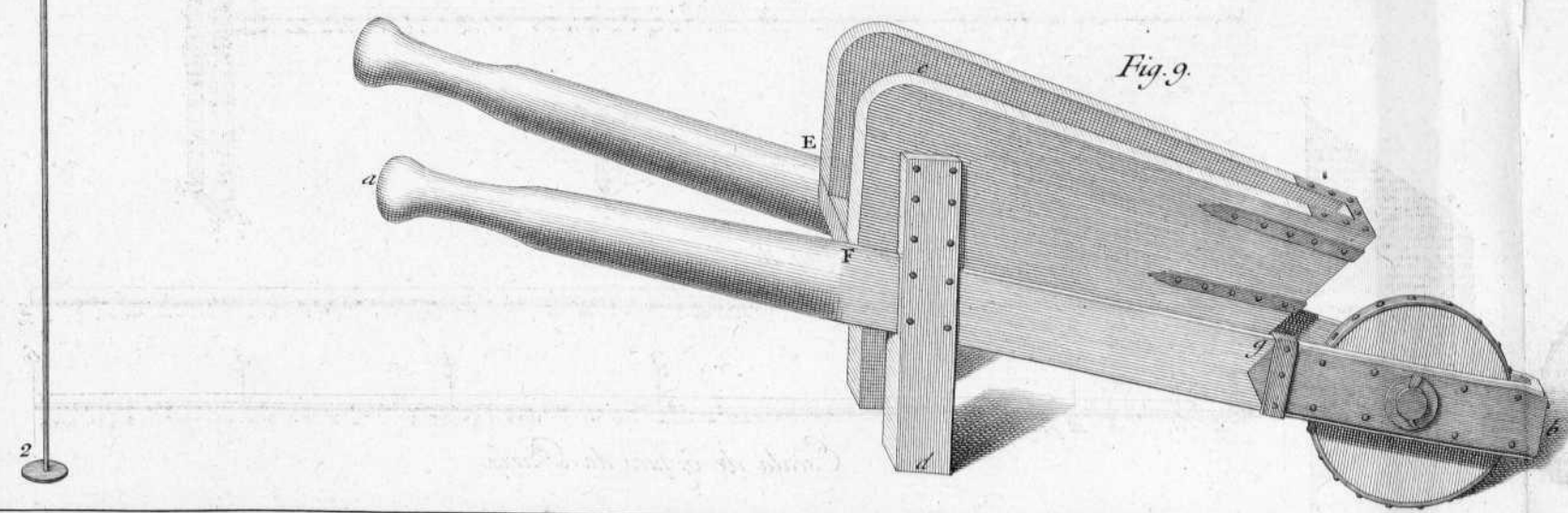


Fig. 9.

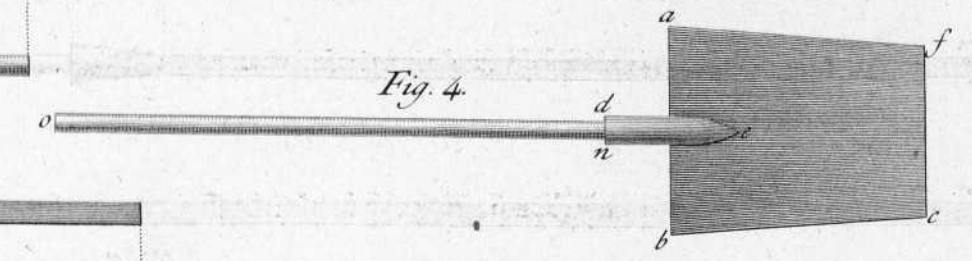


Fig. 4.



Fig. 10.

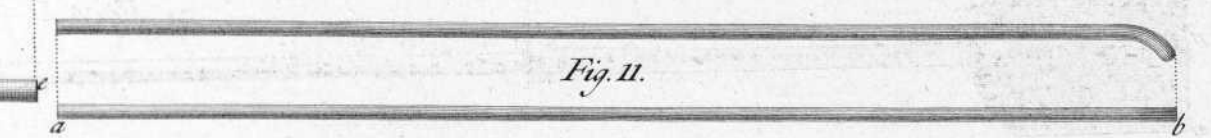


Fig. 11.

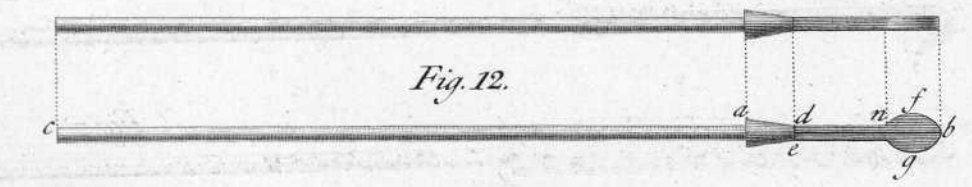


Fig. 12.



Fig. 13.



Fig. 14.

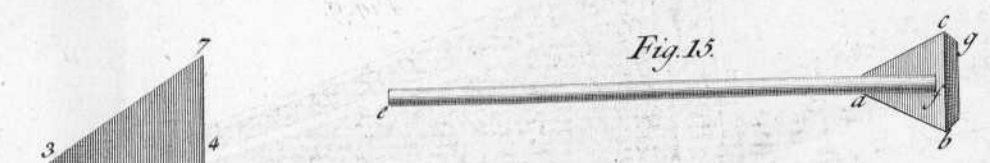


Fig. 15.

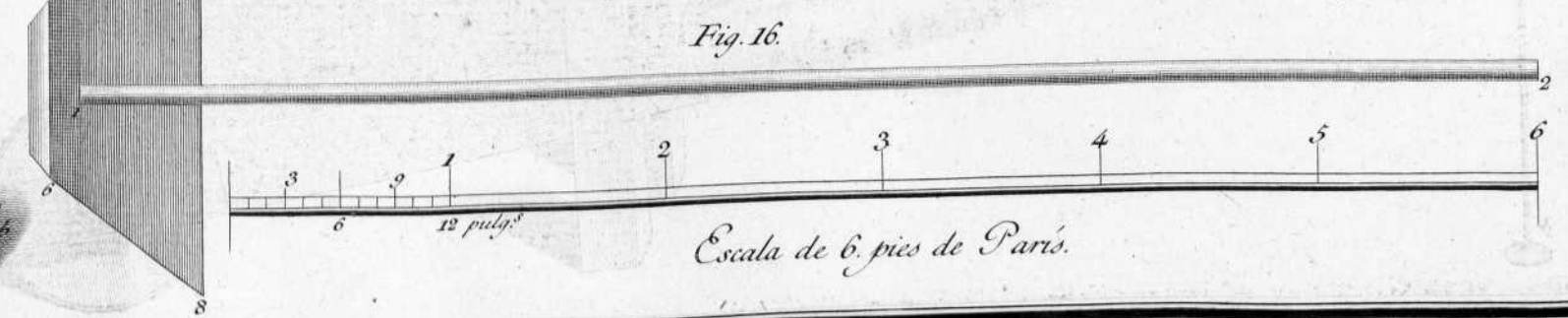
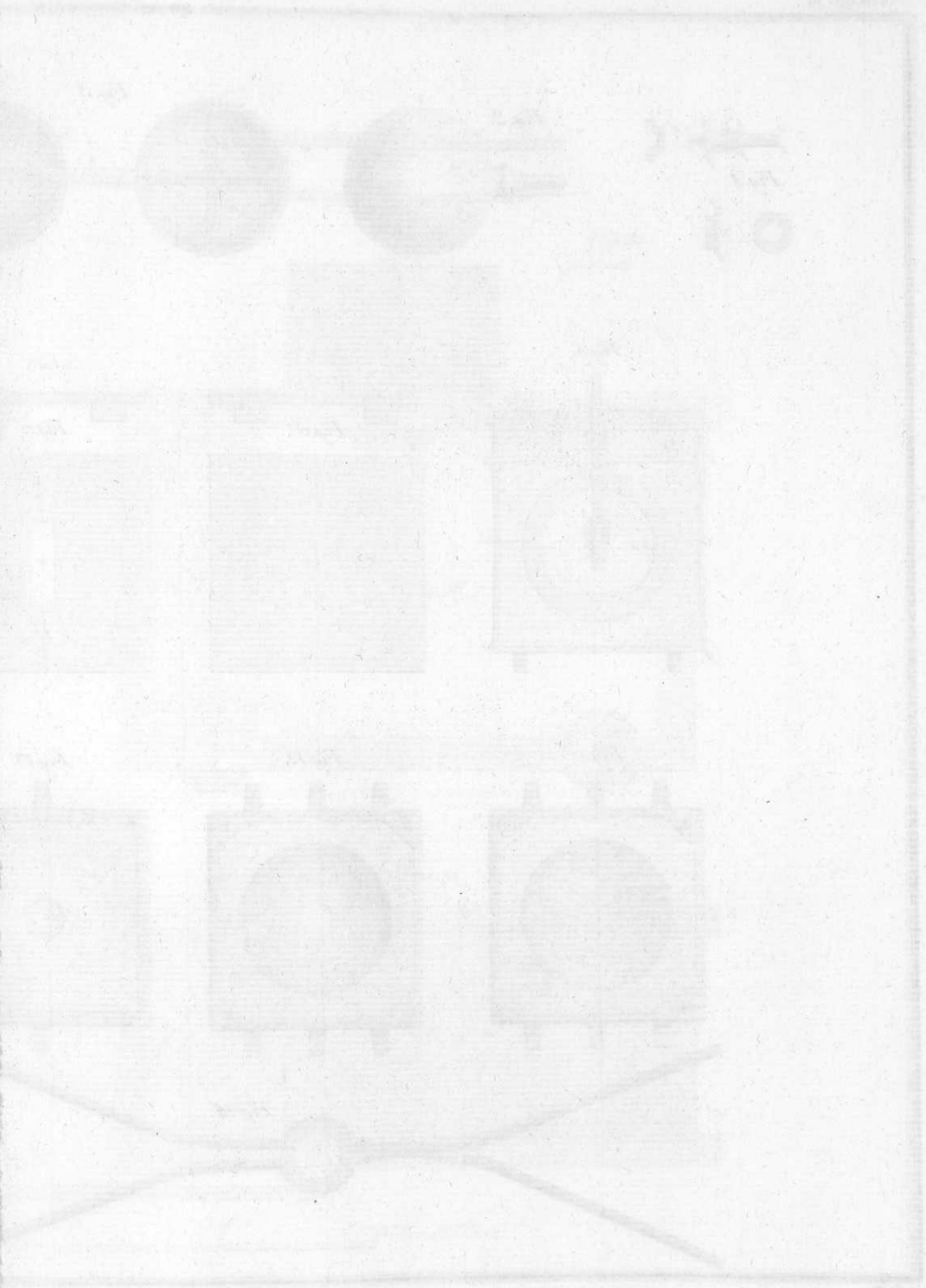


Fig. 16.



Escala de 6. pies de París.



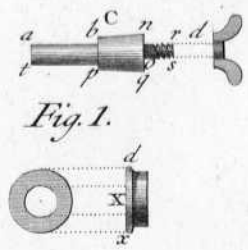


Fig. 1.

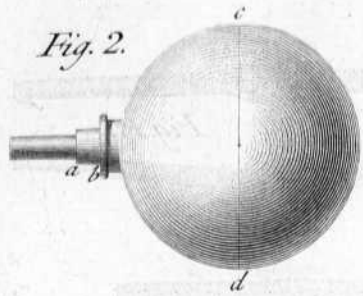


Fig. 2.

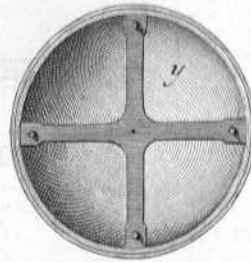


Fig. 3.

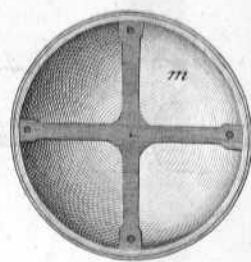


Fig. 4.

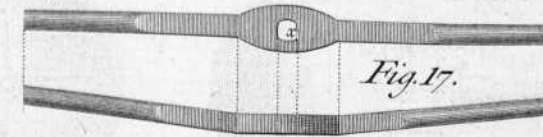


Fig. 17.



Fig. 20.

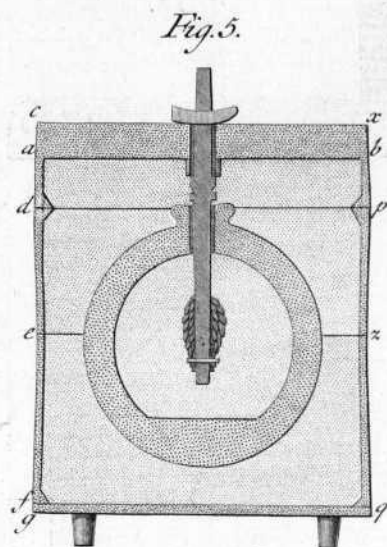


Fig. 5.

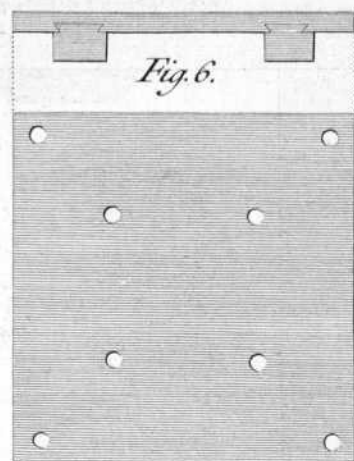


Fig. 6.

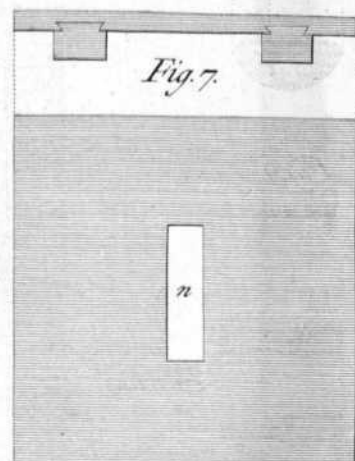


Fig. 7.

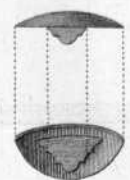


Fig. 8.



Fig. 9.

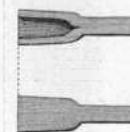


Fig. 10.

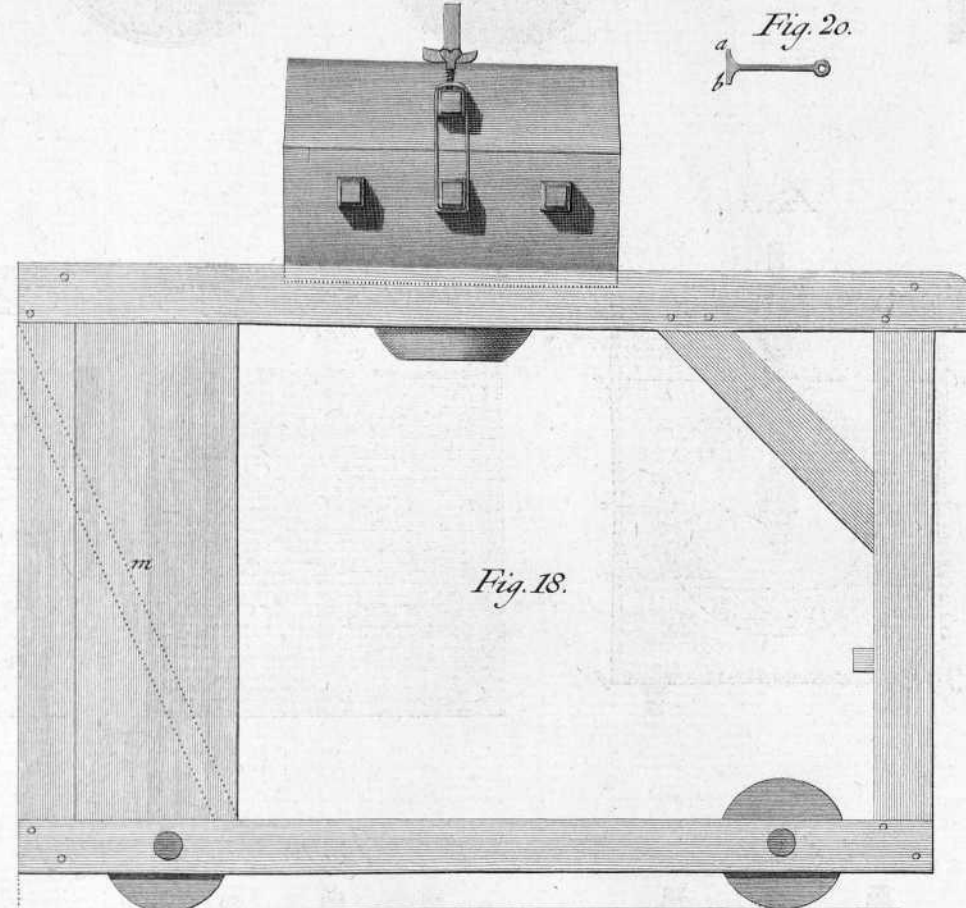


Fig. 18.

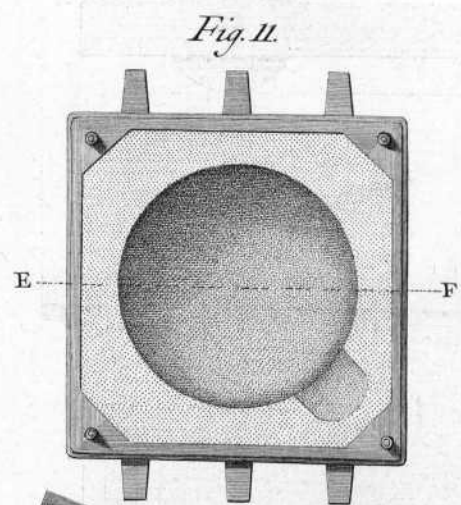


Fig. 11.

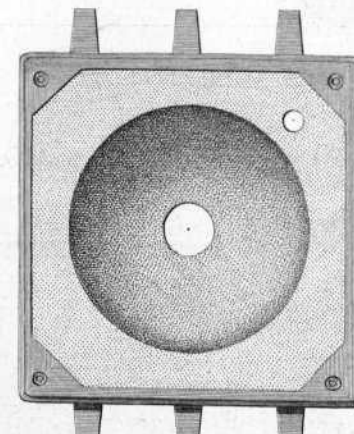


Fig. 12.

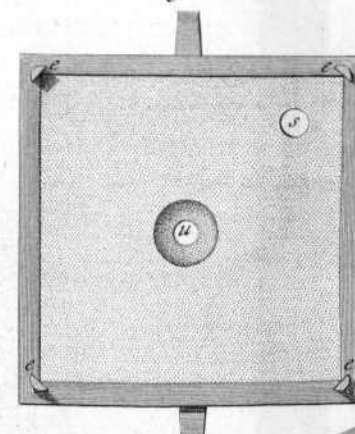


Fig. 13.

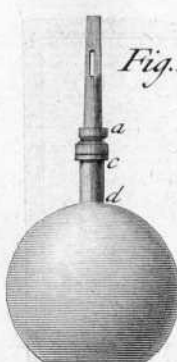


Fig. 15.

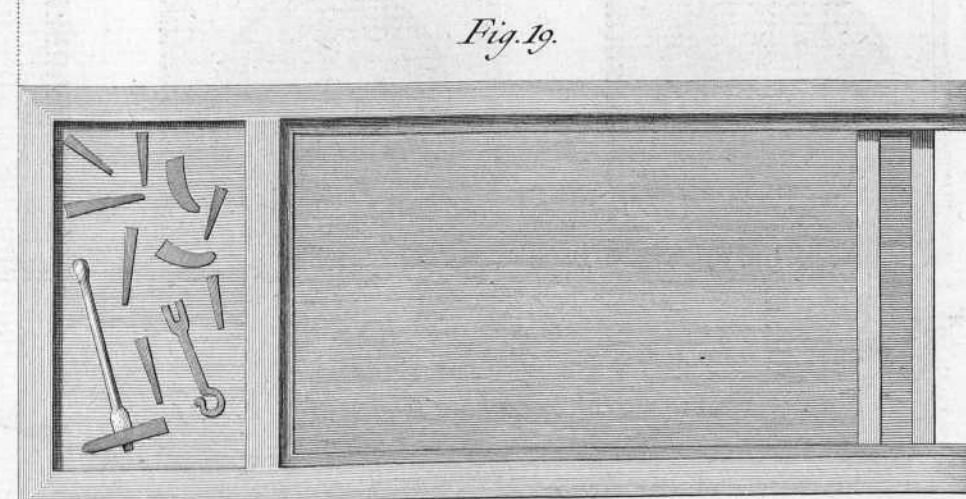


Fig. 19.

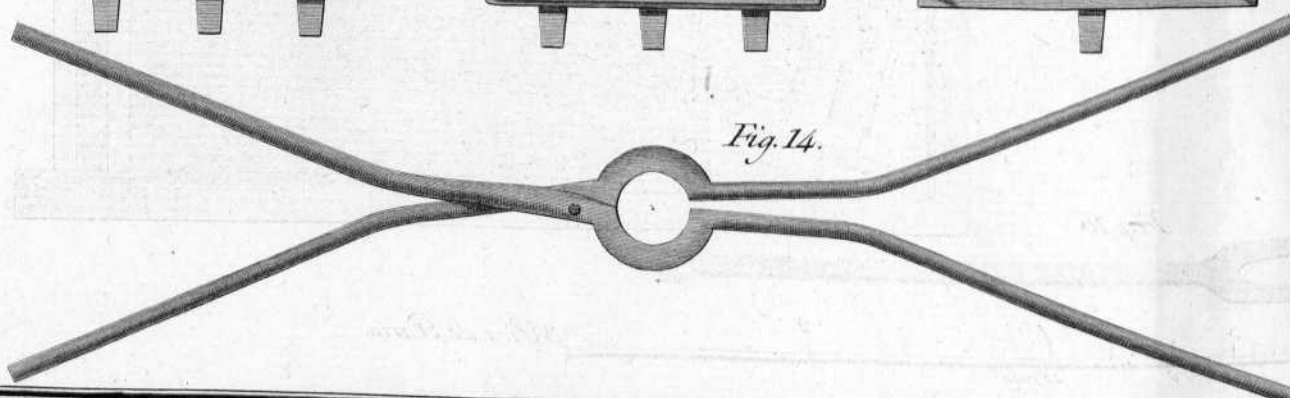


Fig. 14.

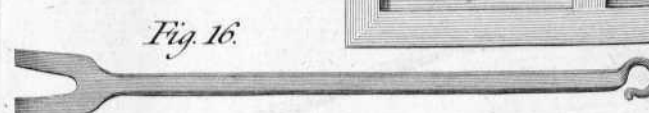
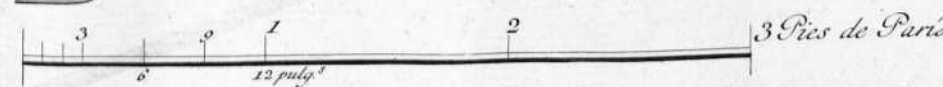
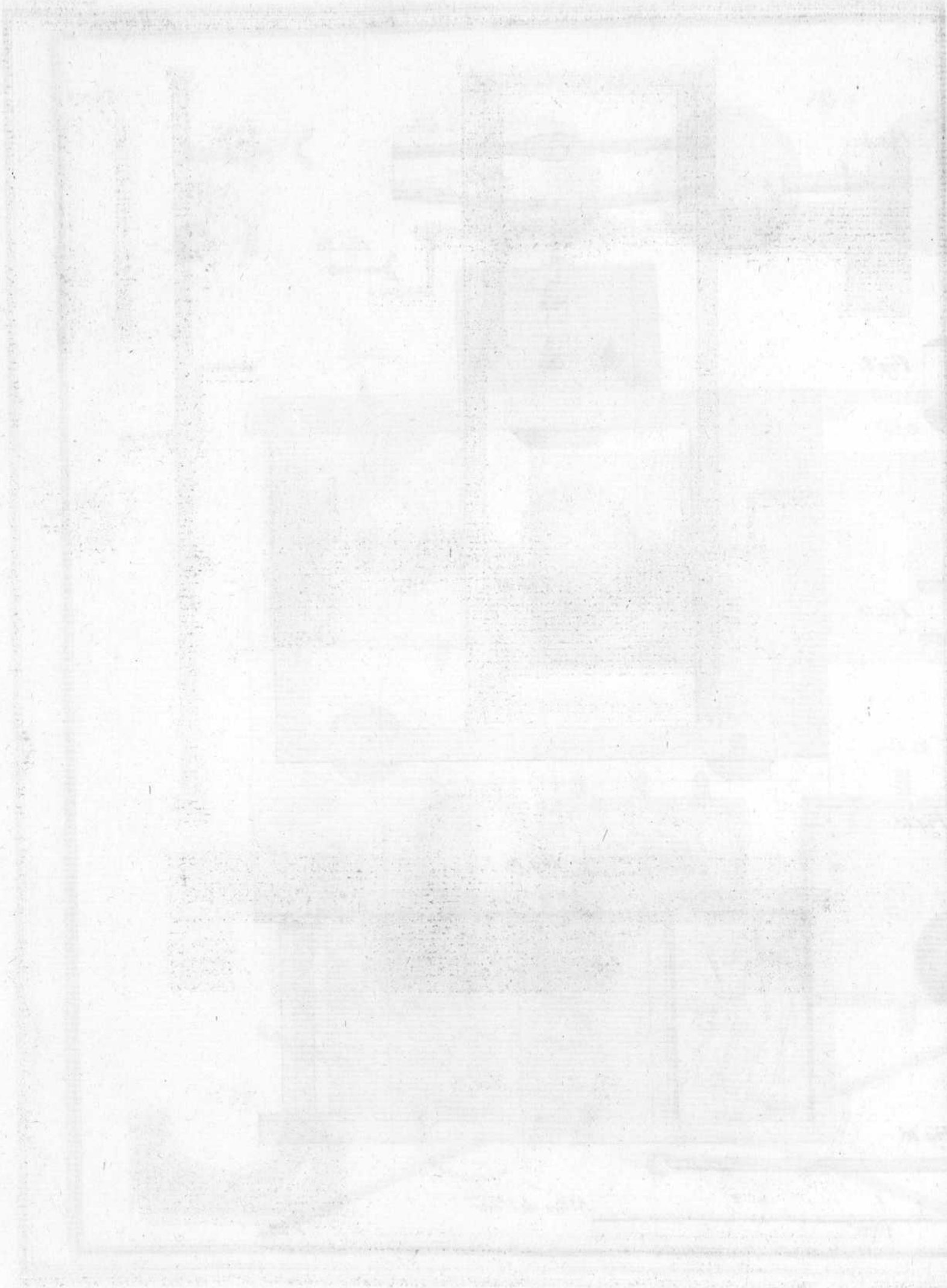
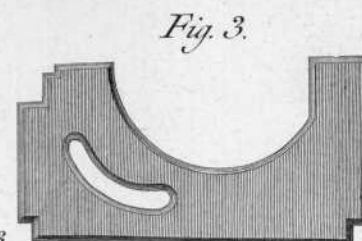
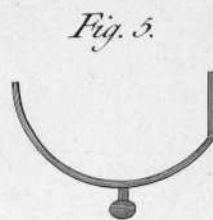
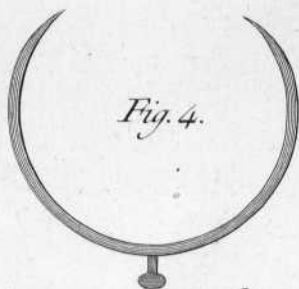
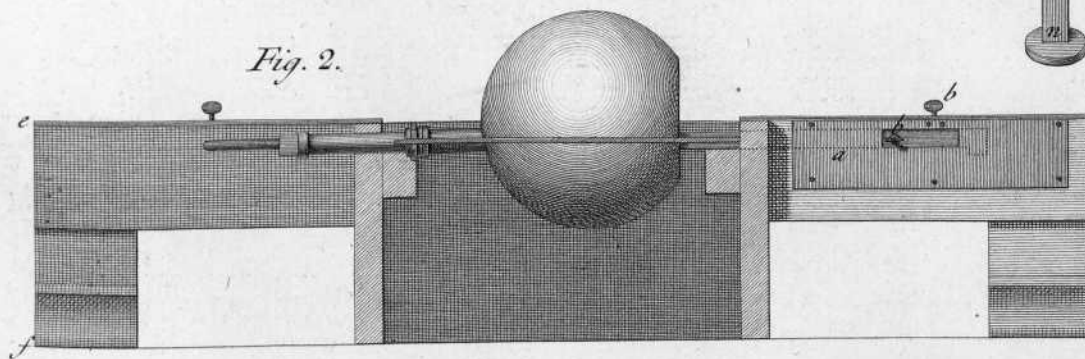
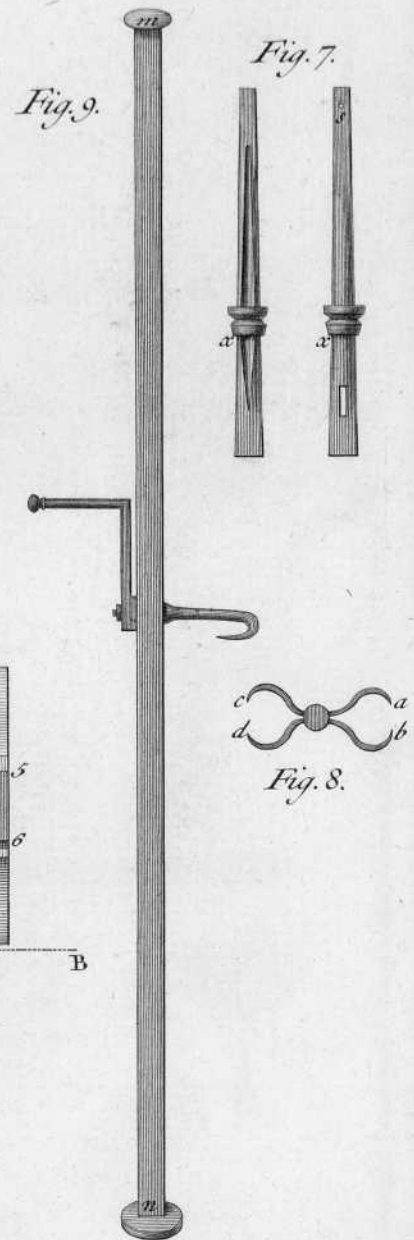
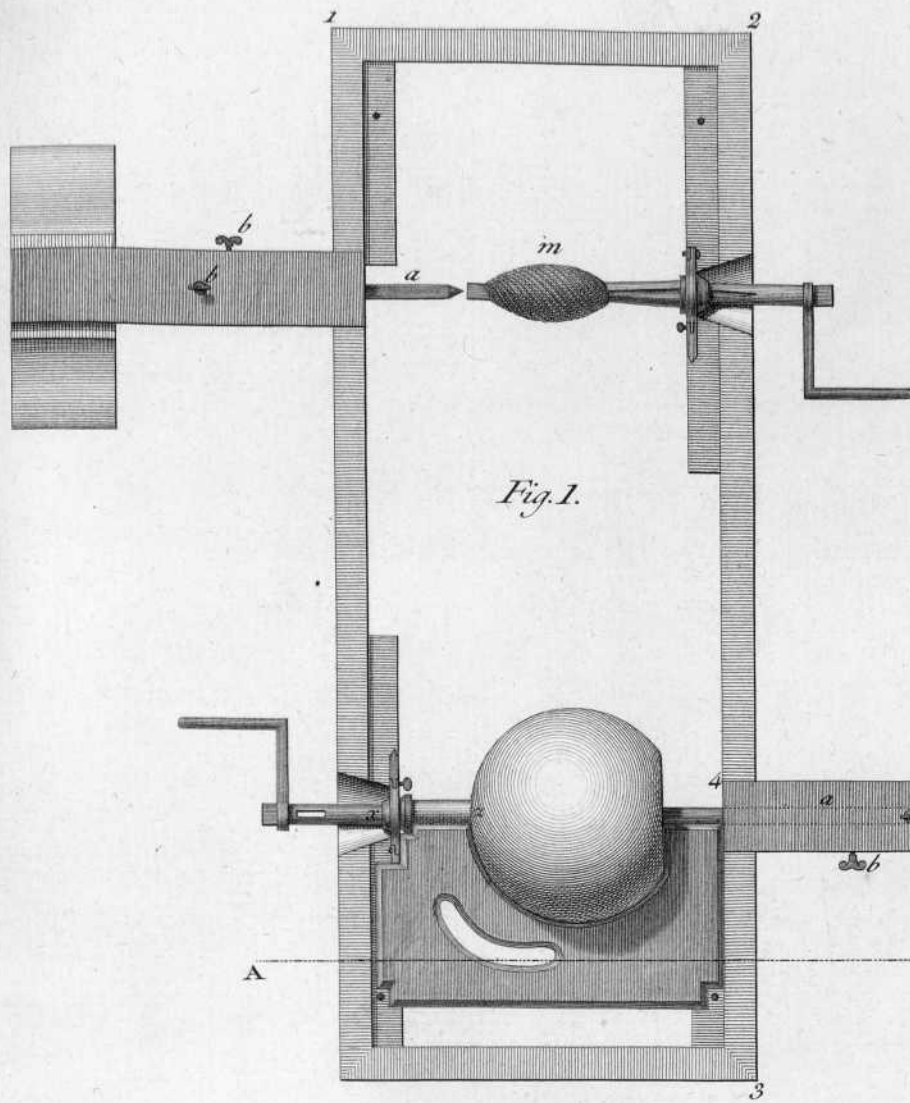


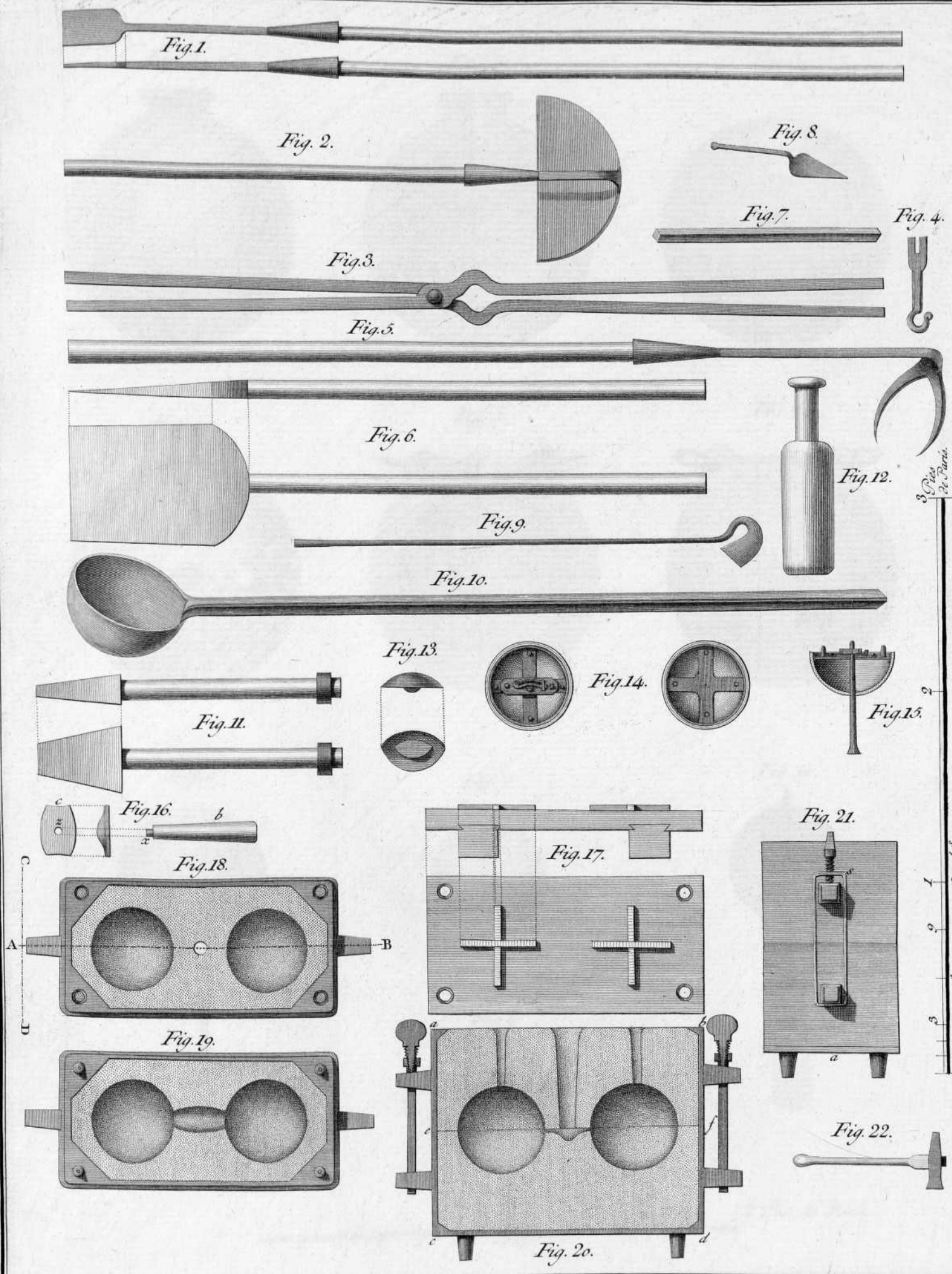
Fig. 16.



3 Pies de Paris.







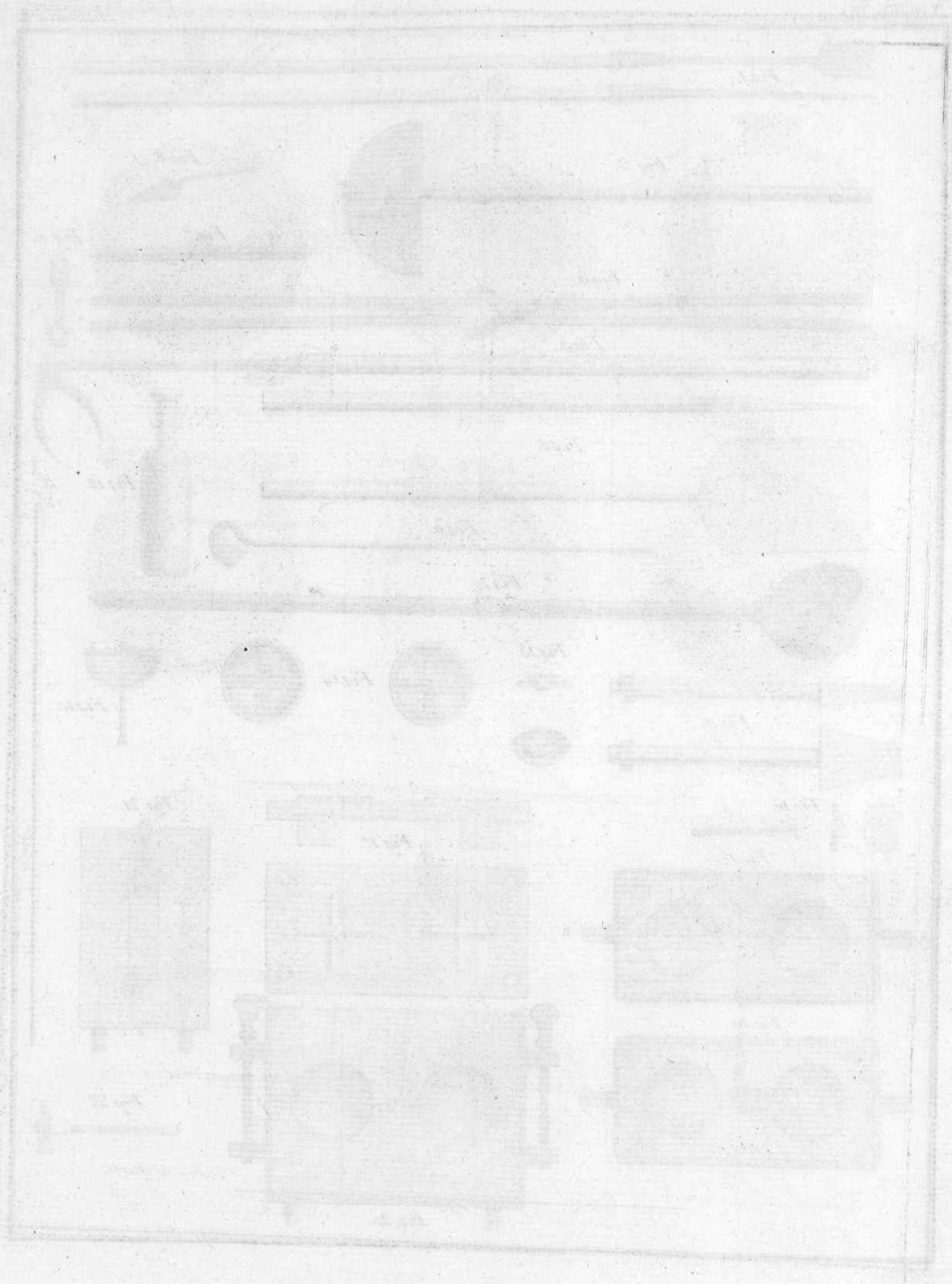


Fig. 1.



Fig. 2.

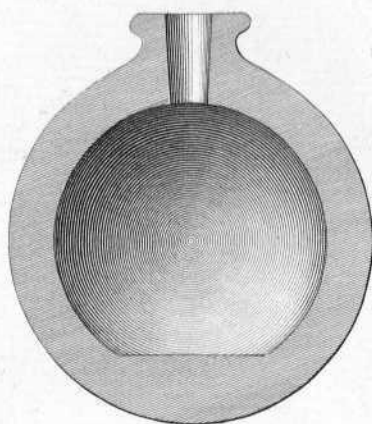


Fig. 3.

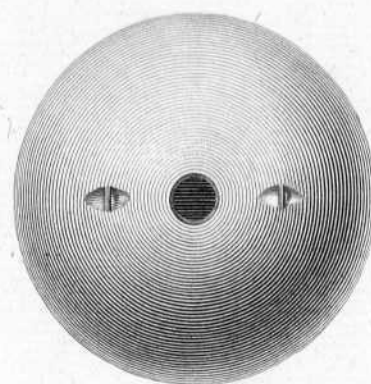


Fig. 4.

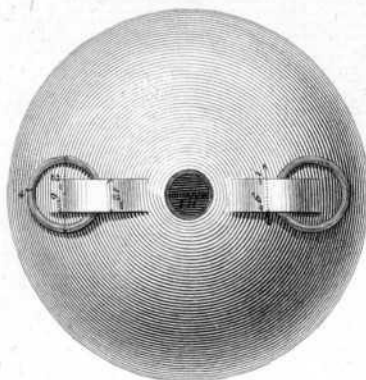


Fig. 5.

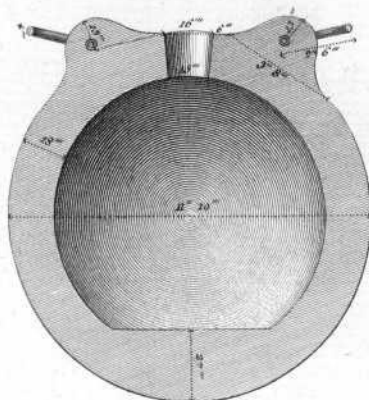


Fig. 6.

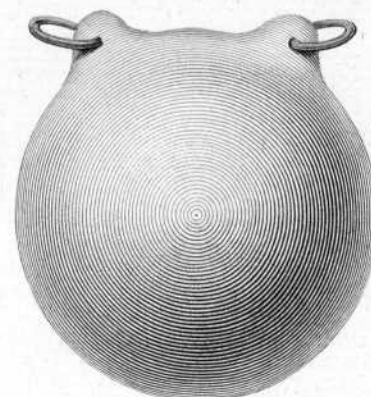


Fig. 9.



Fig. 7.

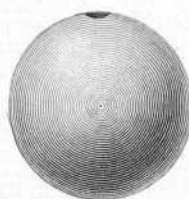


Fig. 8.

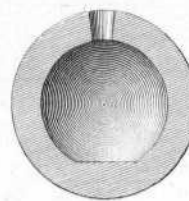
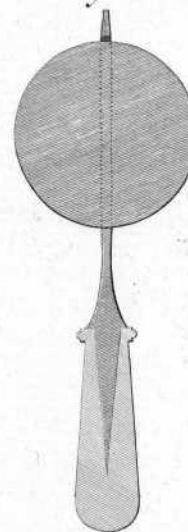
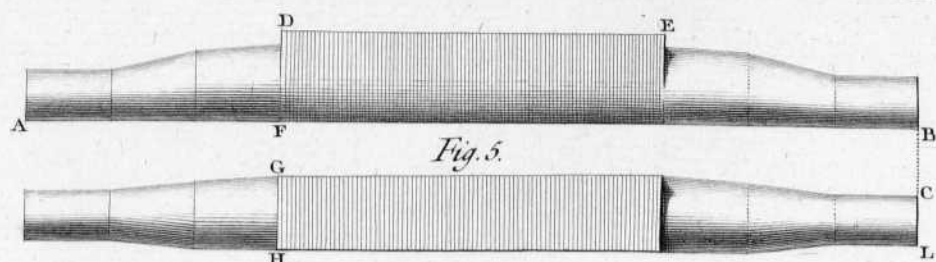
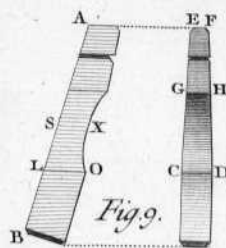
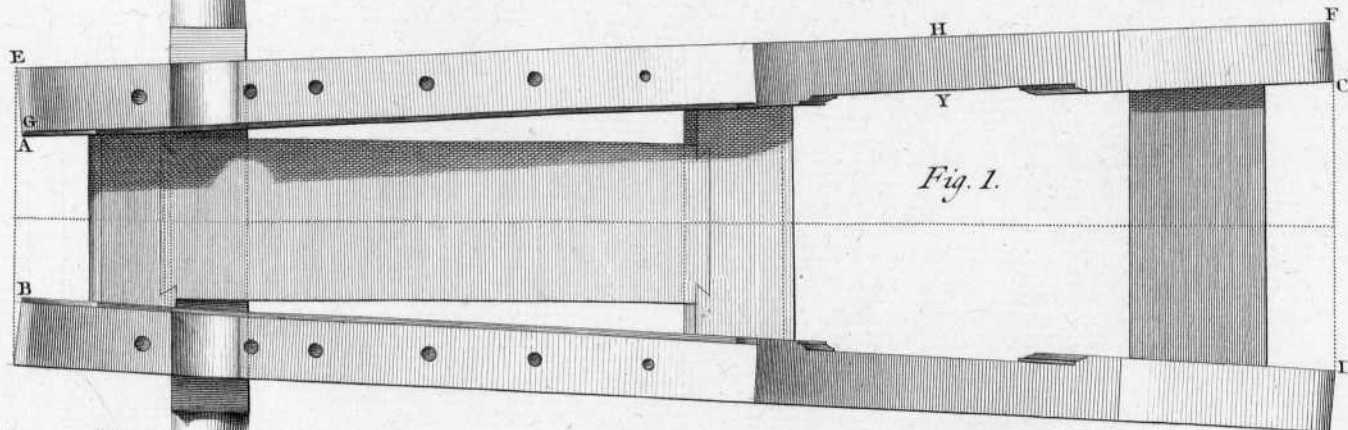
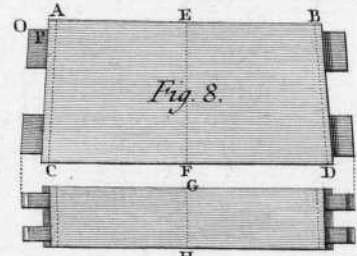
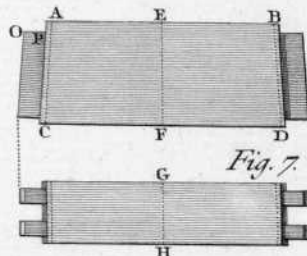
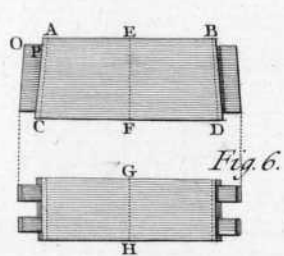
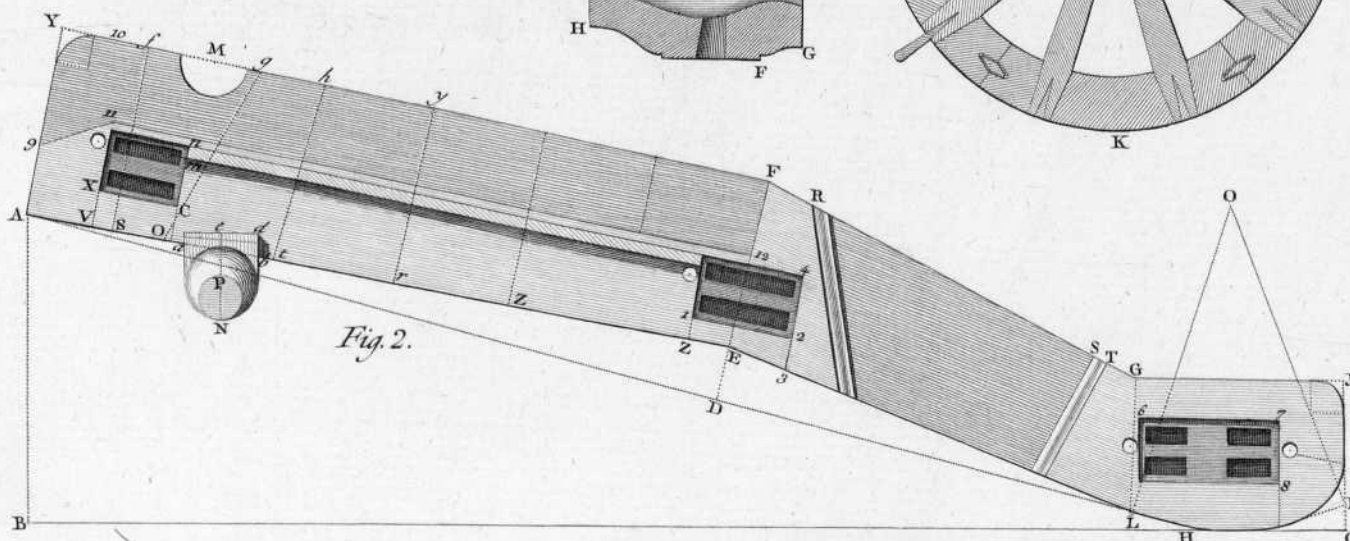
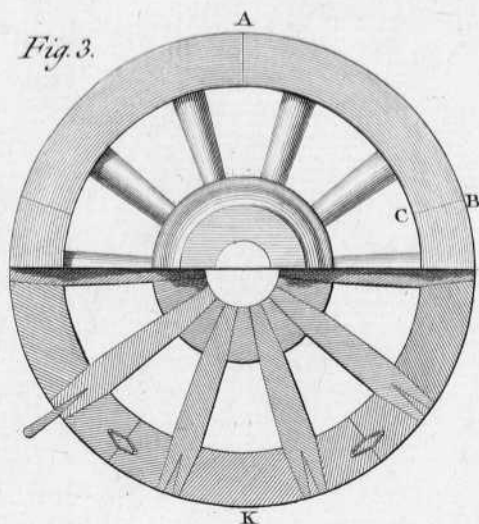
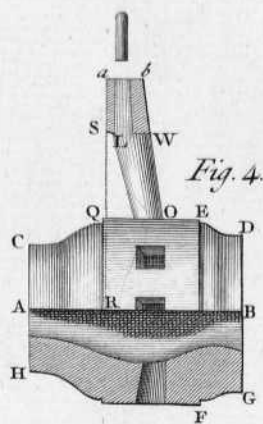
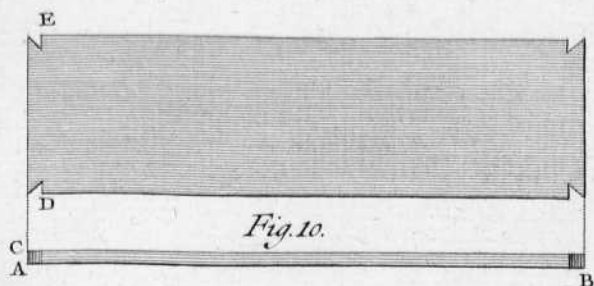


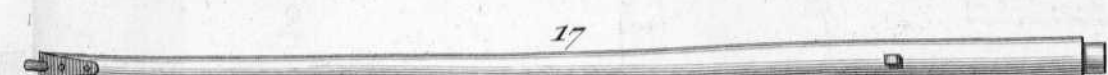
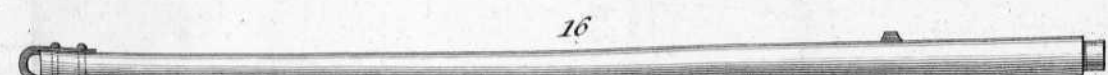
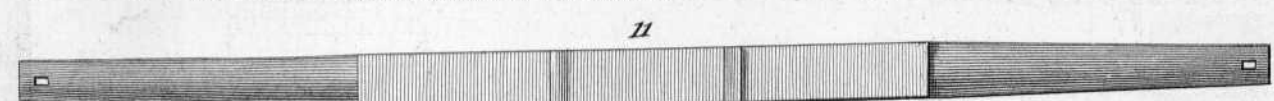
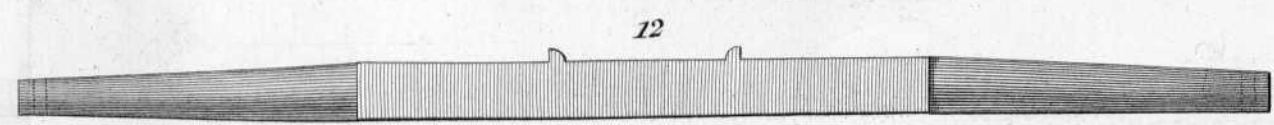
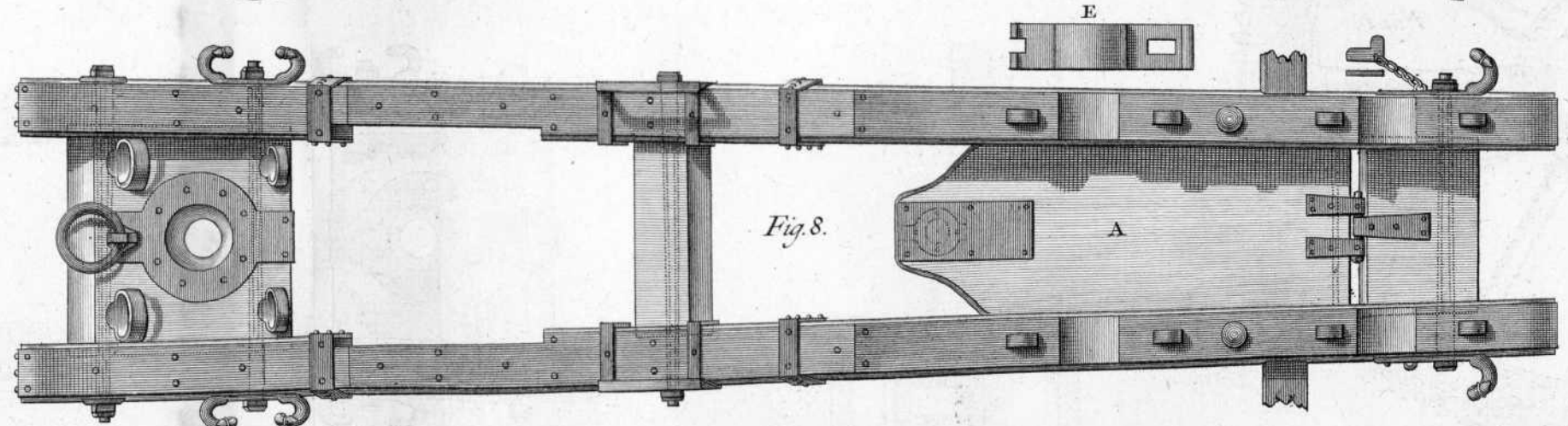
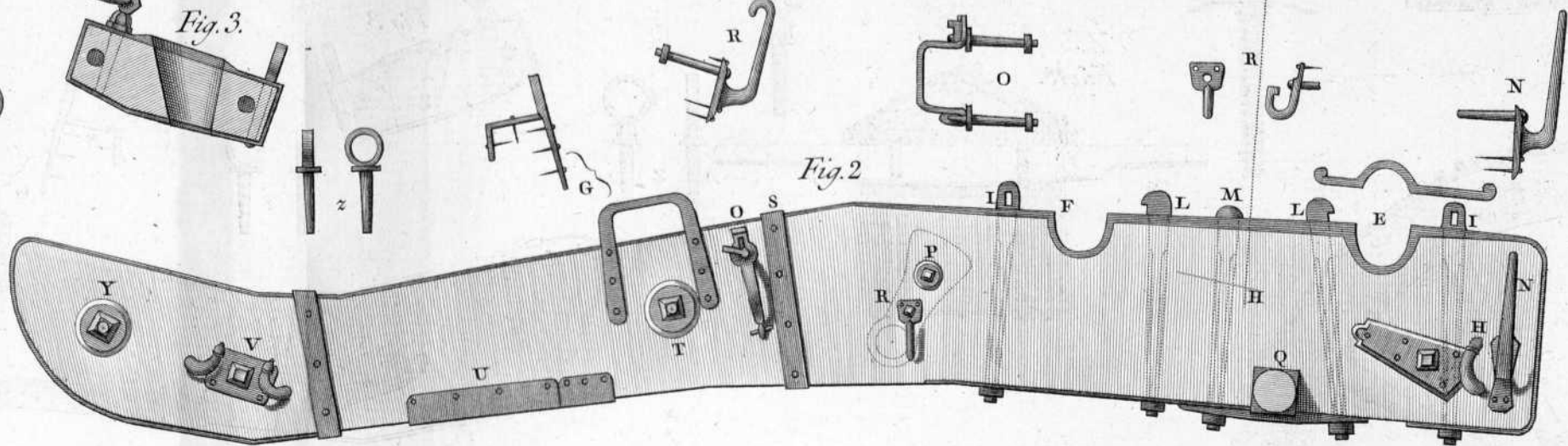
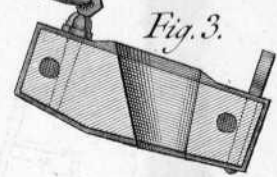
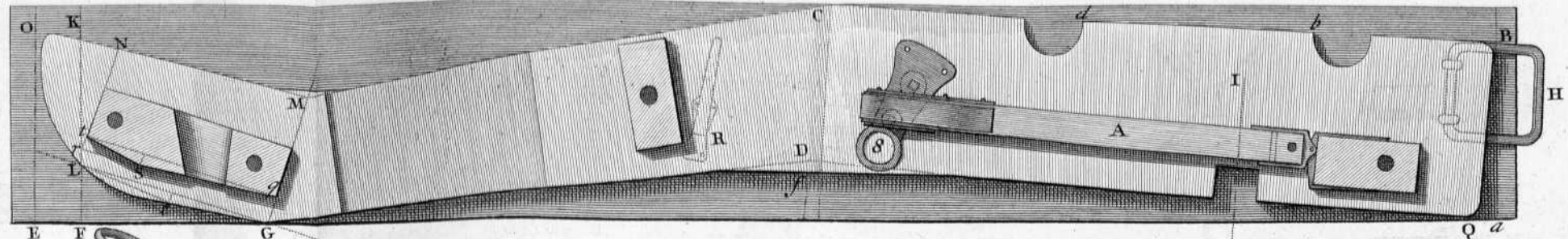
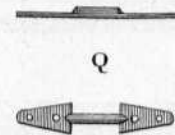
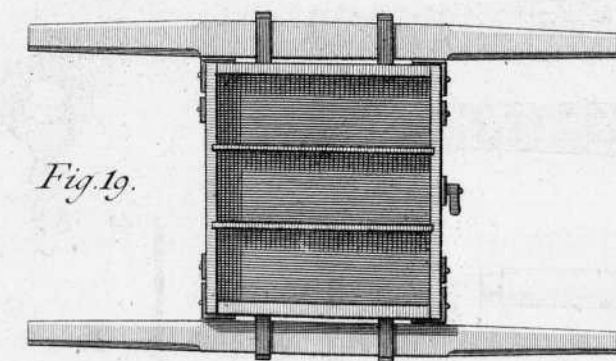
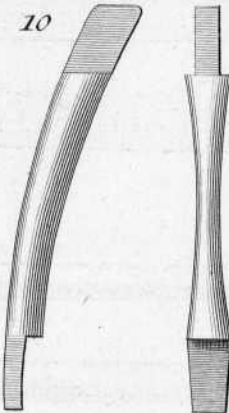
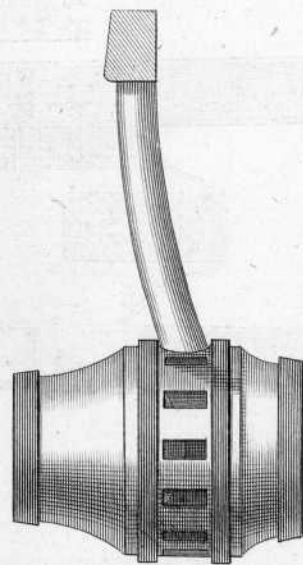
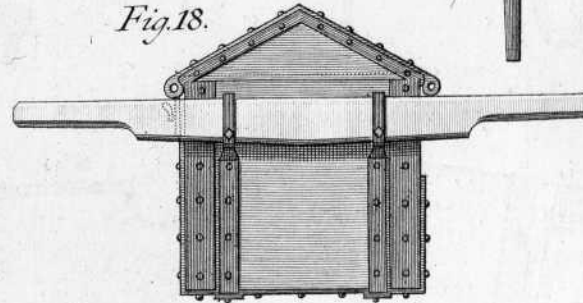
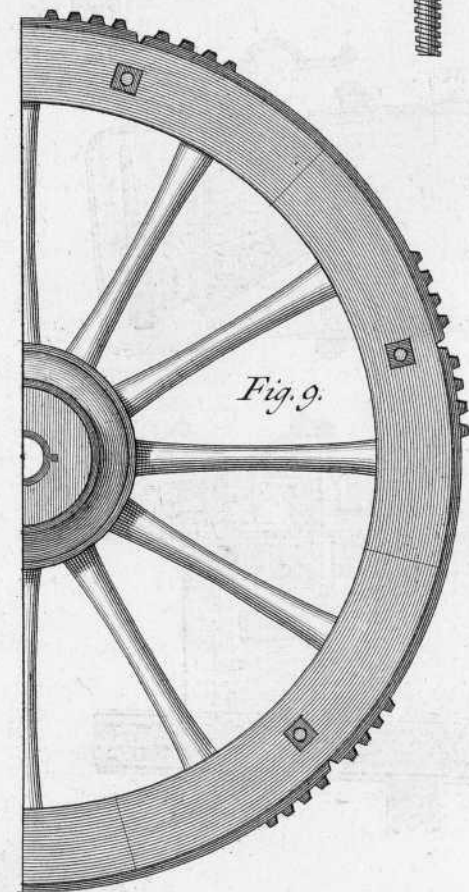
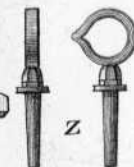
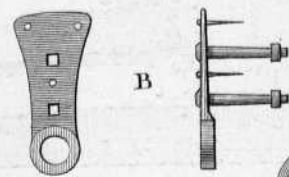
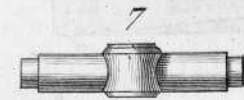
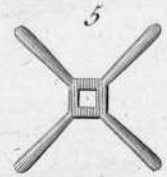
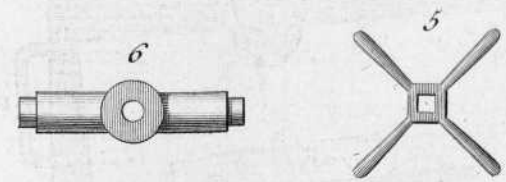
Fig. 10.

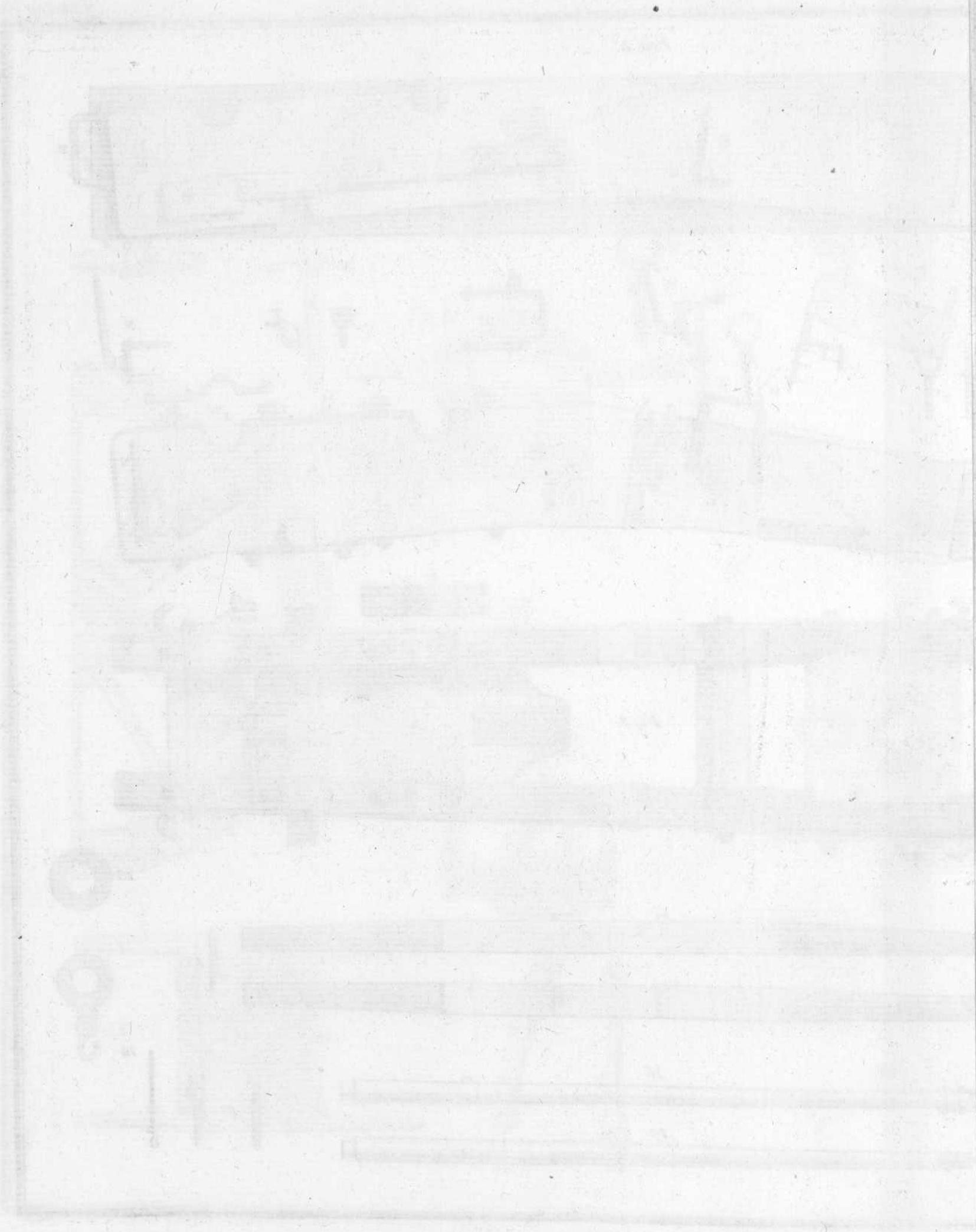












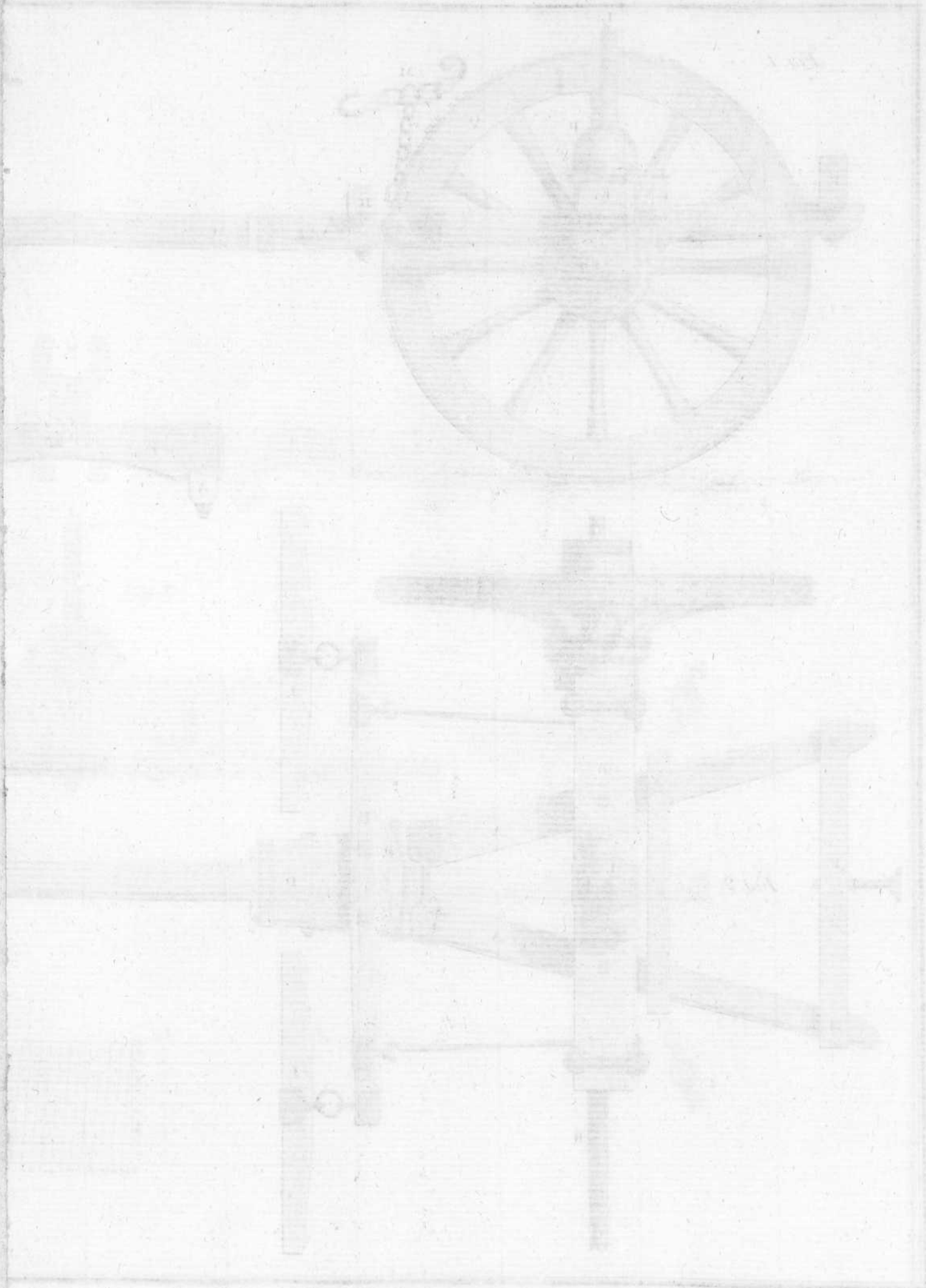


Fig. 1.

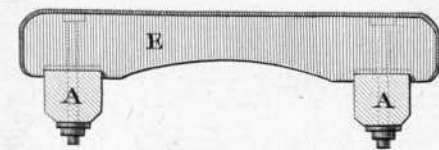
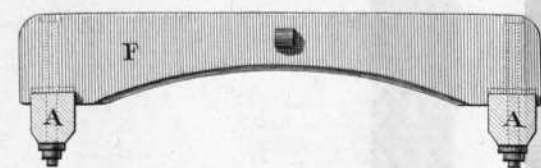
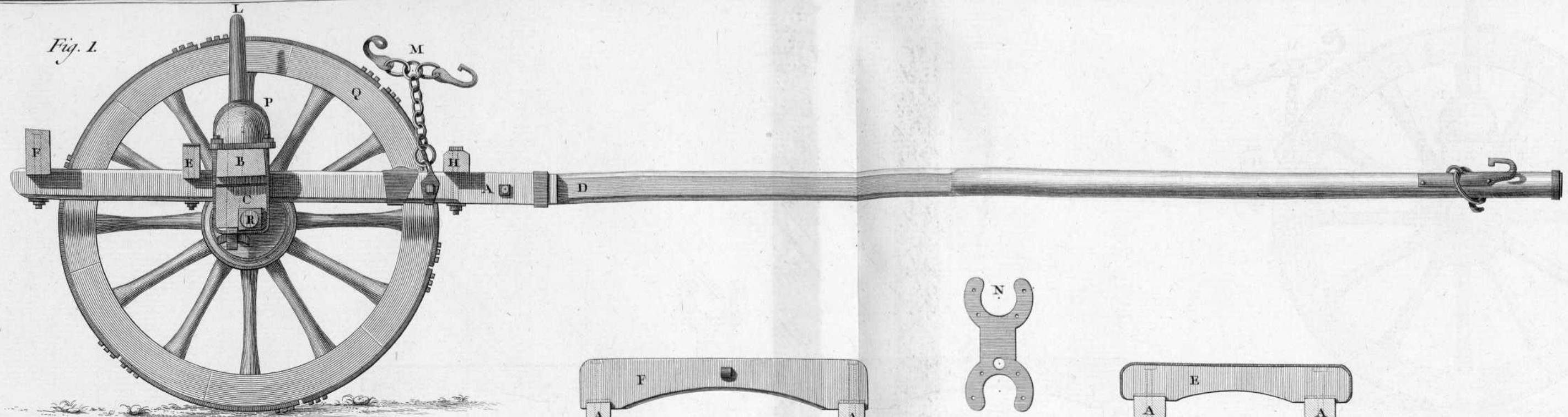


Fig. 3.

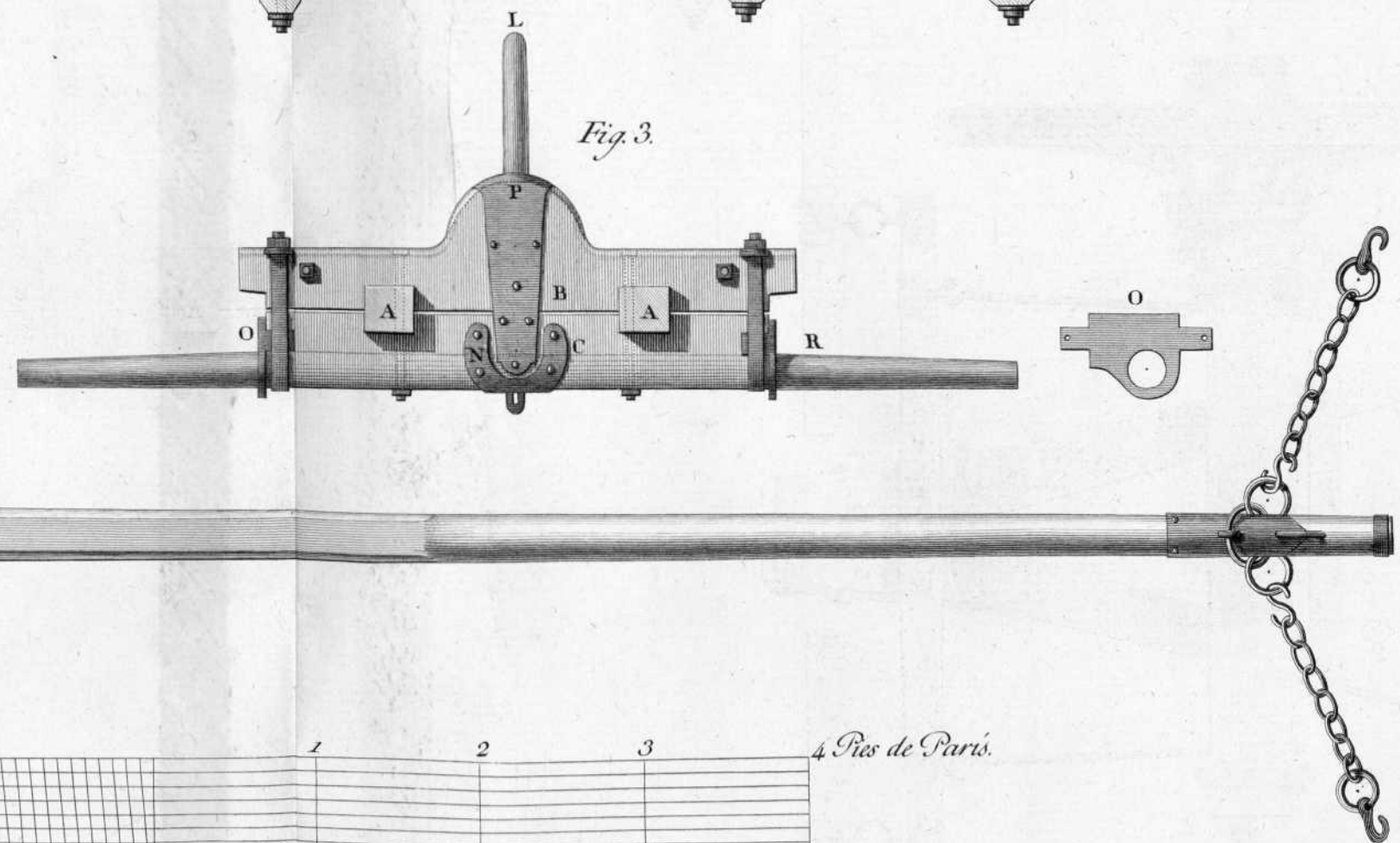
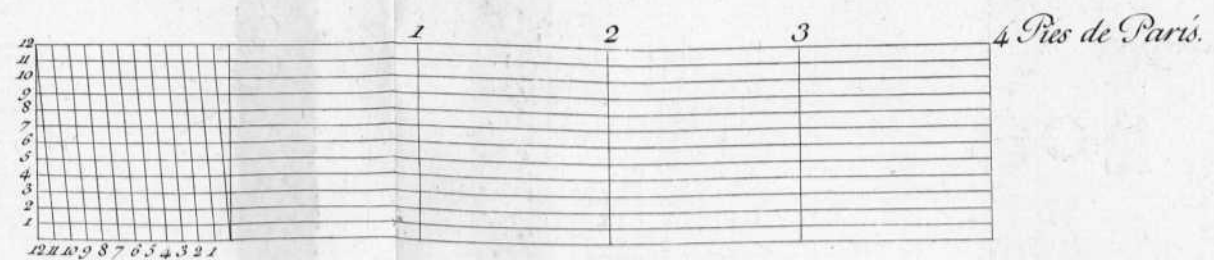
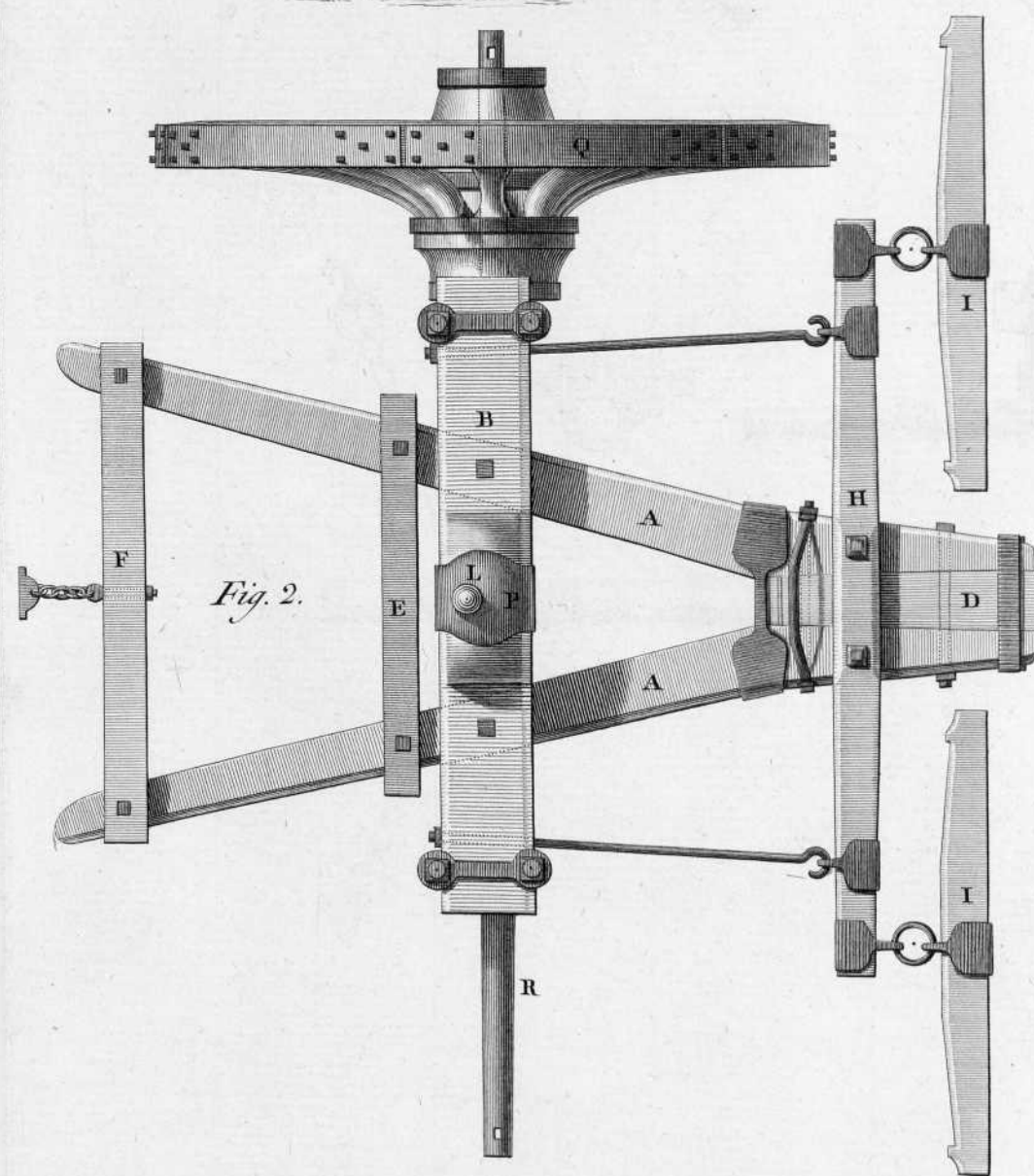


Fig. 2.



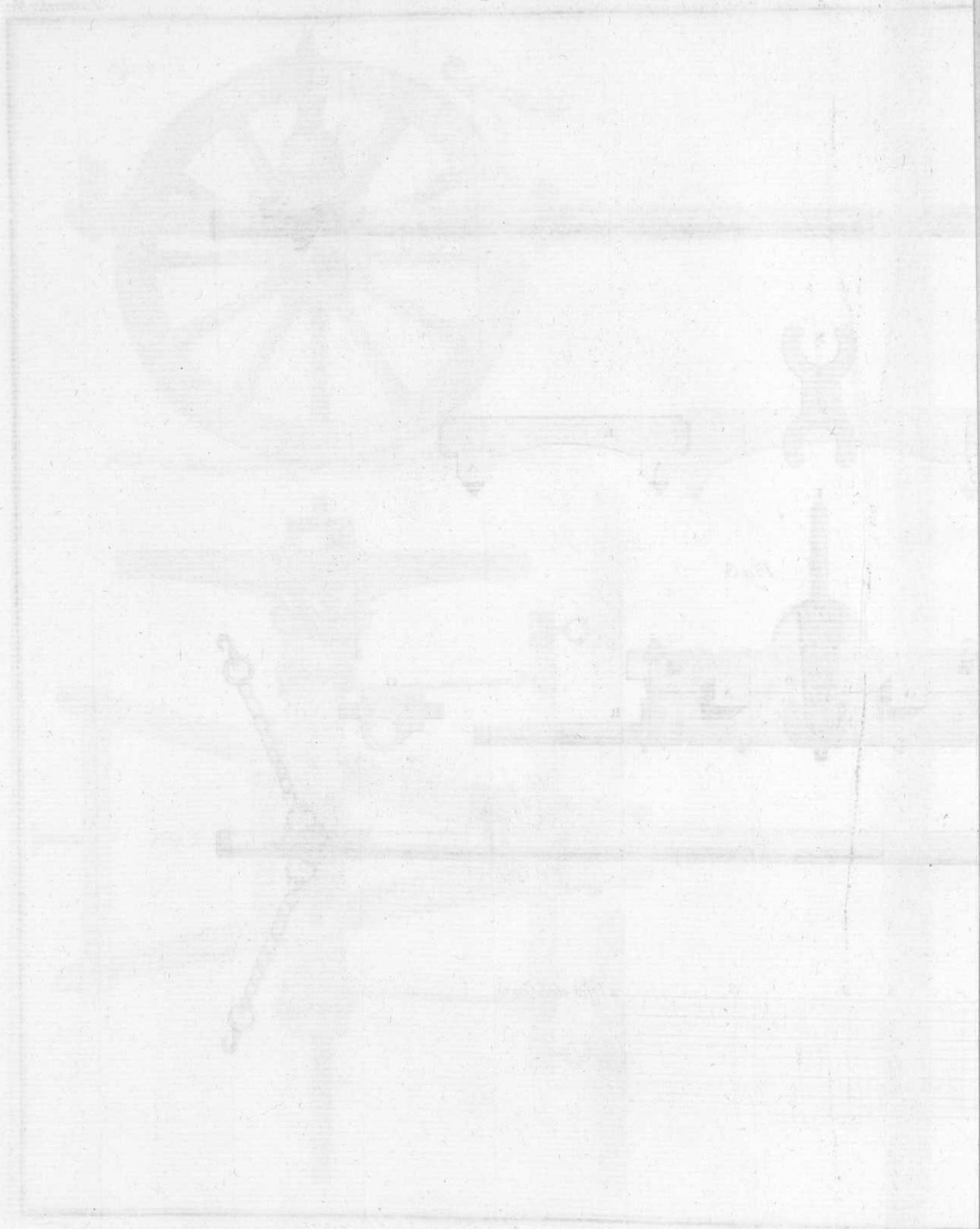




Fig. 1.

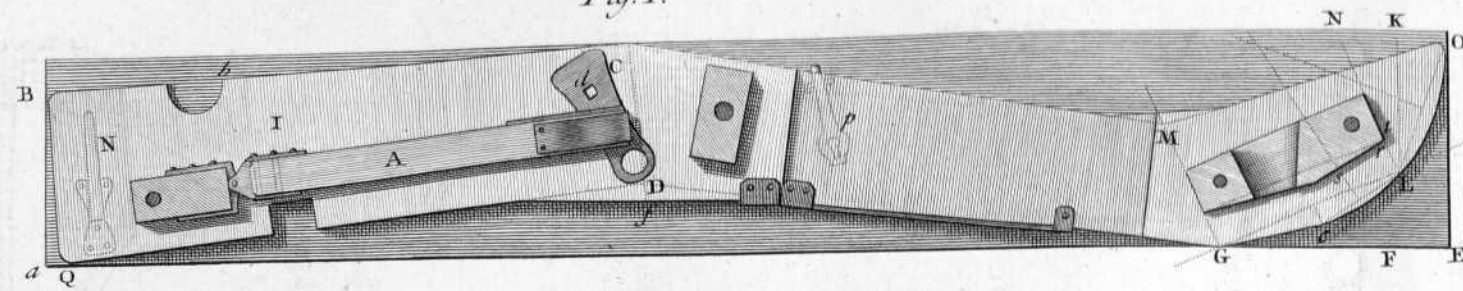


Fig. 2.

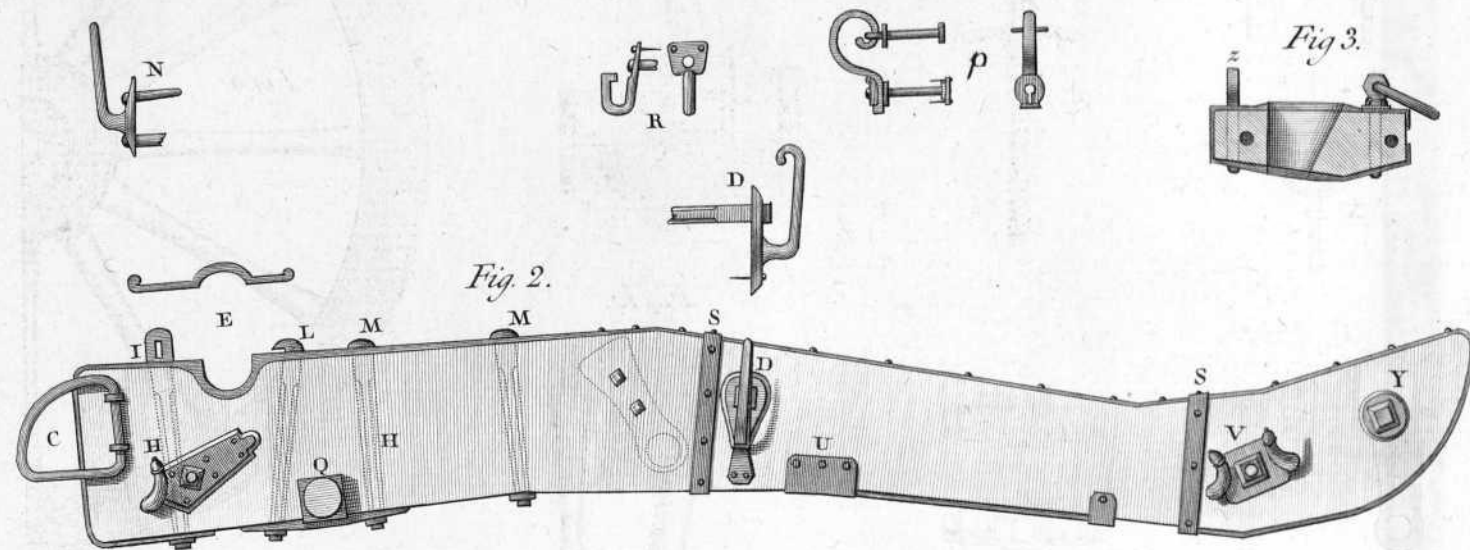


Fig. 8.

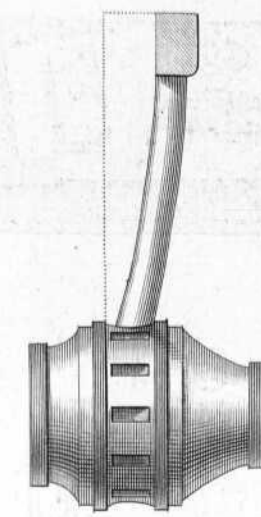
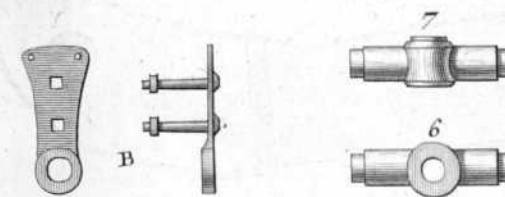
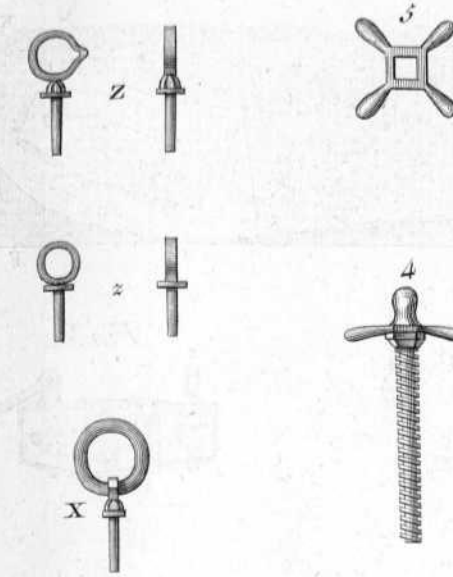
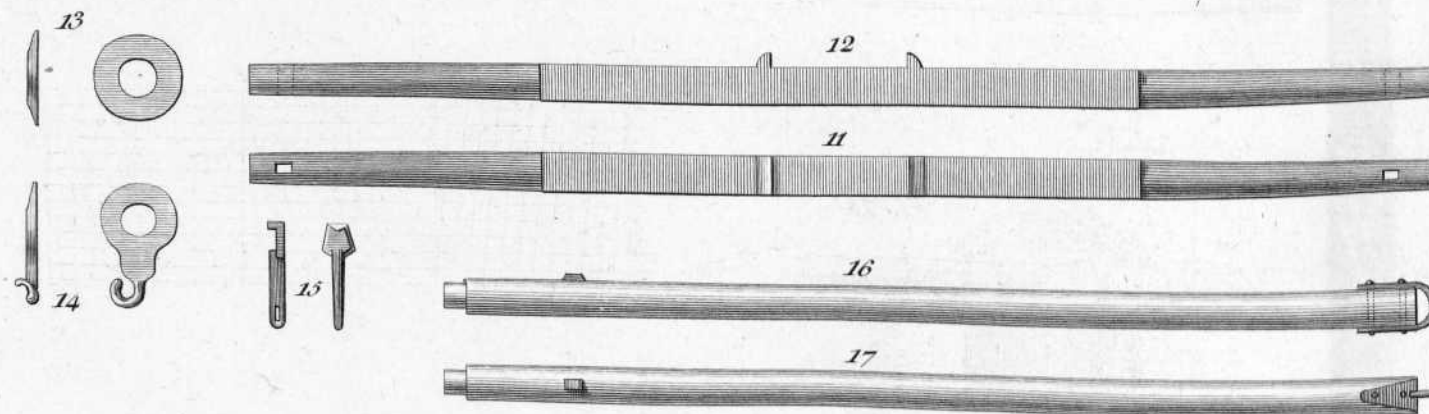
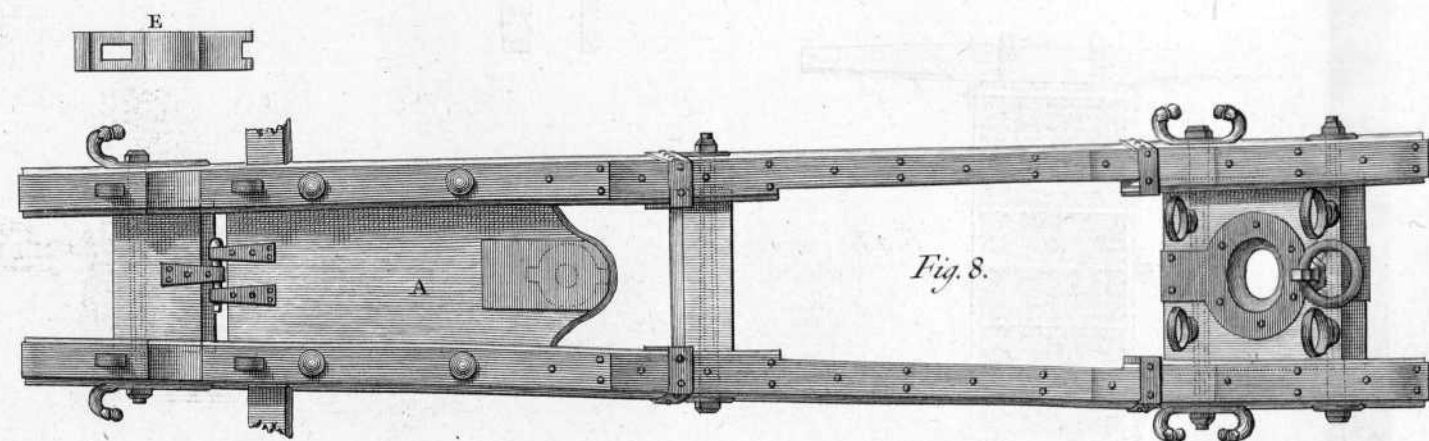


Fig. 10.

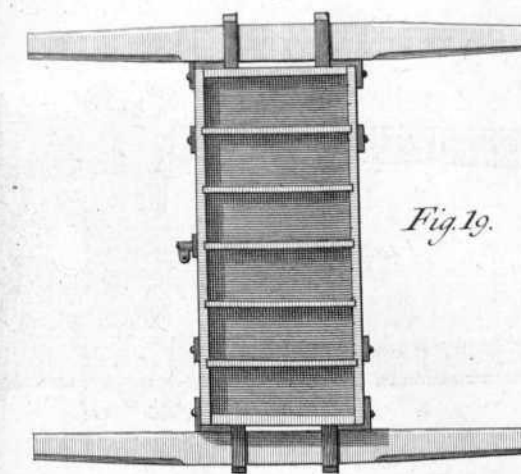
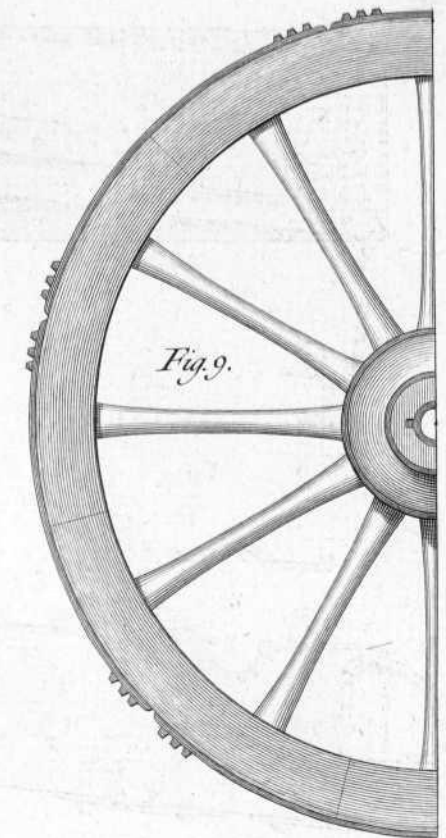
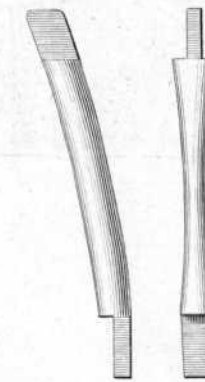


Fig. 19.

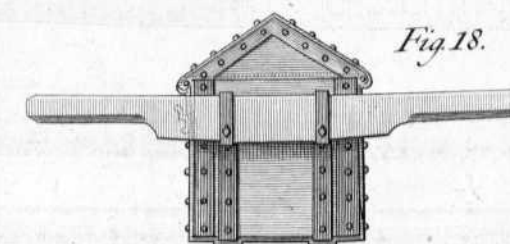
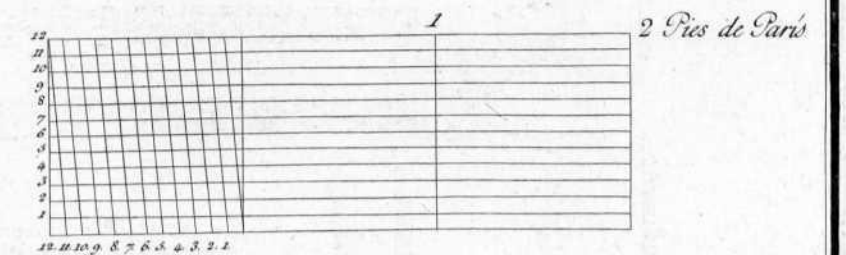
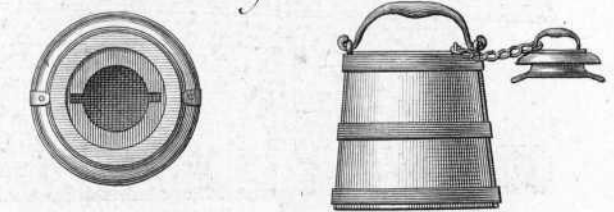
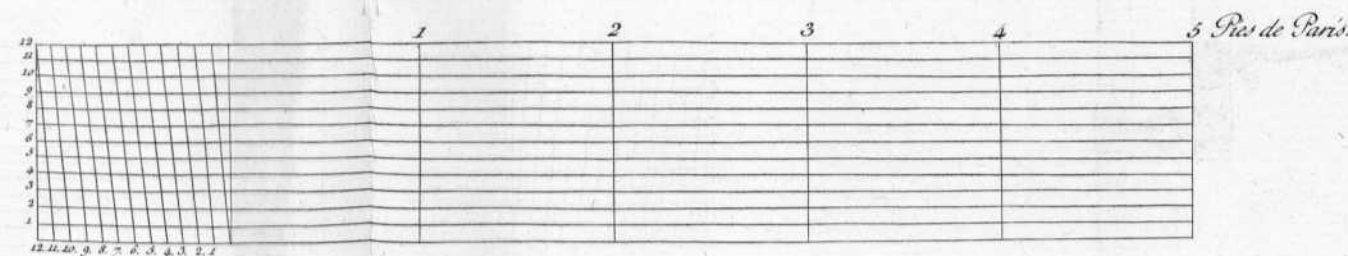
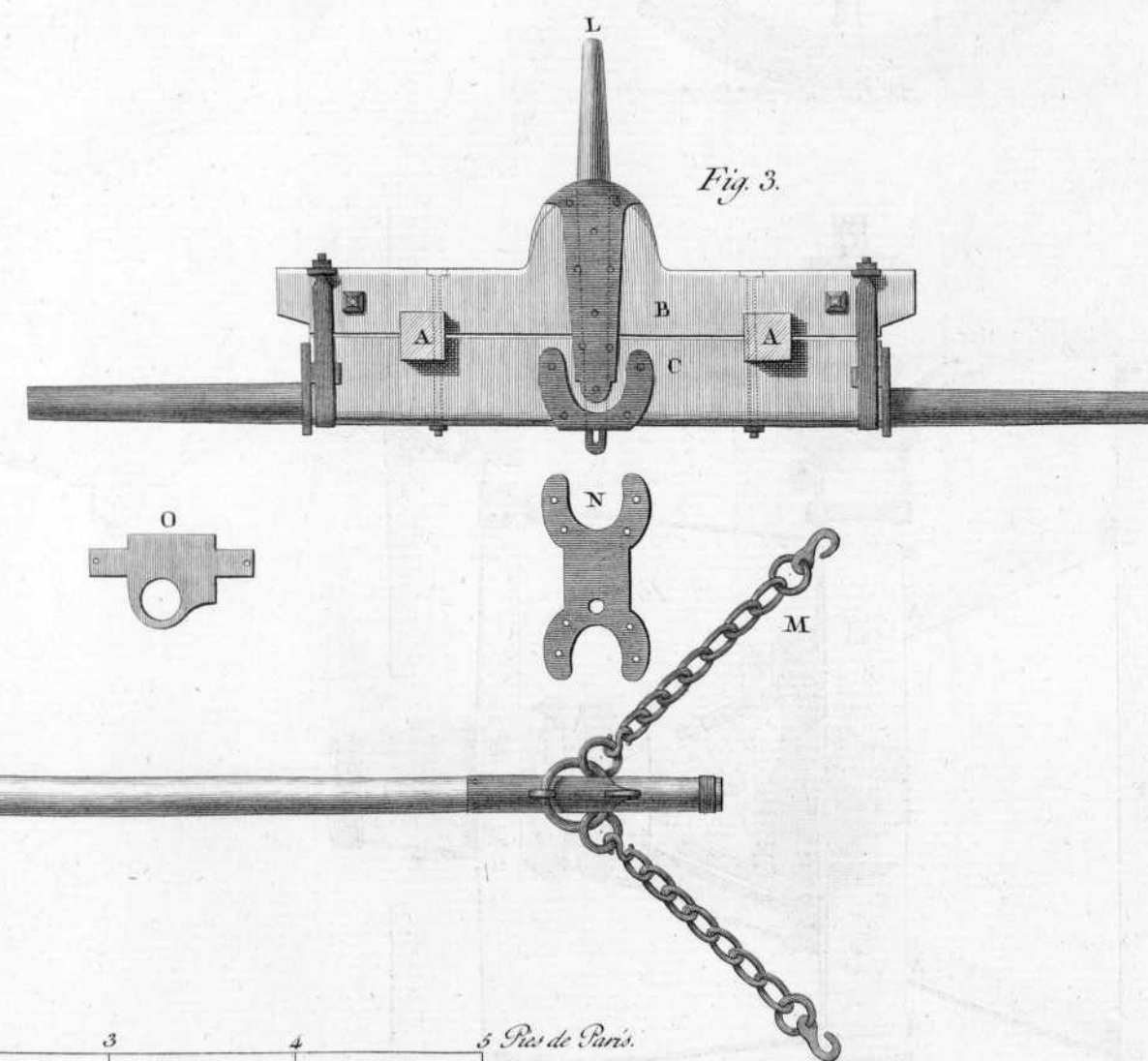
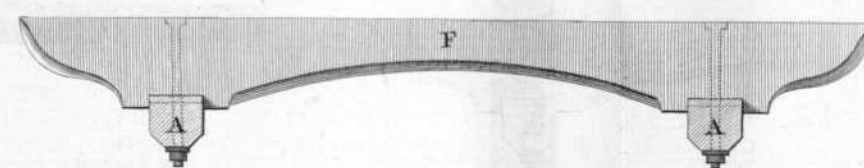
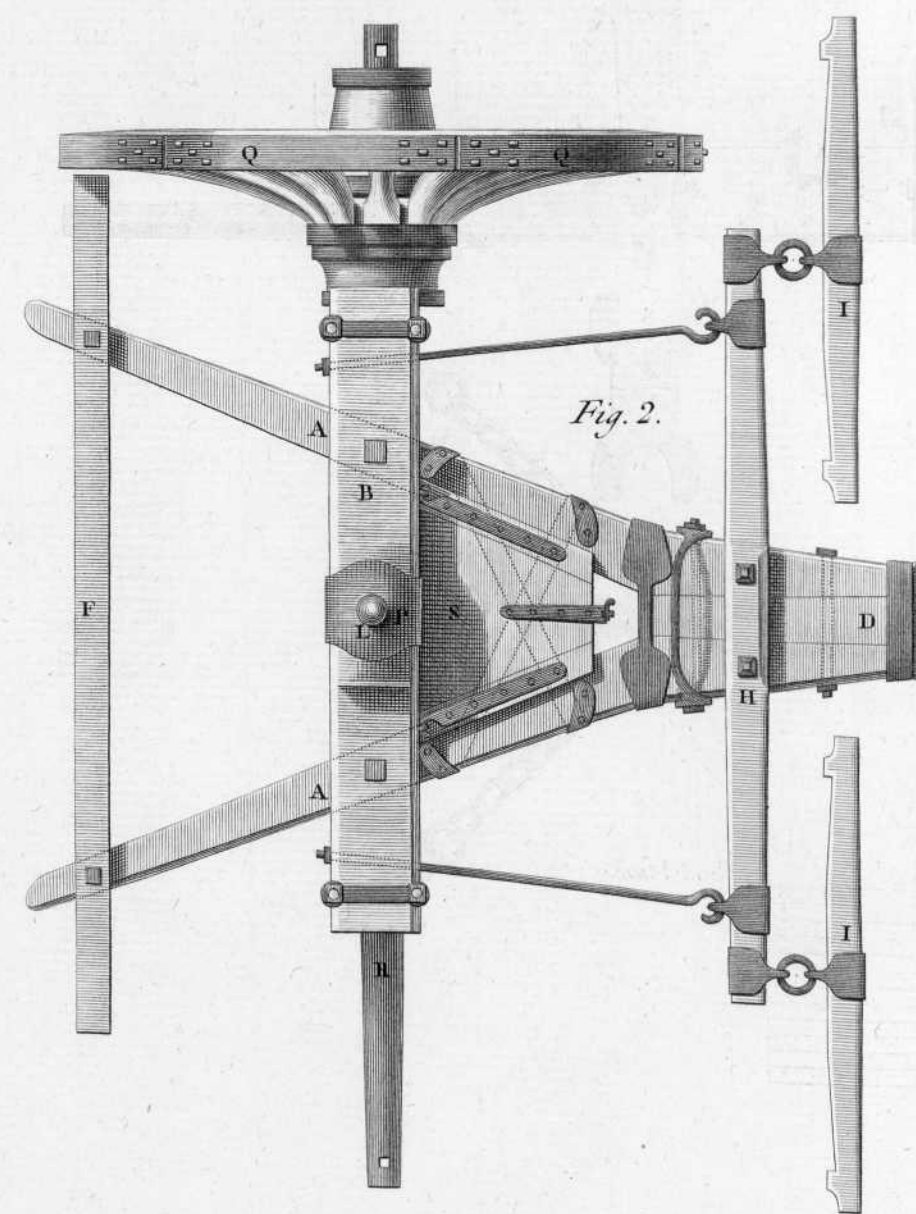
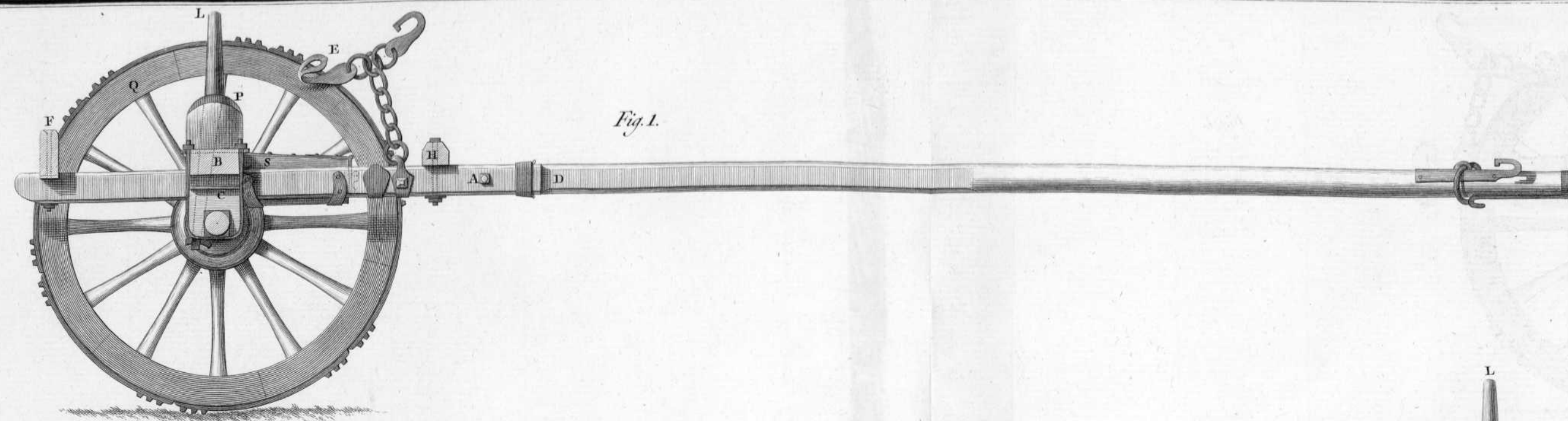
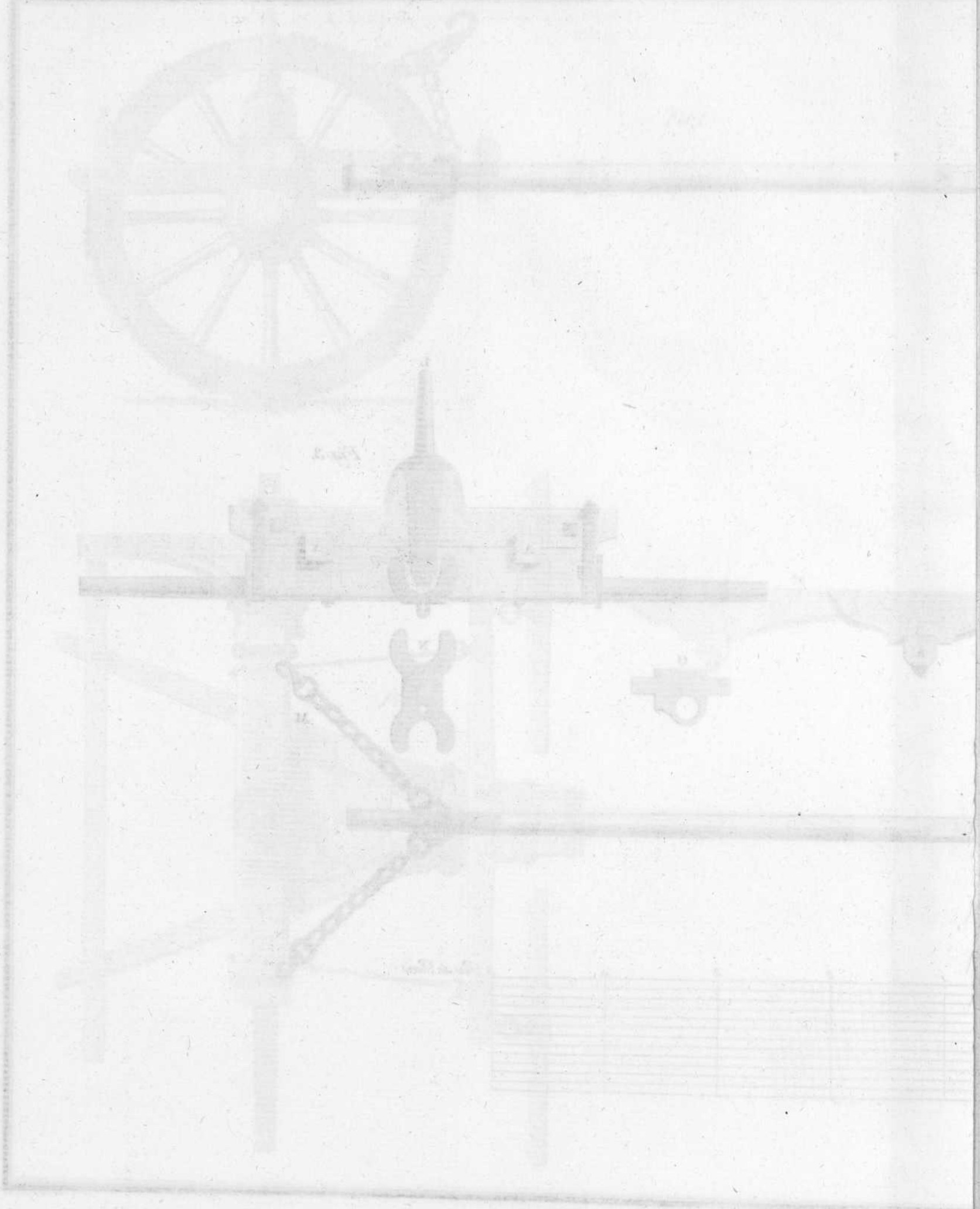


Fig. 18.

Fig. 20.







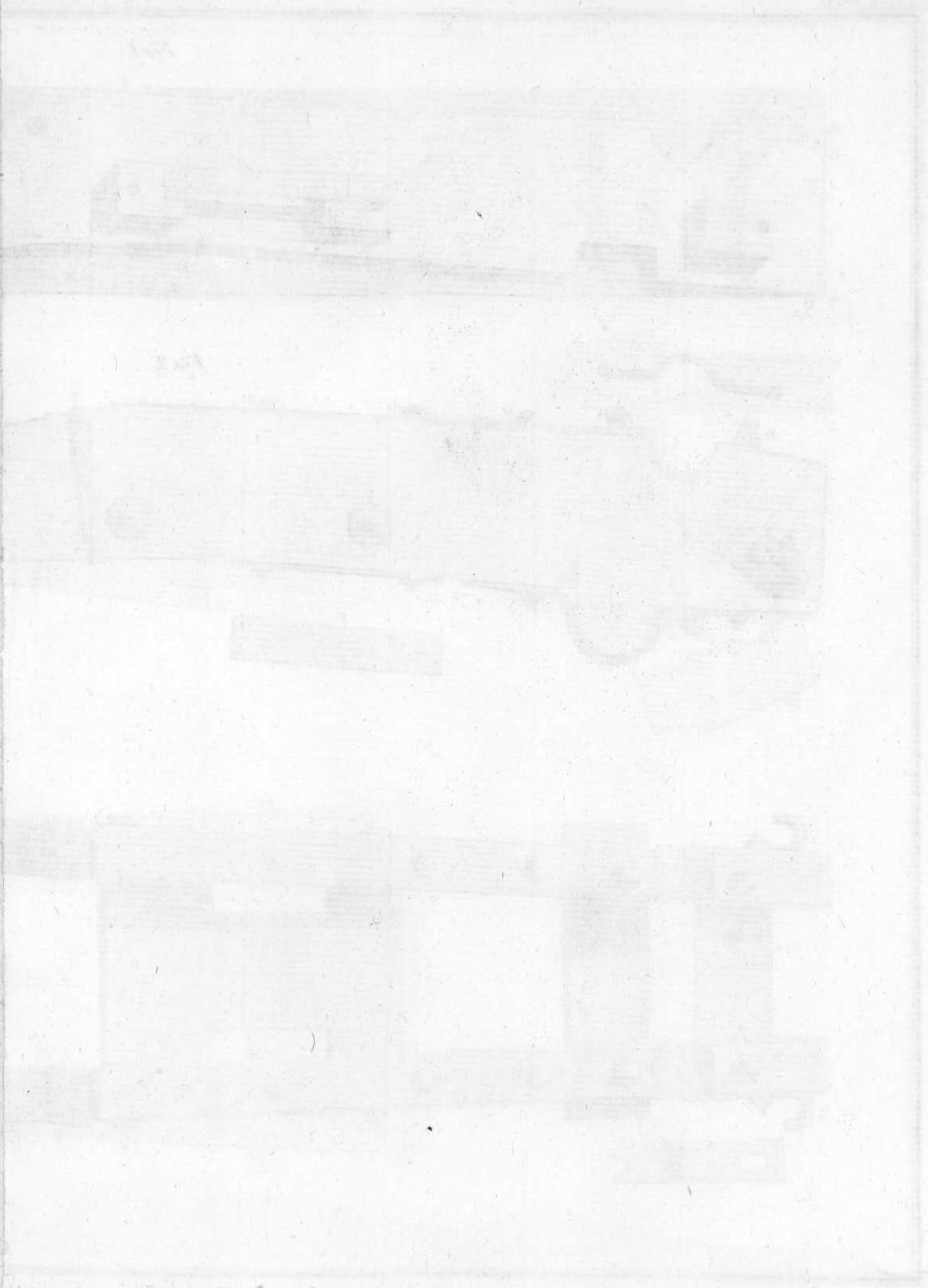


Fig. 1.

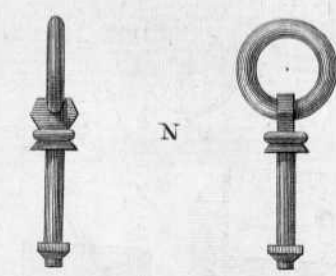
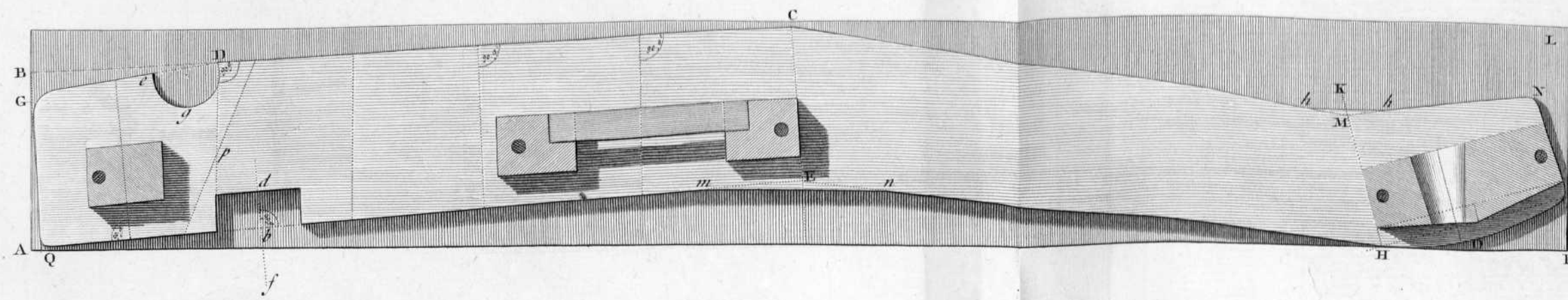


Fig. 2.

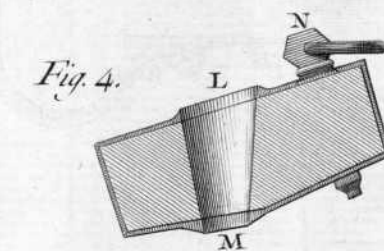
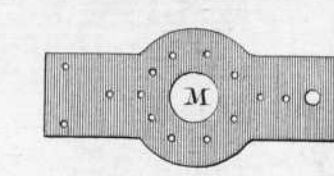
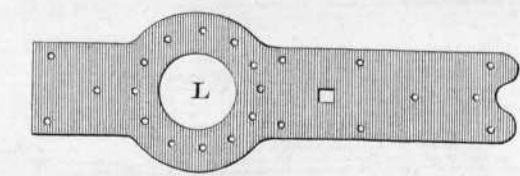
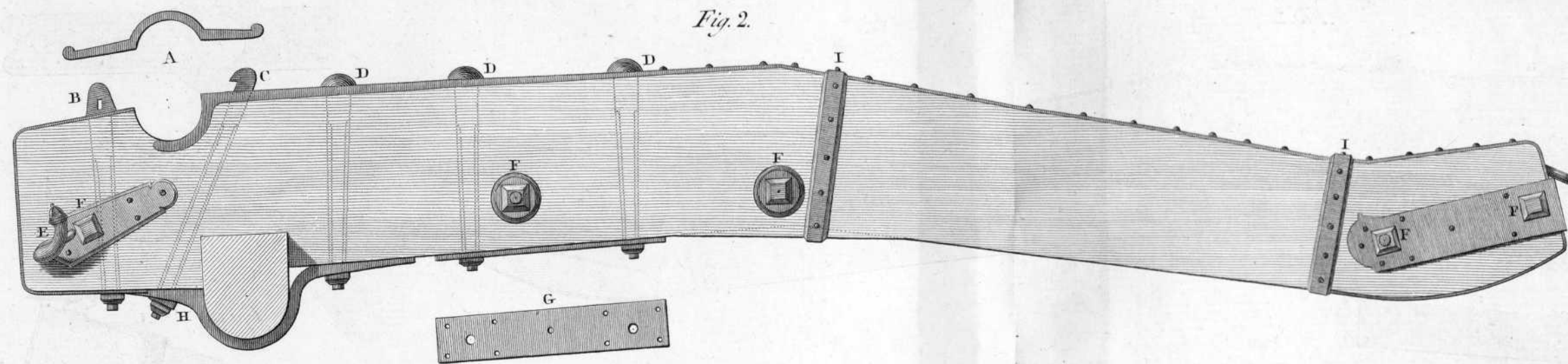
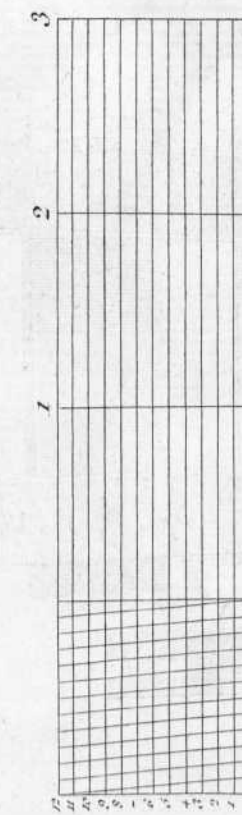
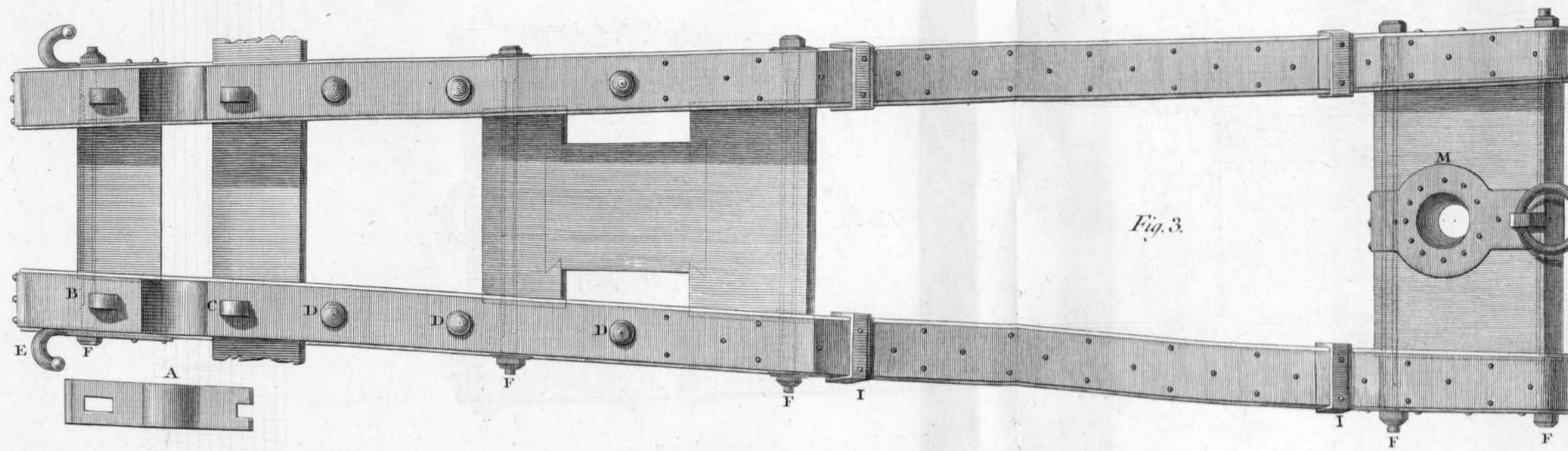
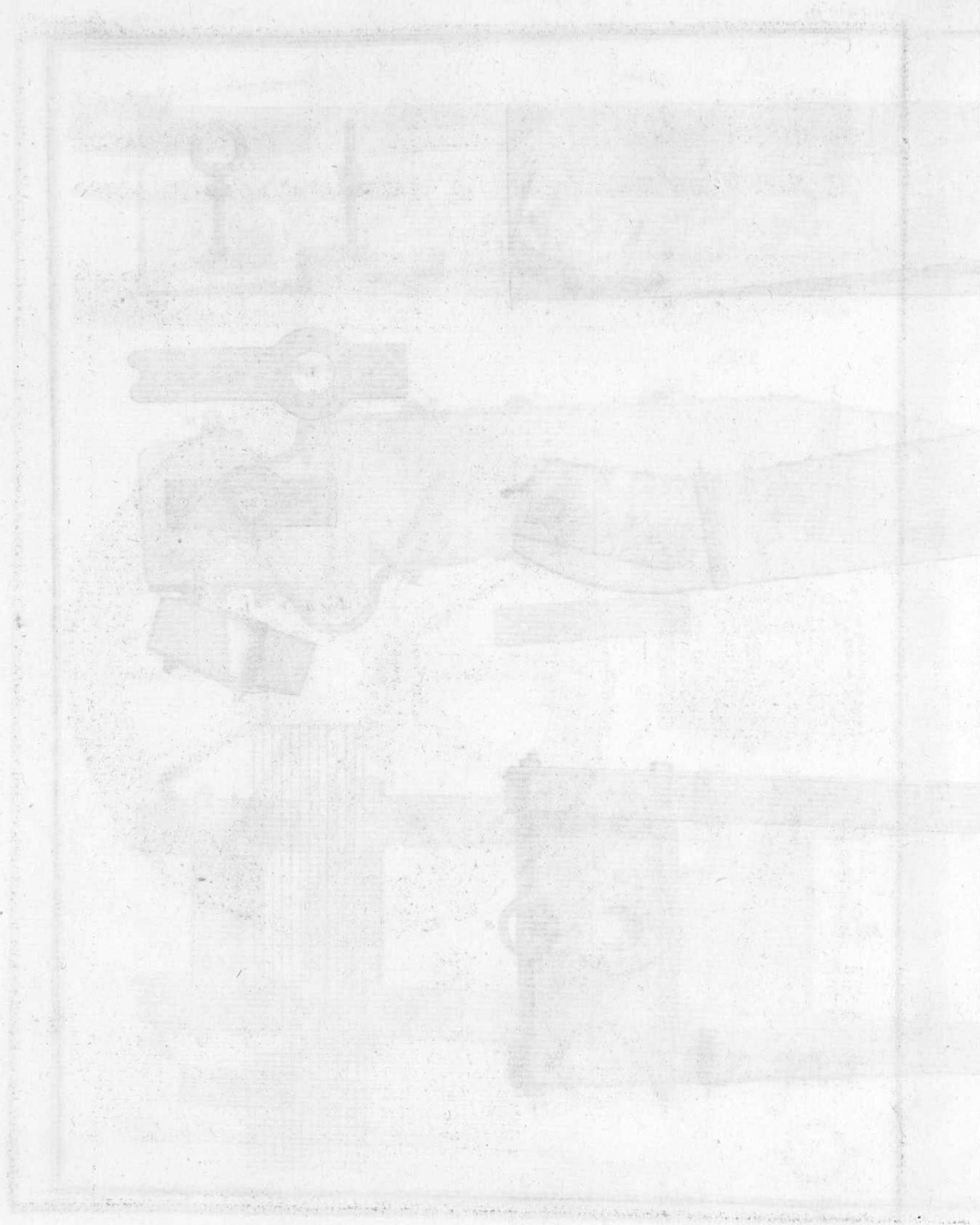
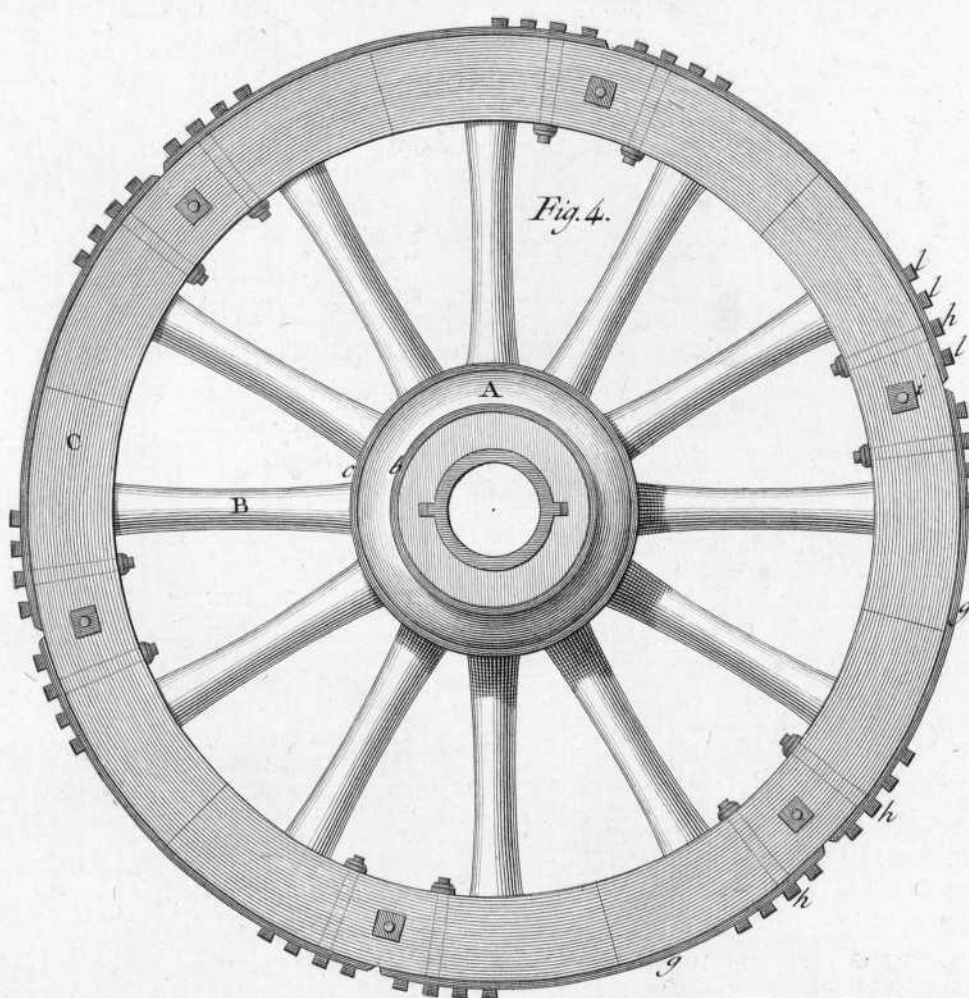
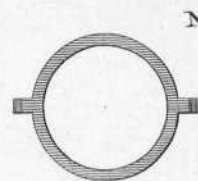
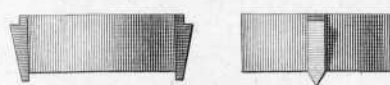
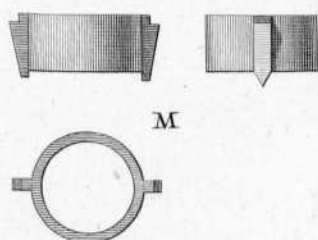
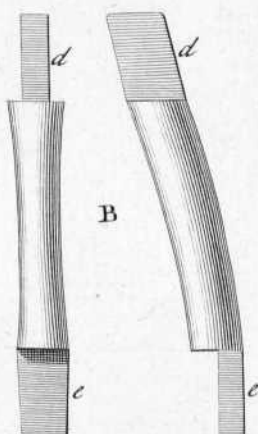
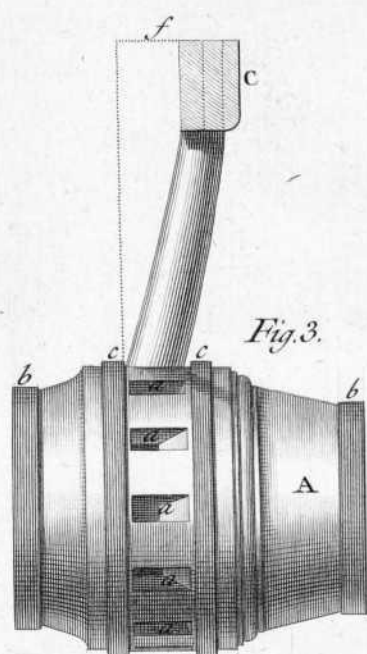
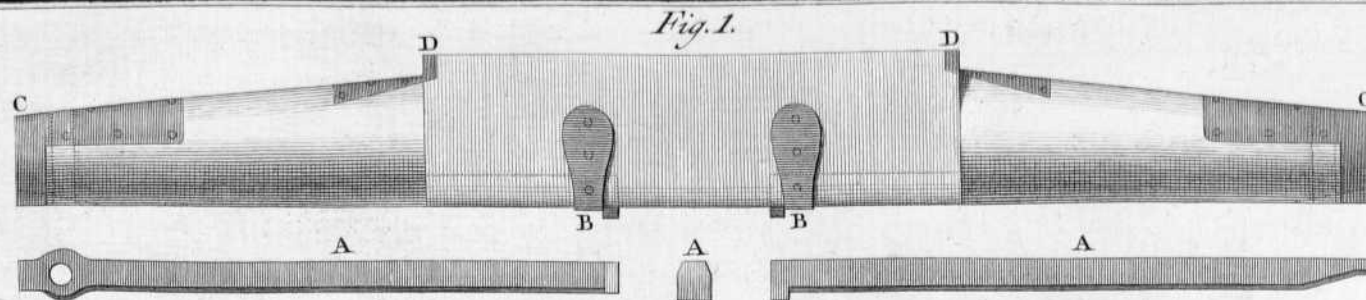


Fig. 3.

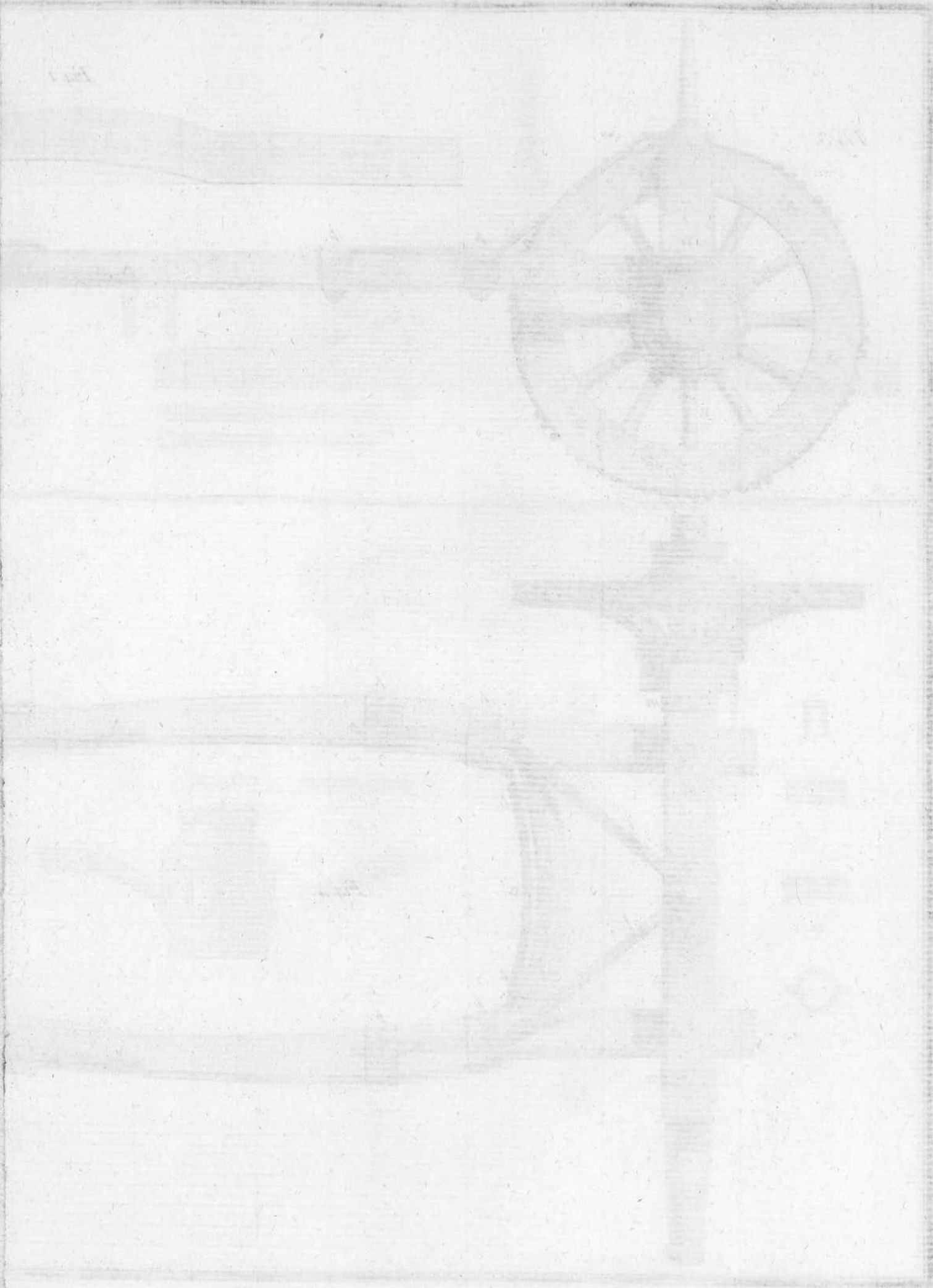






	1	2	3. Pies de París.
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			





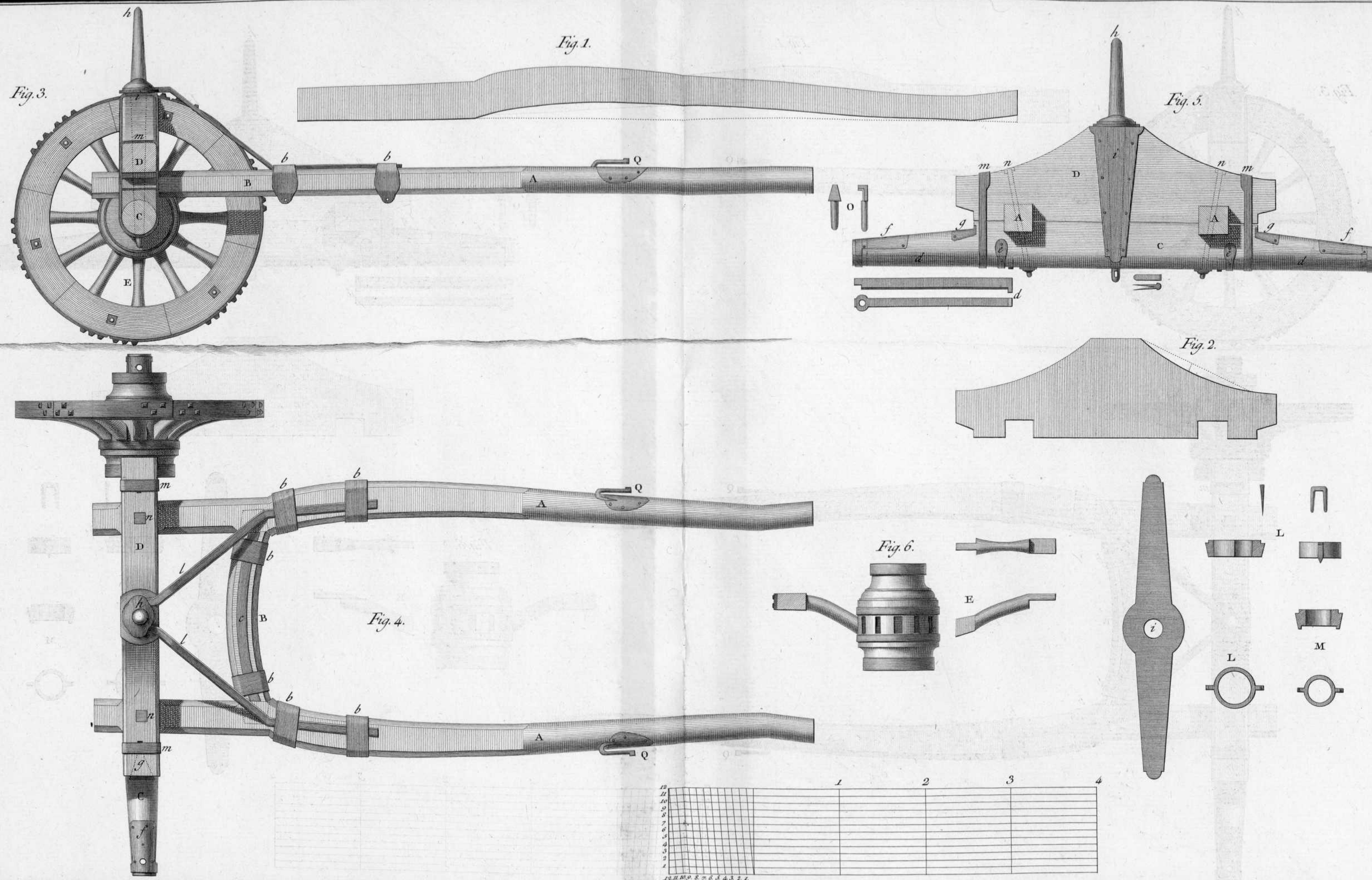






Fig. 4.

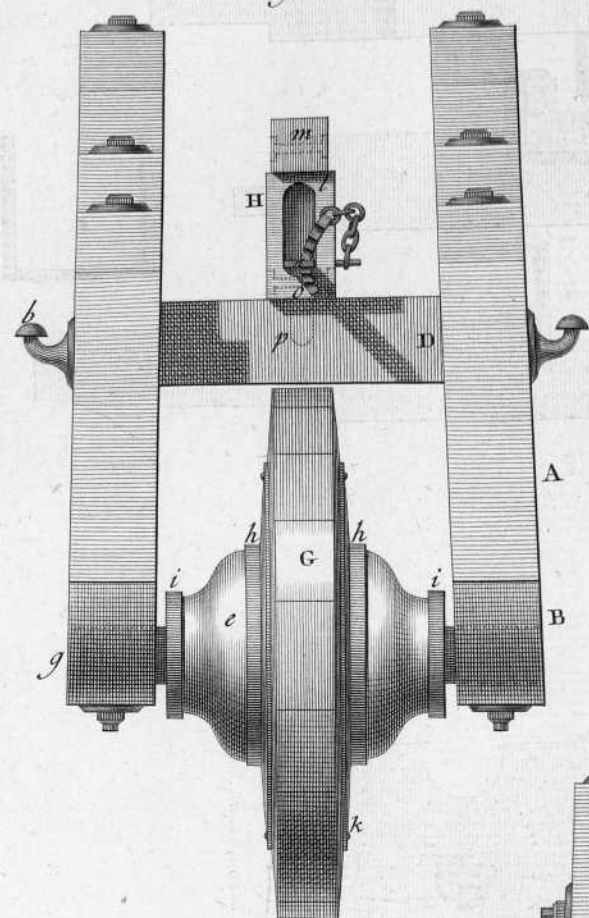


Fig. 3.

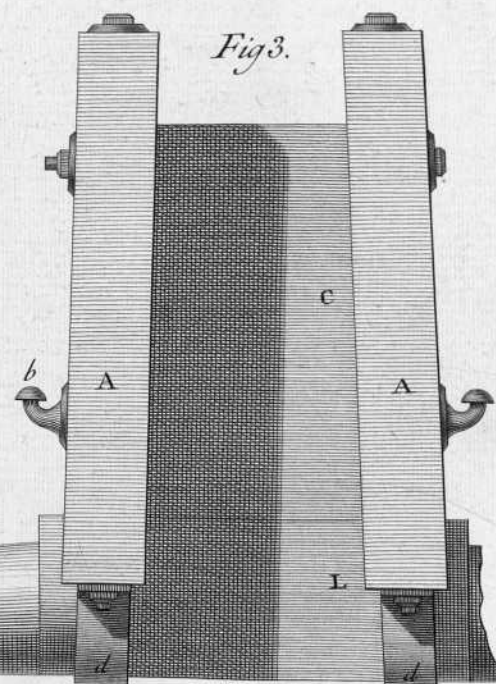


Fig. 2.

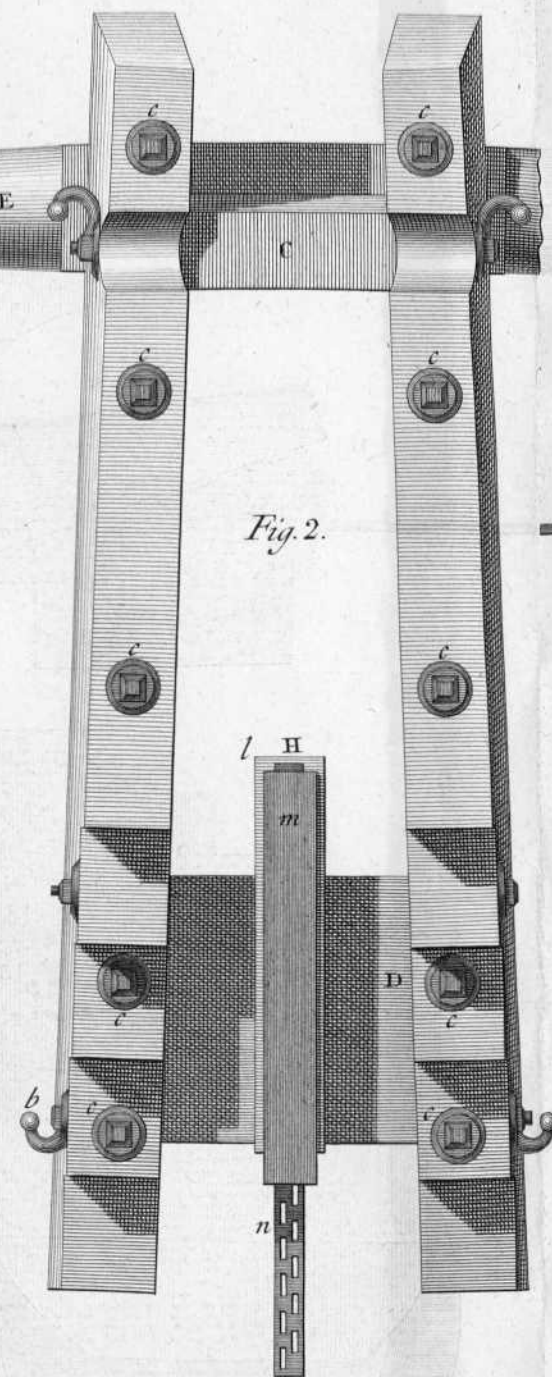
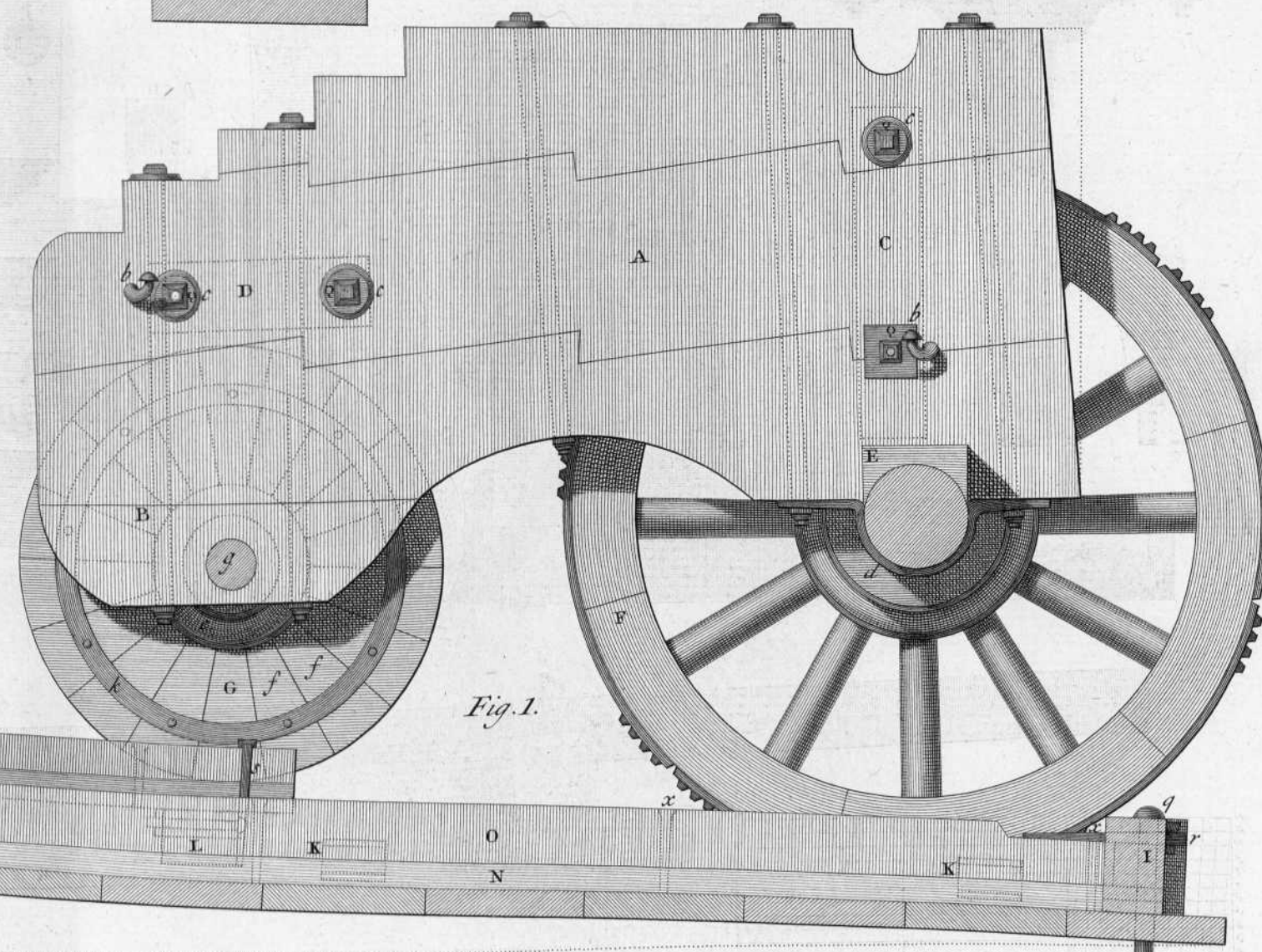
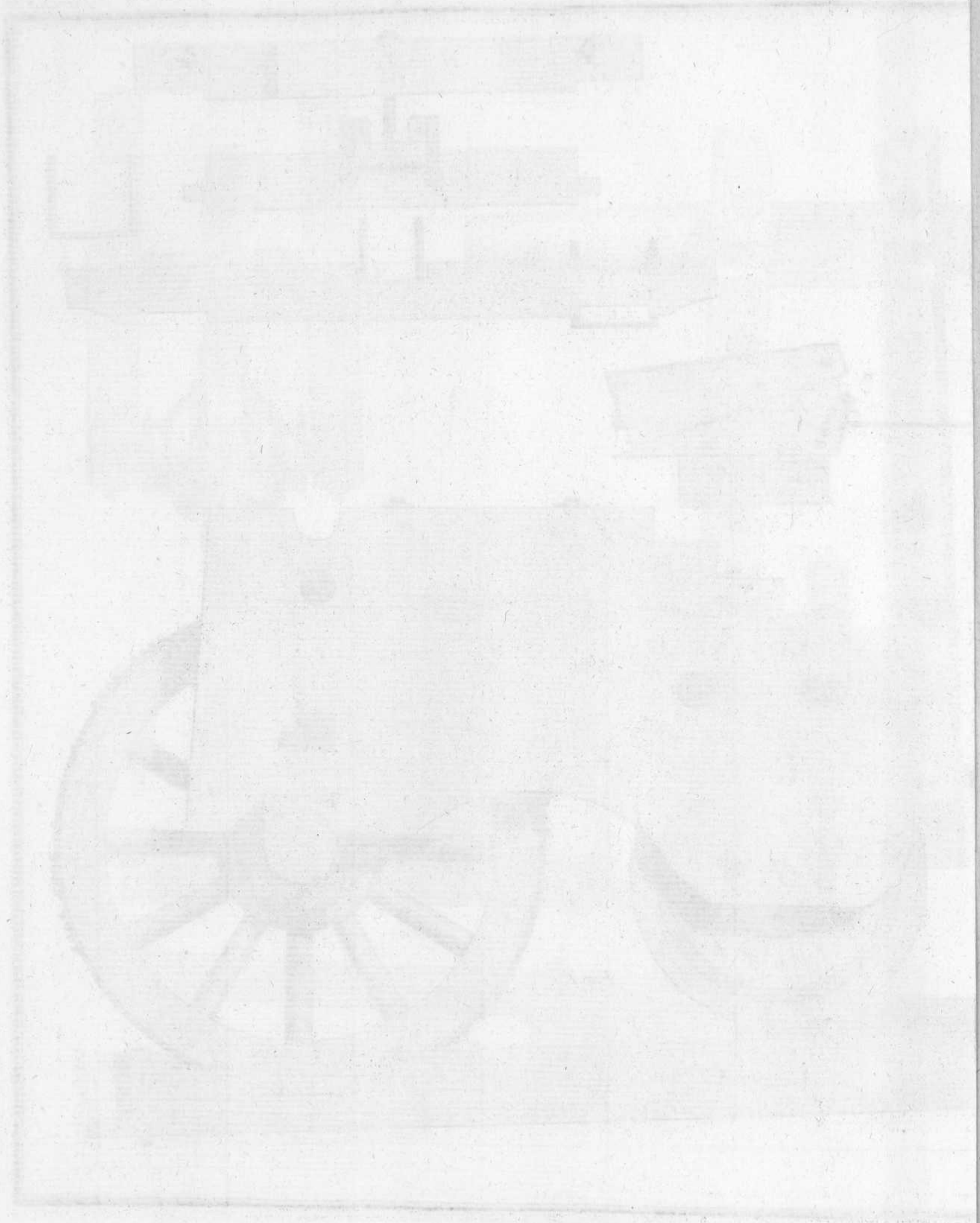


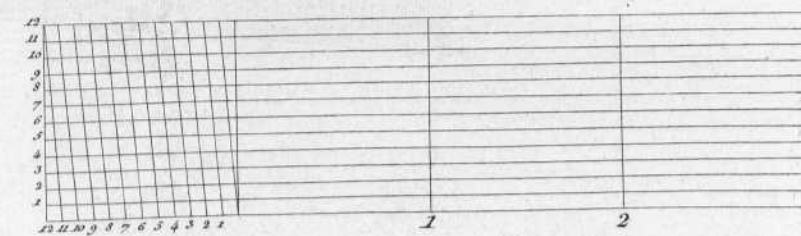
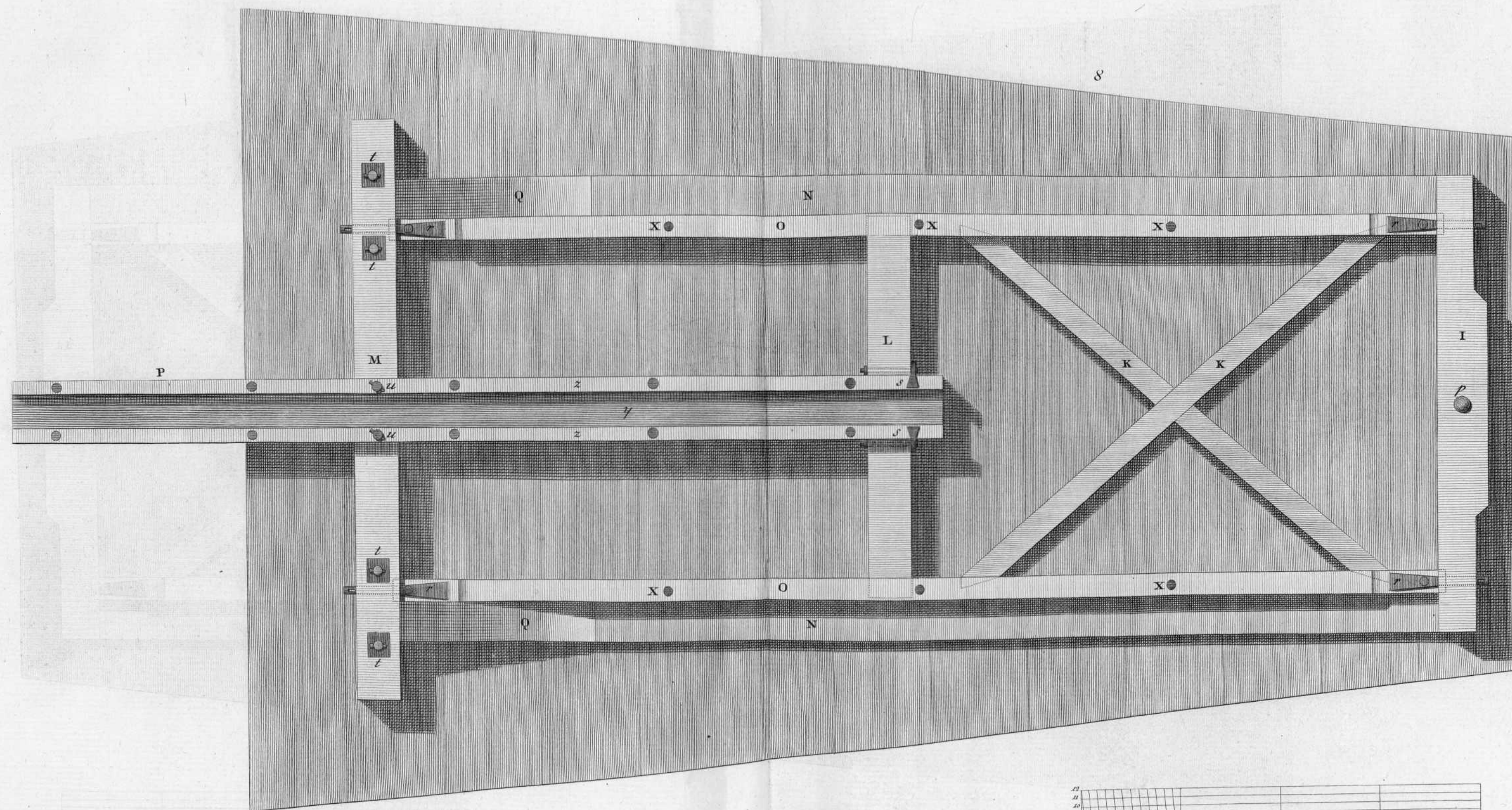
Fig. 1.



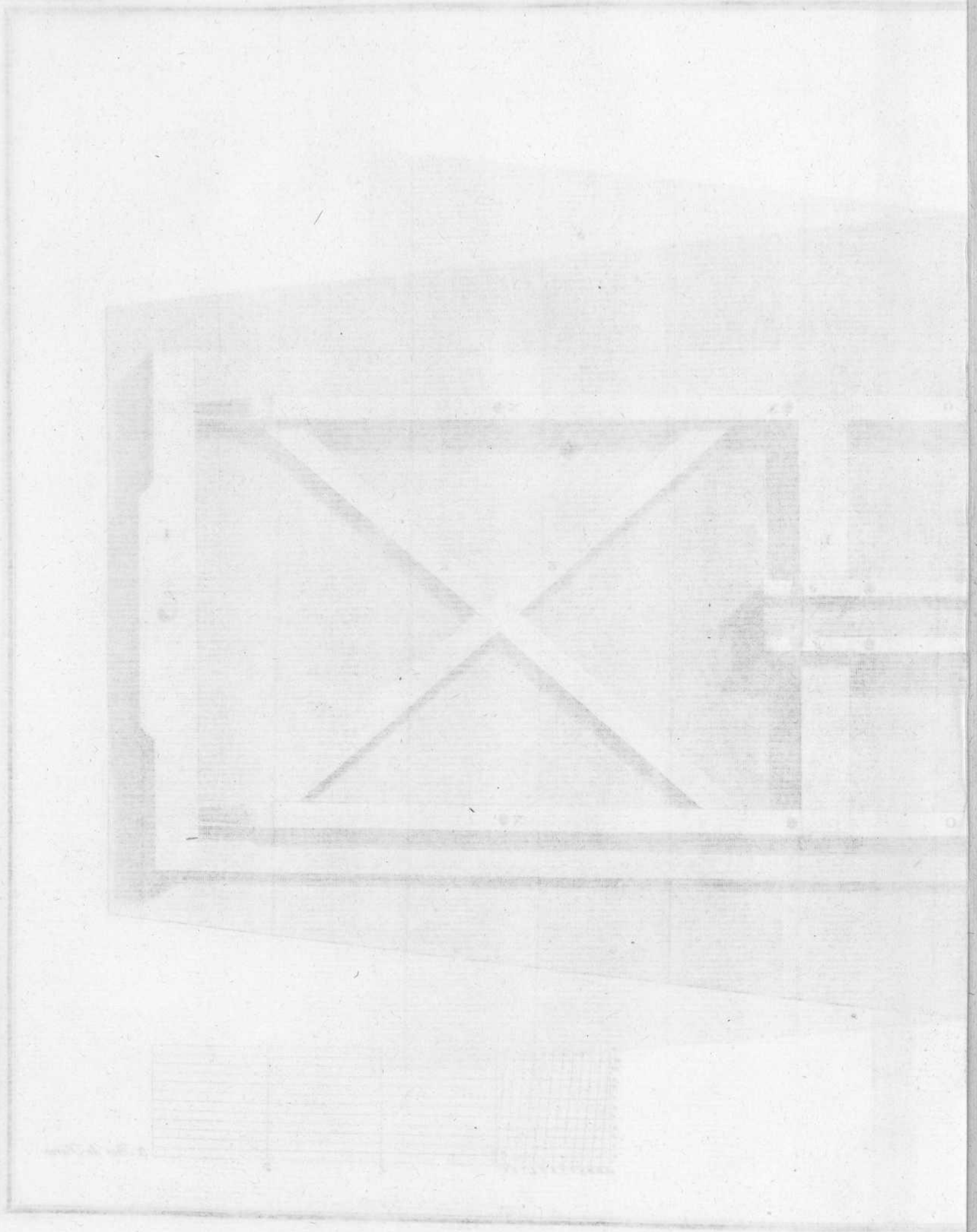
1	2
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100



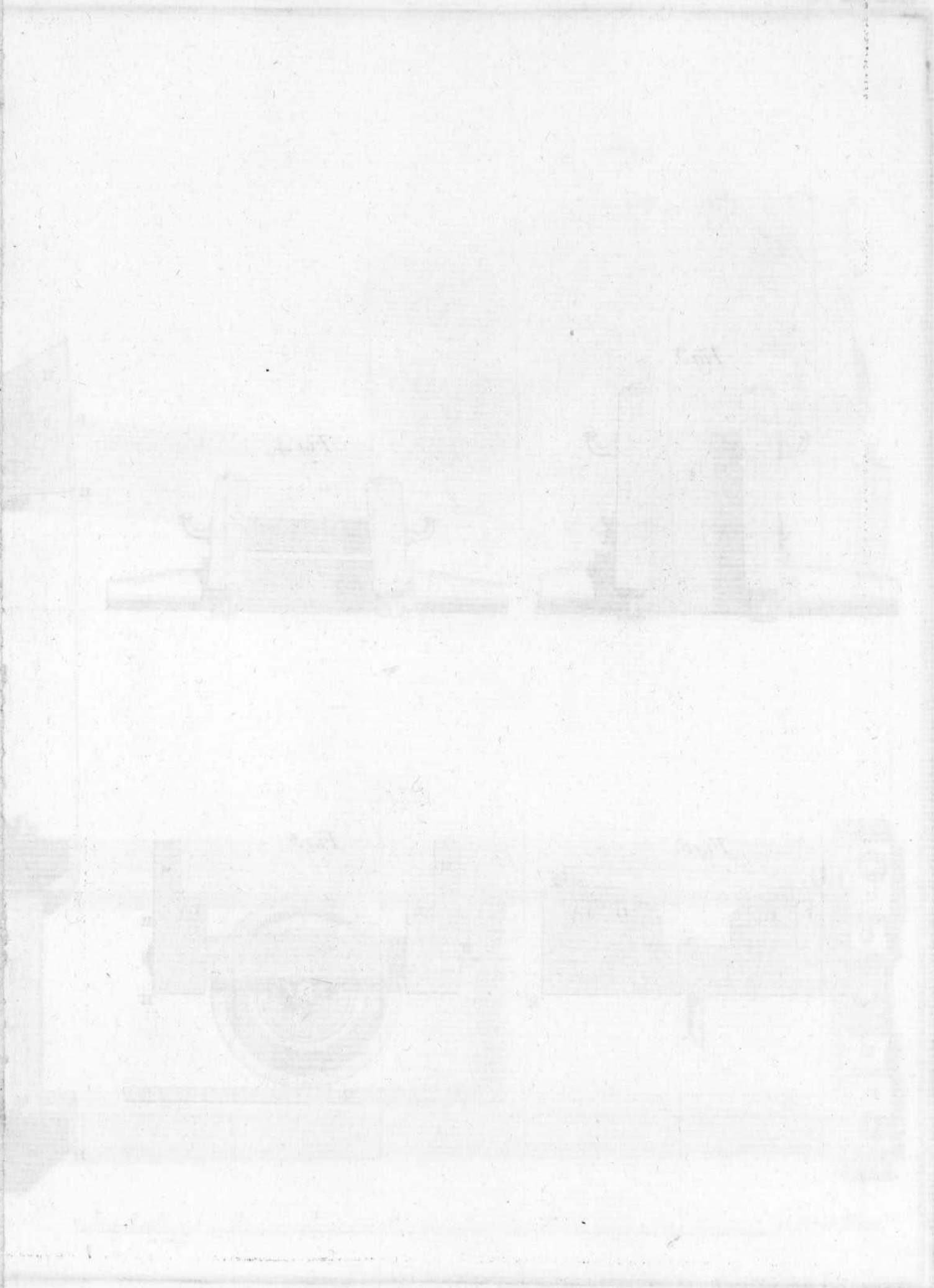


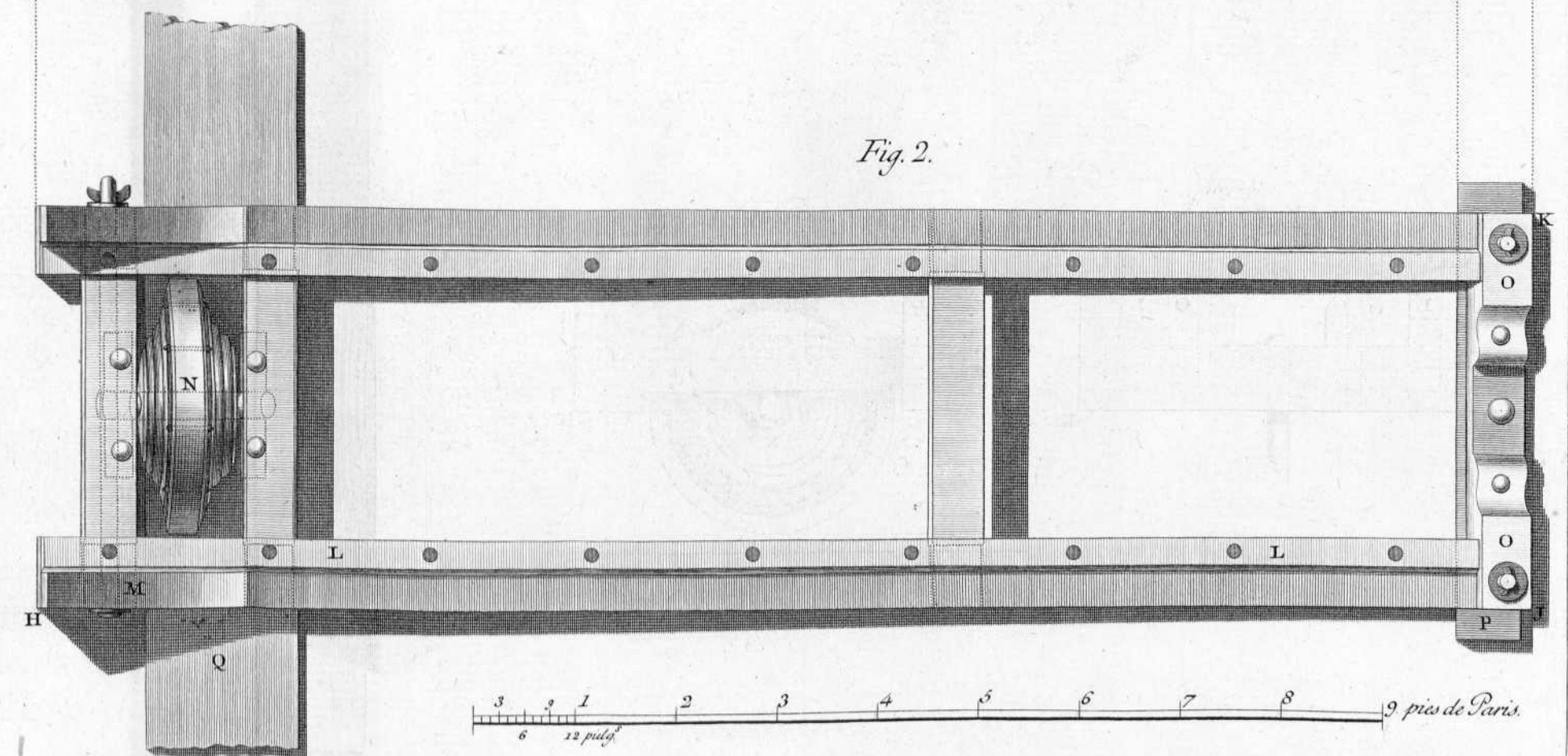
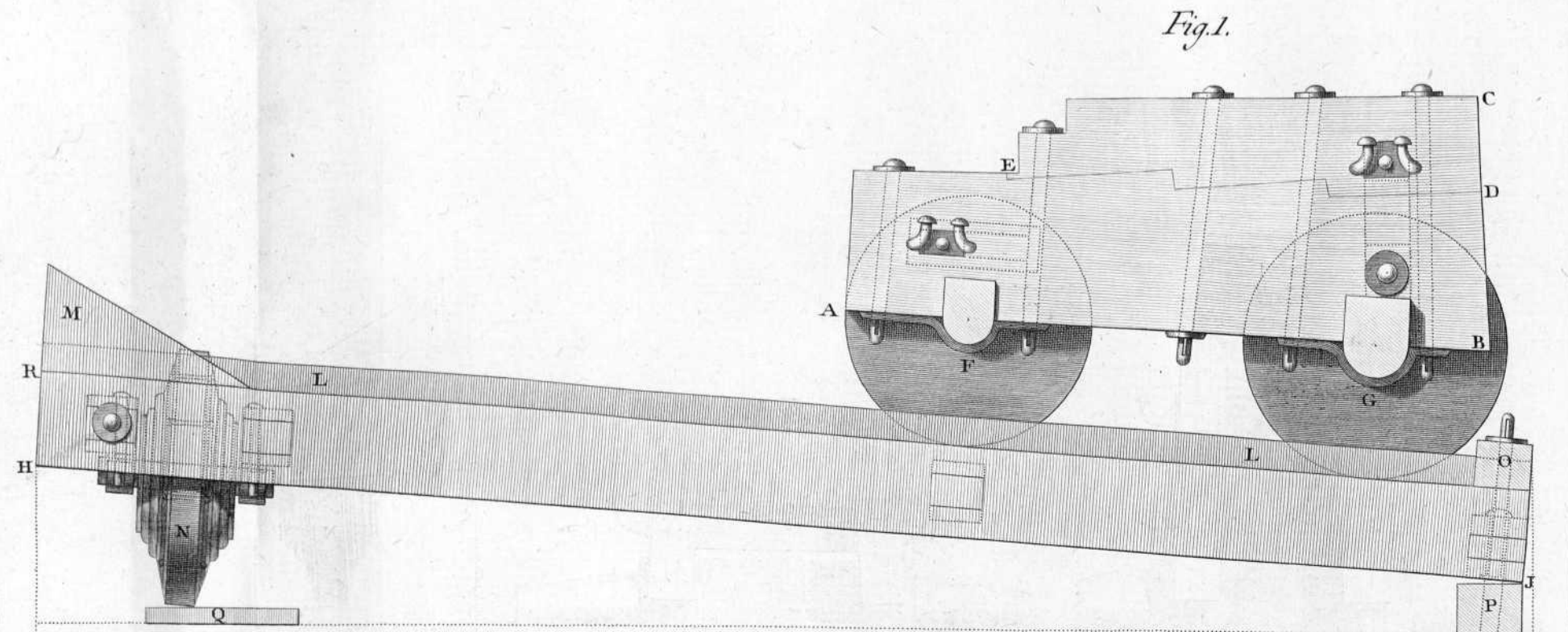
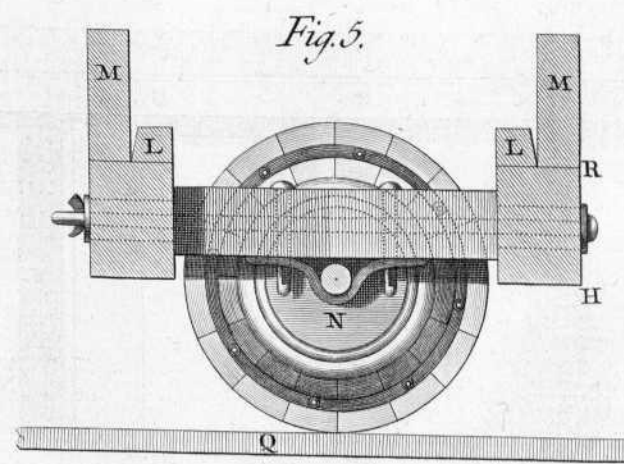
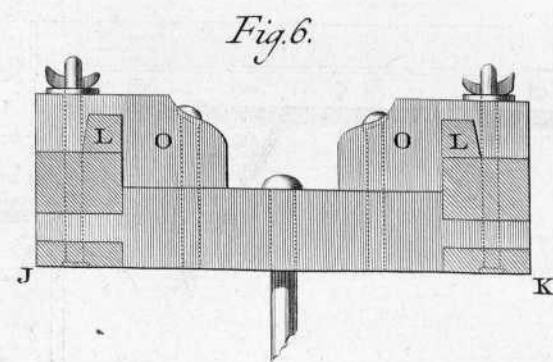
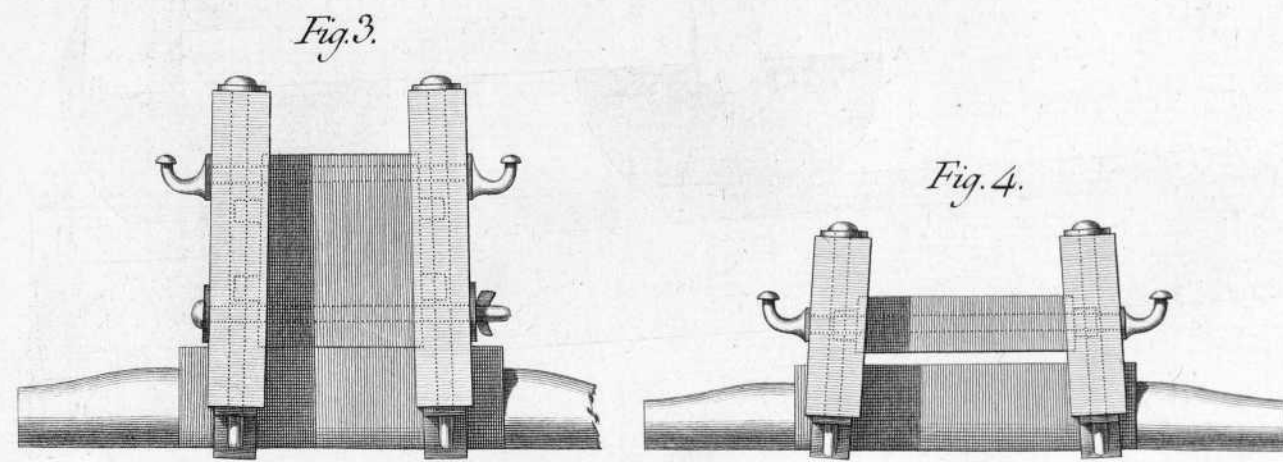


3 Pies de París.

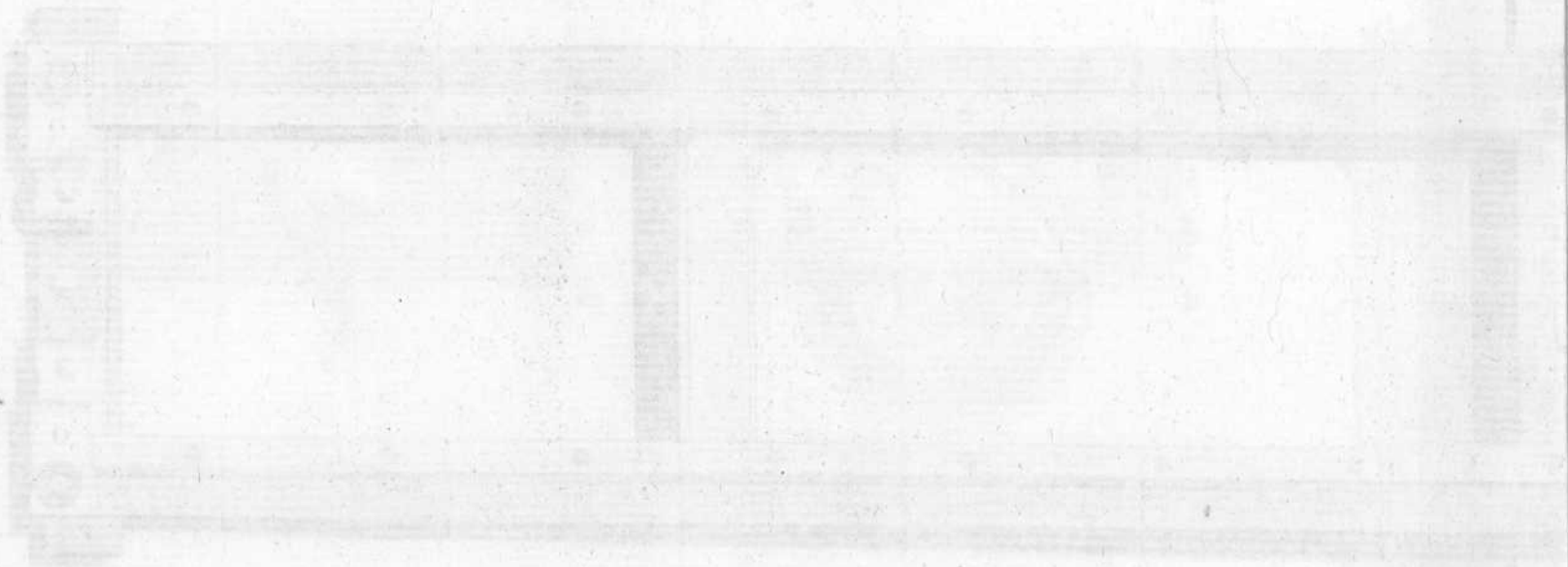
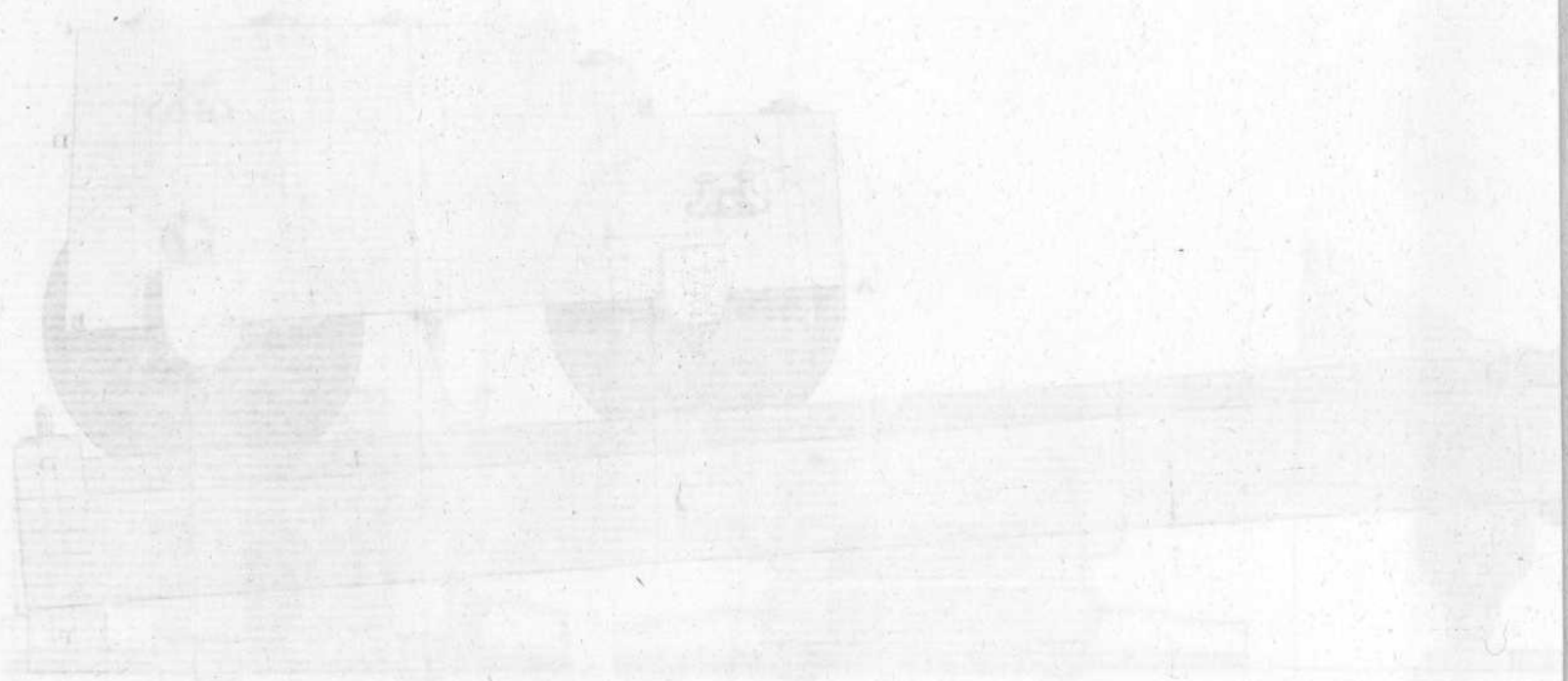


85 25 87





3 4 5 6 7 8 9 pies de Paris.
6 12 pulg.



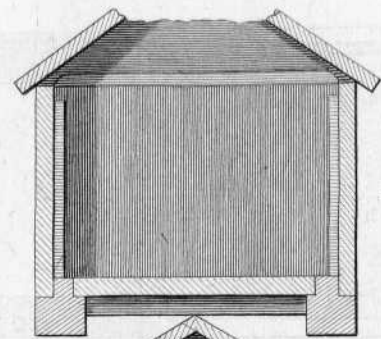


Fig. 2.

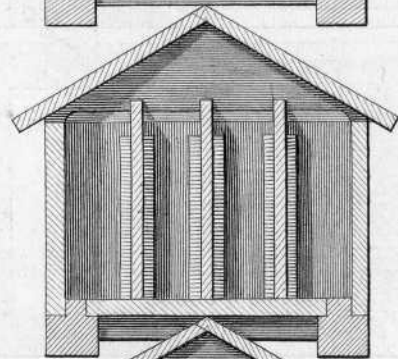


Fig. 4.

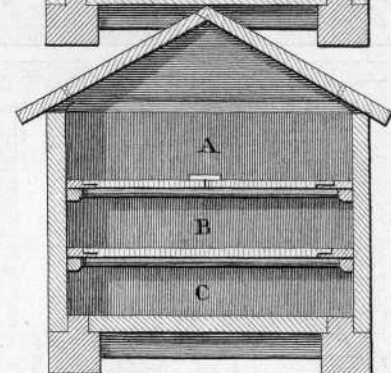


Fig. 6.

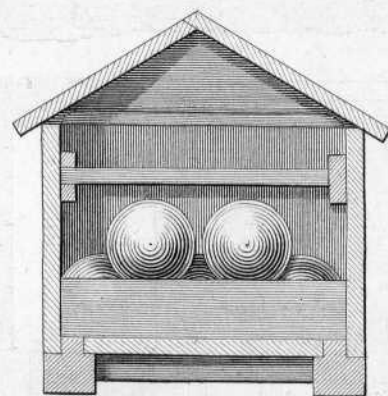
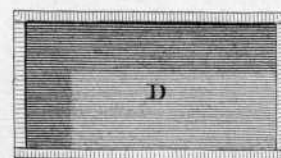


Fig. 9.



D

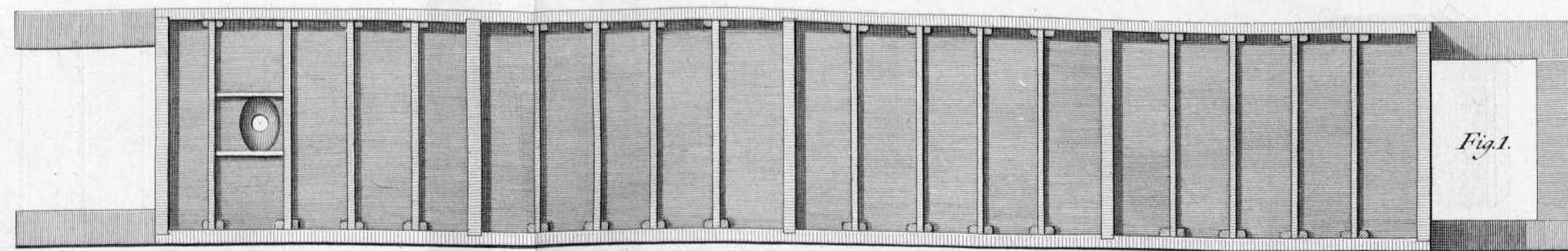


Fig. 1.

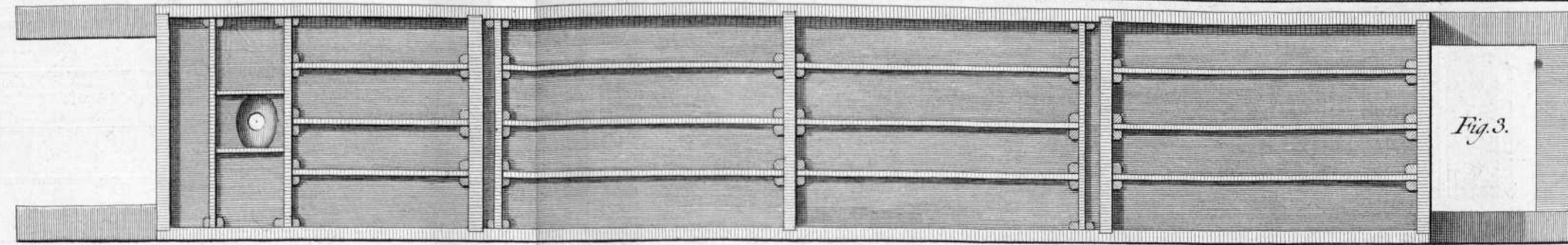


Fig. 3.

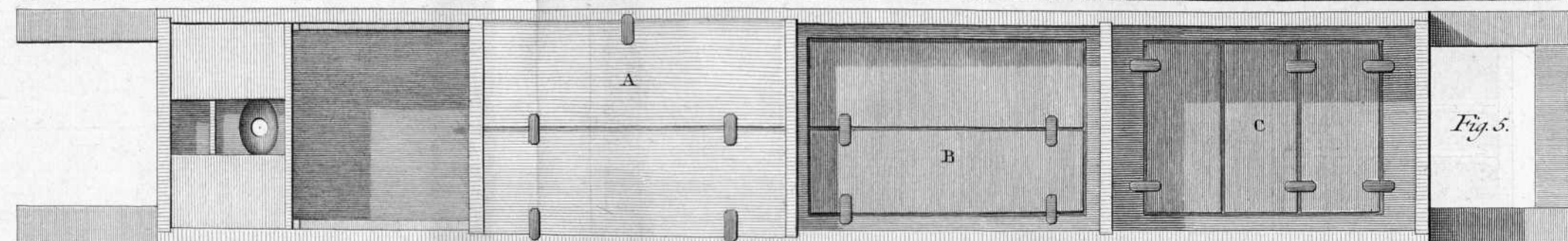


Fig. 5.

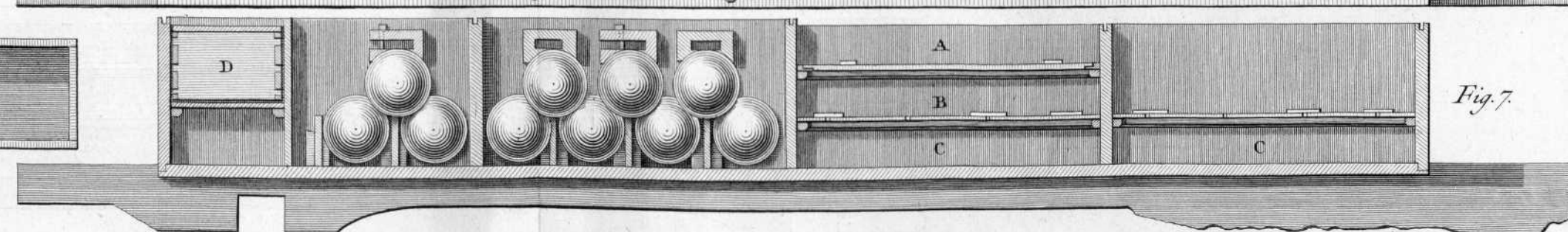


Fig. 7.

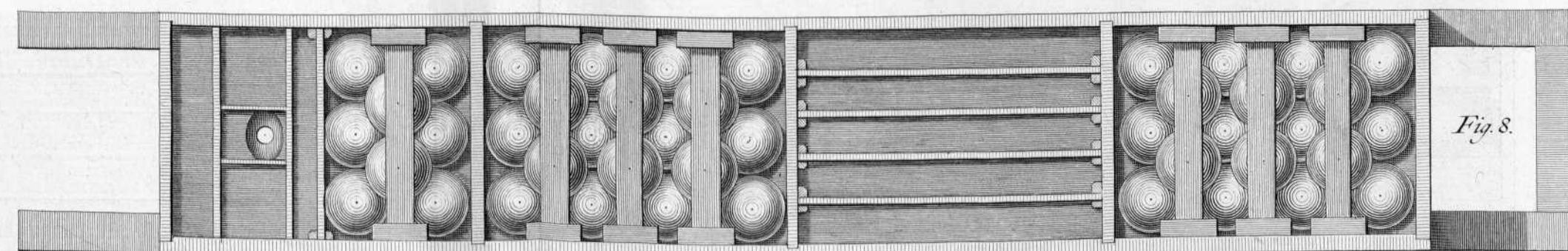
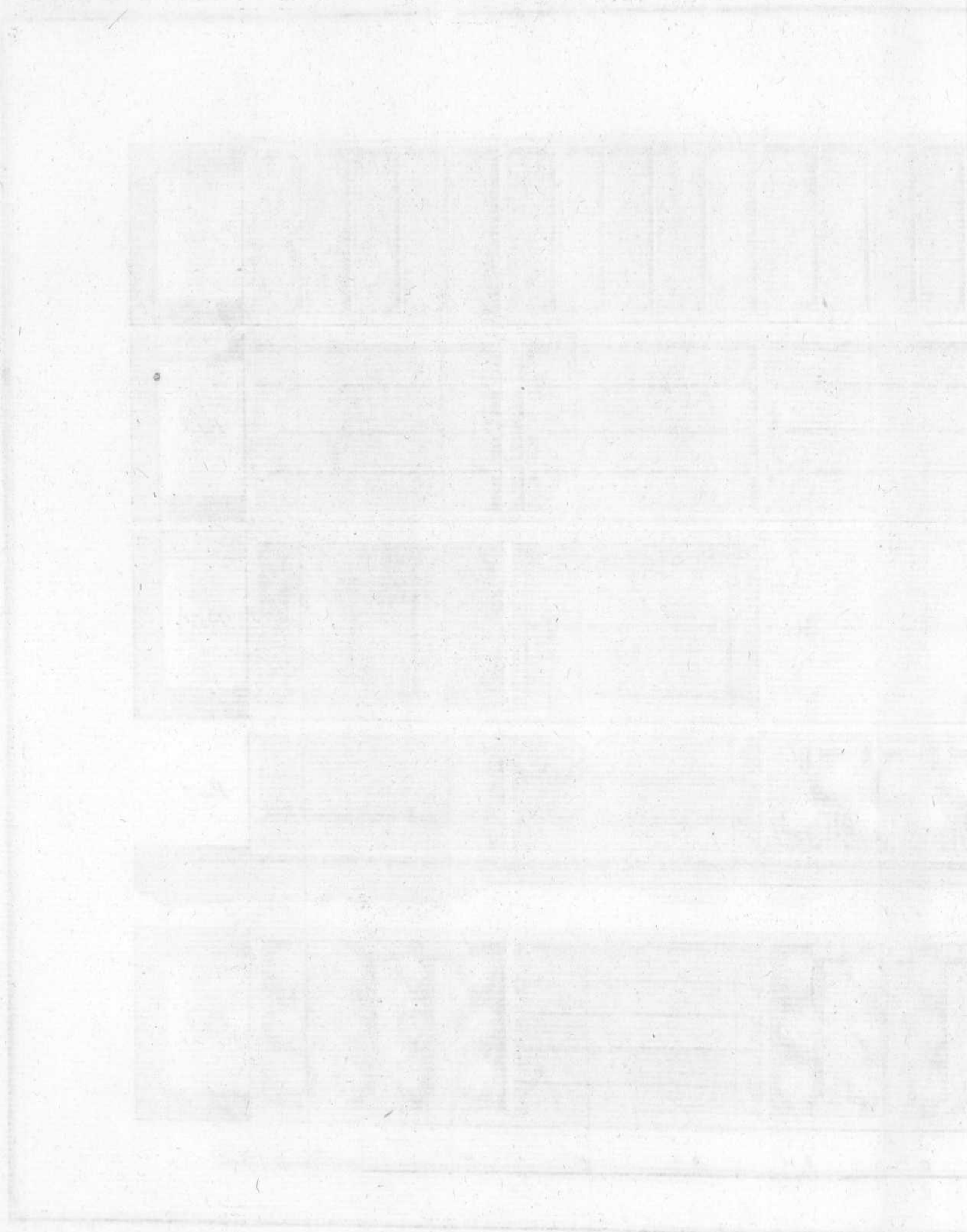
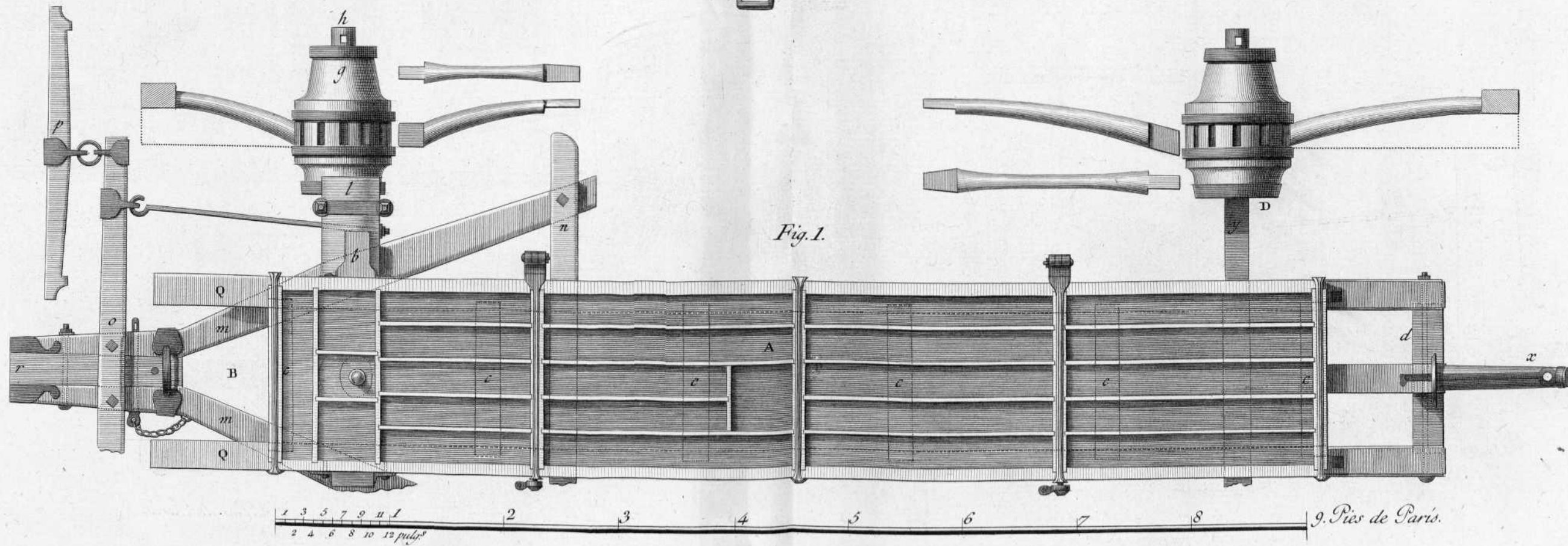
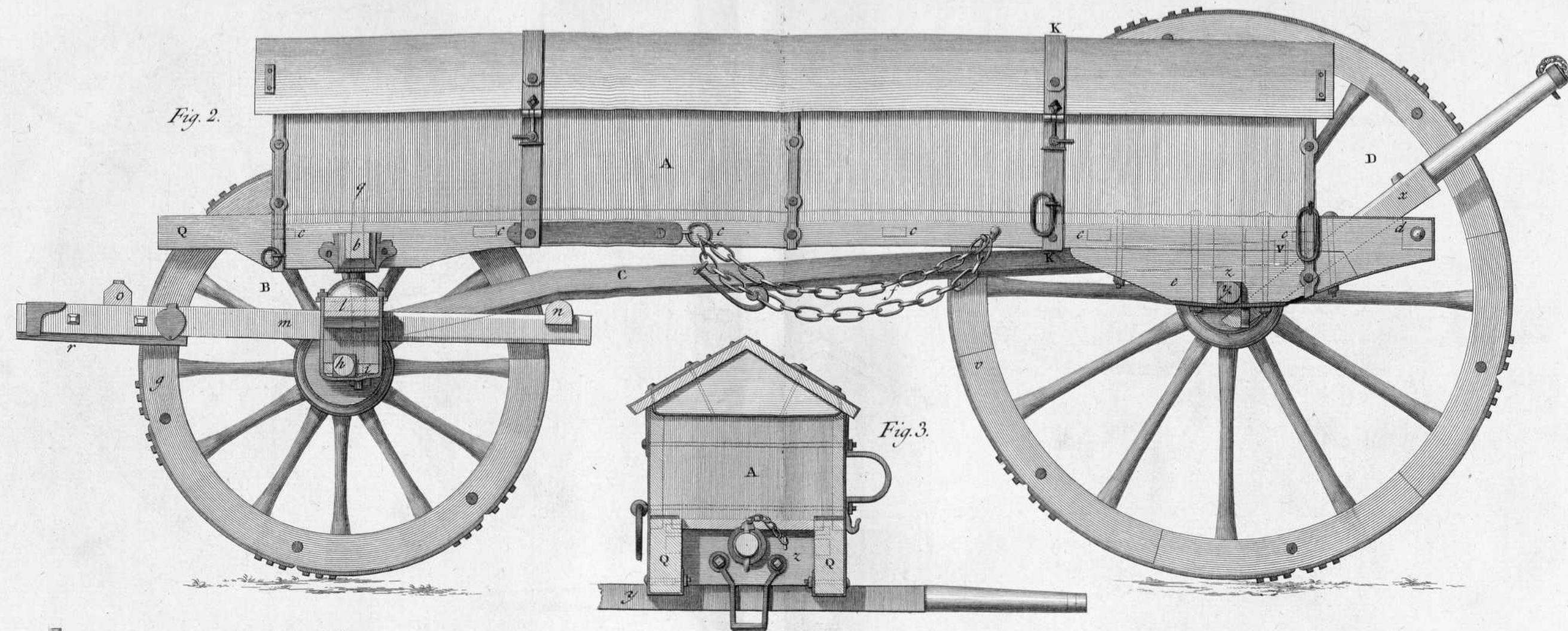


Fig. 8.

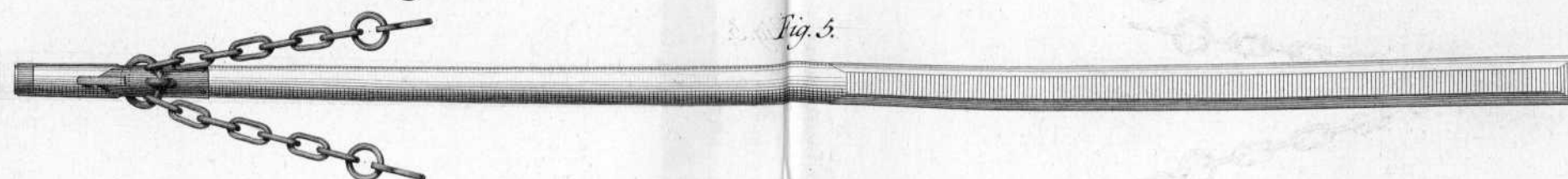
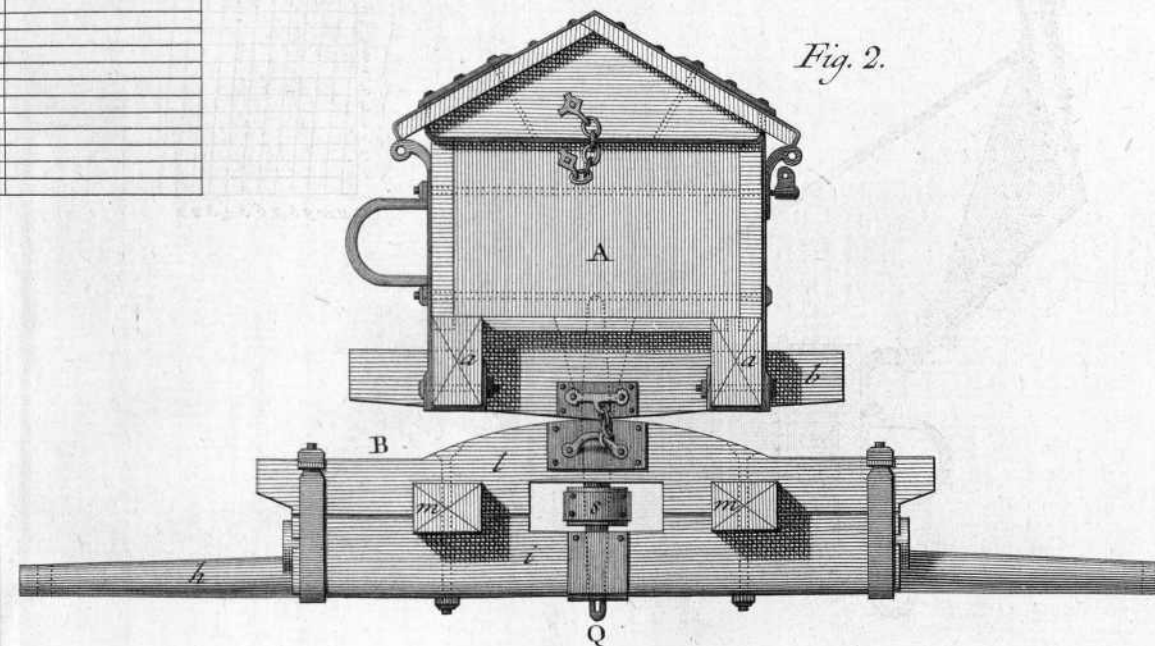
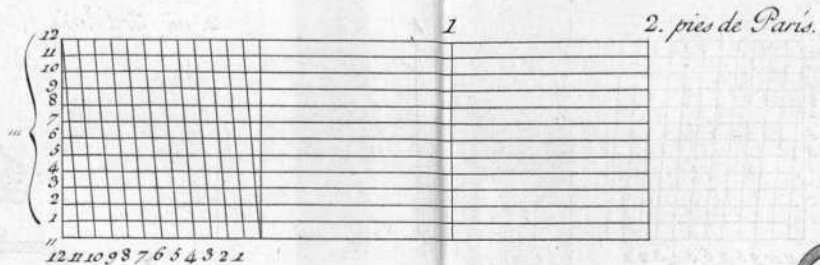
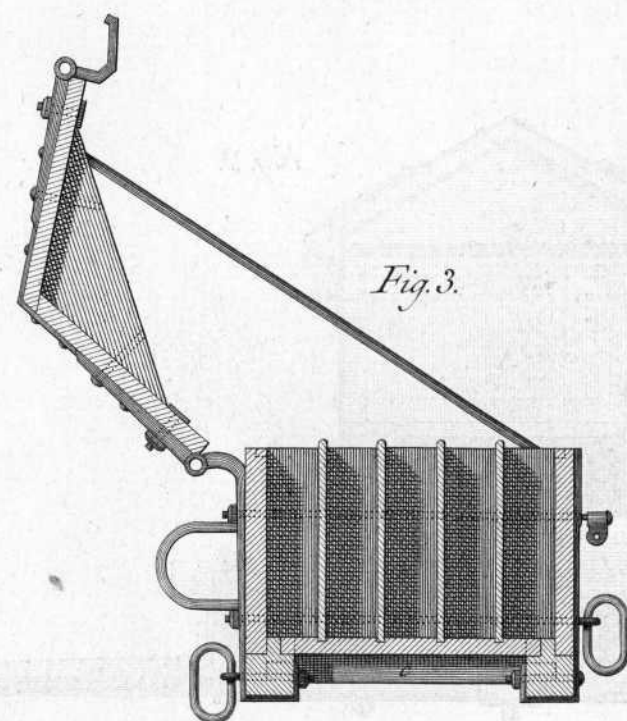
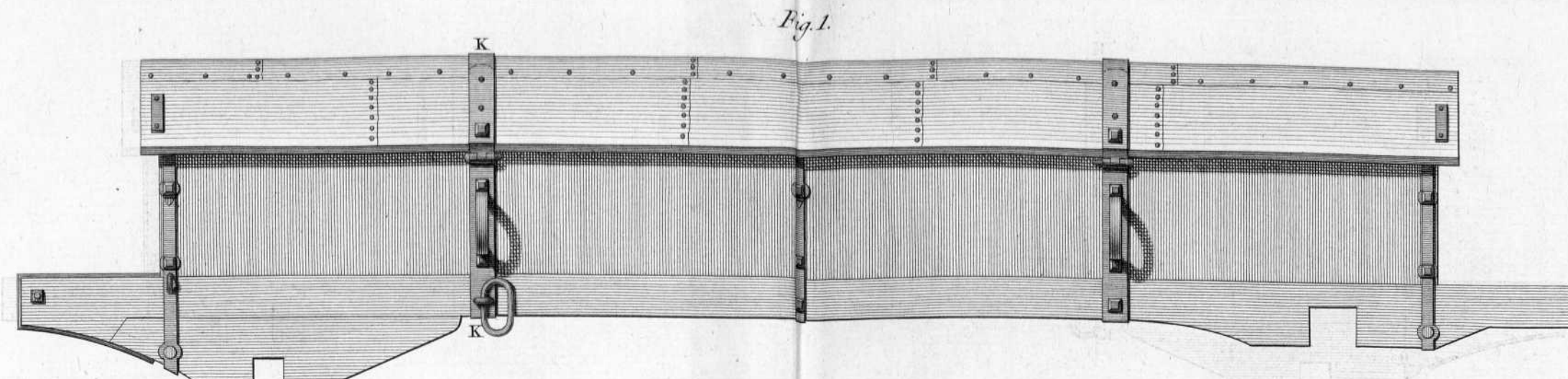
1 3 5 7 9 11 1 2 3 4 5 6 7 8 9 10 11 12. Pies de París.



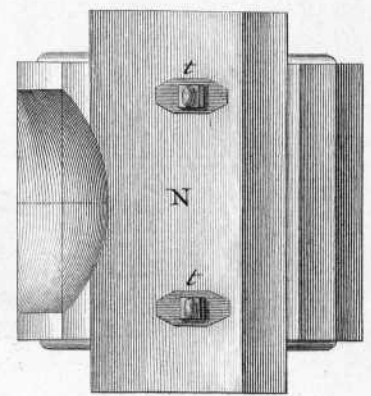
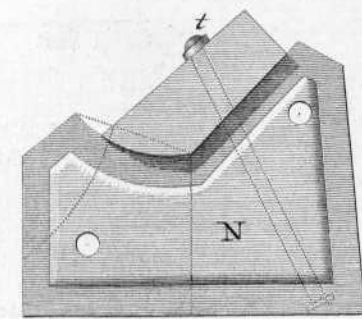
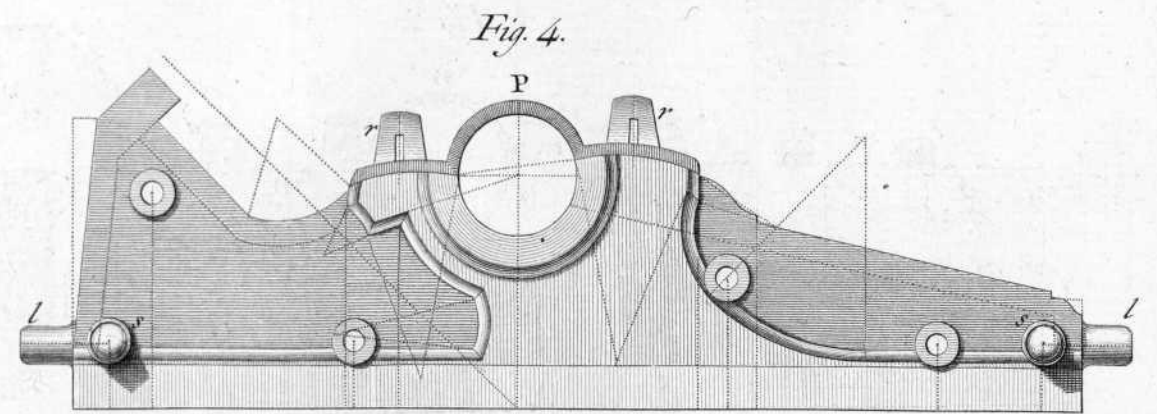
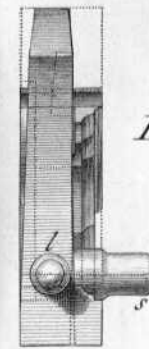
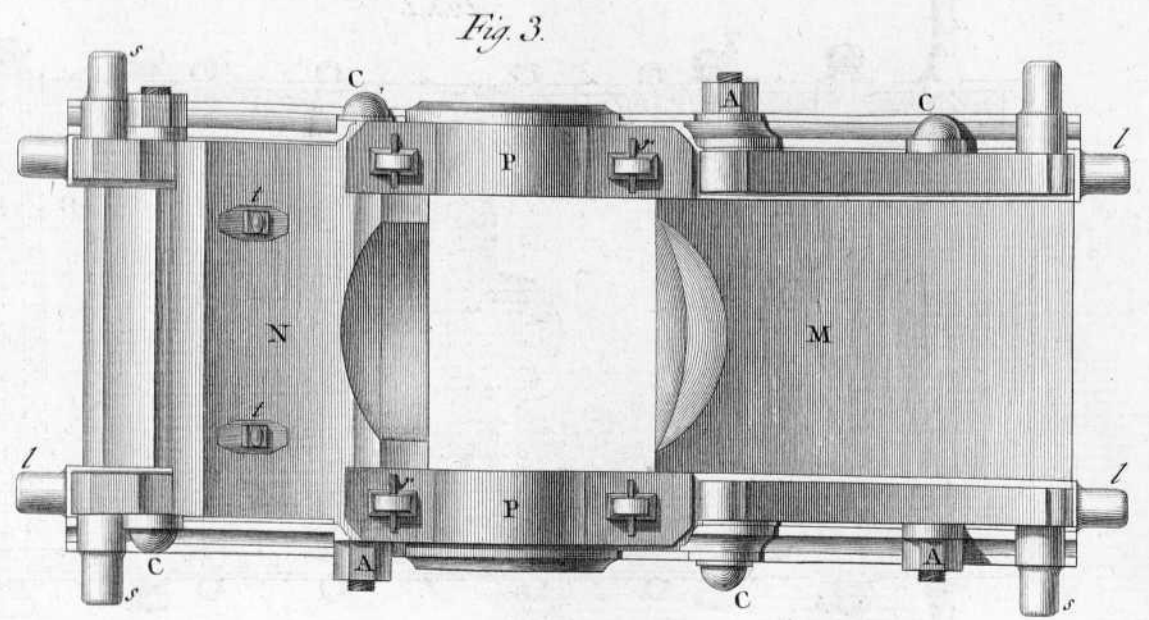
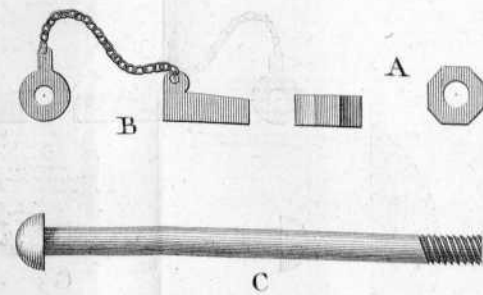
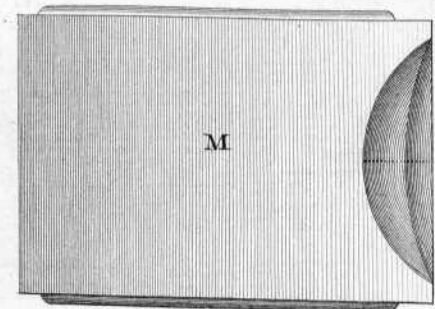
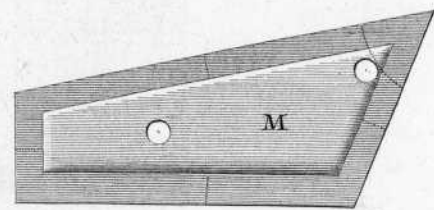
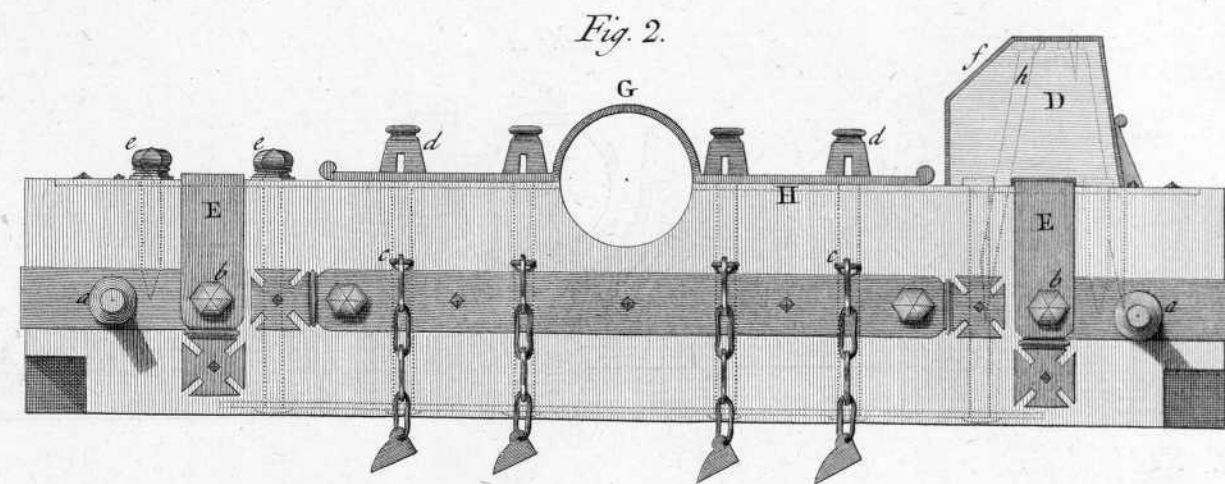
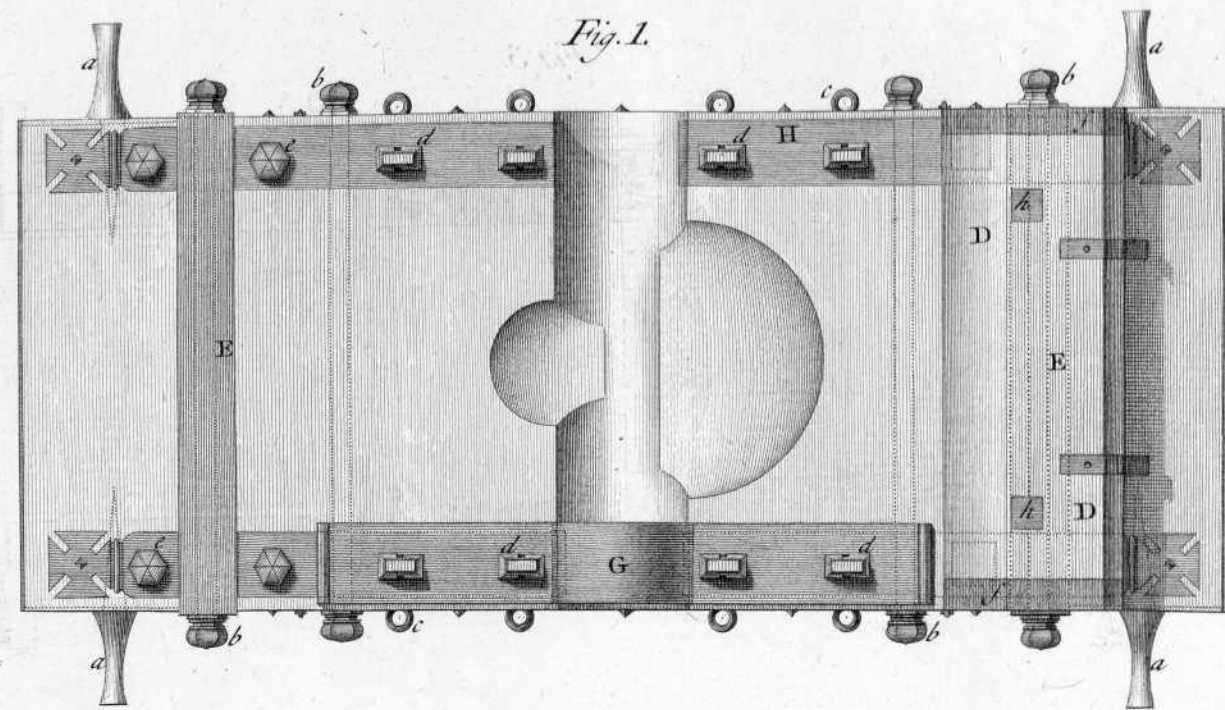




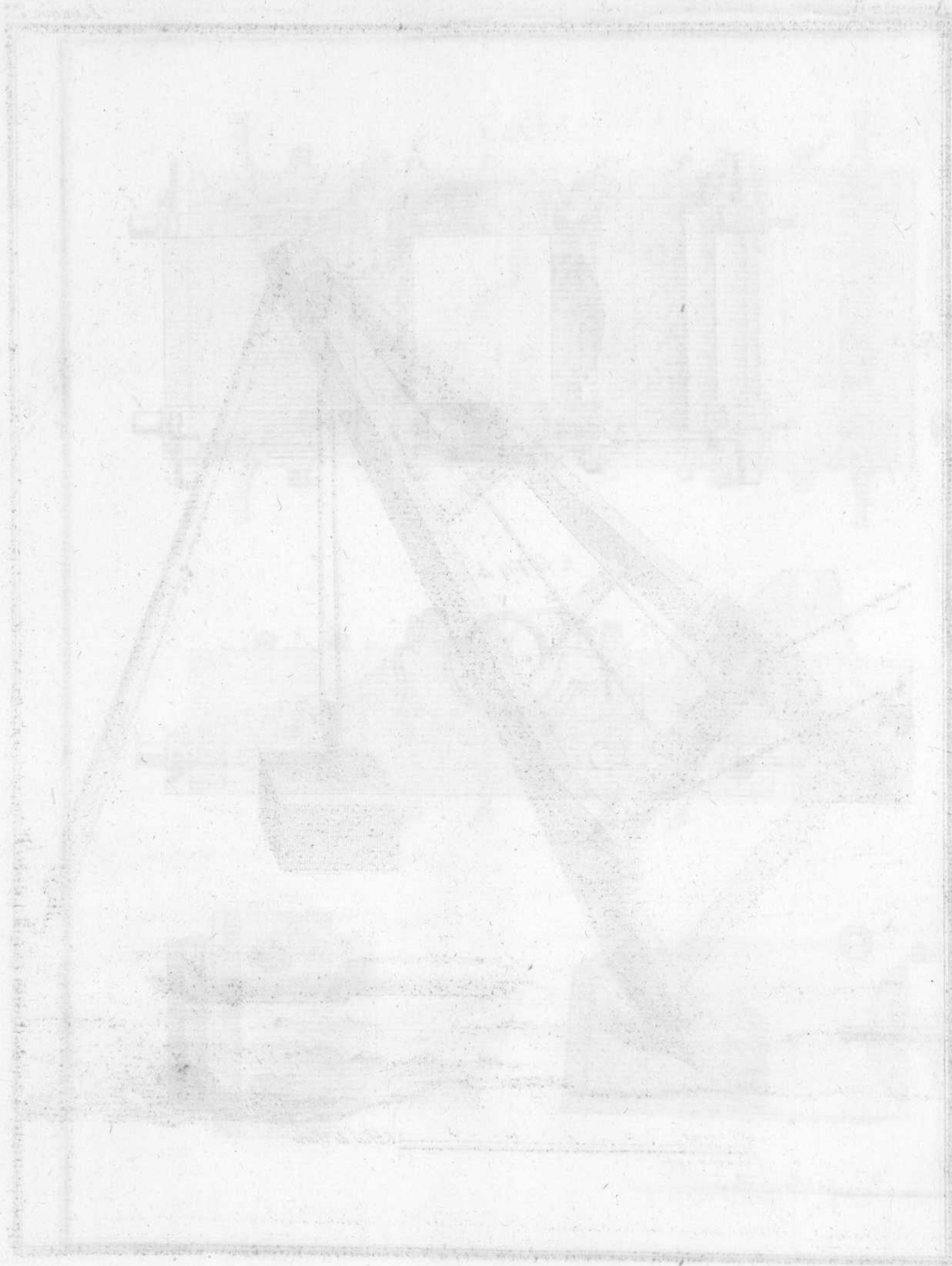


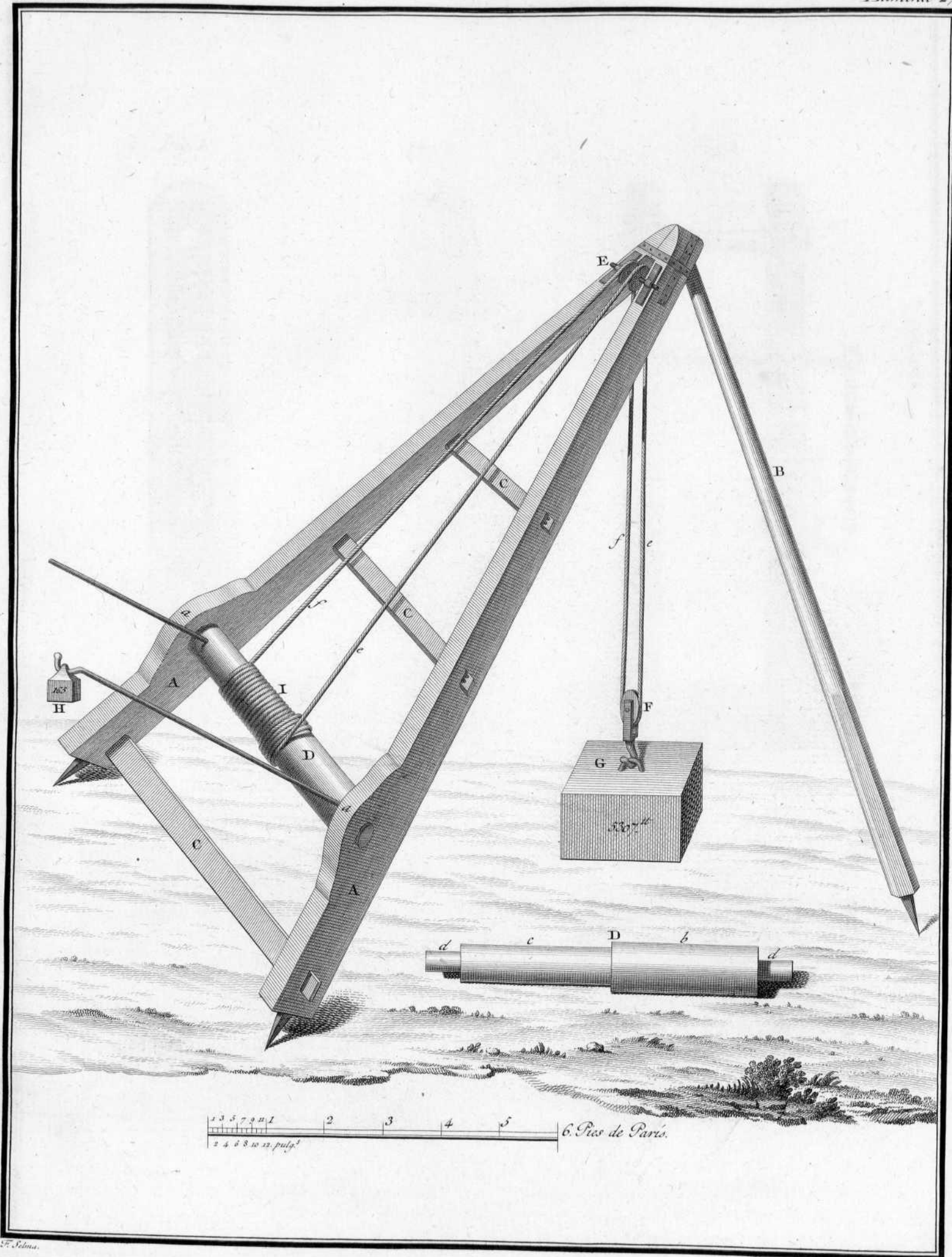






1 2 3 4 5 6 7 8 9 10 11 12 pulg.
2 3 4 5 Pas de Paris.





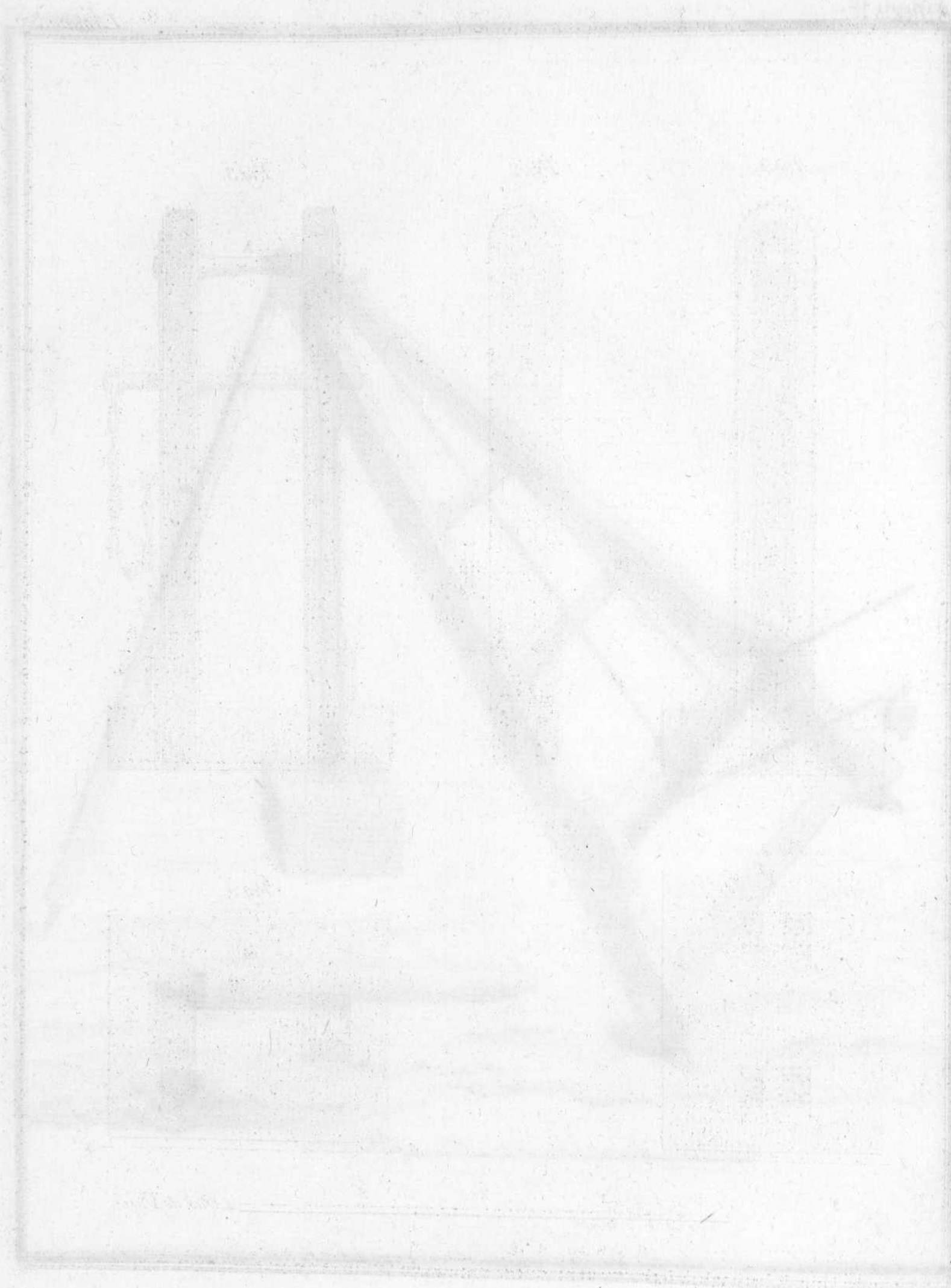


Fig. 1.

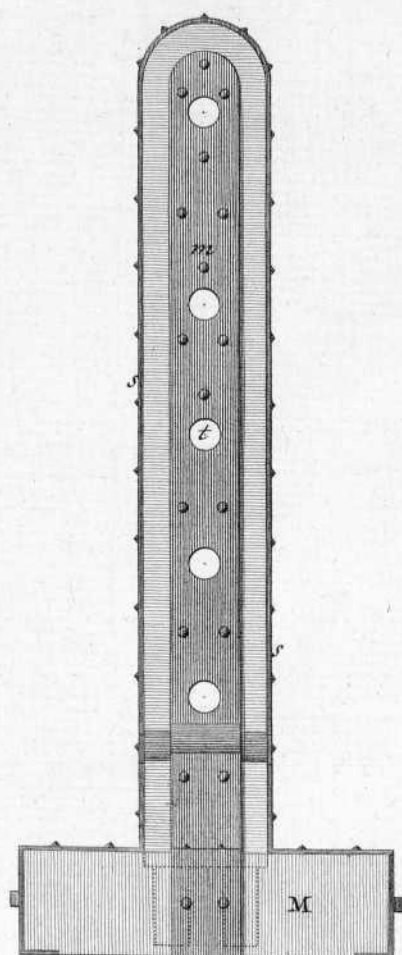


Fig. 2.



Fig. 3.

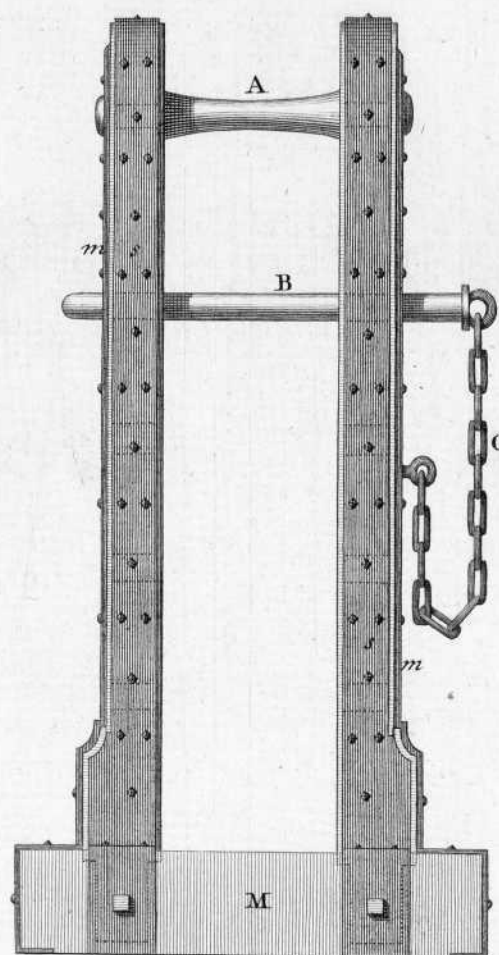


Fig. 4.

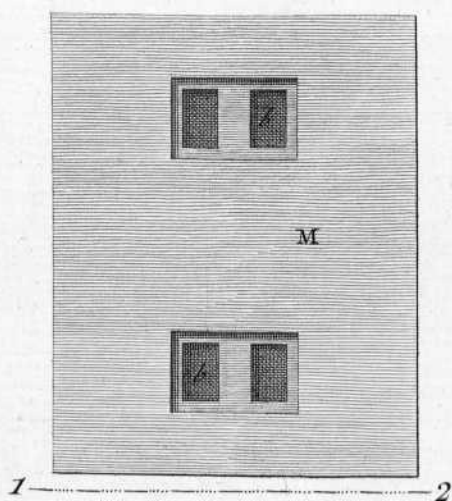
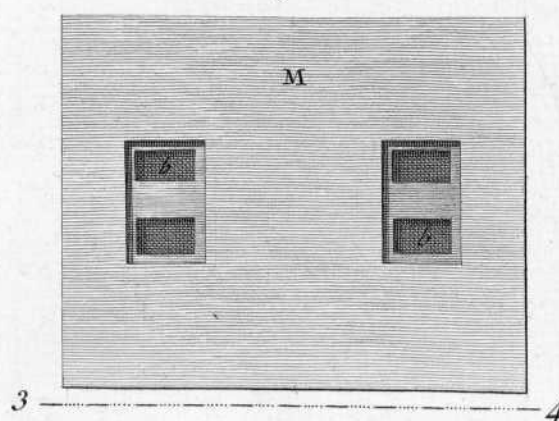


Fig. 5.



1 2 3 4 5 6 7 8 9 10 11 12 pulg.

2

3

4. Pies de París.

Fig. 1.

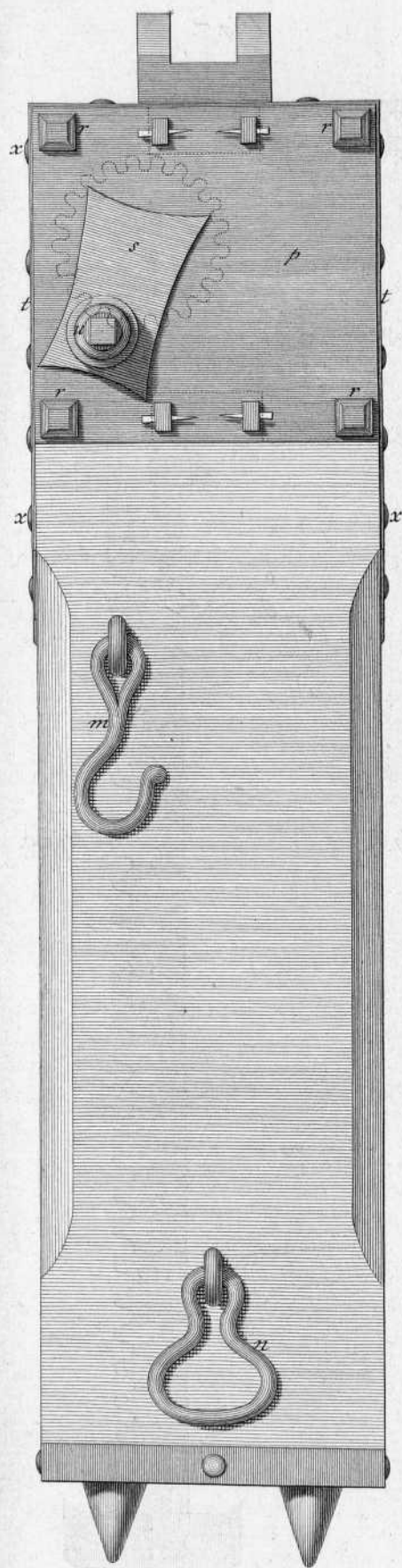


Fig. 2.

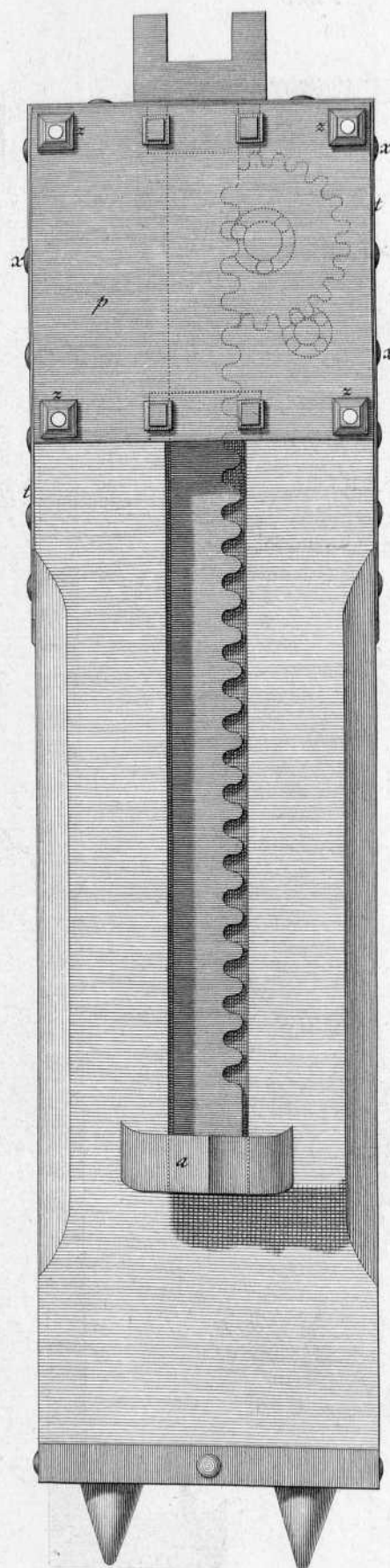


Fig. 3.

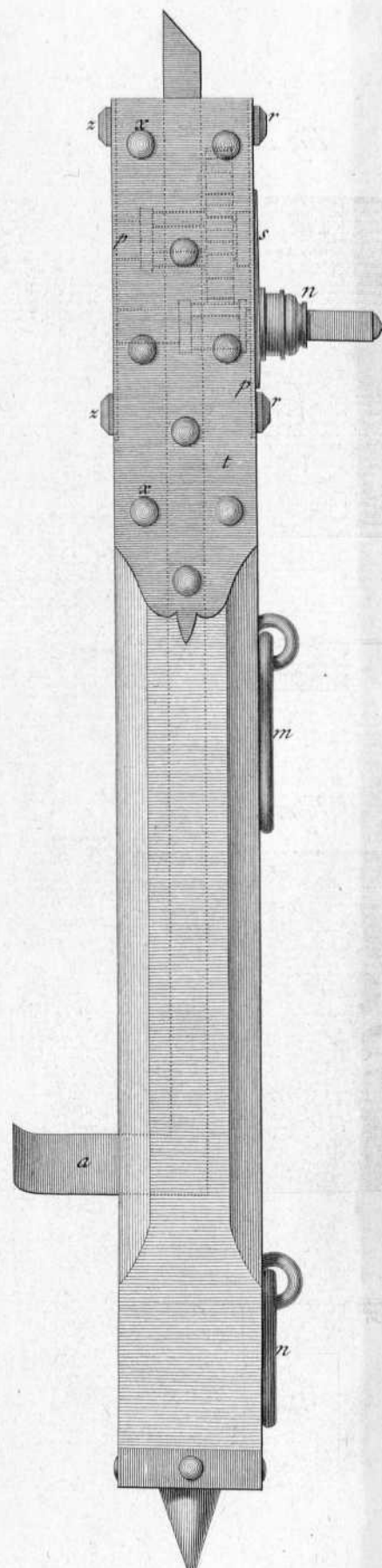


Fig. 4.

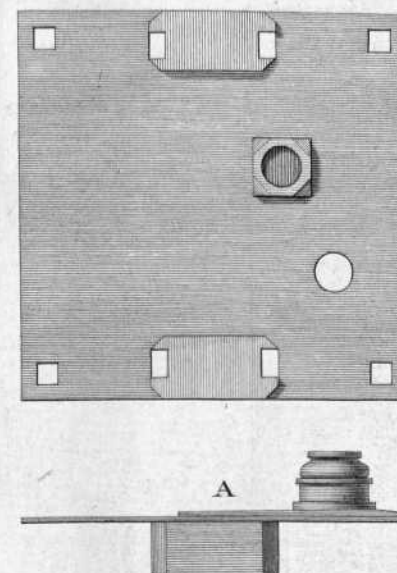


Fig. 5.

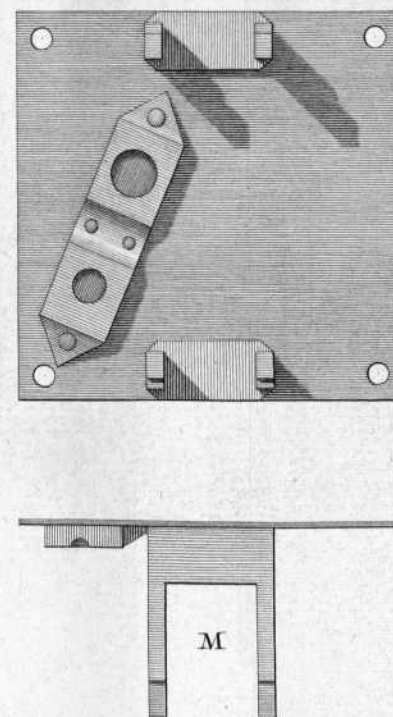


Fig. 6.

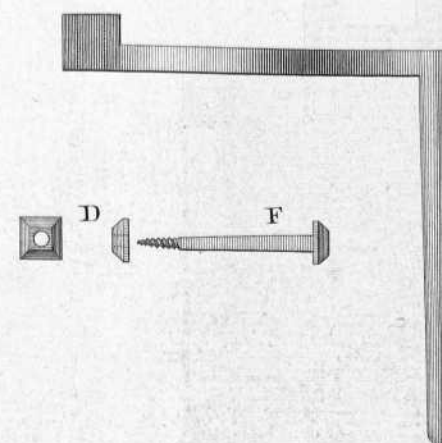


Fig. 10.

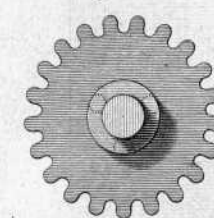


Fig. 11.

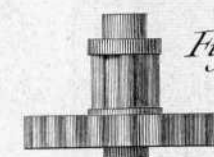


Fig. 7.

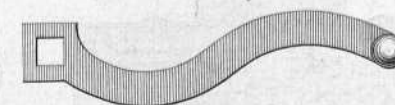


Fig. 8.

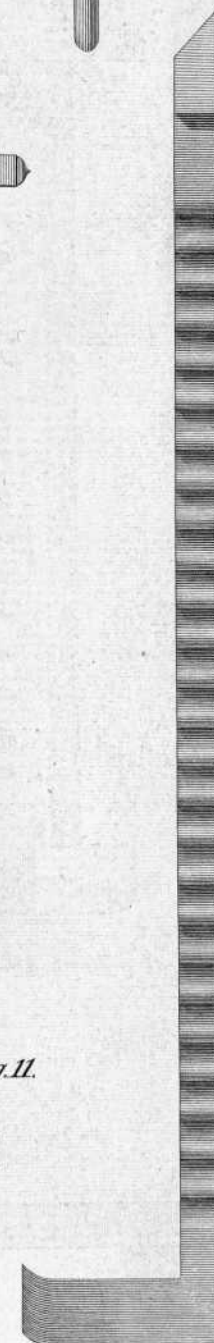
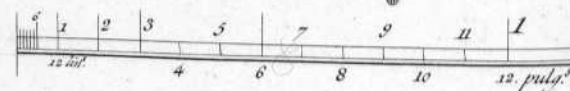
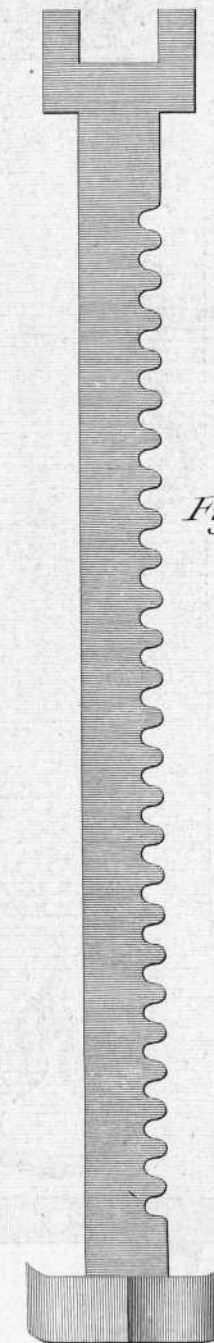
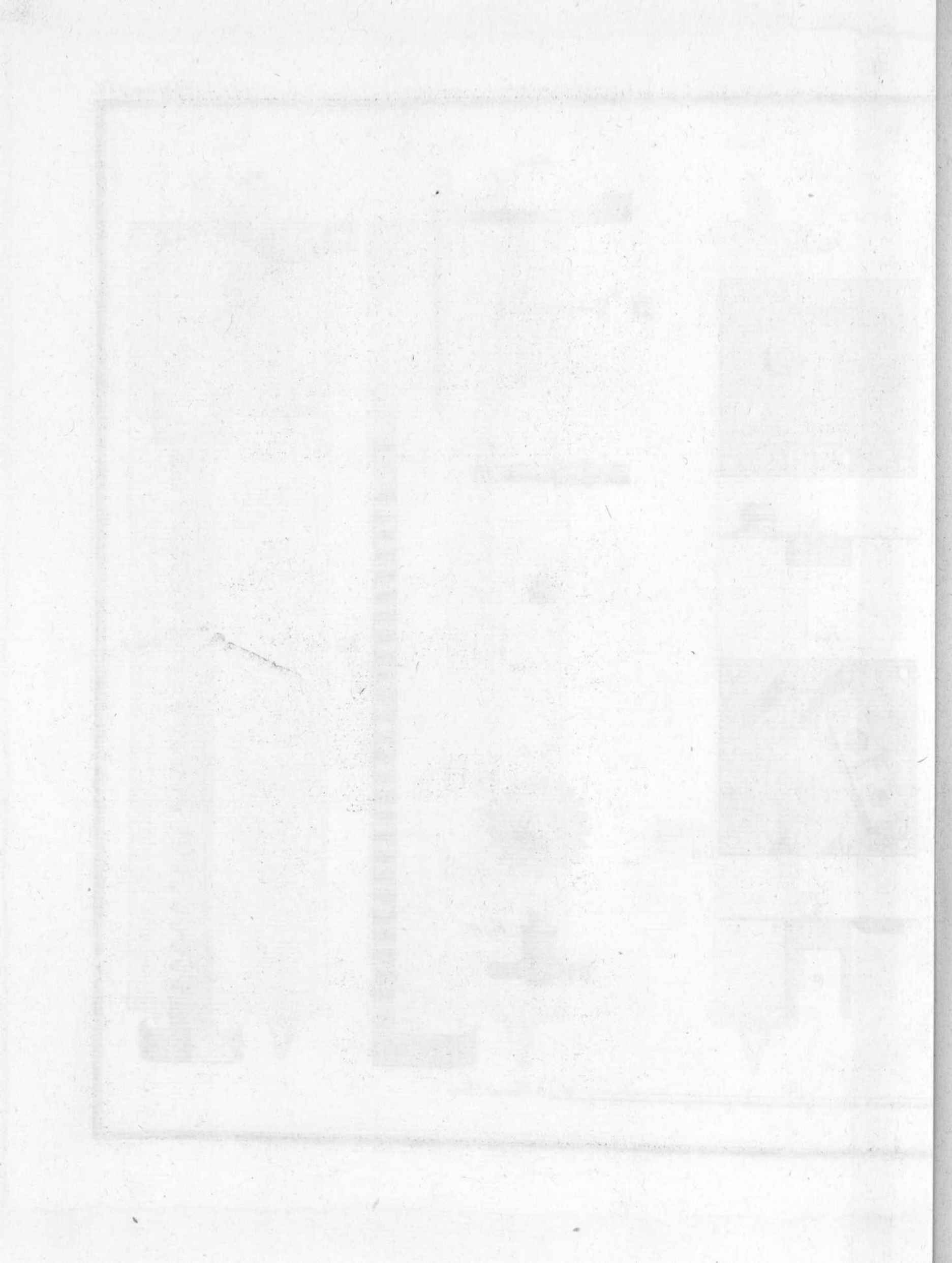


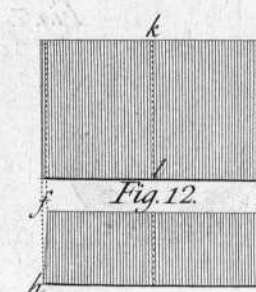
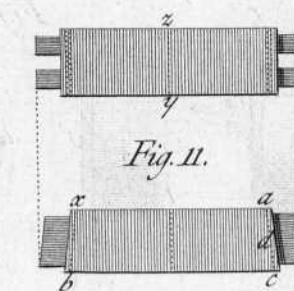
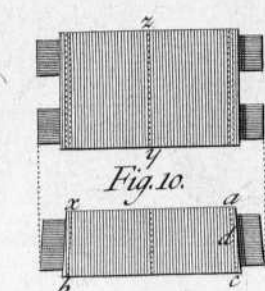
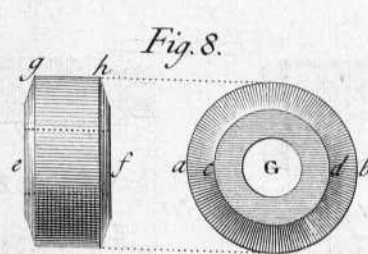
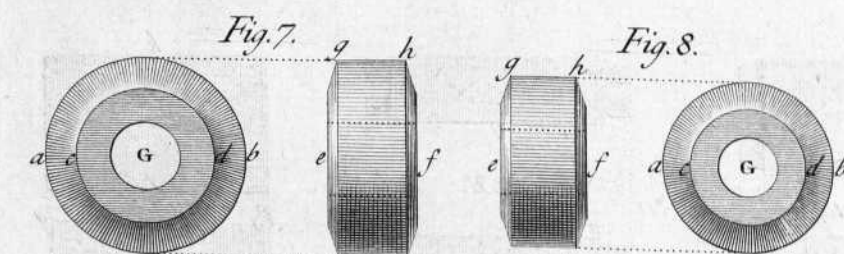
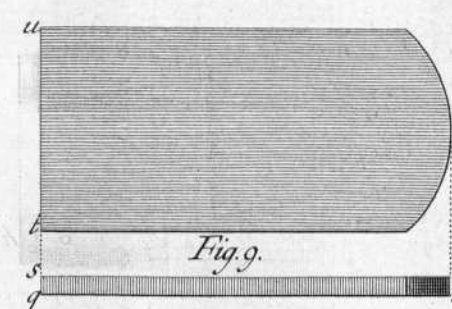
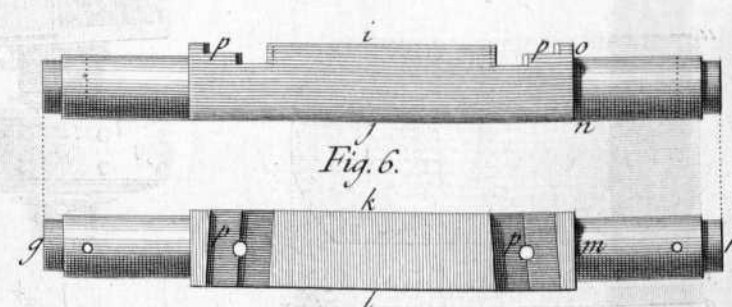
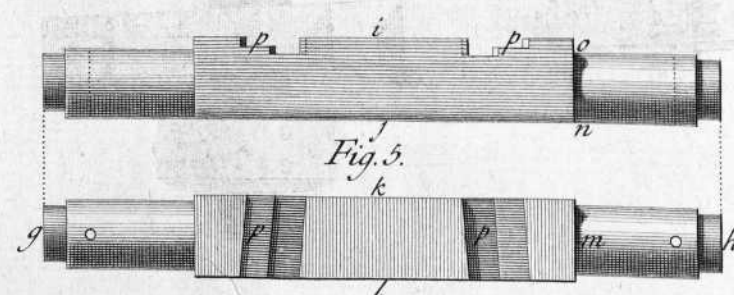
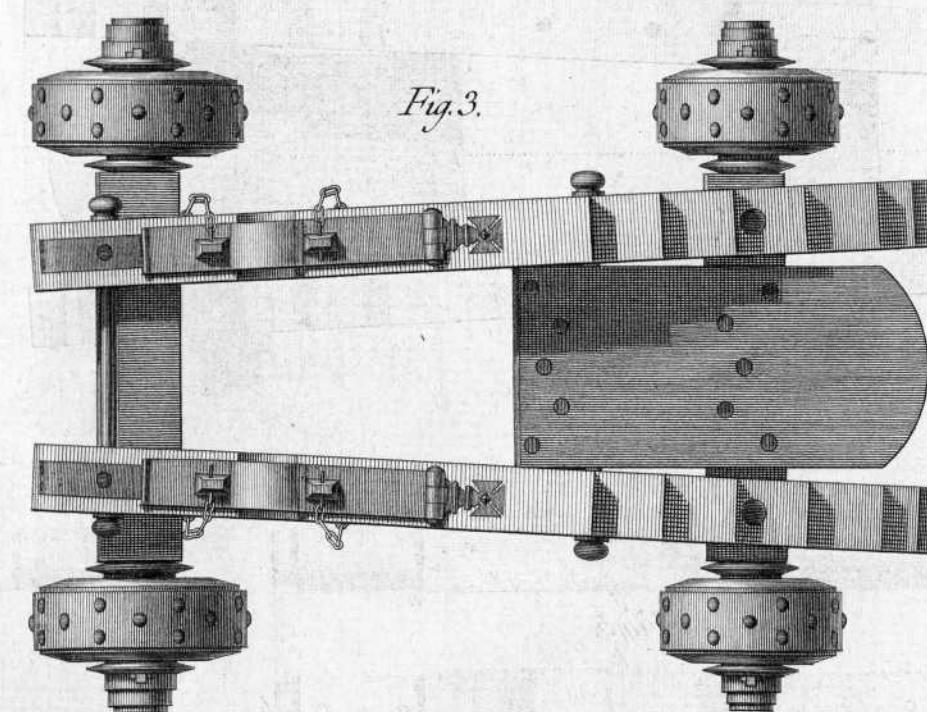
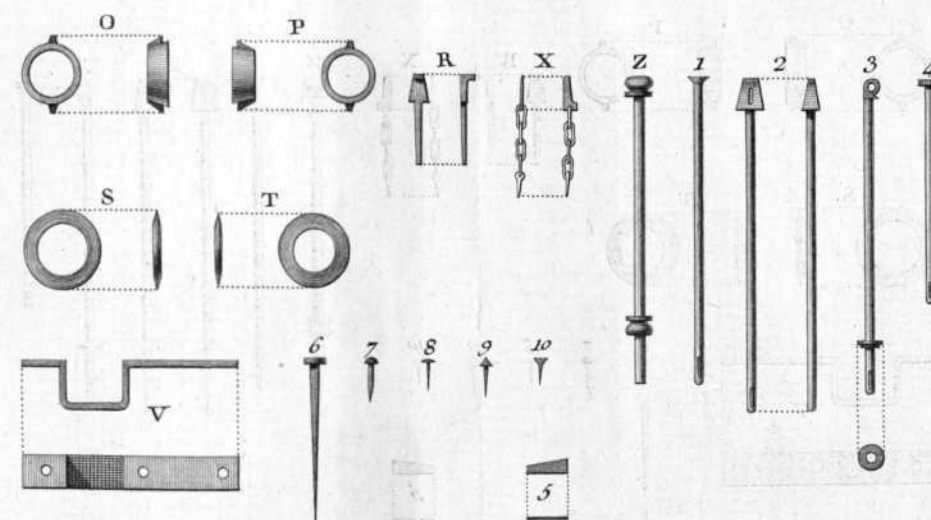
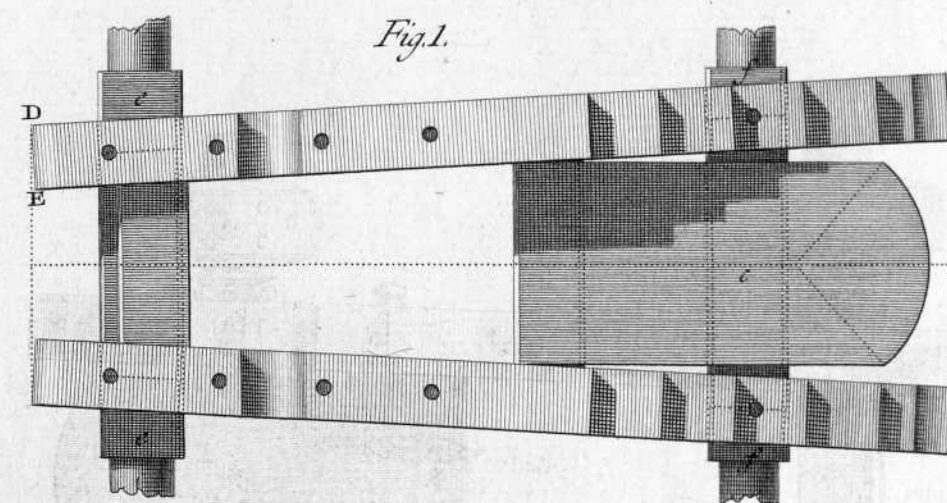
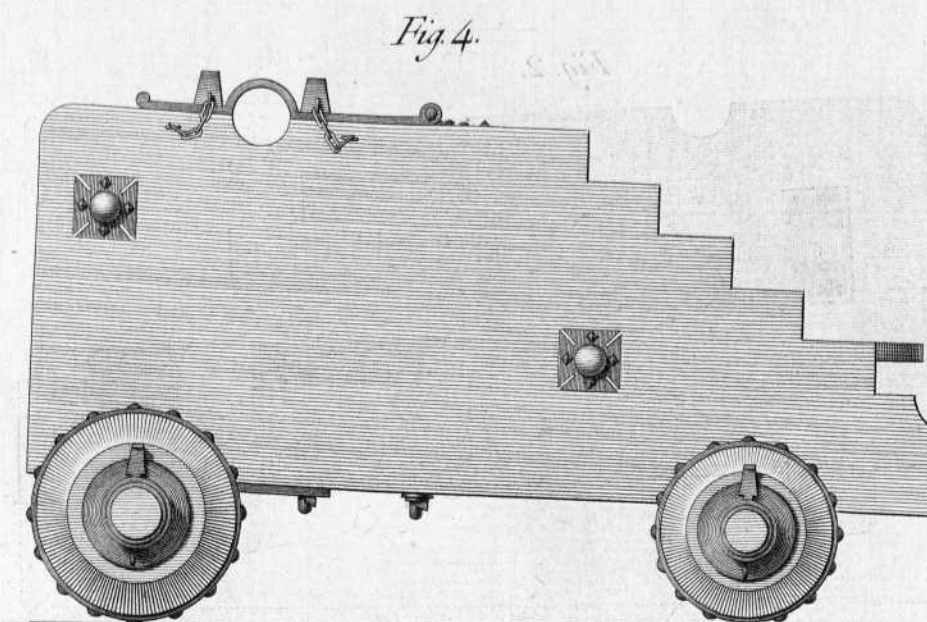
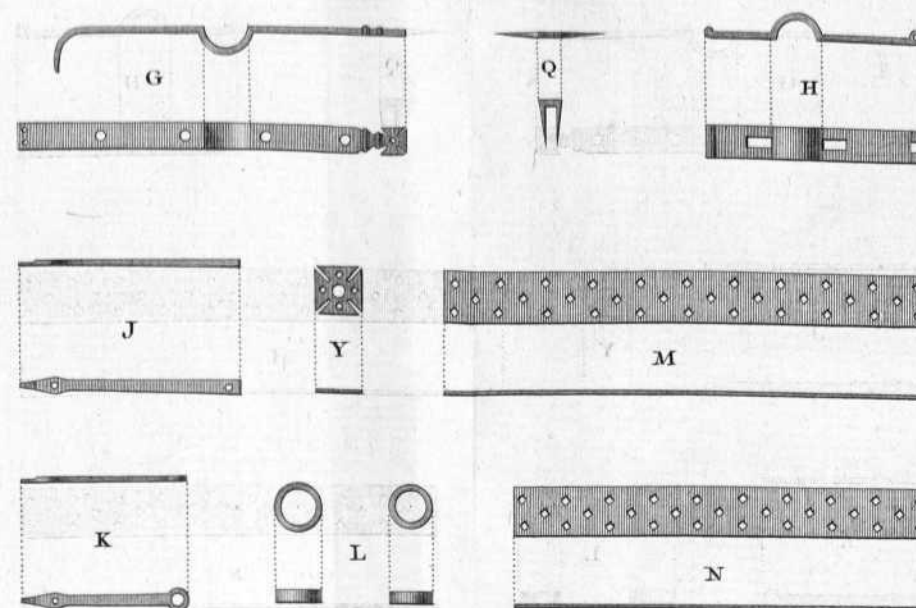
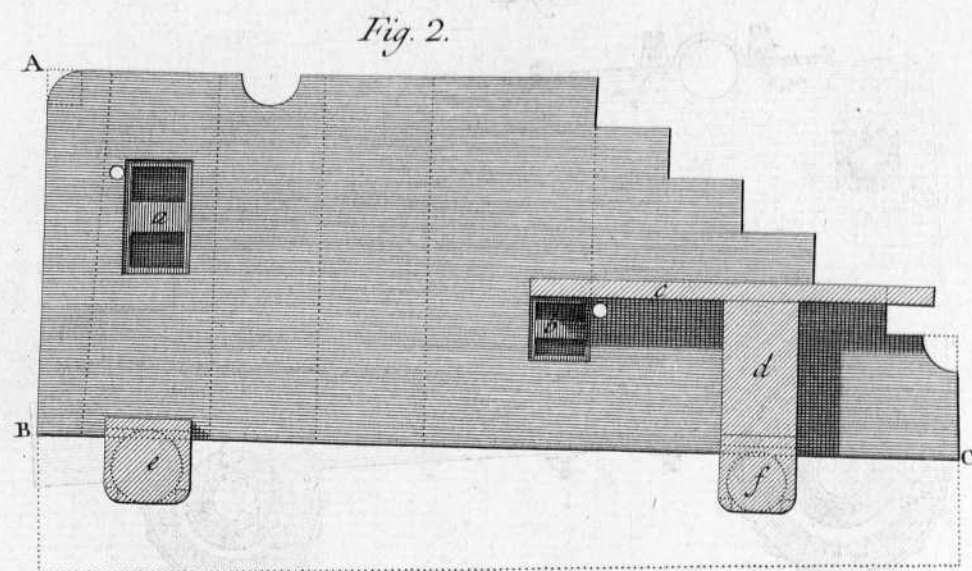
Fig. 9.



3. Pies de París.



Cureña de Marina para el calibre de á 24.





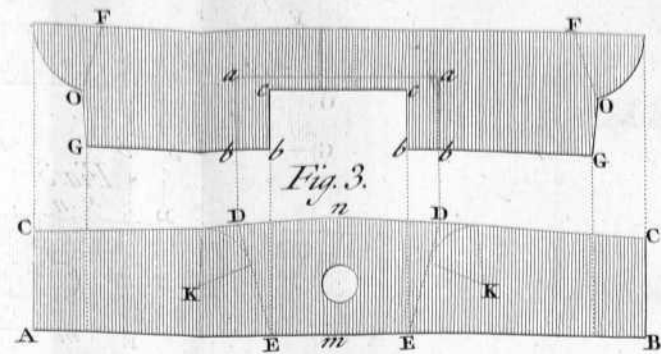
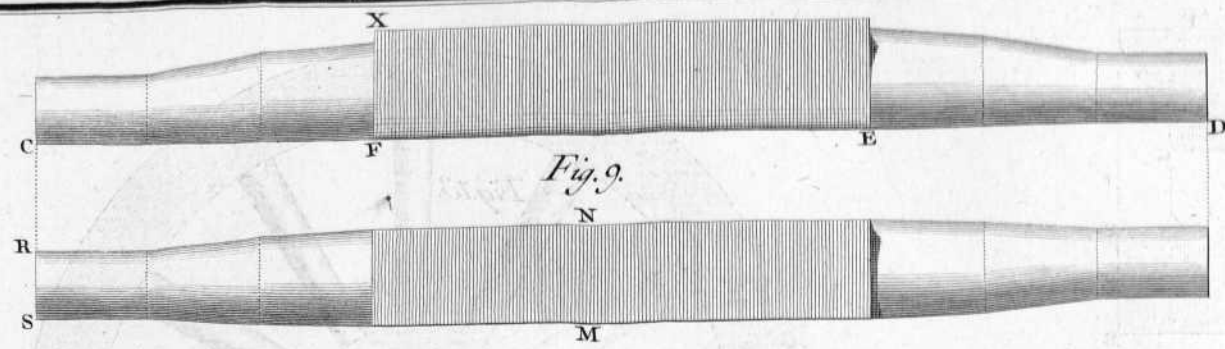


Fig. 8.

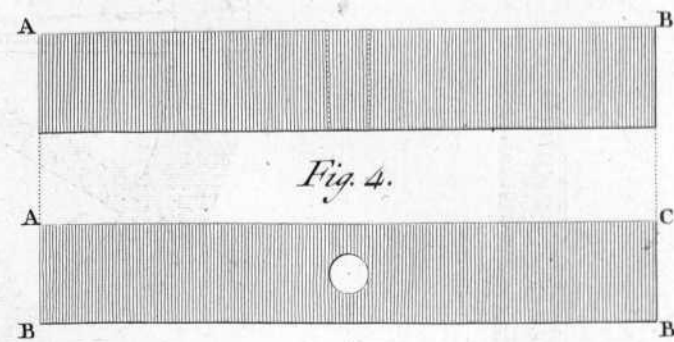


Fig. 1.

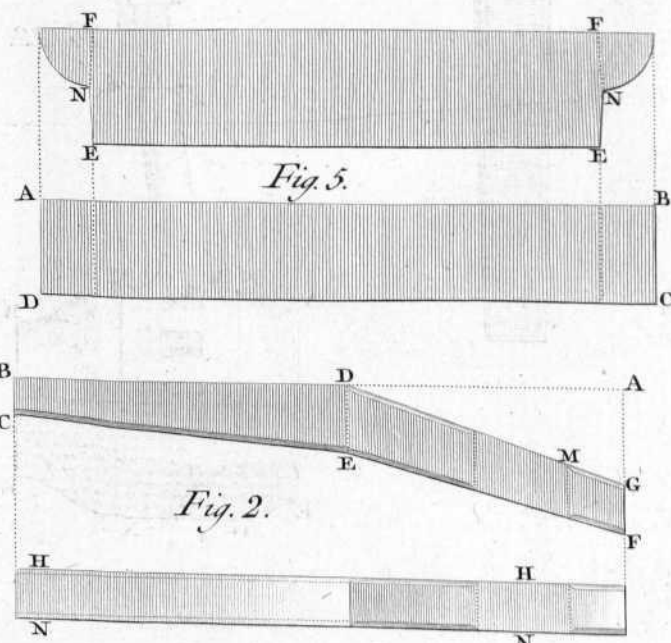
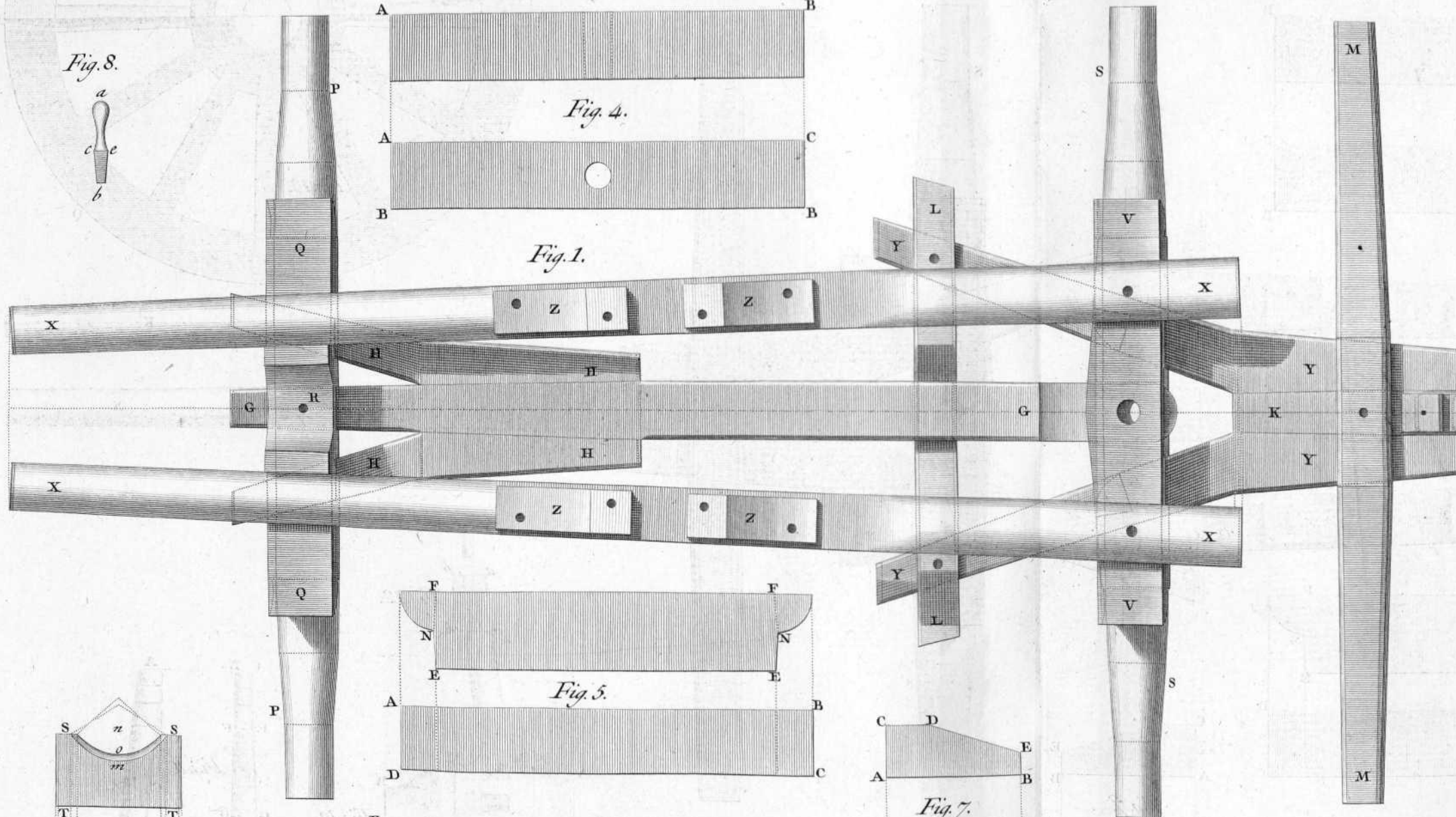


Fig. 5.

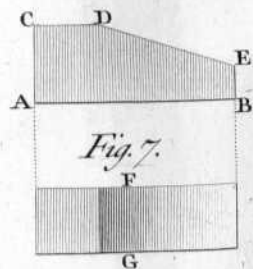


Fig. 7.

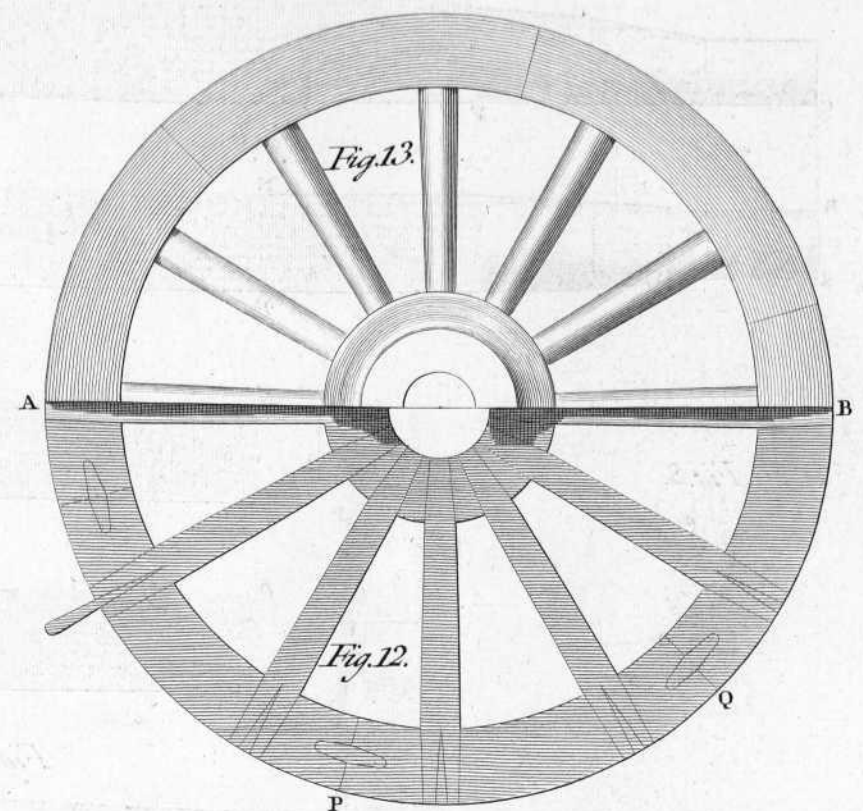


Fig. 12.

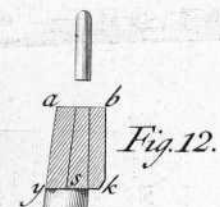


Fig. 12.

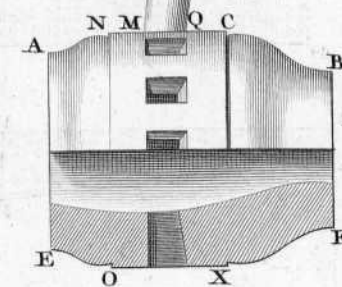


Fig. 10.

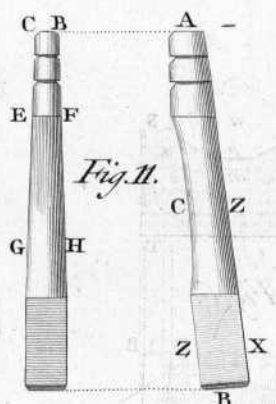


Fig. 11.

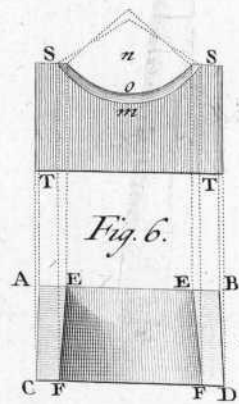
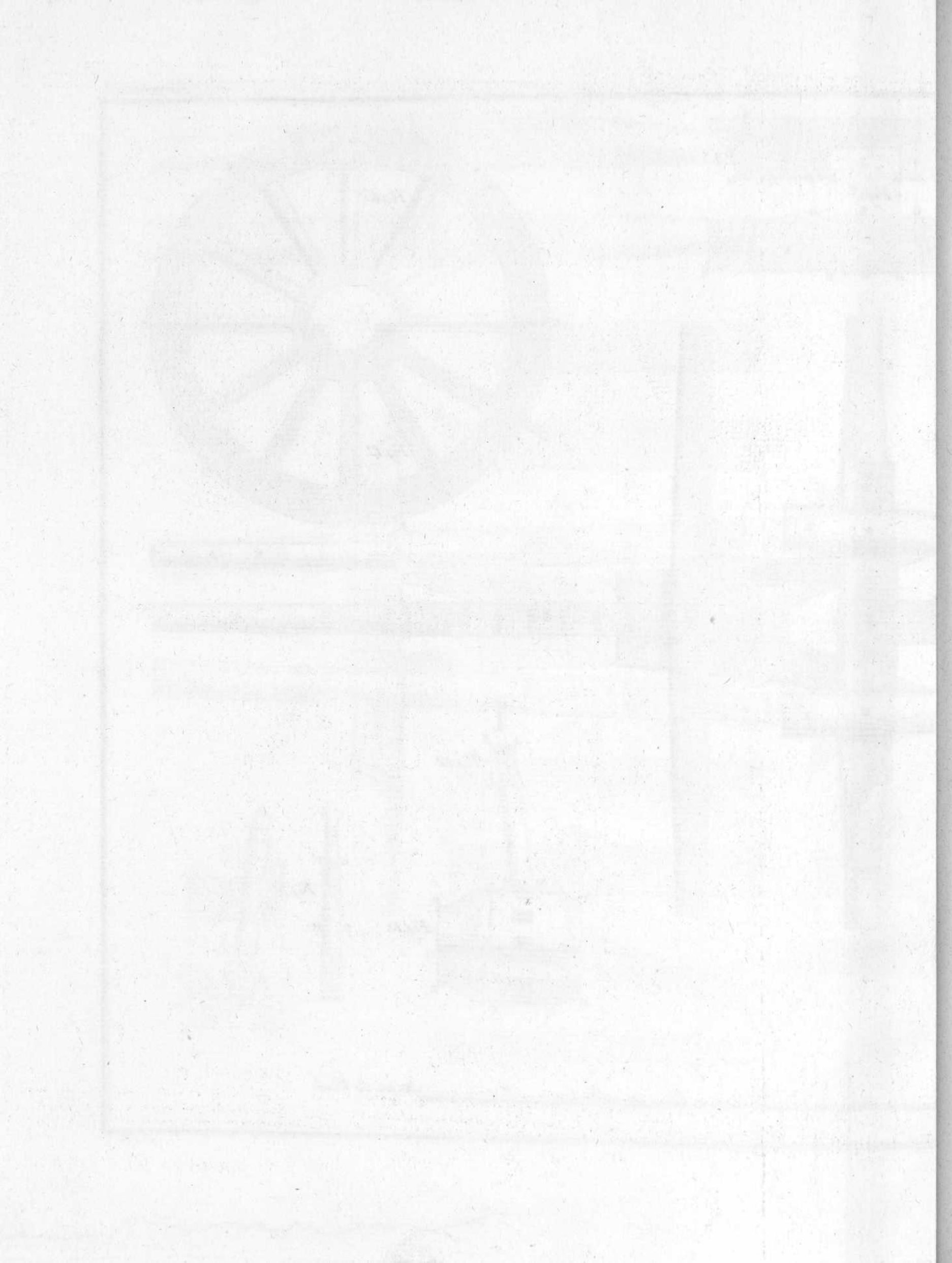
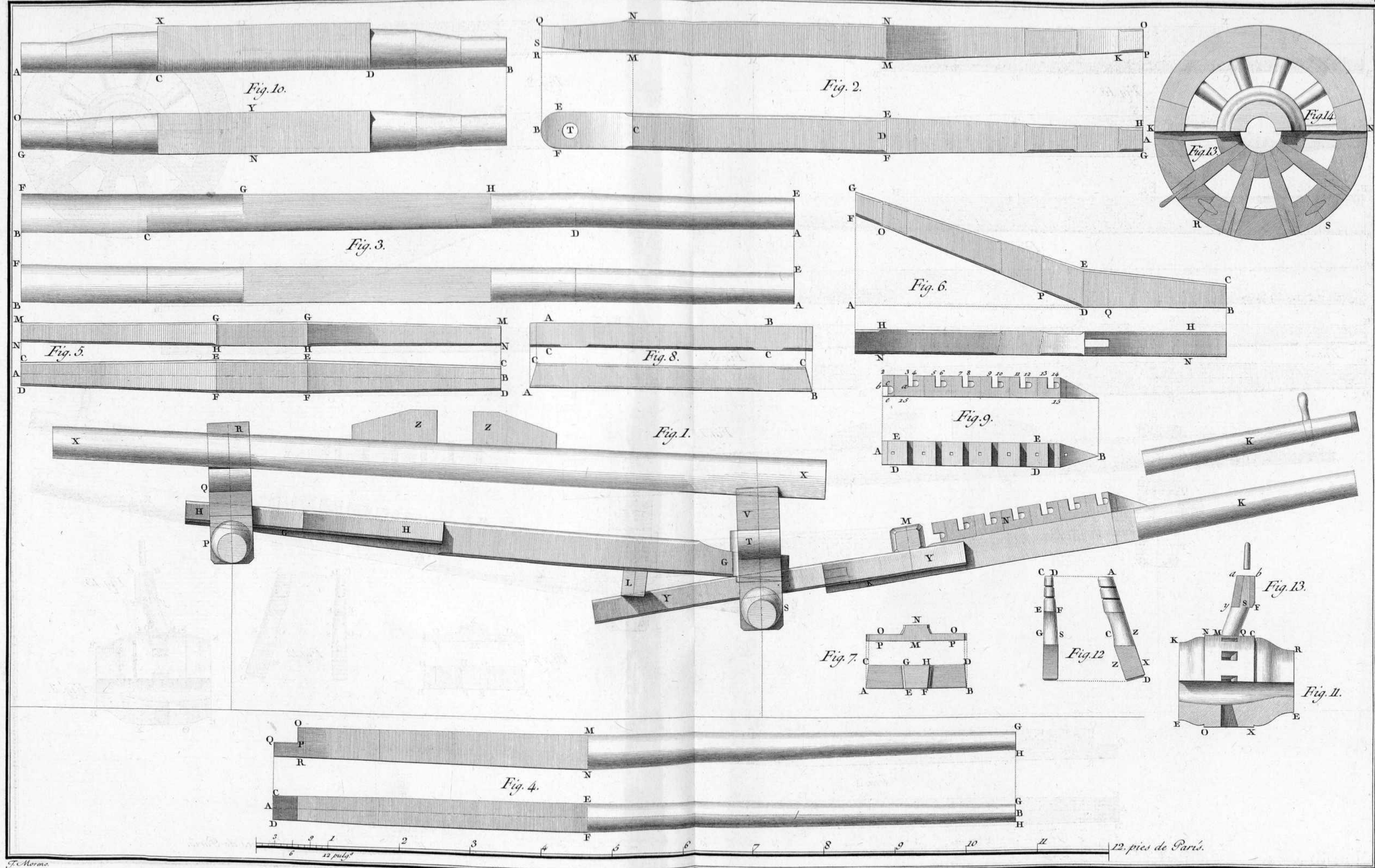
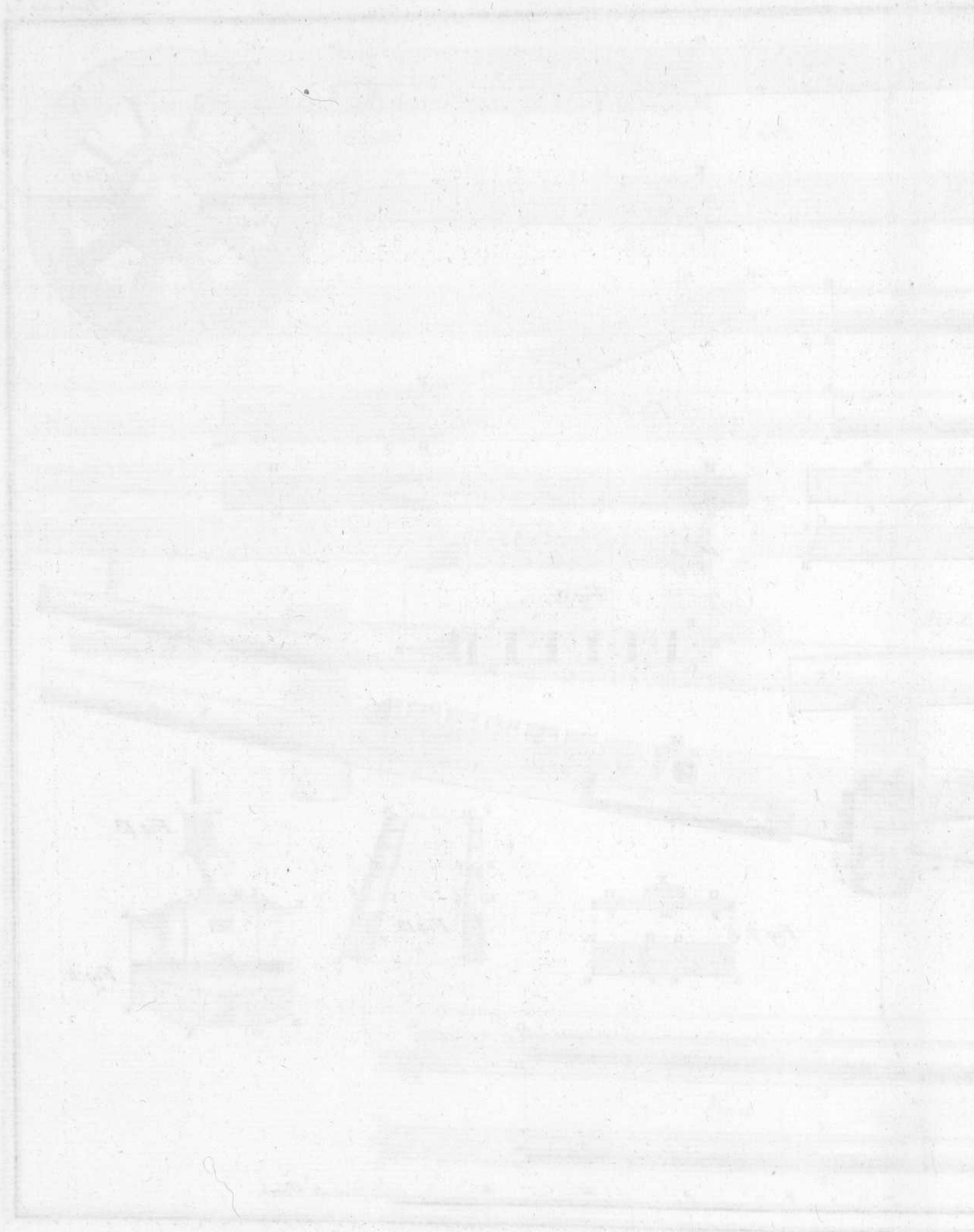


Fig. 6.









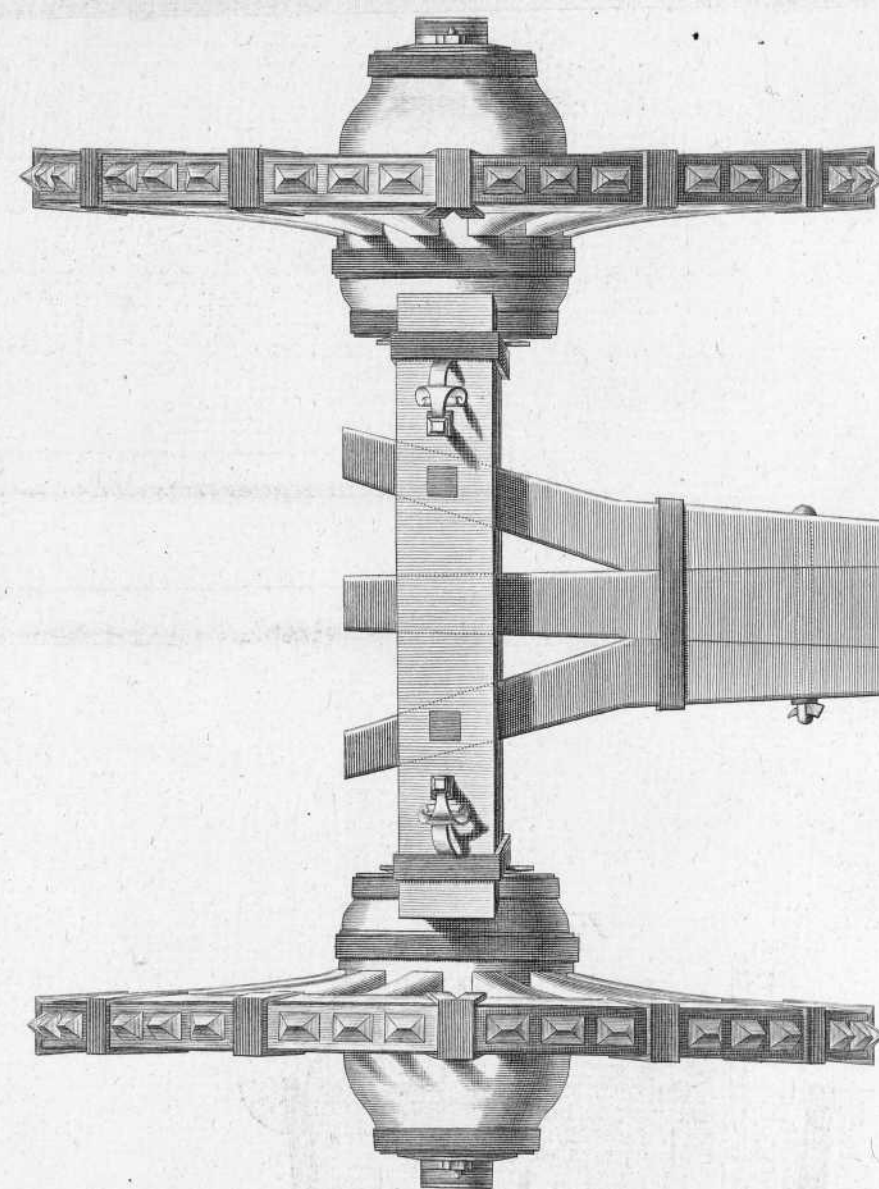


Fig. 1.

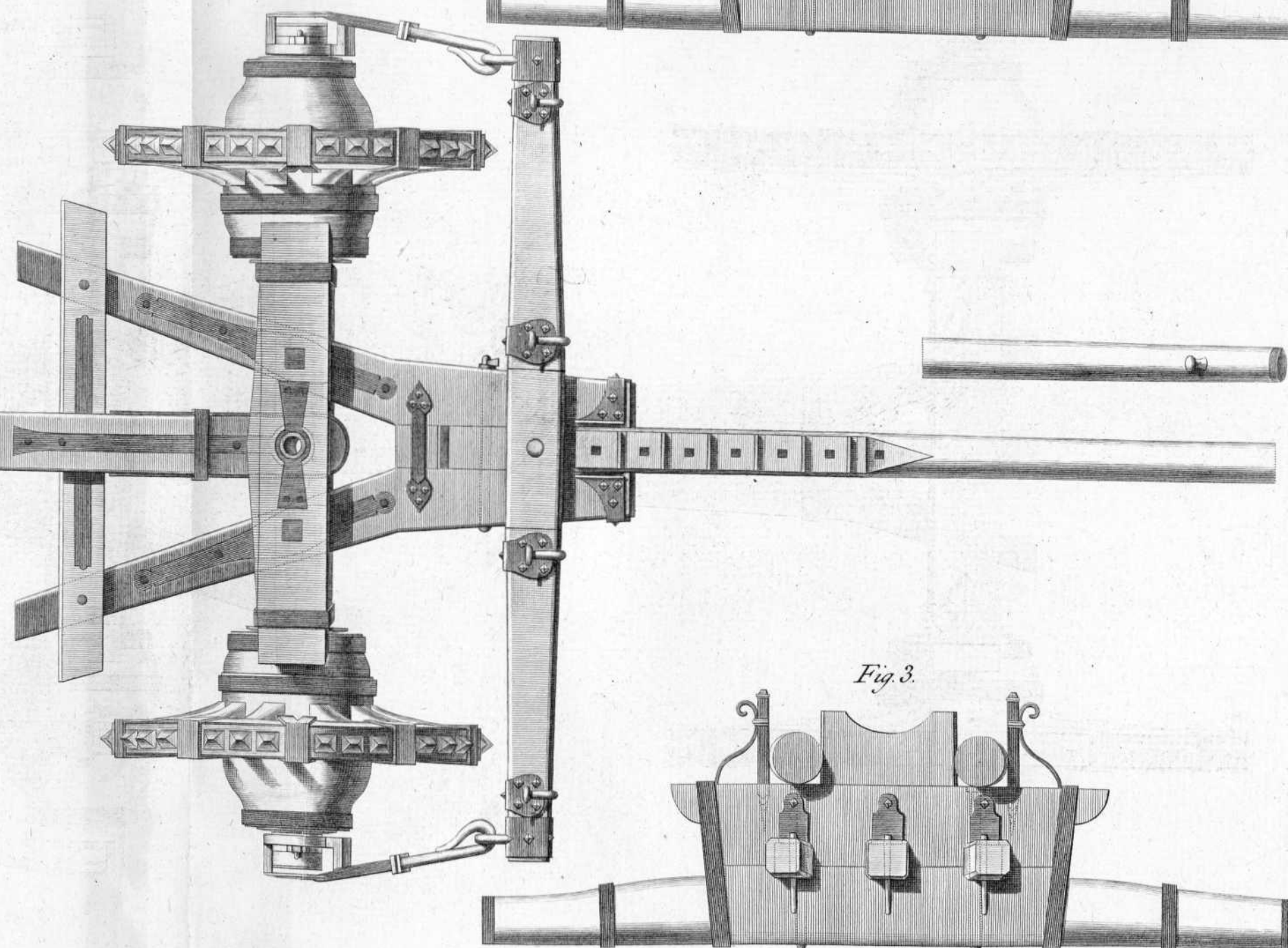
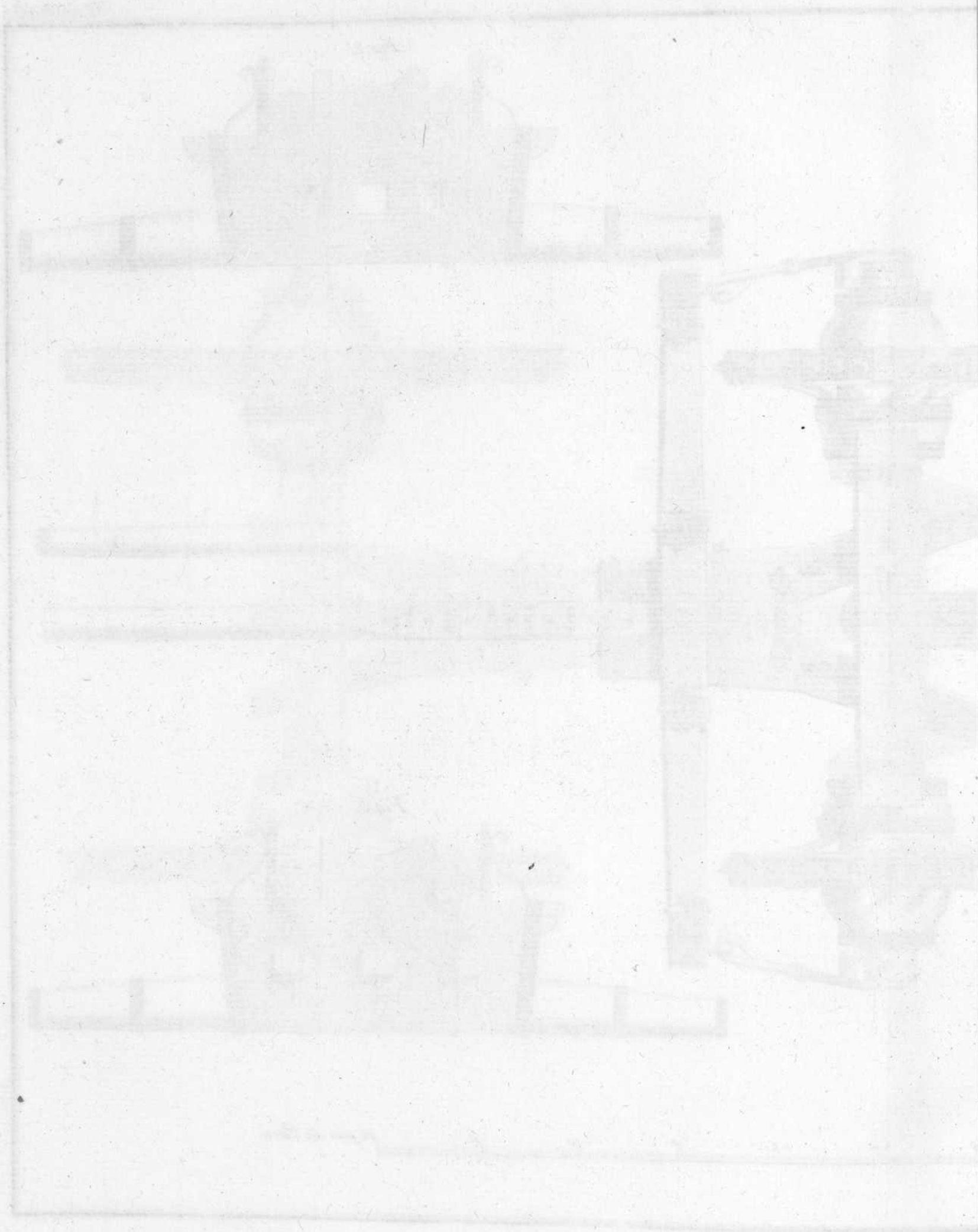
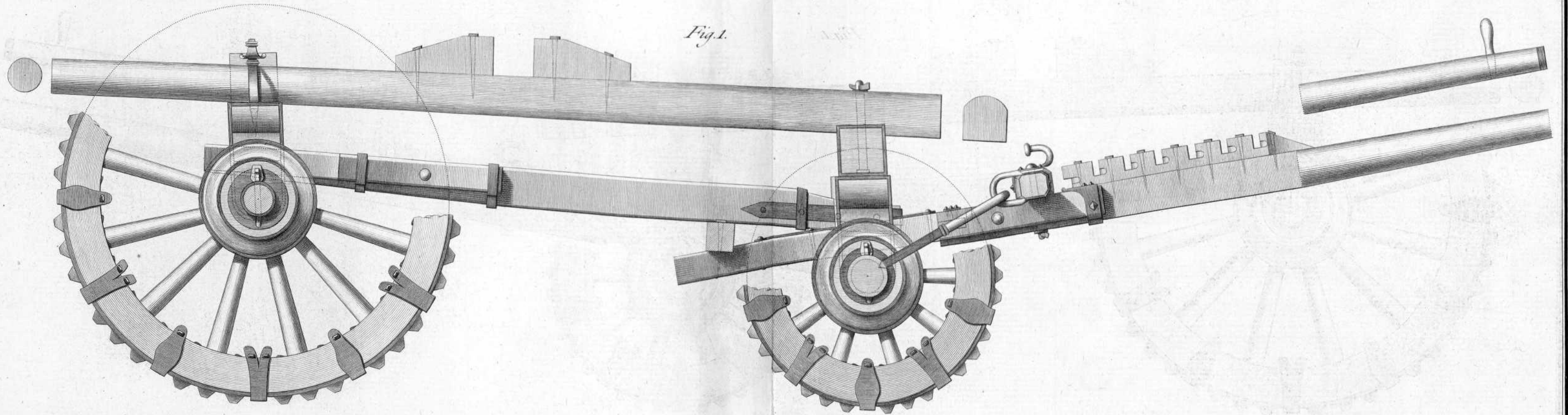
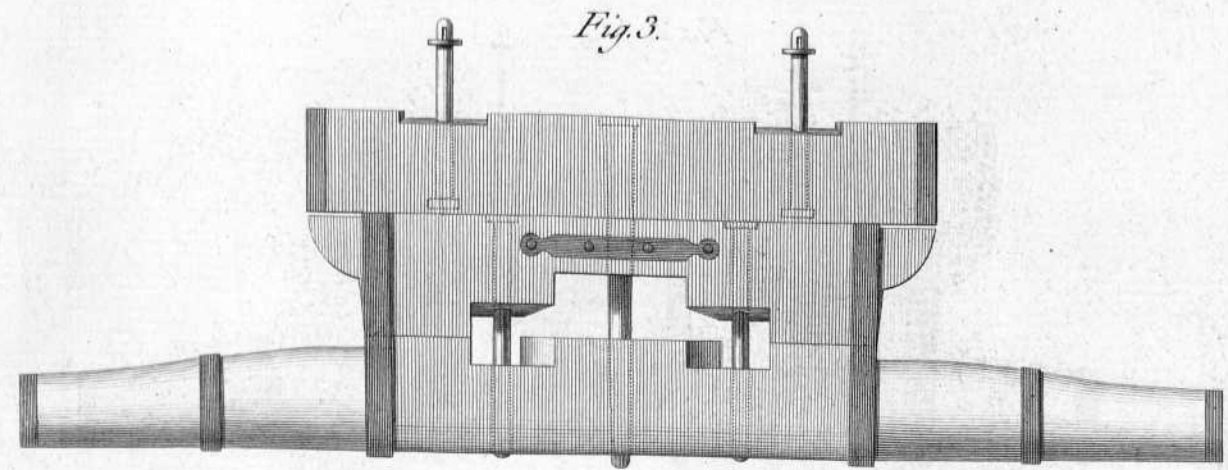
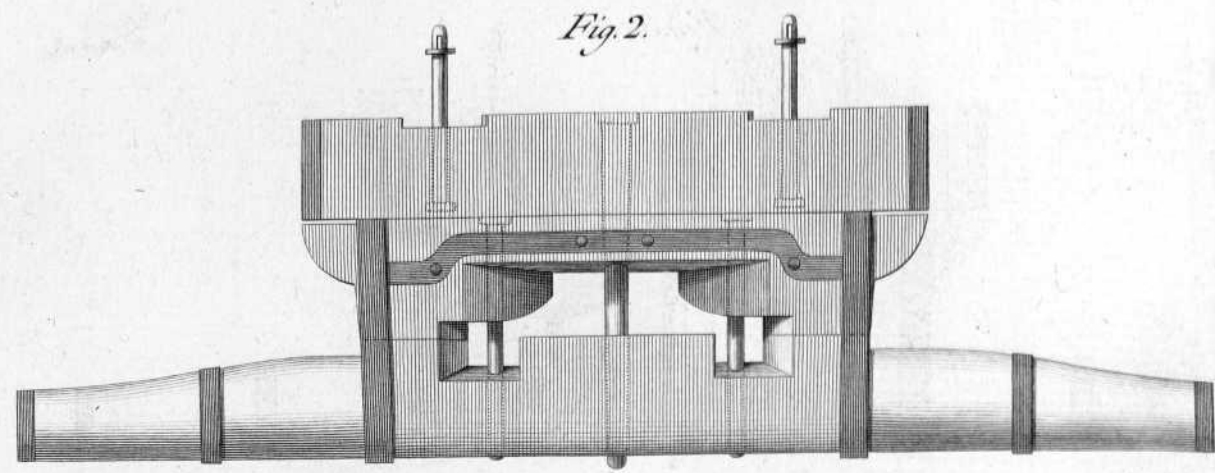


Fig. 3.

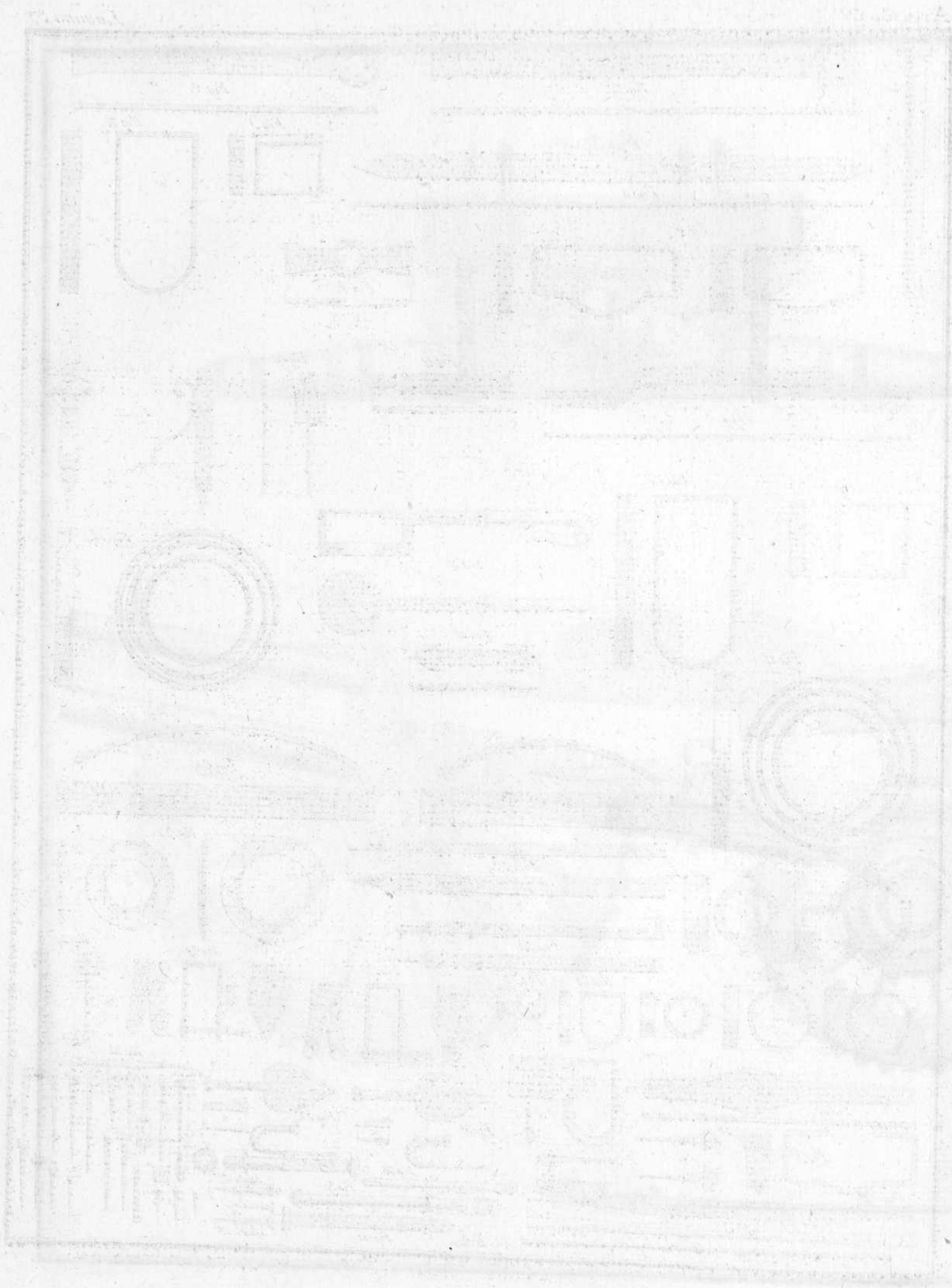


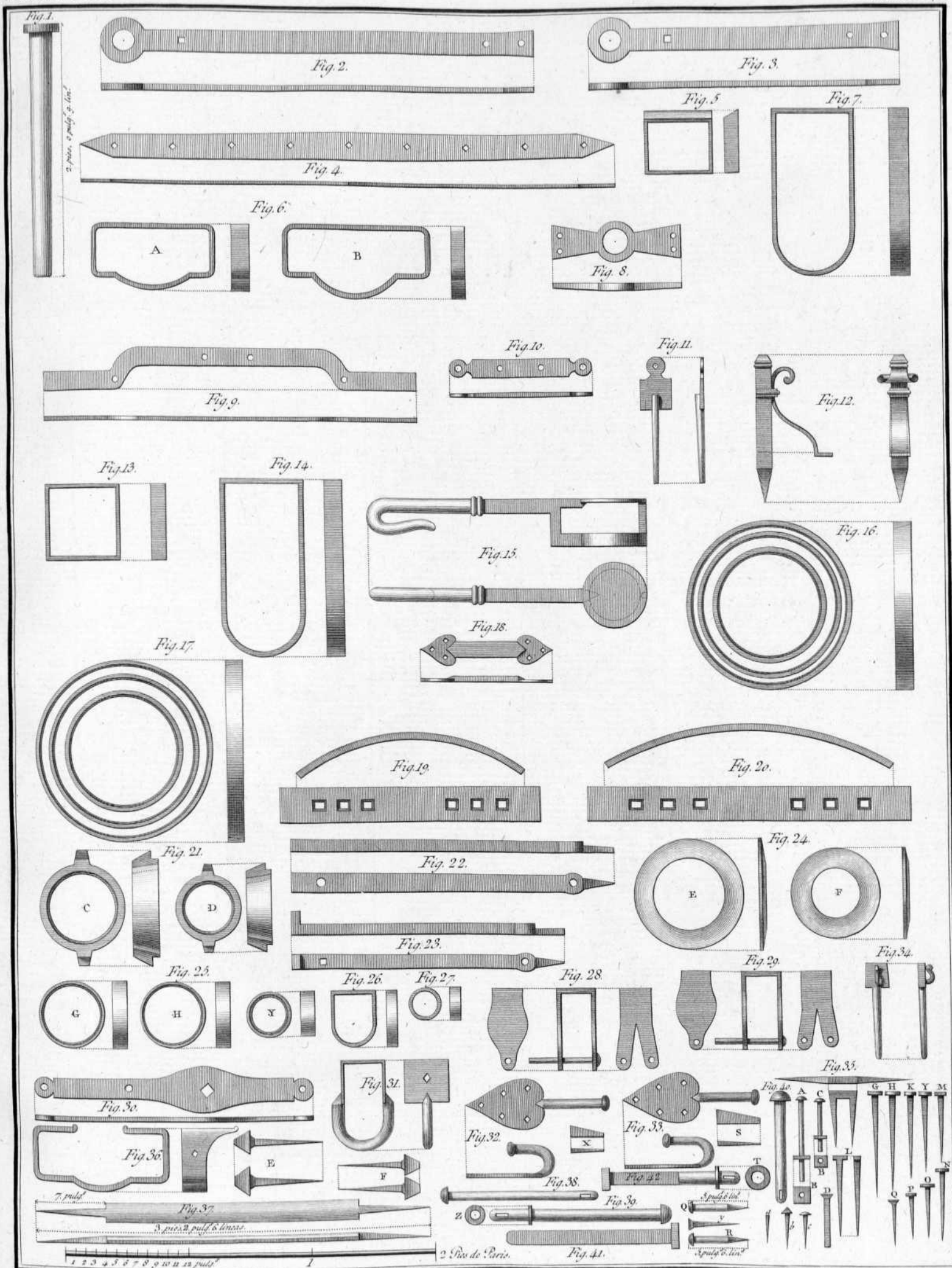


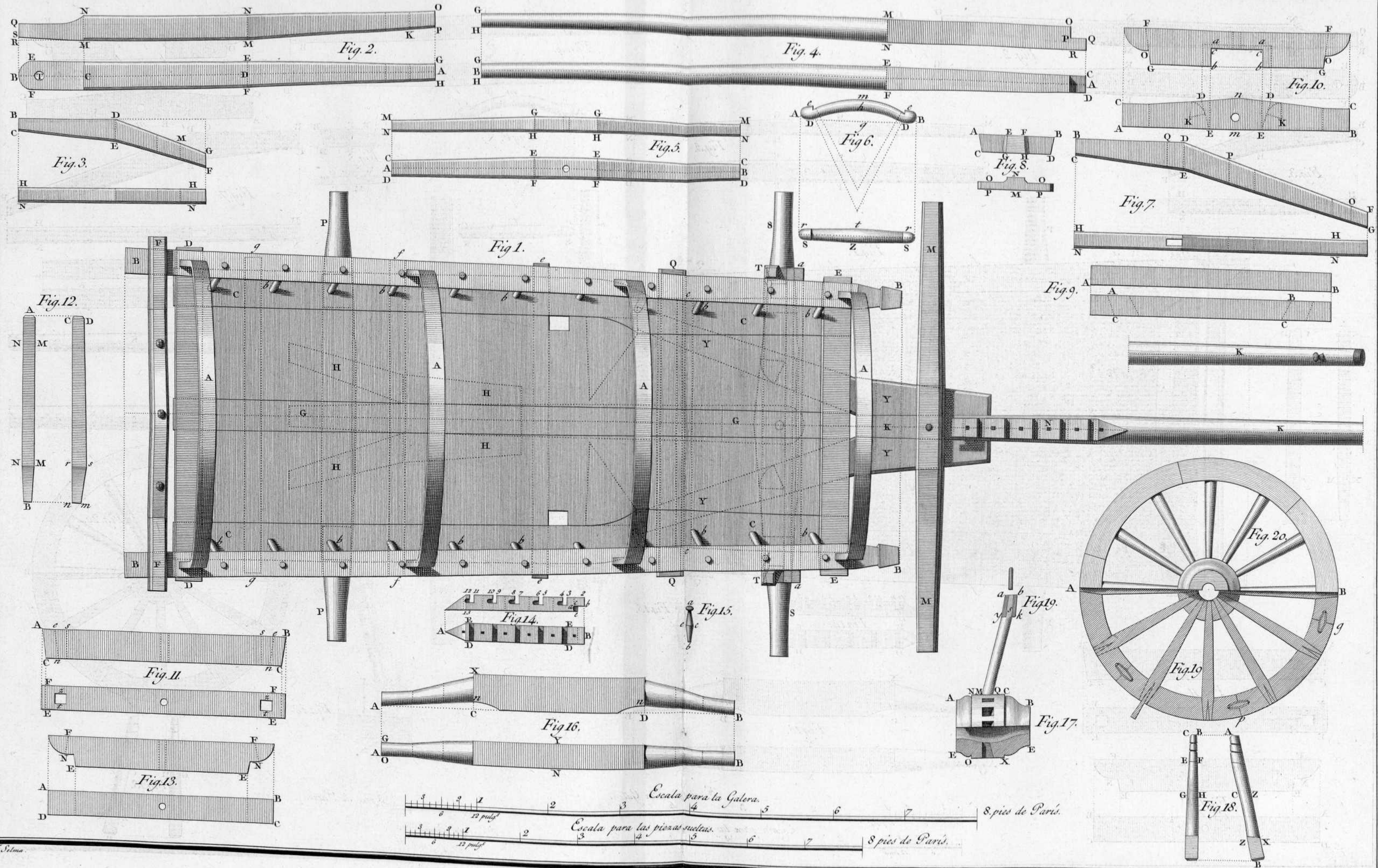


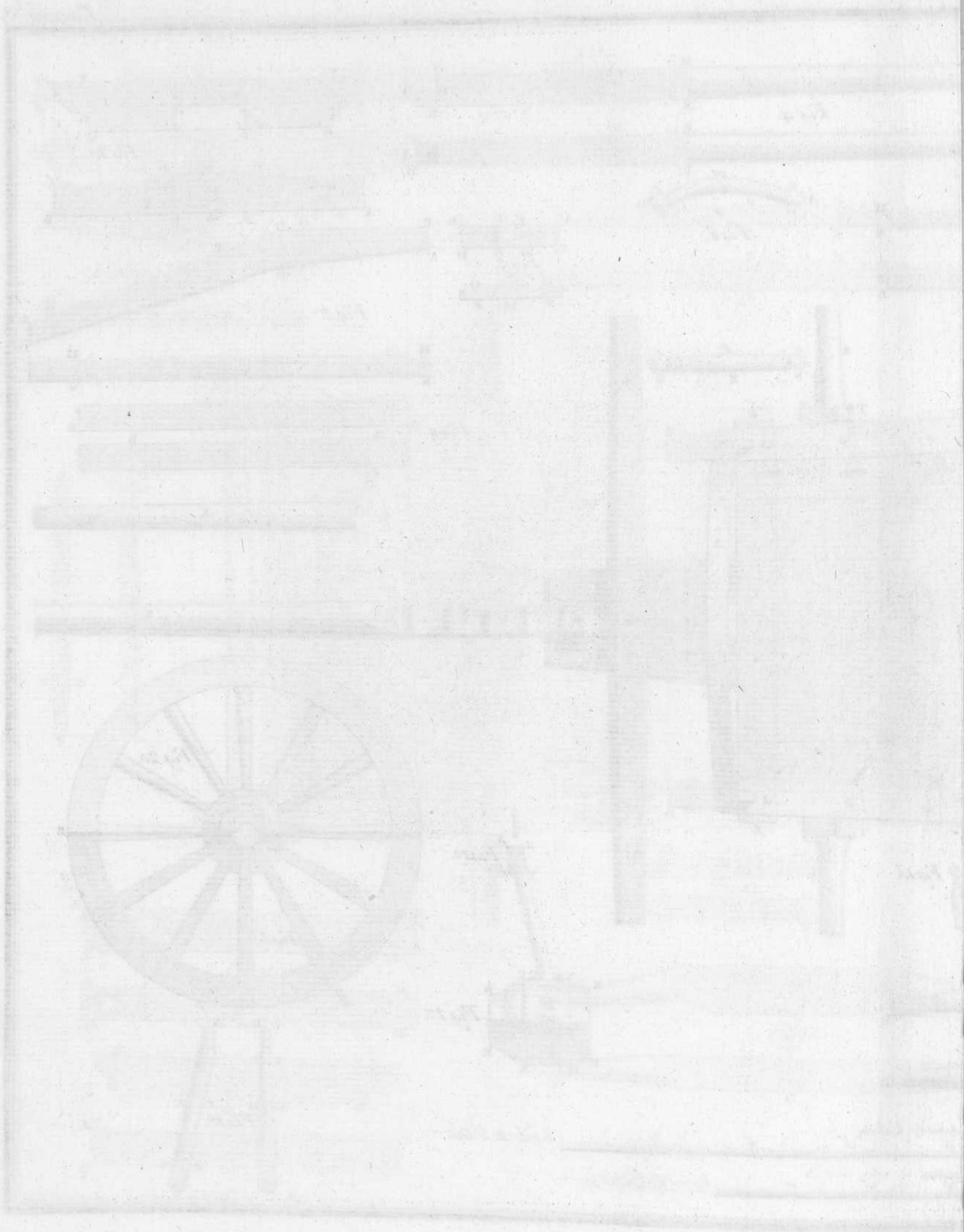


3 4 5 6 7 8 *pieds de Paris.*









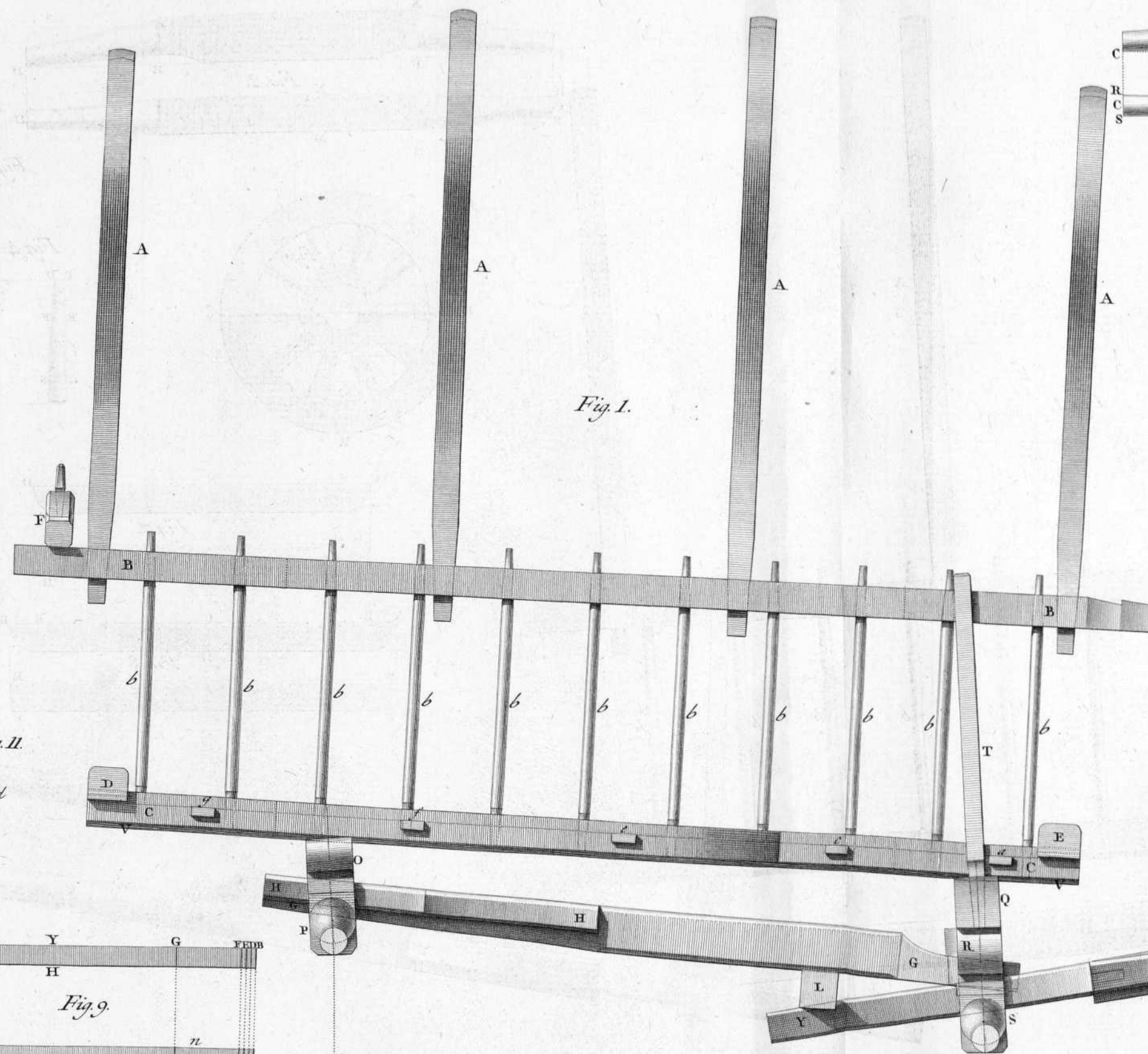


Fig. 1.

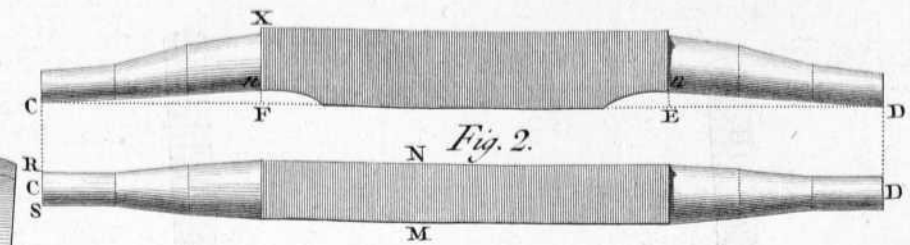


Fig. 2.

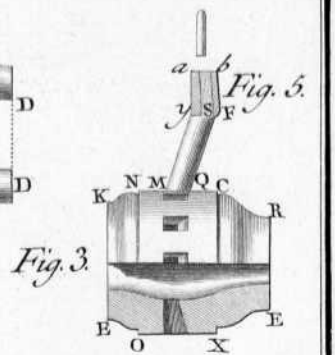


Fig. 3.

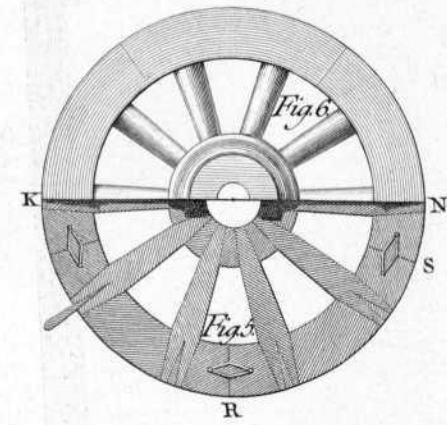


Fig. 4.

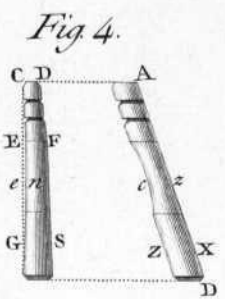


Fig. 5.

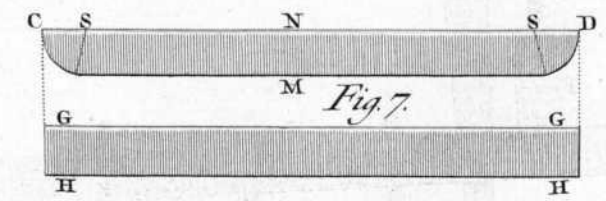


Fig. 6.

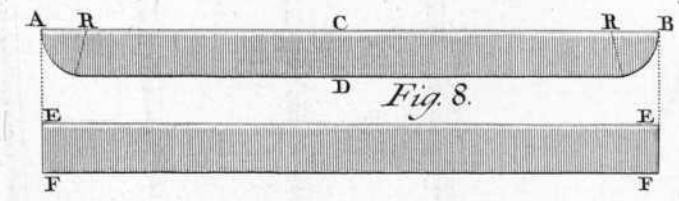


Fig. 7.

Fig. 10.



Fig. 11.

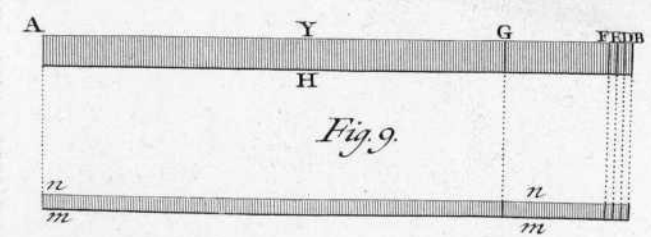
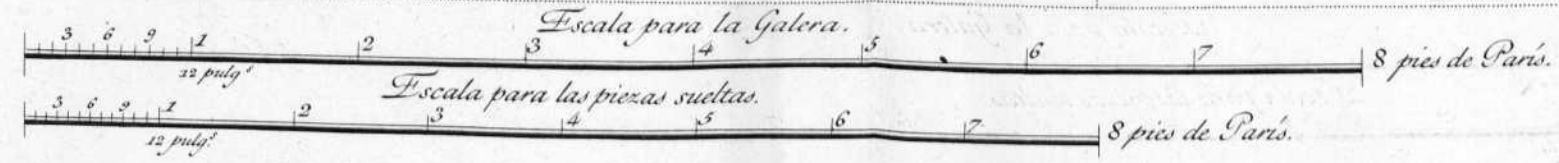
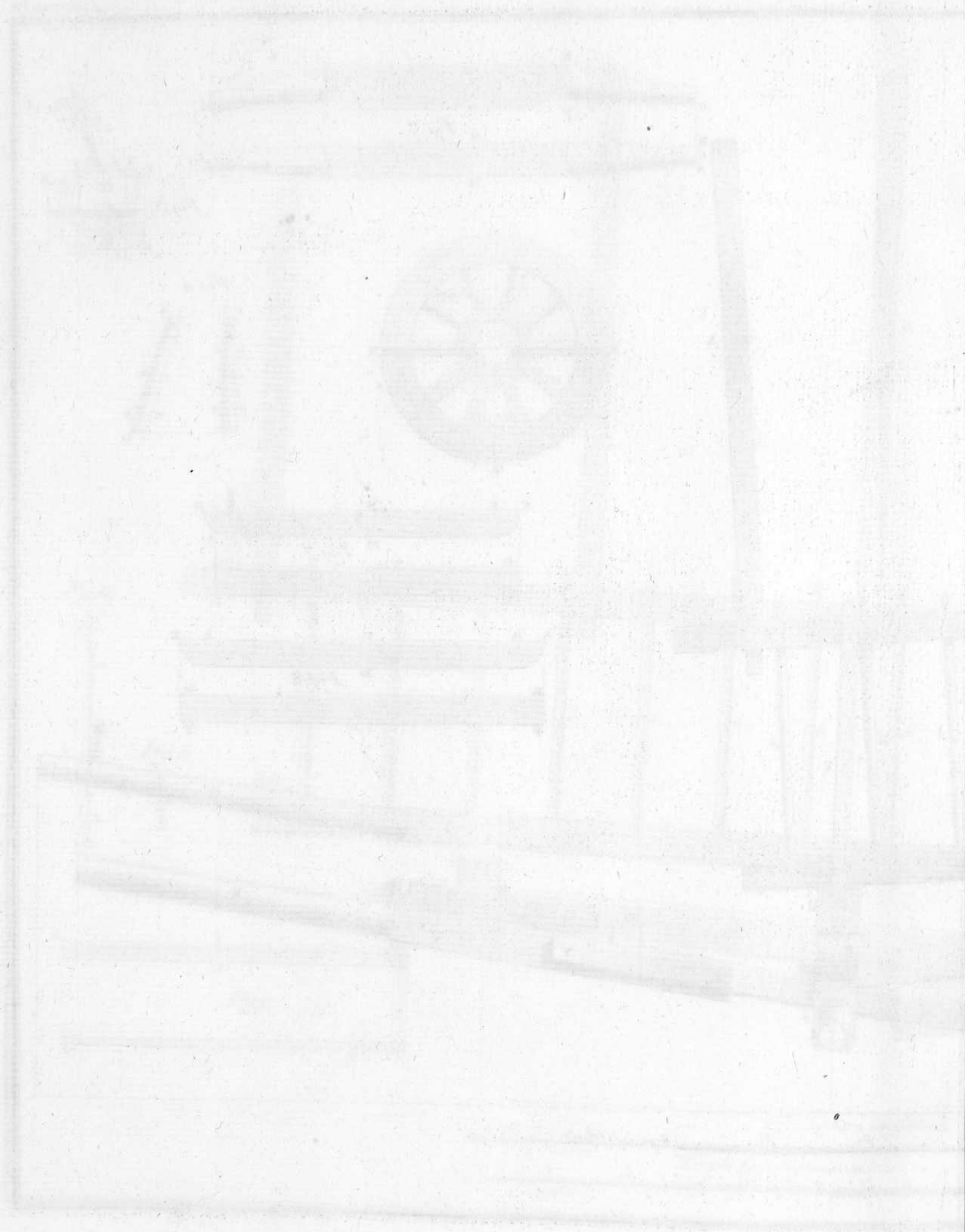
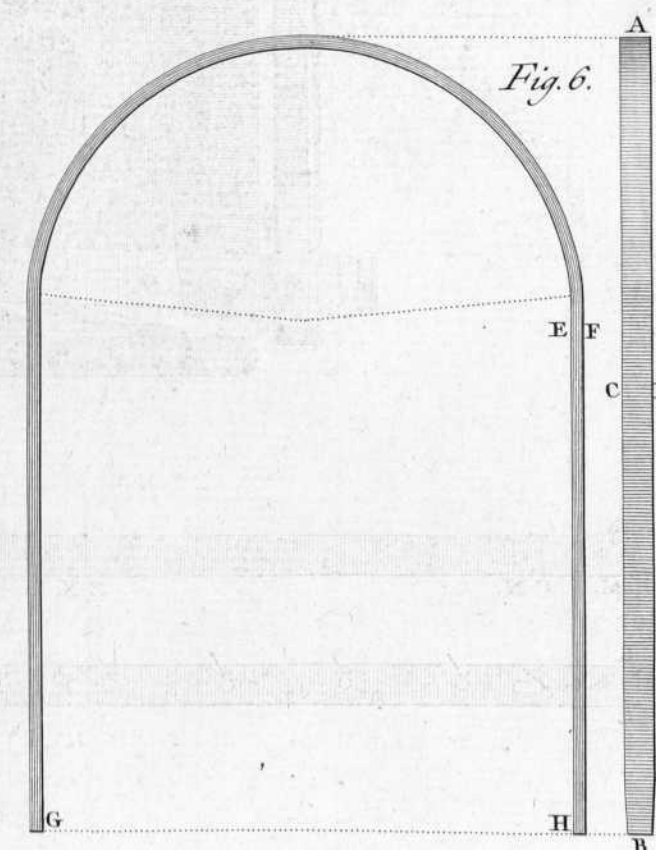
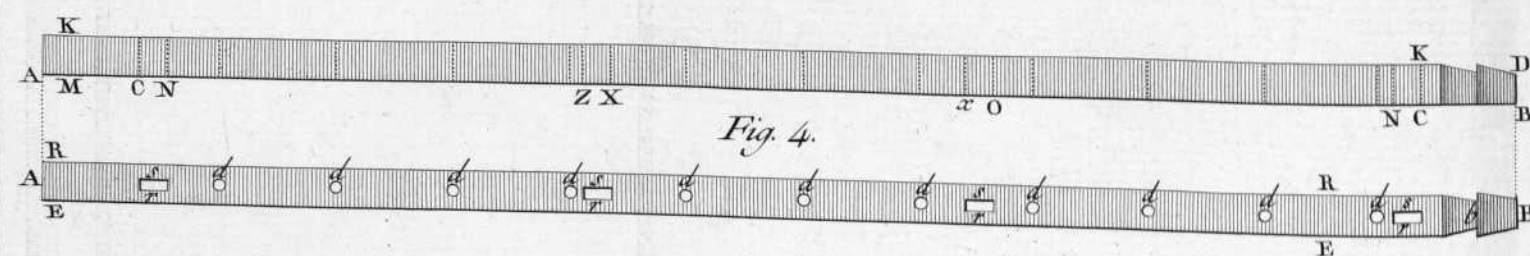
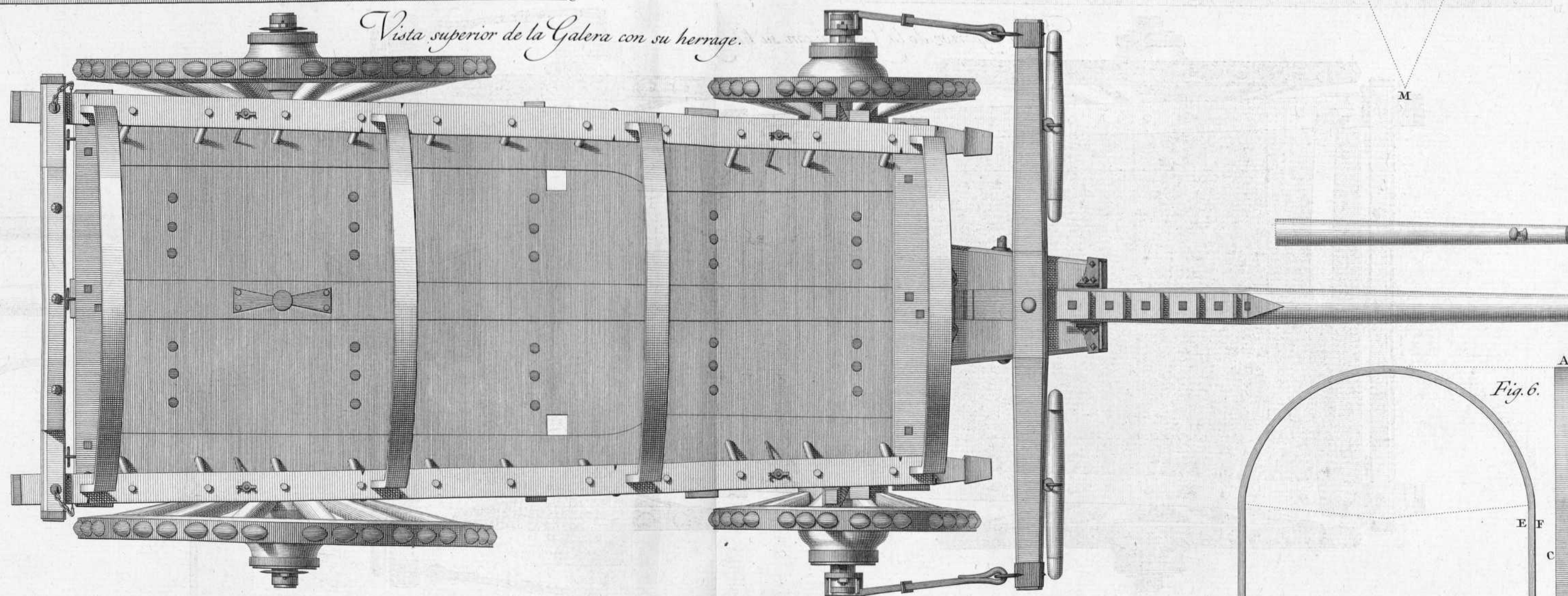
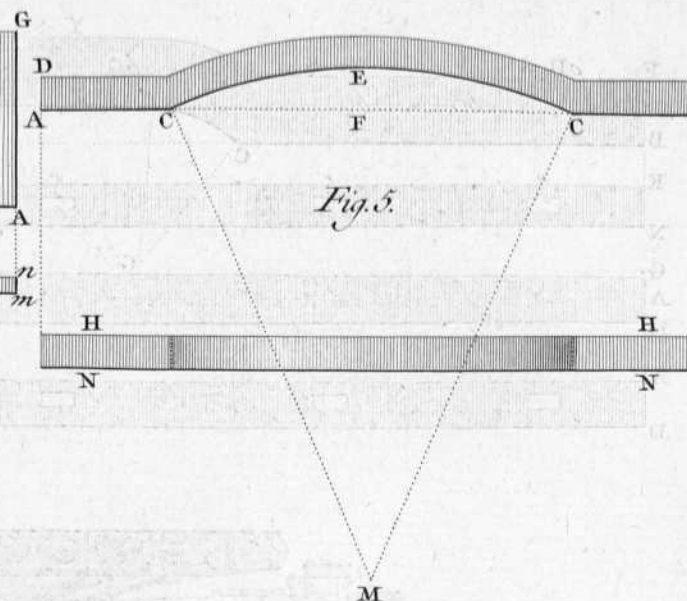
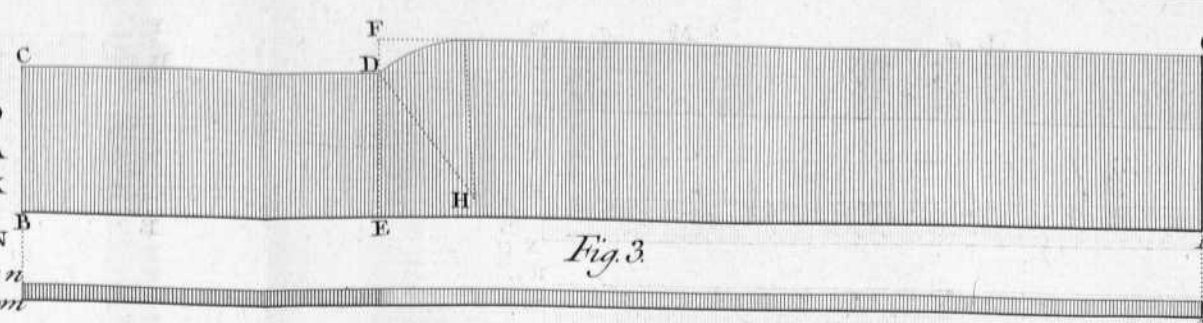
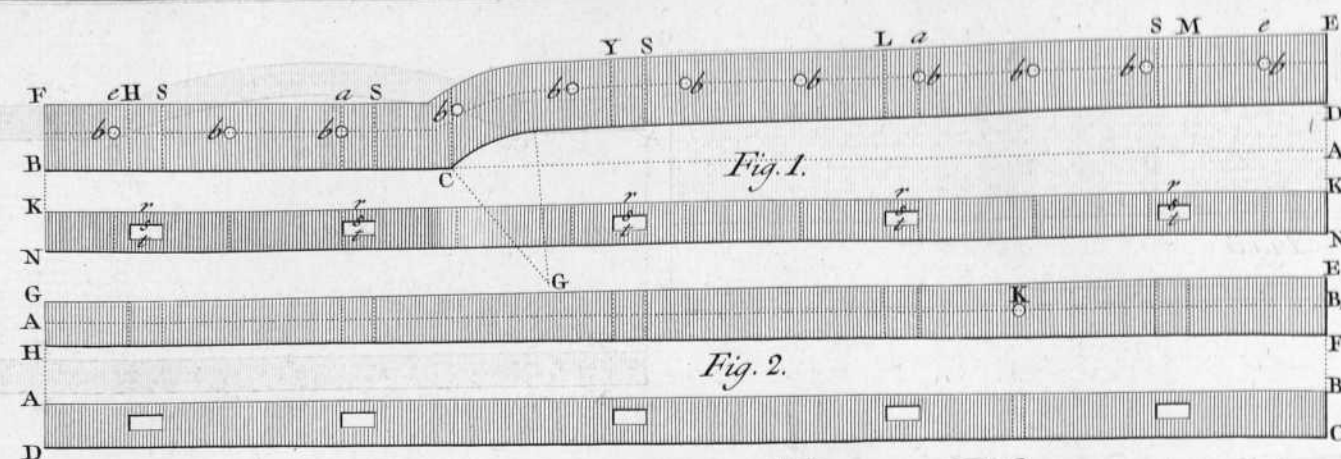


Fig. 9.







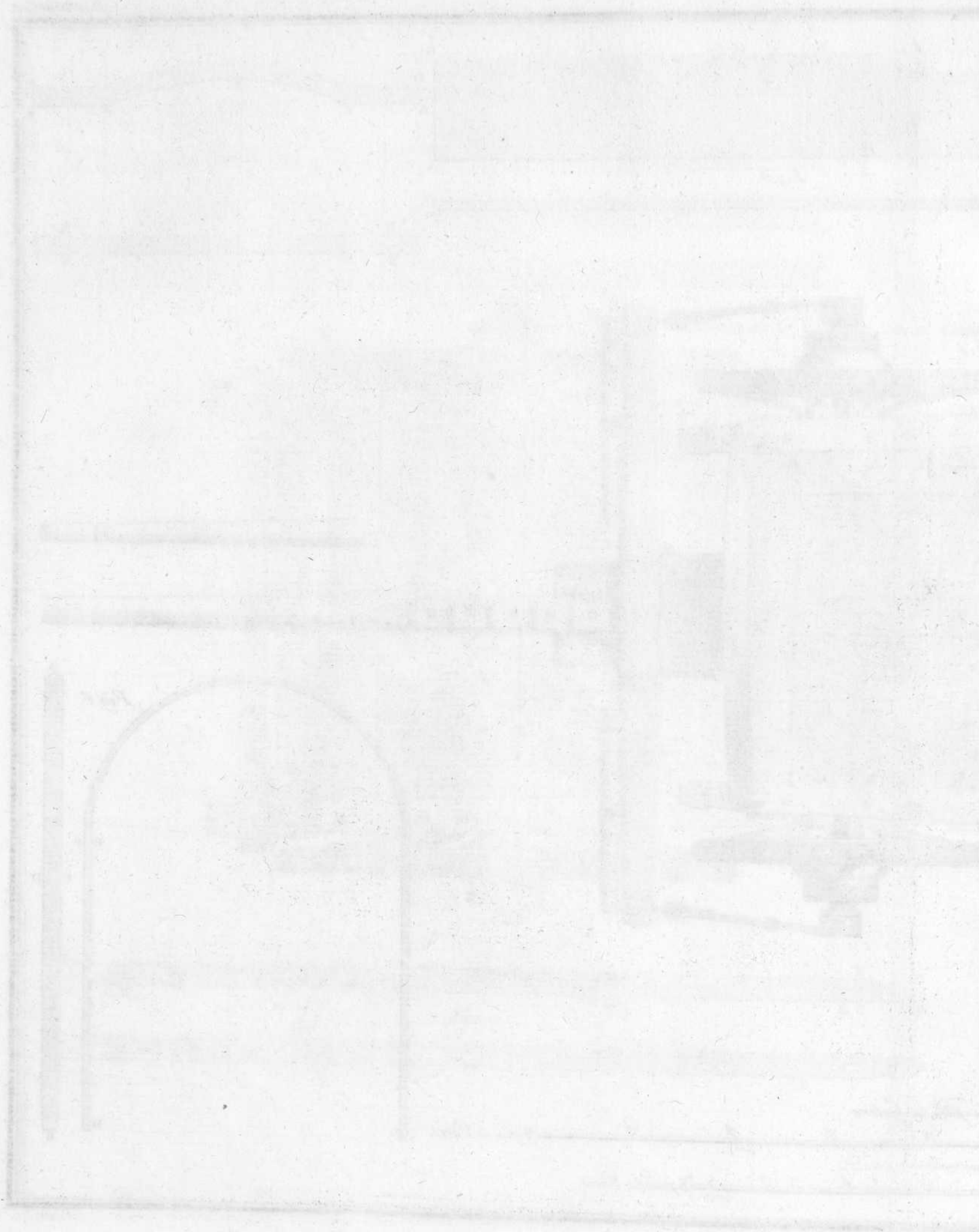


Escala para la Galera.

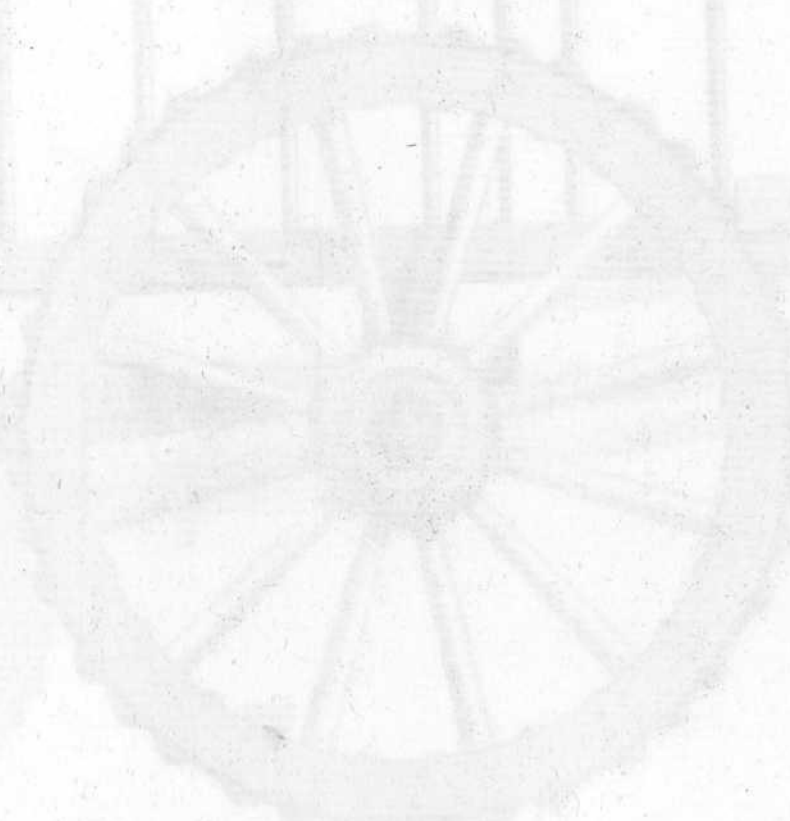
Escala para las piezas sueltas.

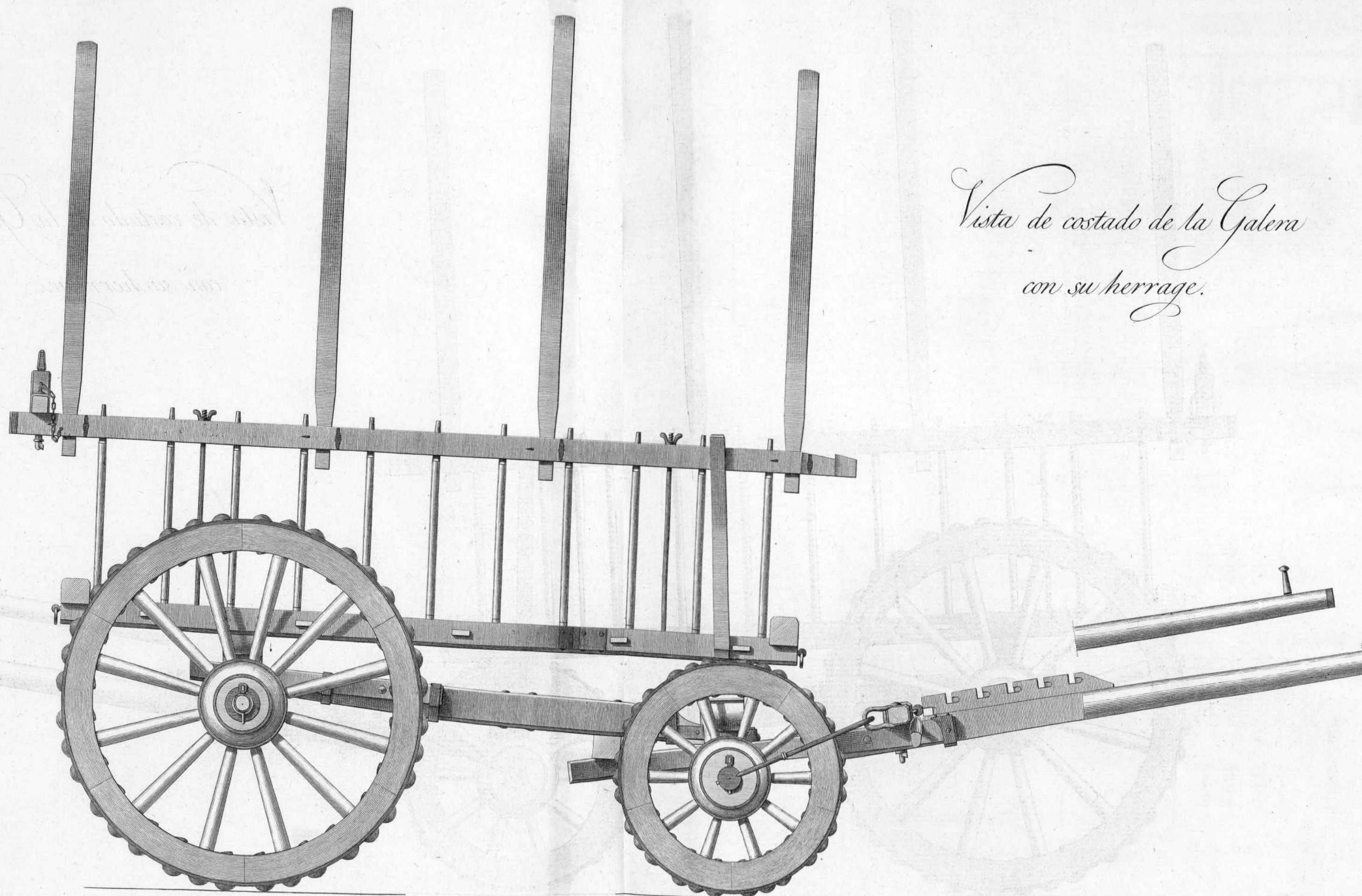
8 pies de París

= 8 *pics de Paris.*



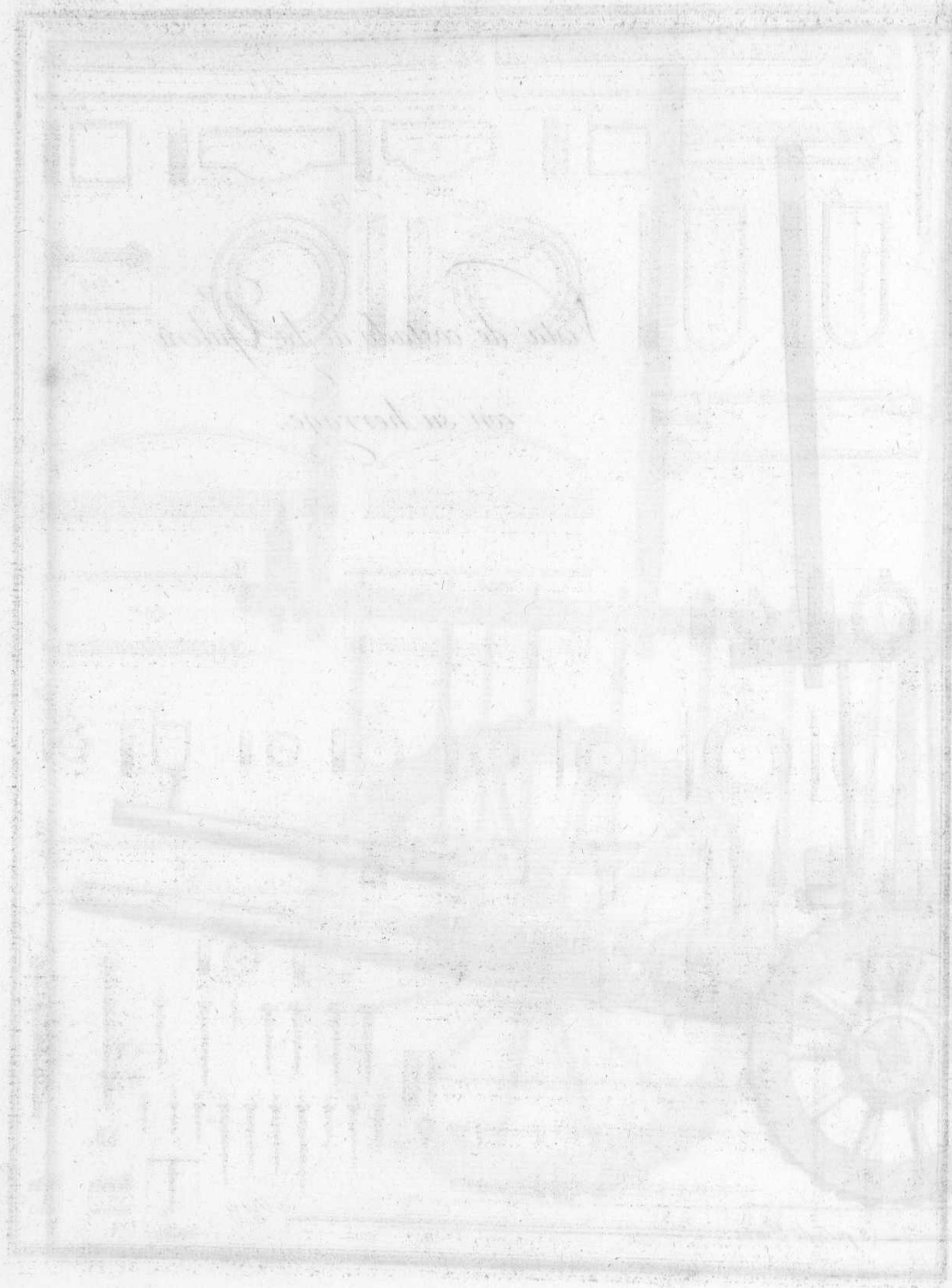
Handwritten text, possibly a title or description, in cursive script.

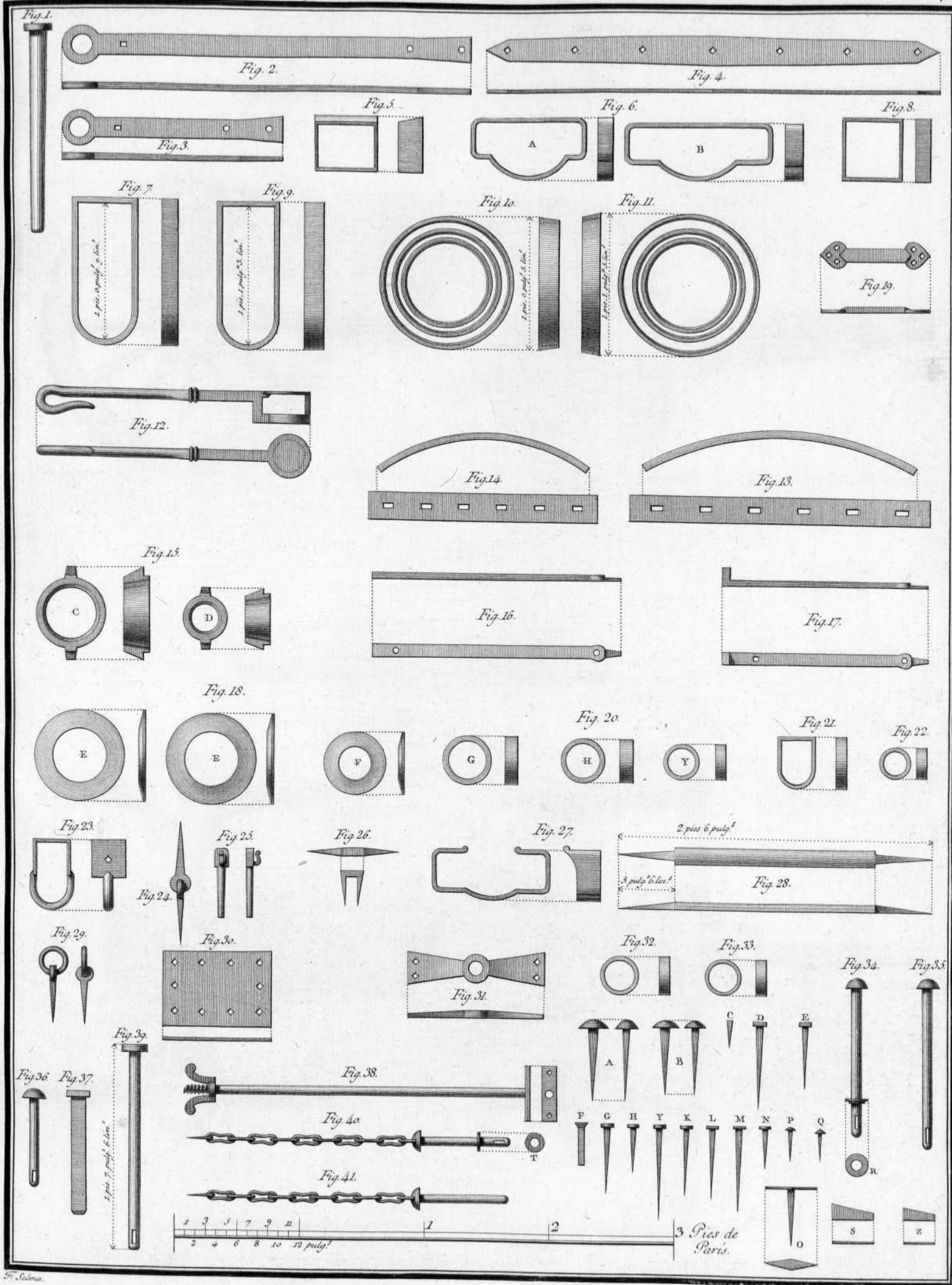


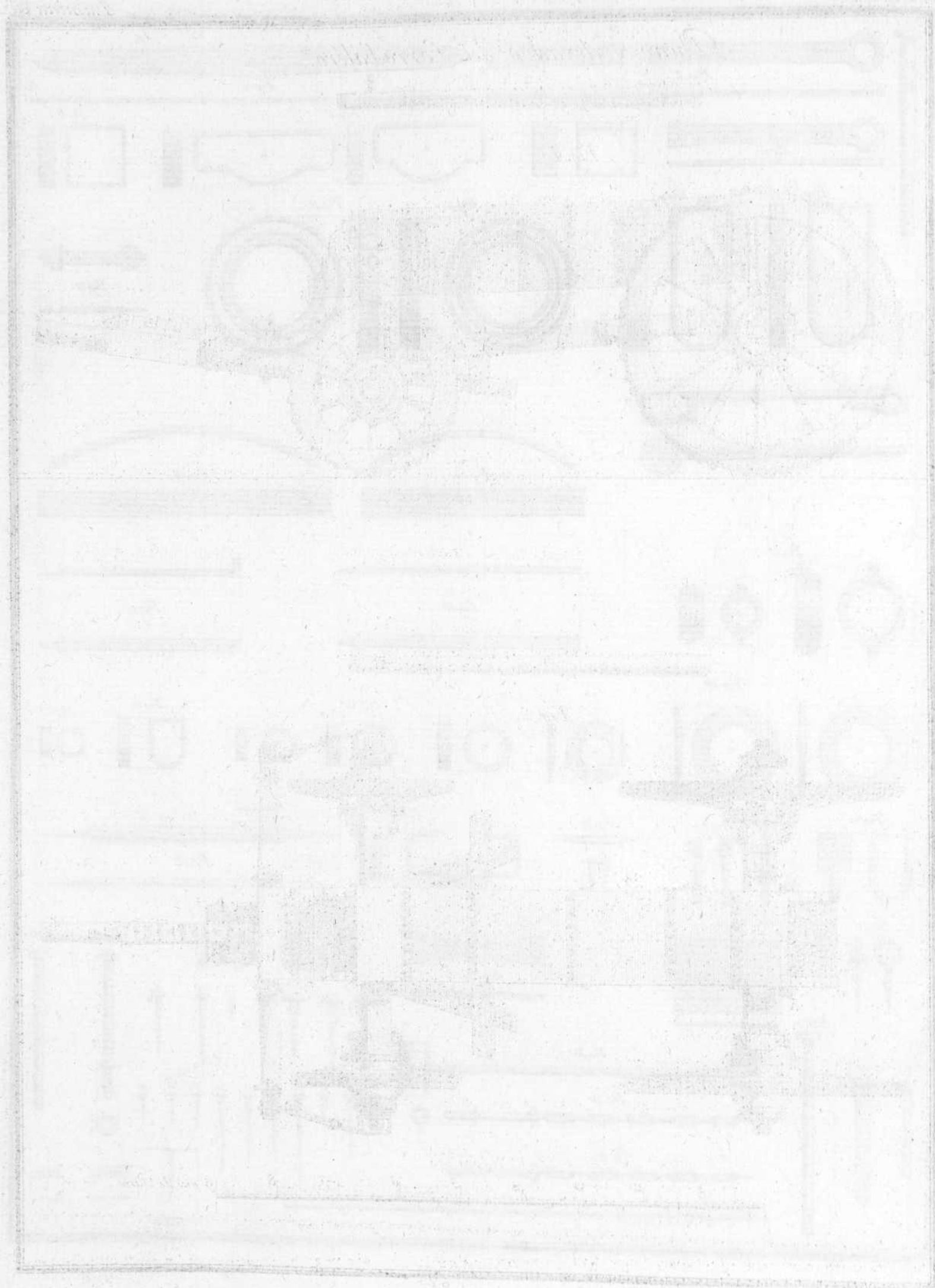


*Vista de costado de la Galera
con su herrage.*

3 4 5 6 7 8 pies de París.







Plano y elevacion del Carro-baléero.



Fig. 1.

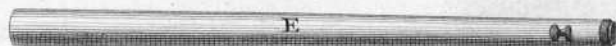
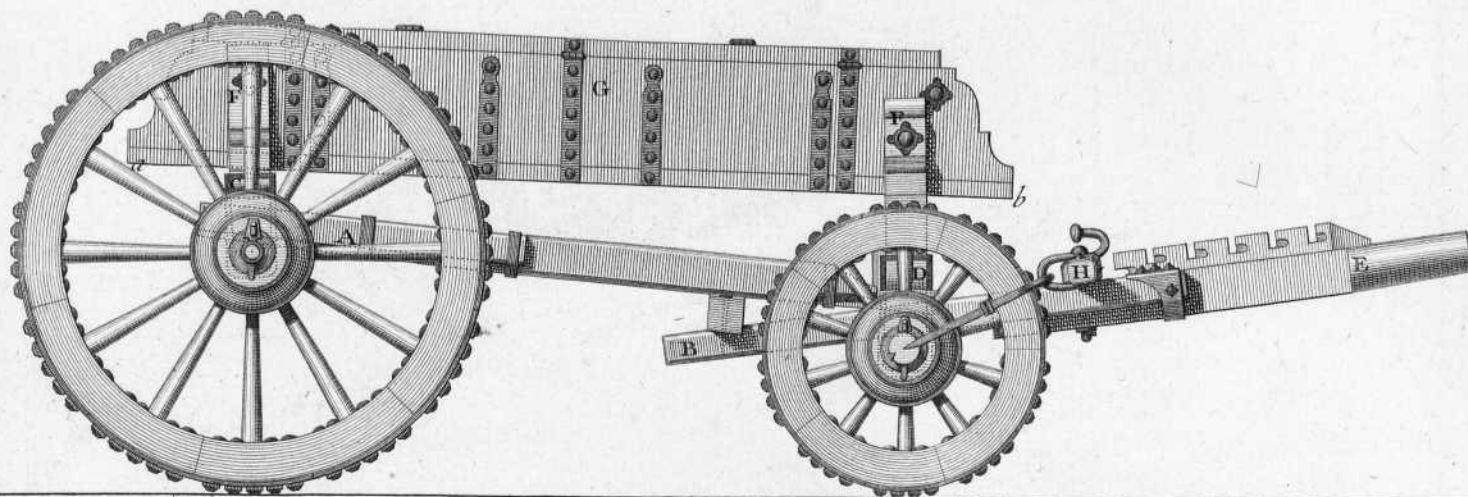
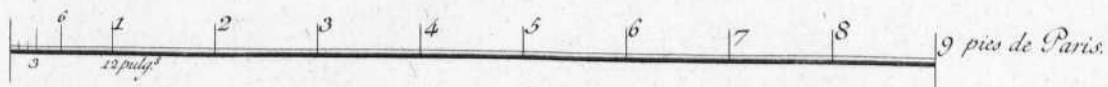
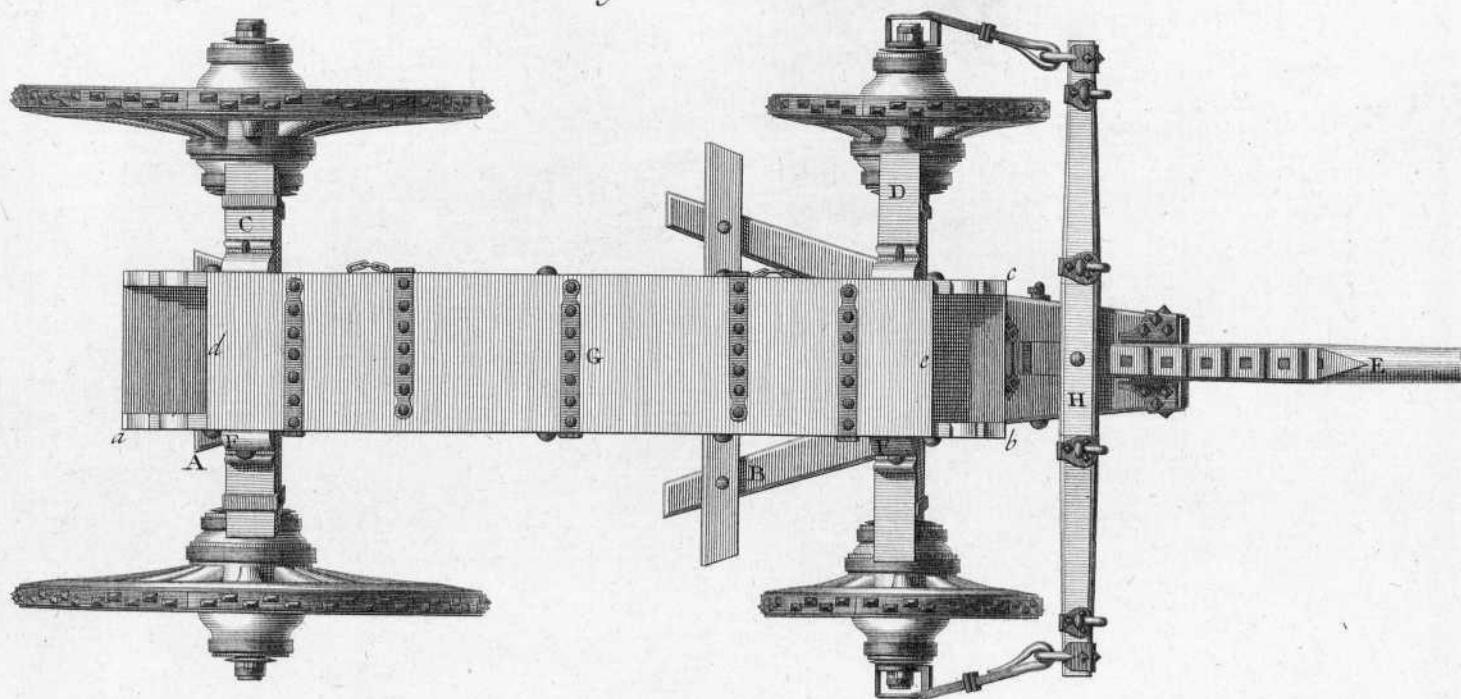
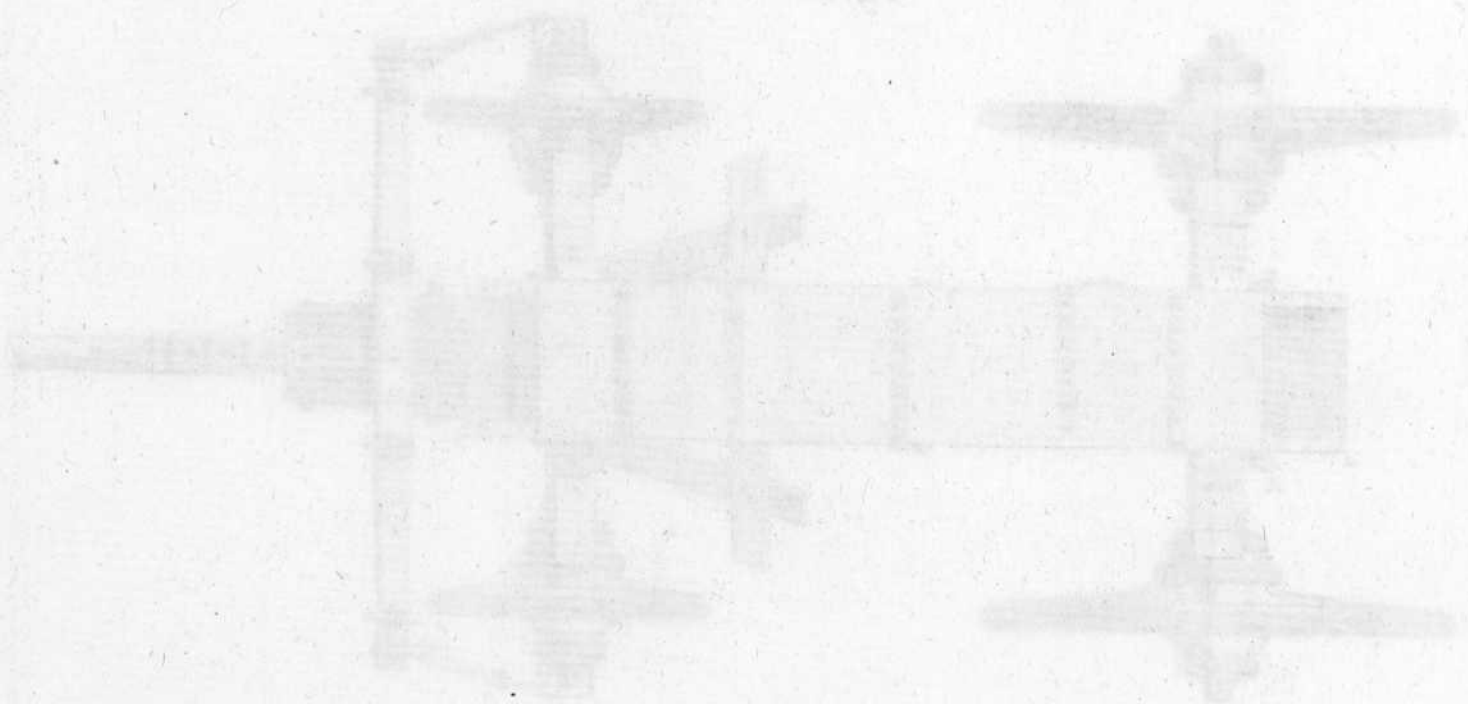
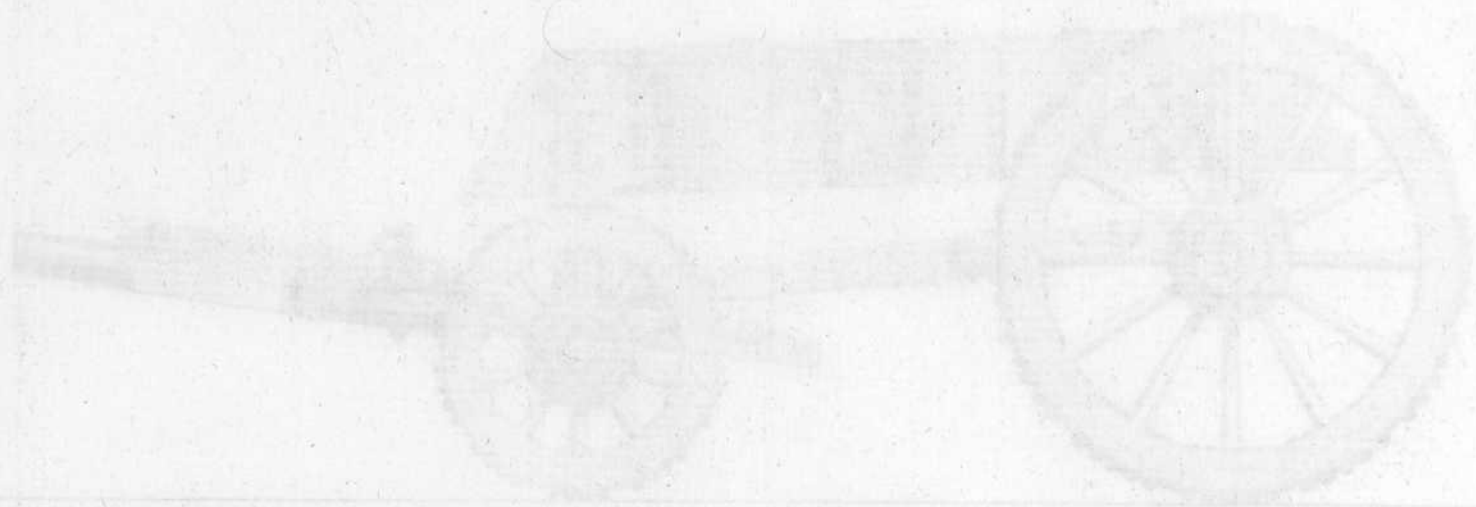


Fig. 2.





Carro-Capuchino, ó de municiones.

Fig. 3.

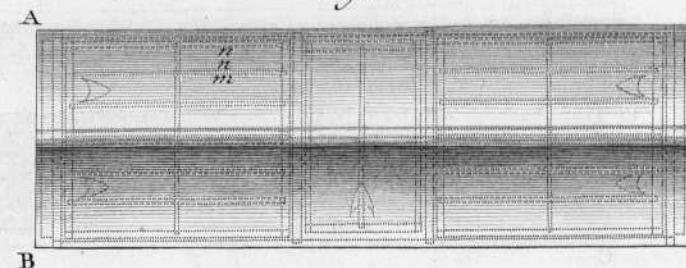


Fig. 6.

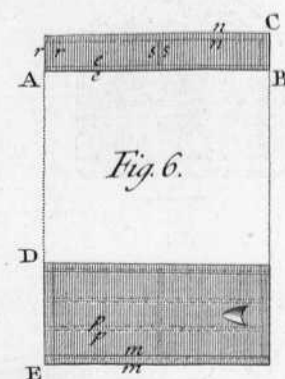


Fig. 7.



Fig. 5.

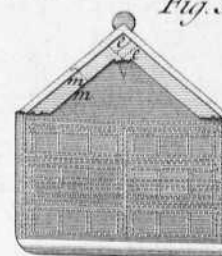


Fig. 4.

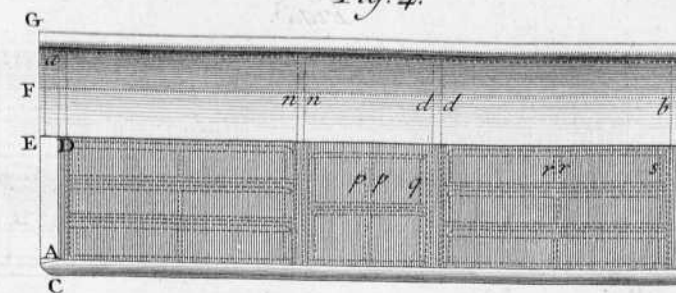


Fig. 2.

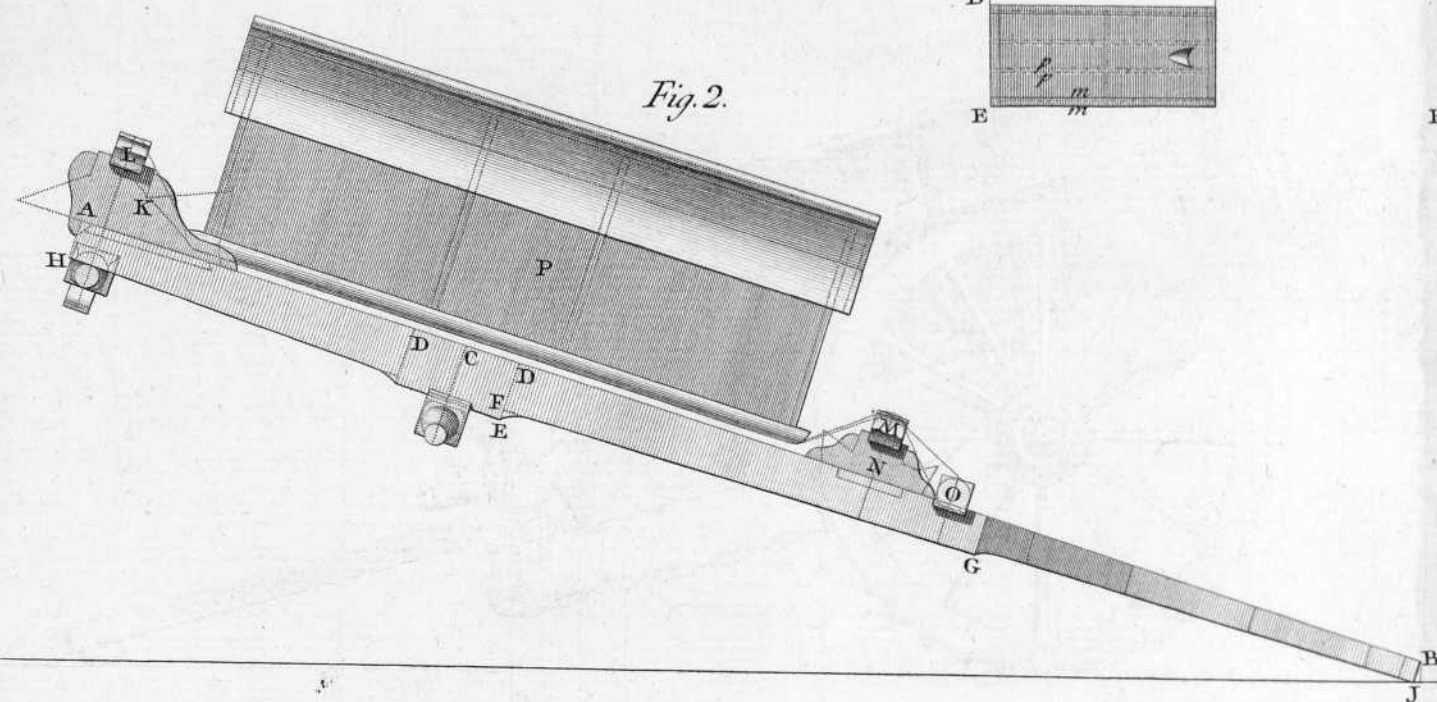


Fig. 1.

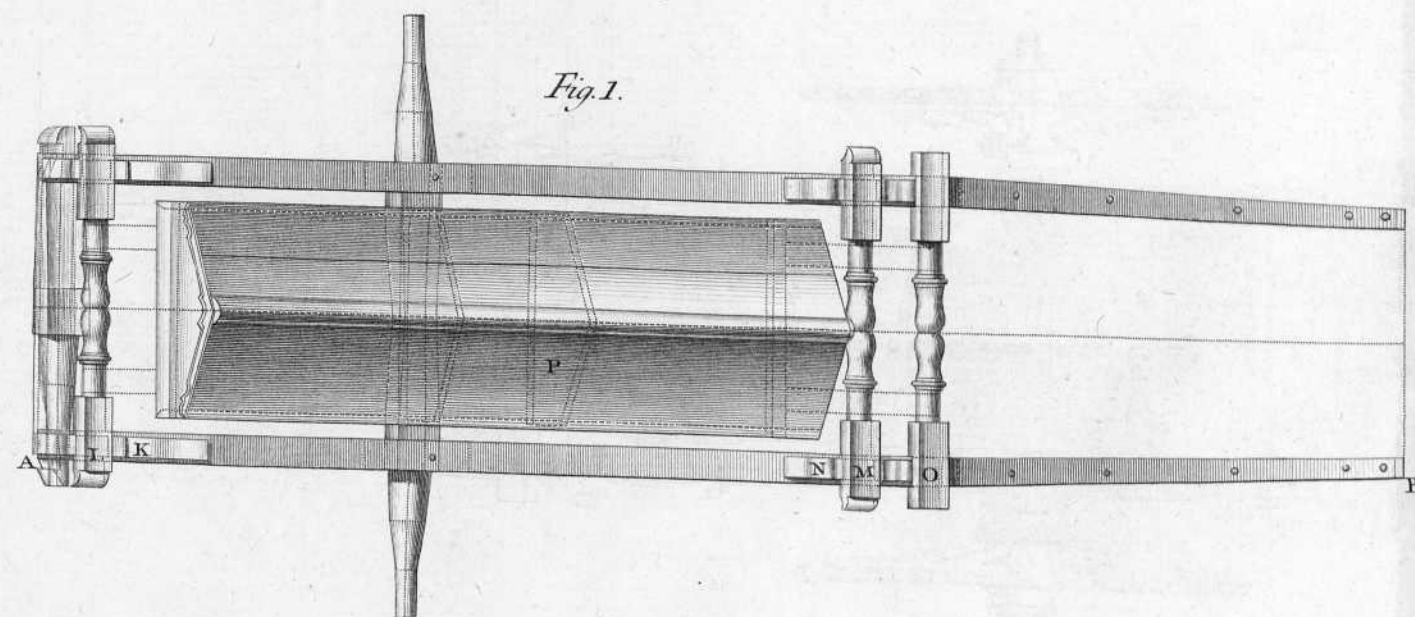


Fig. 9.

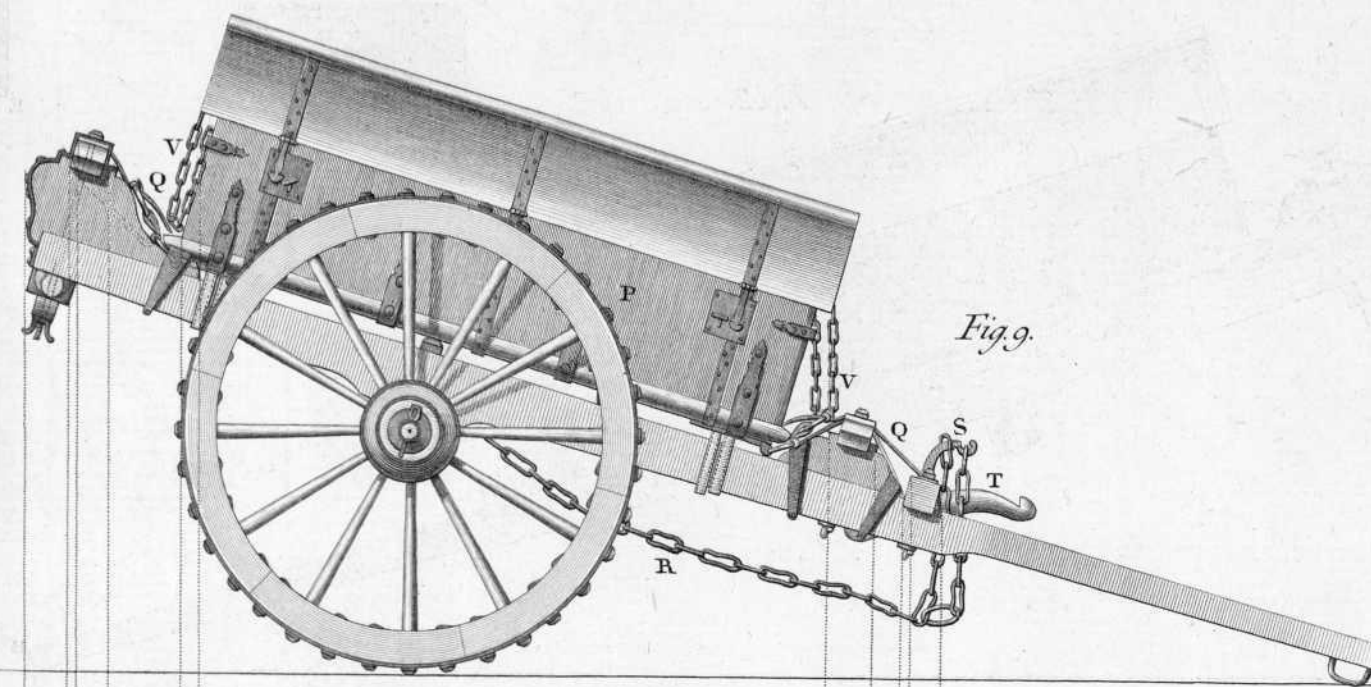
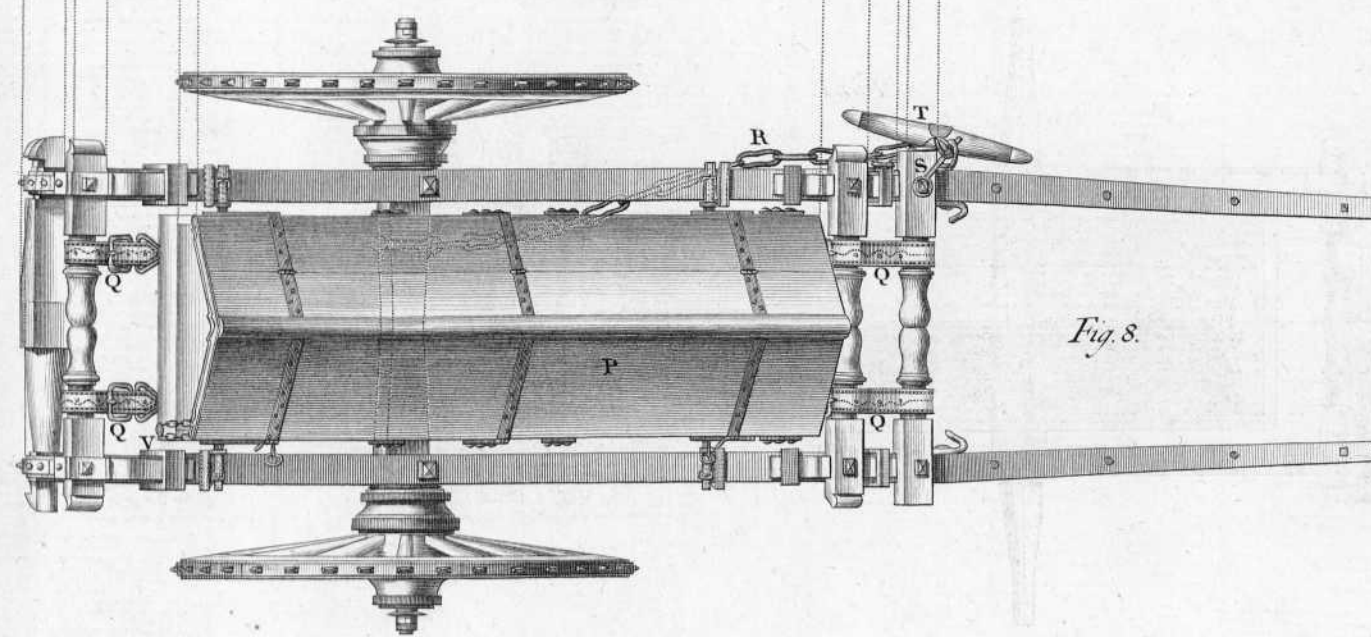
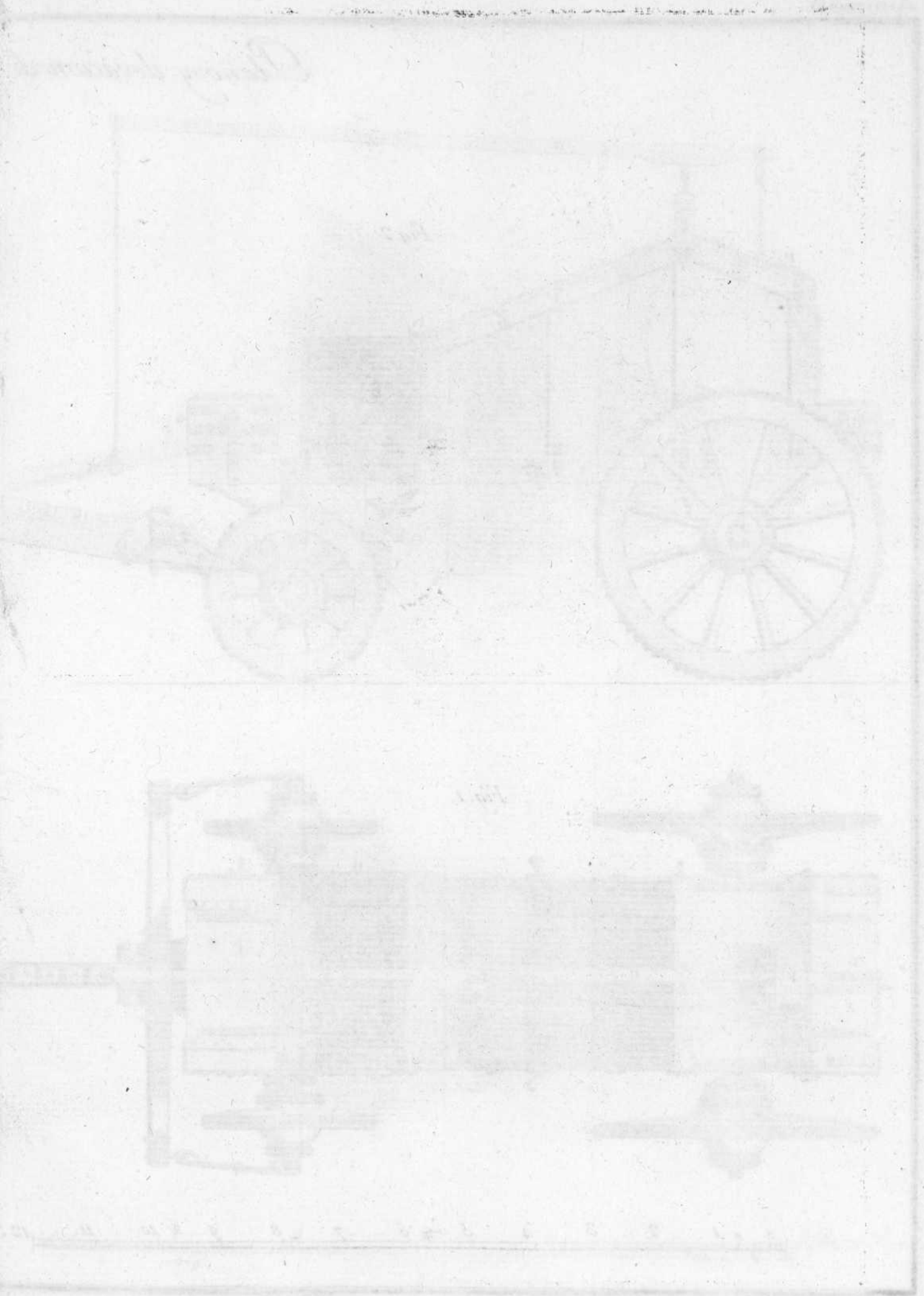


Fig. 8.

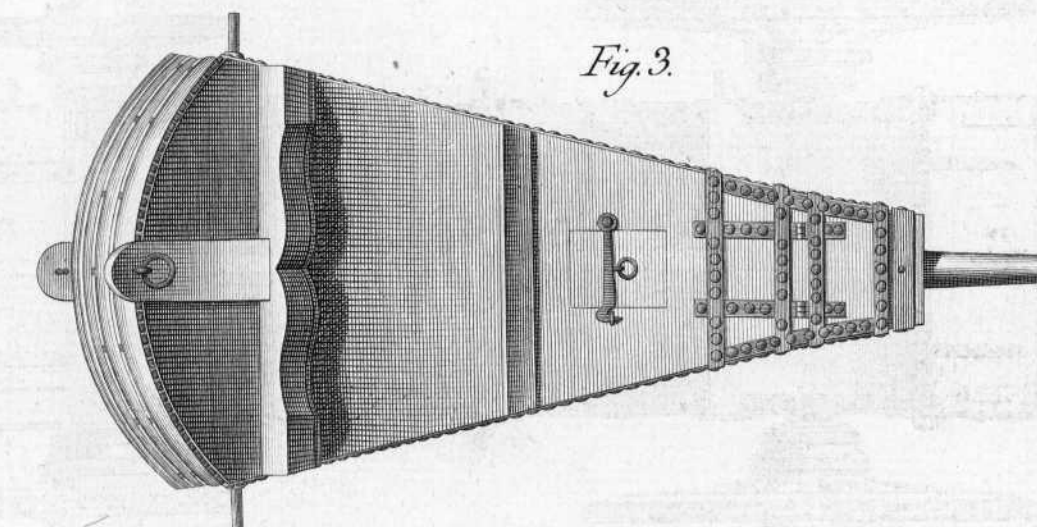
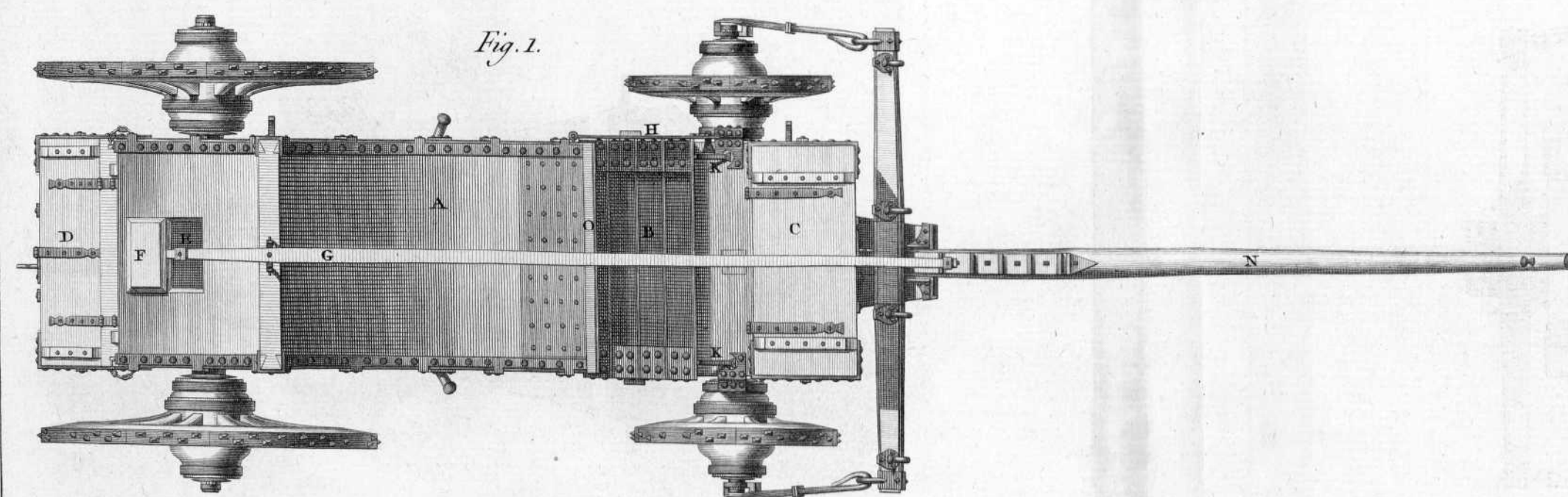
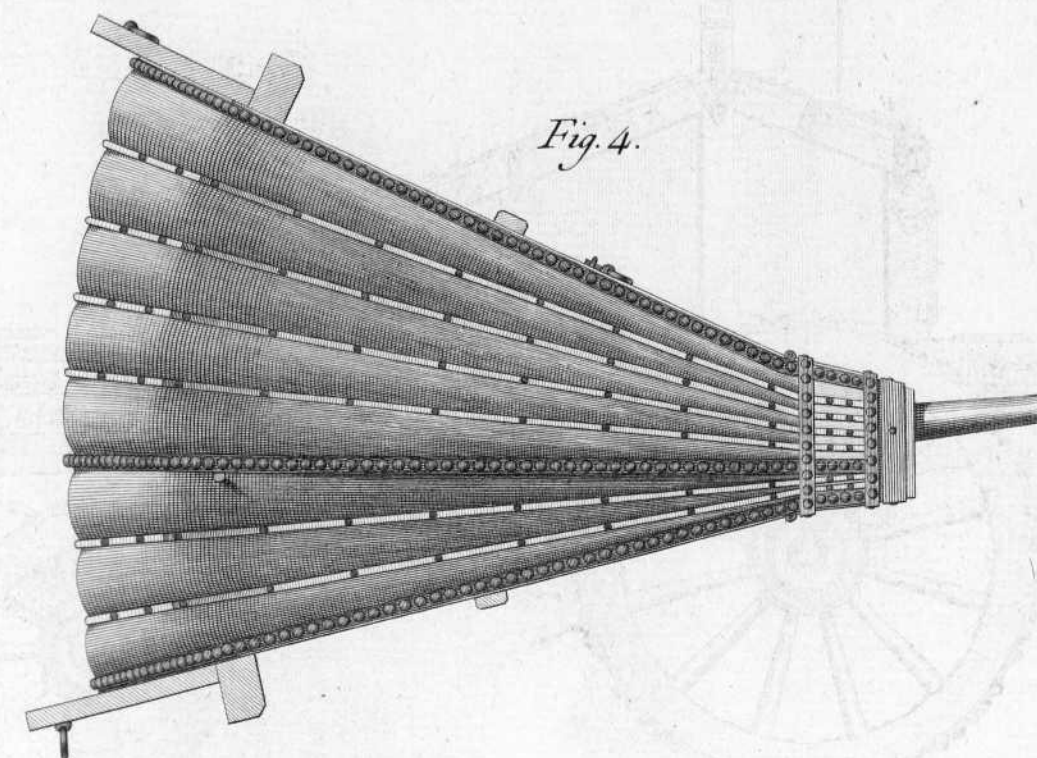
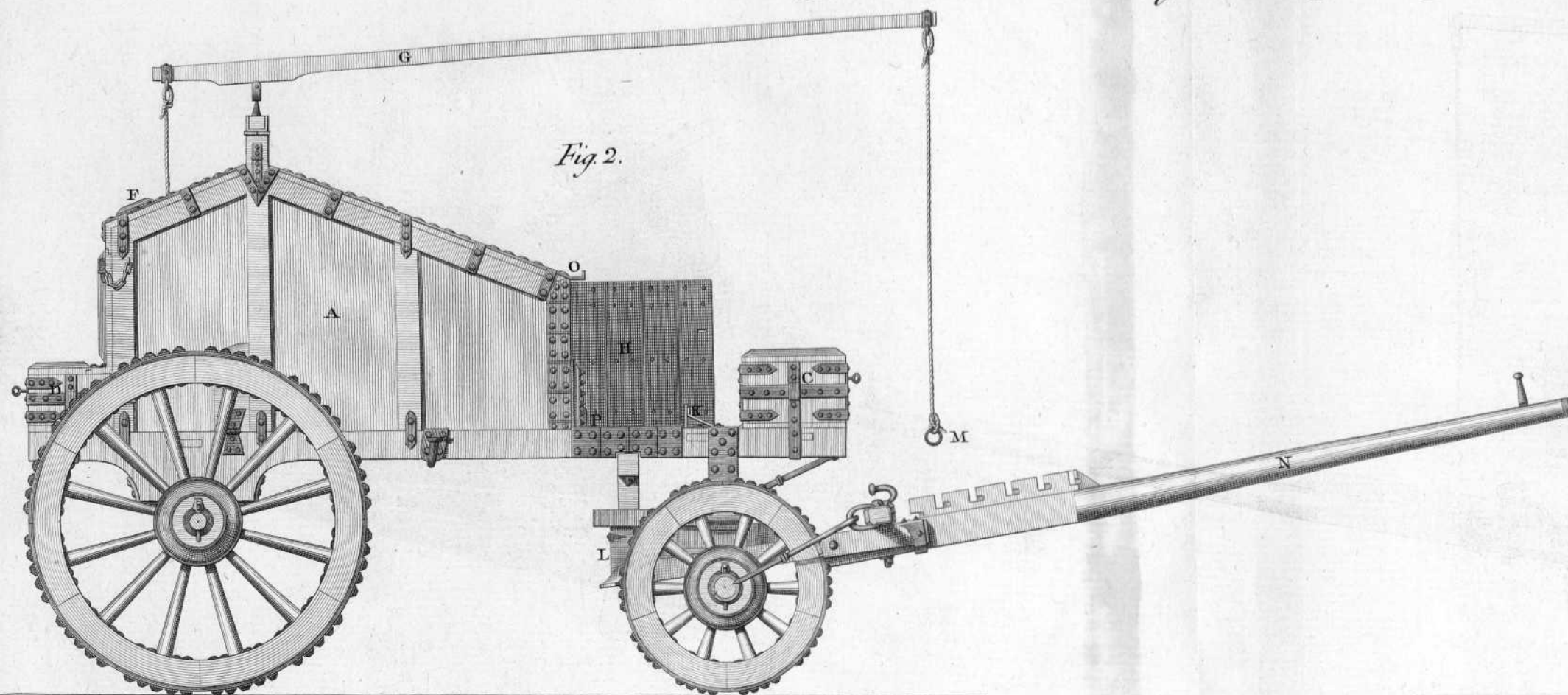


3 4 5 6 7 8 9 10 11 12 Pies de París.



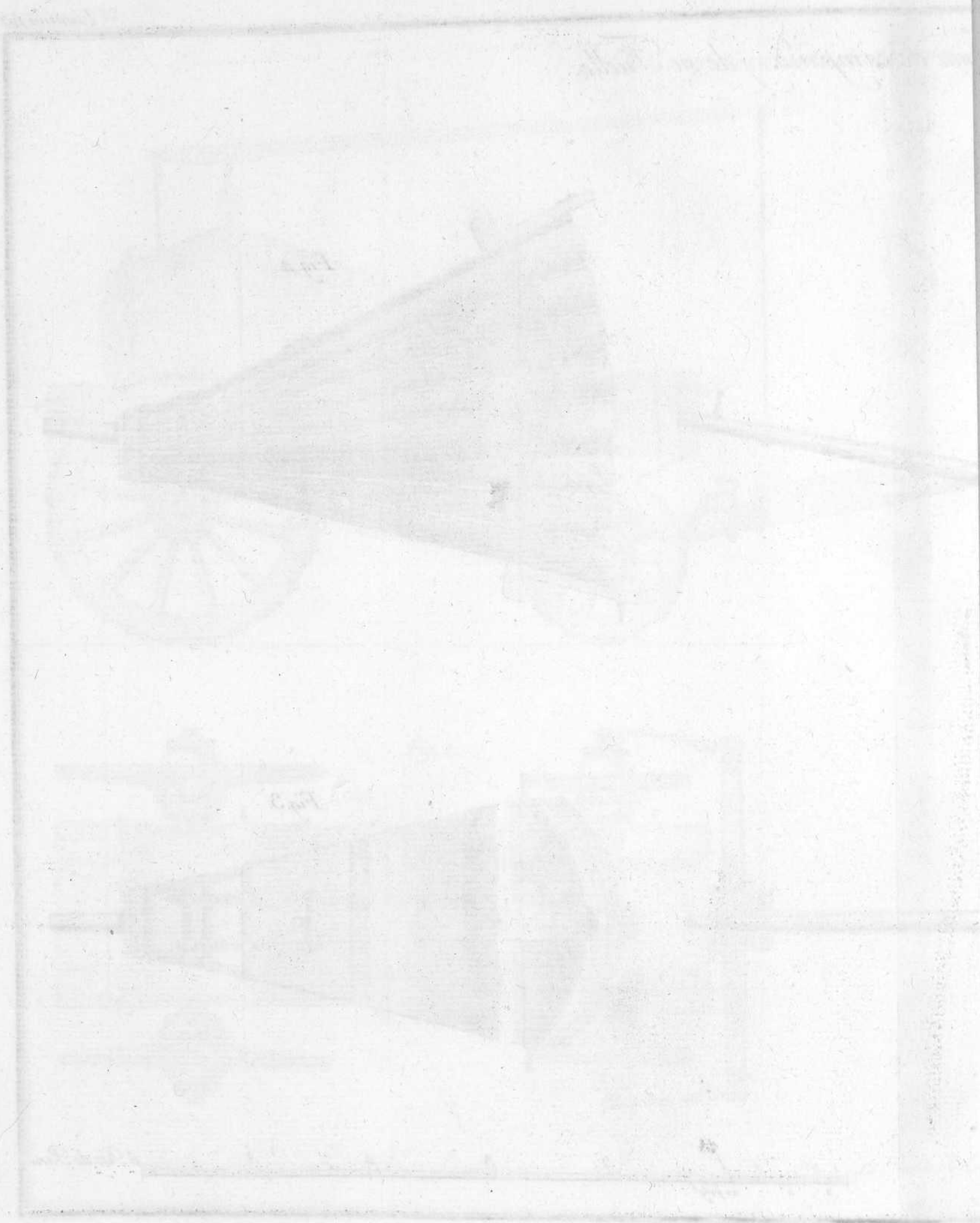


Plano y elevacion de la Fragua de campaña y de su Fuelle.



3 2 1 2 3 4 5 6 7 8 9 10 11 12 Pies de Paris.

1 3 2 1 2 3 4 5 6 Pies de Paris.



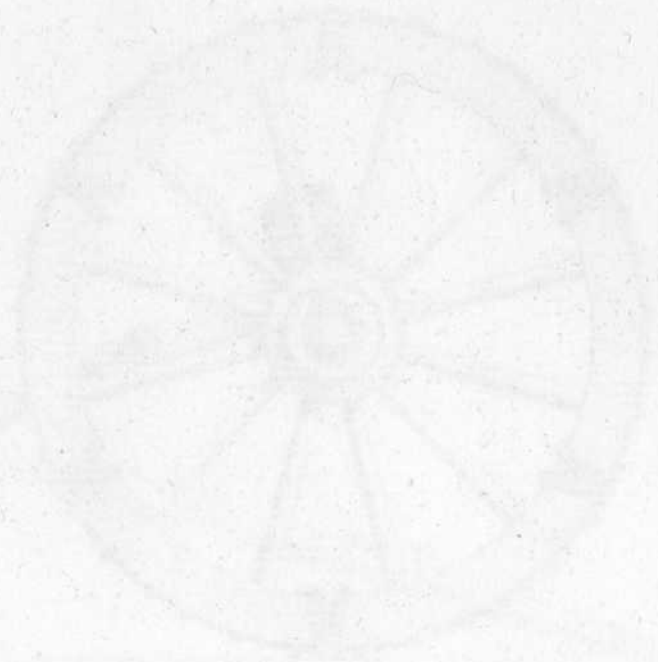


Fig. 2.

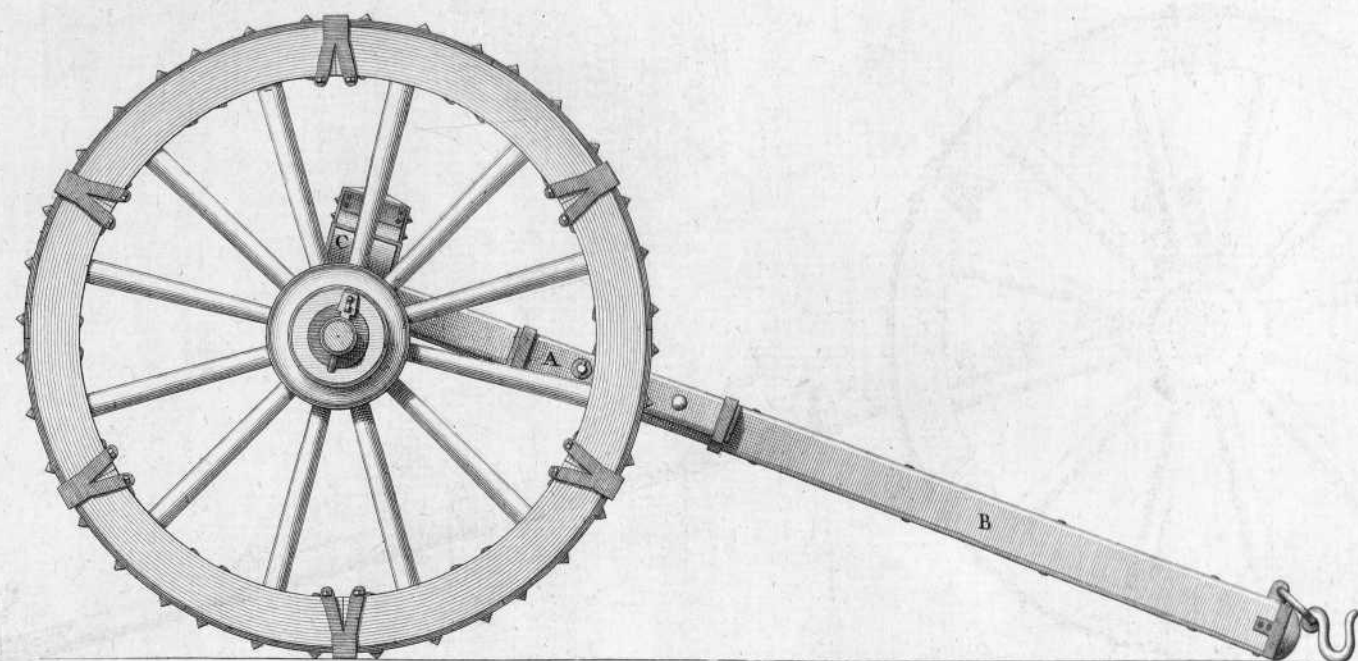
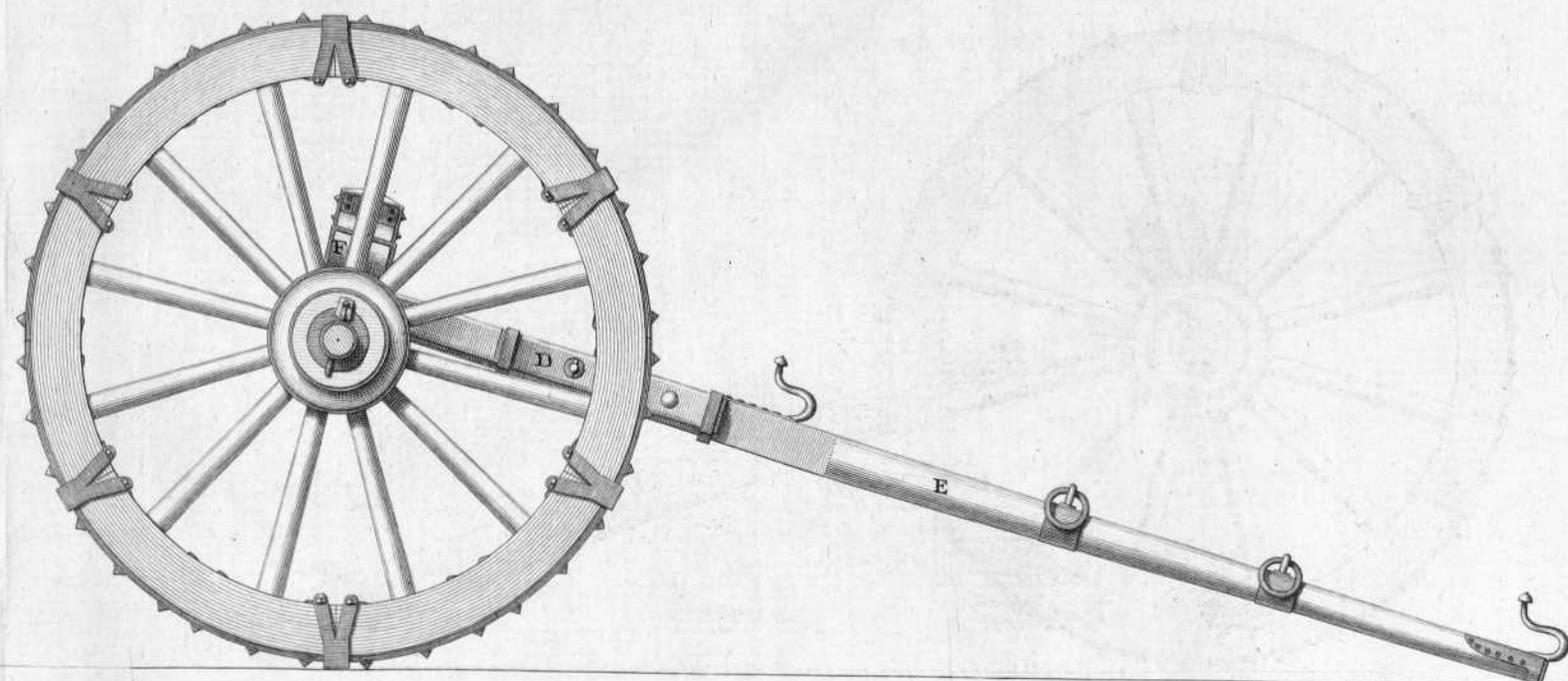


Fig. 4.



Trinquival de mula.

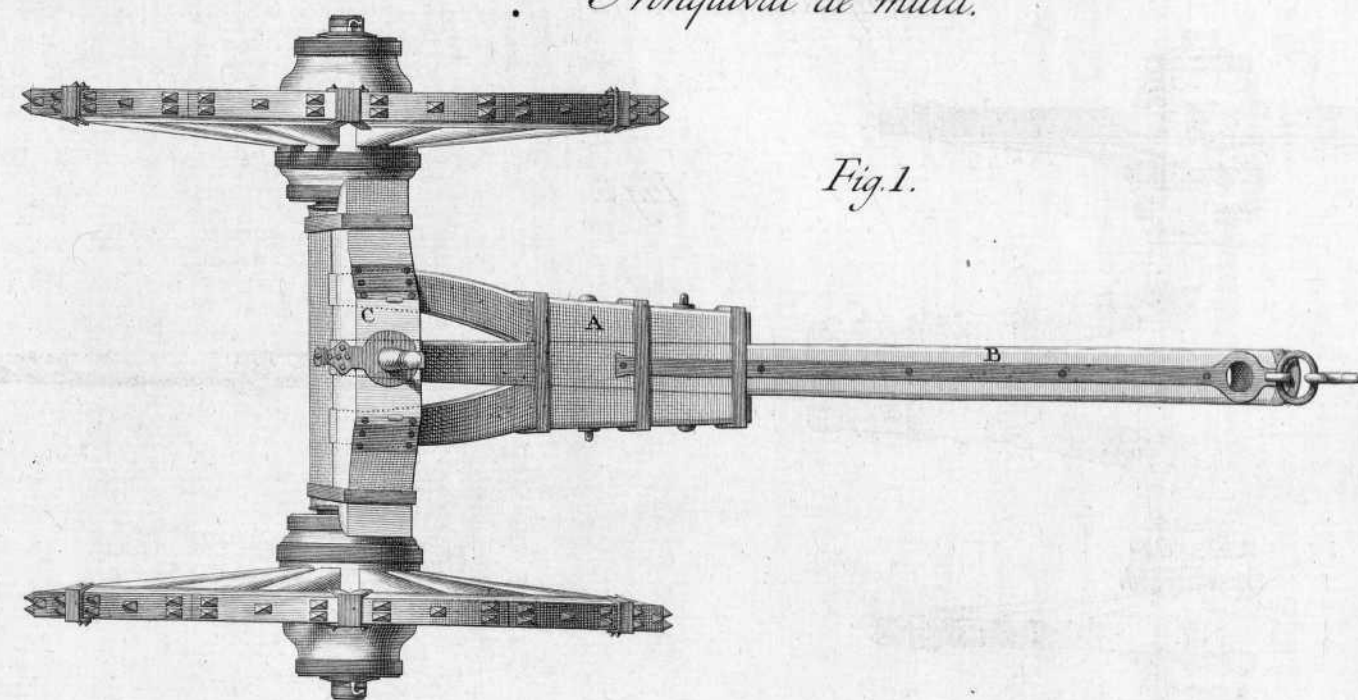


Fig. 1.

Trinquival de mano.

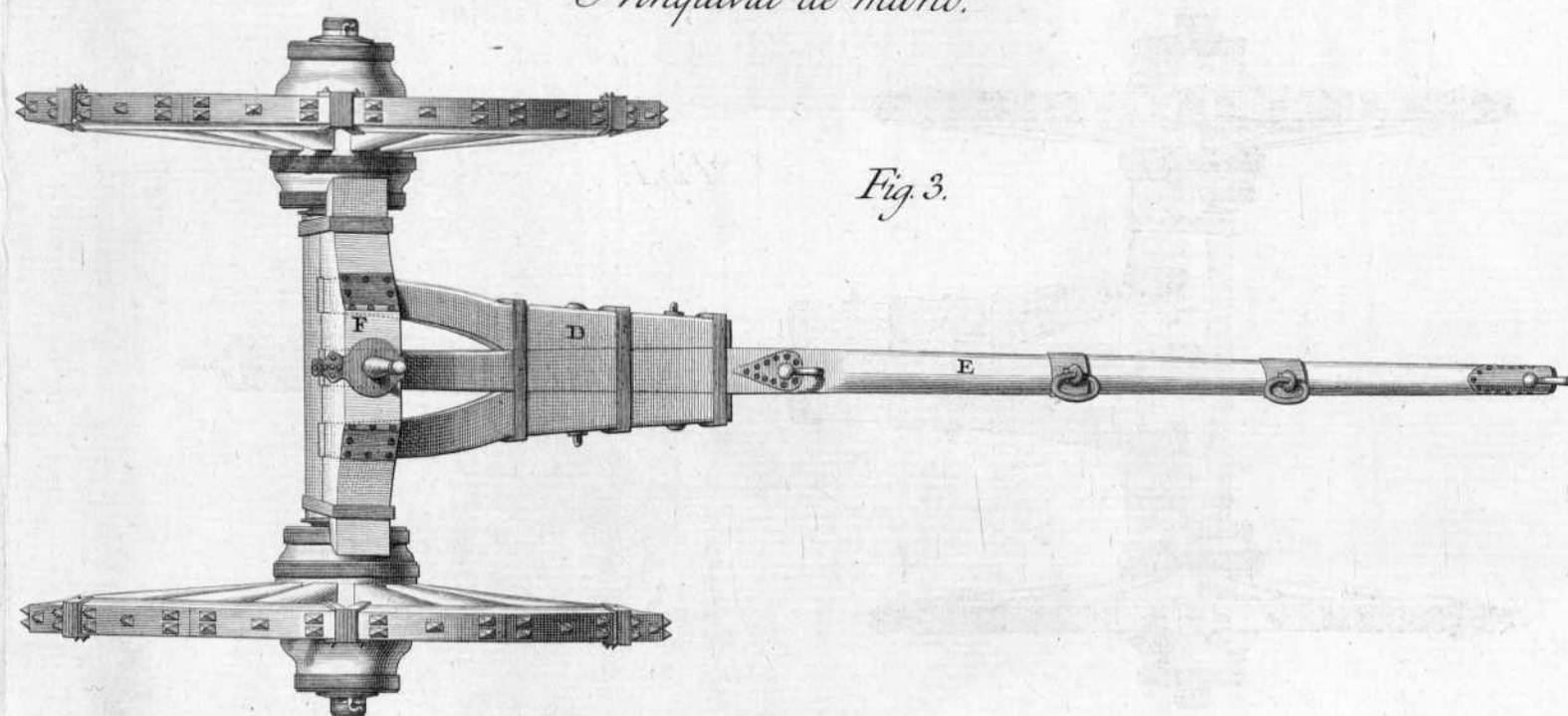
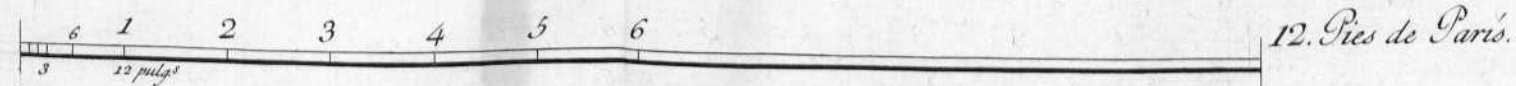
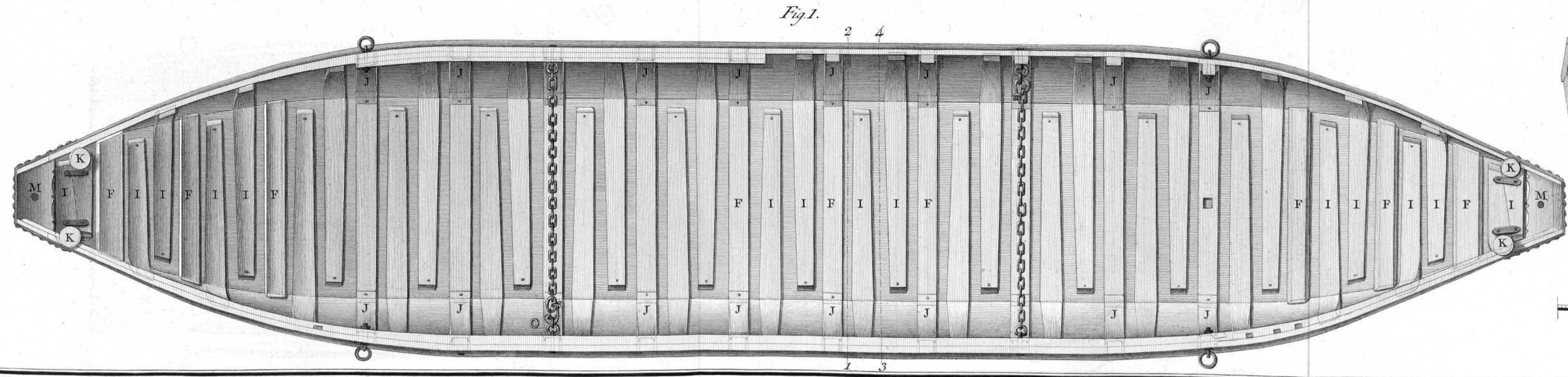
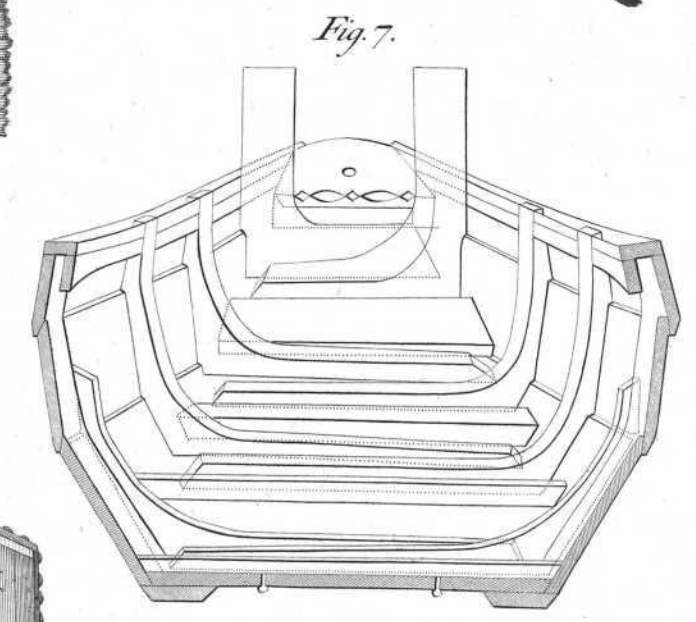
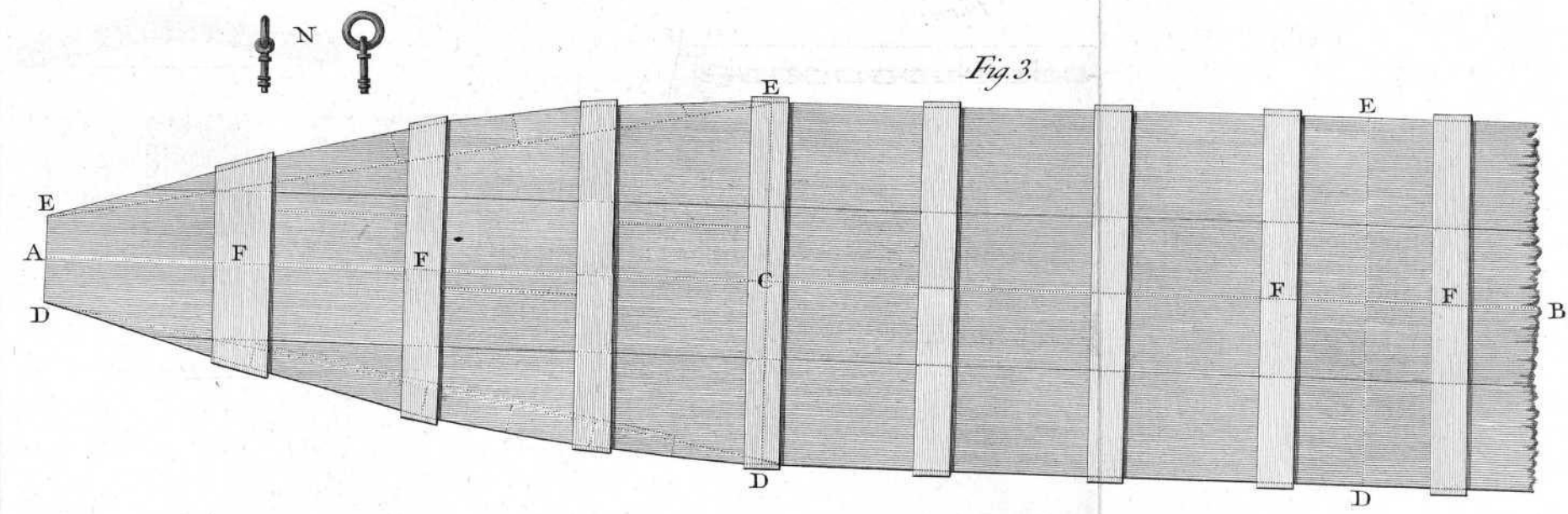
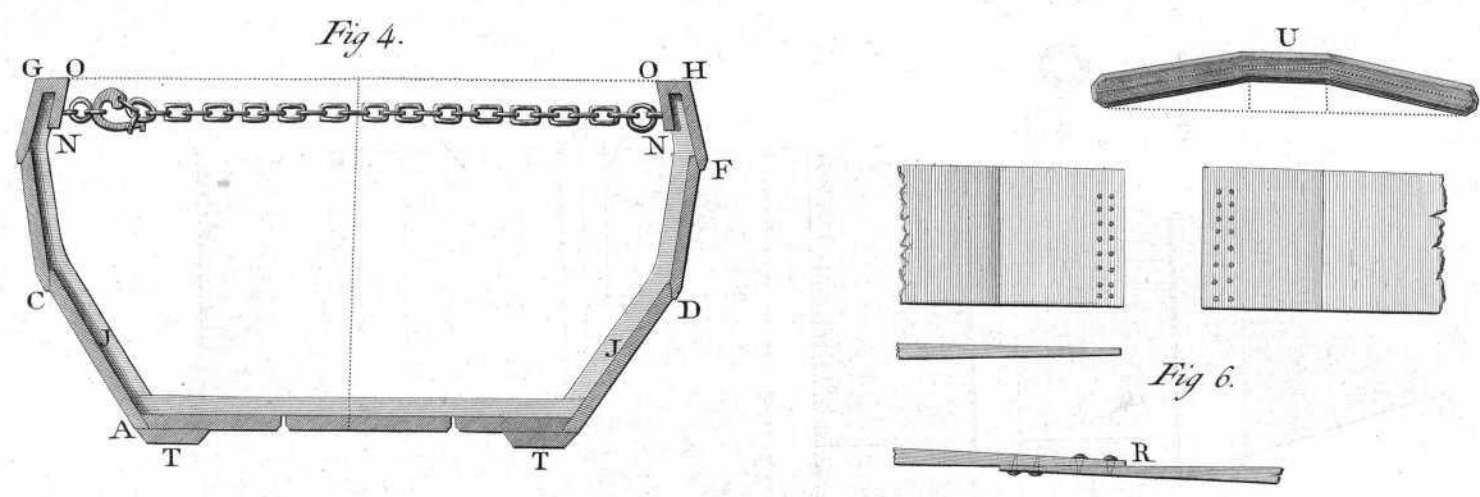
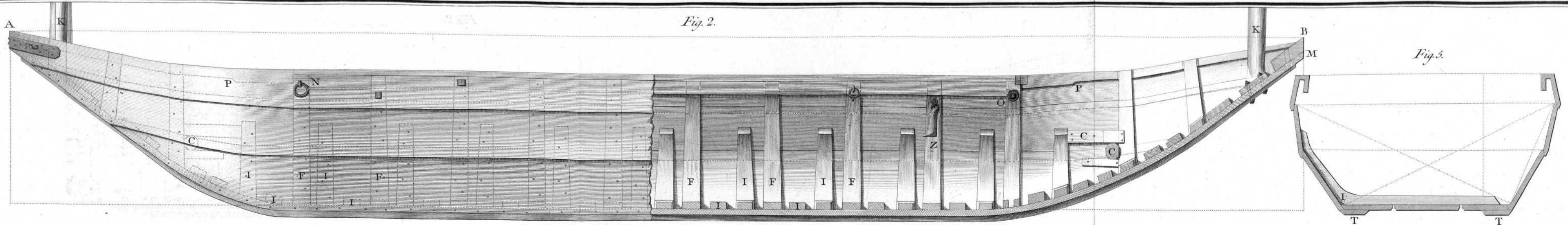
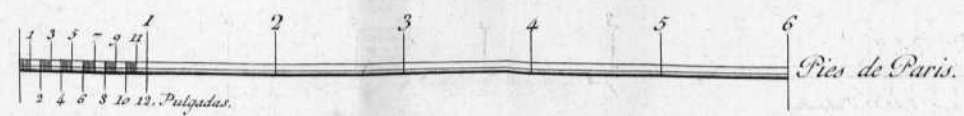
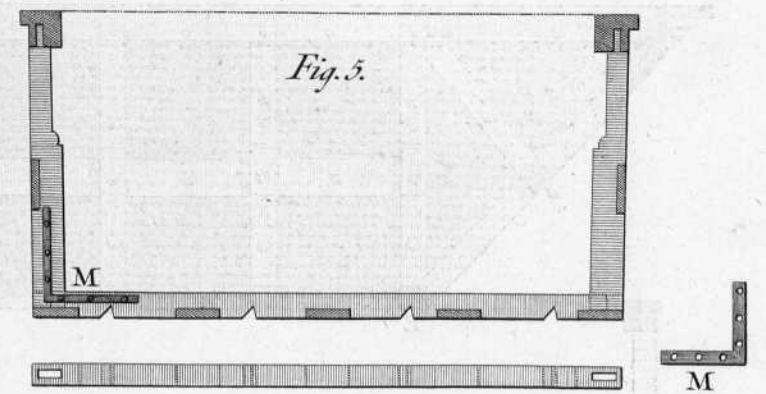
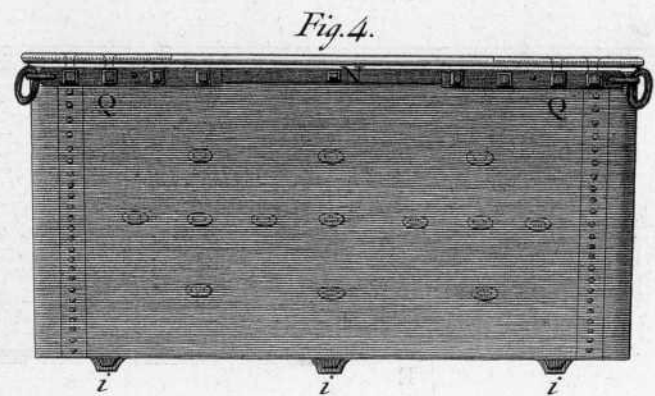
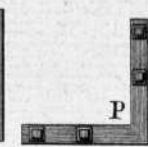
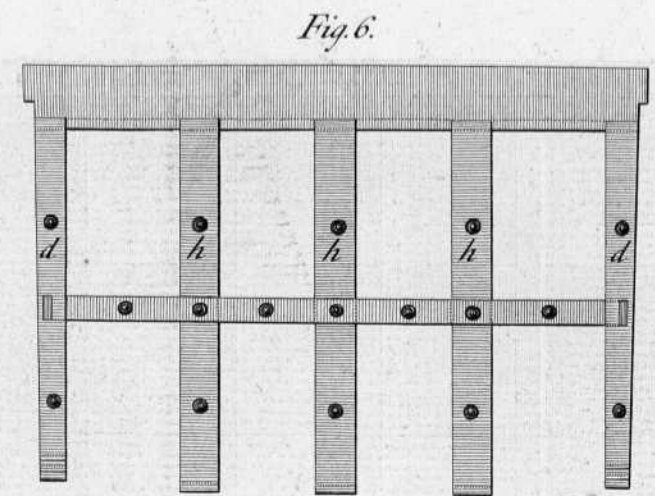
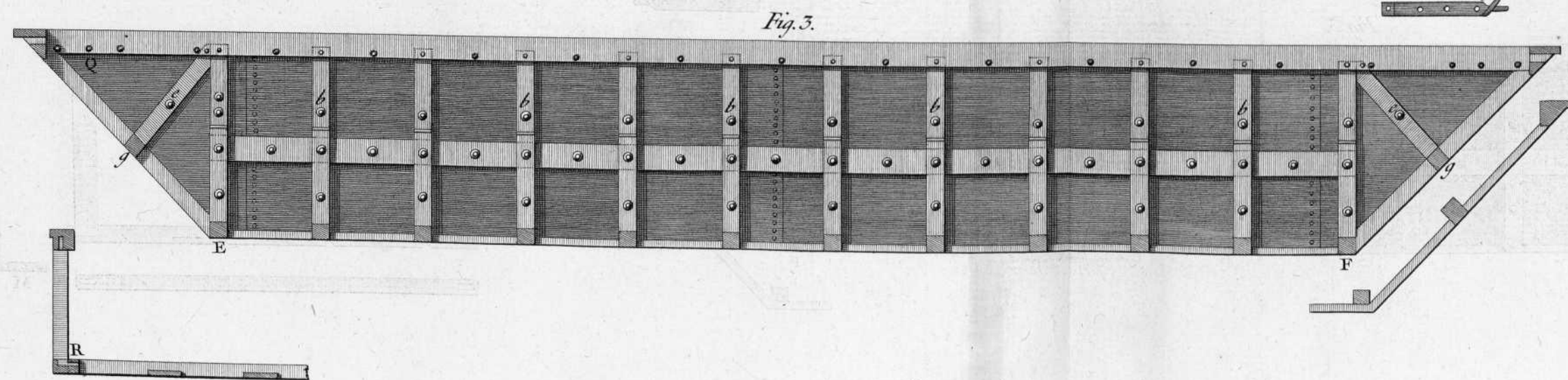
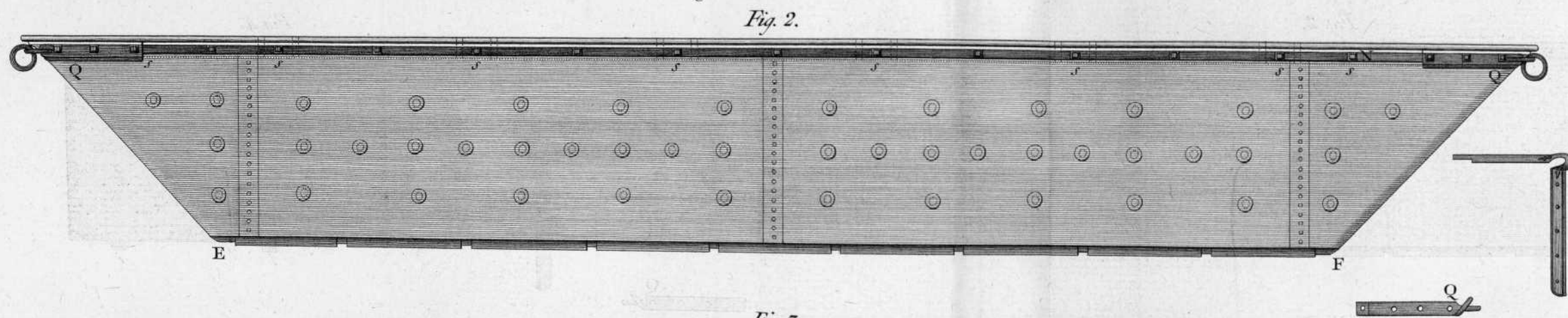
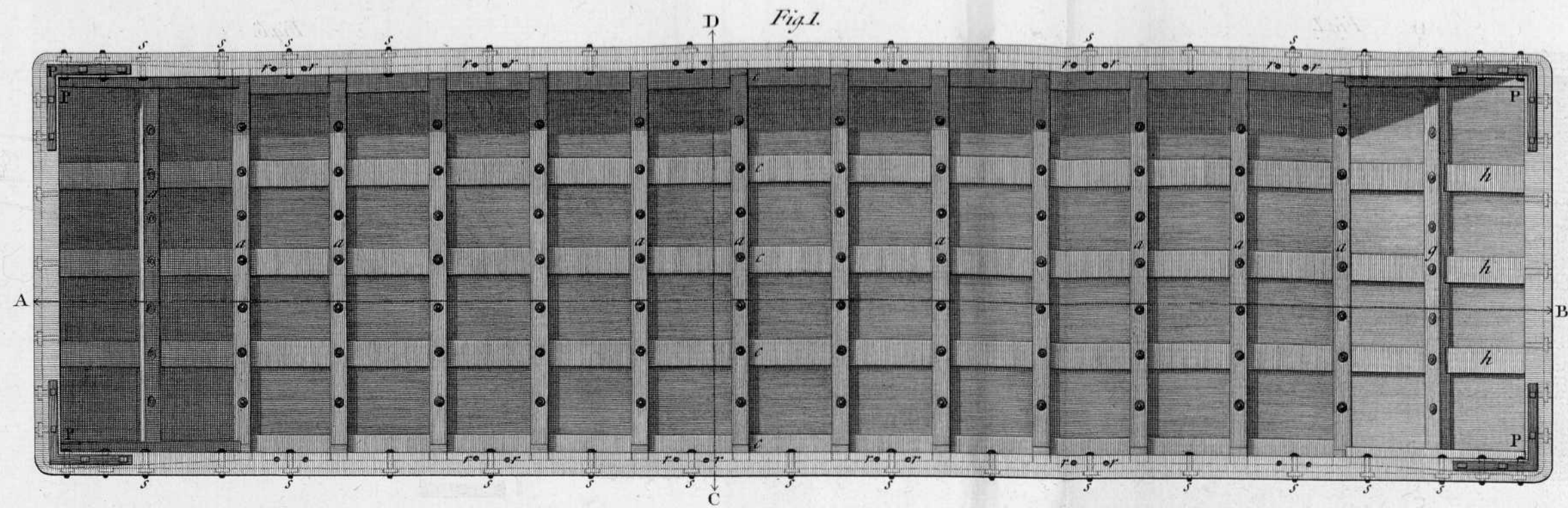


Fig. 3.

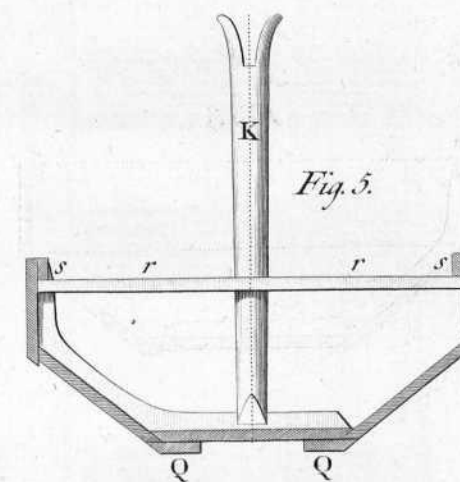
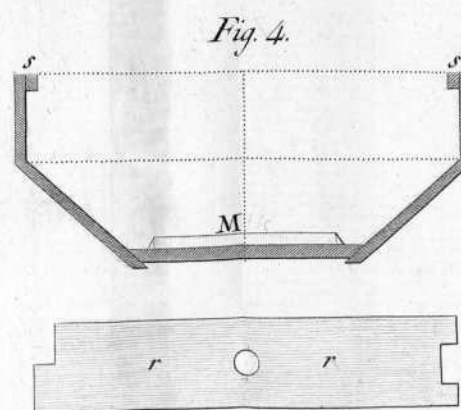
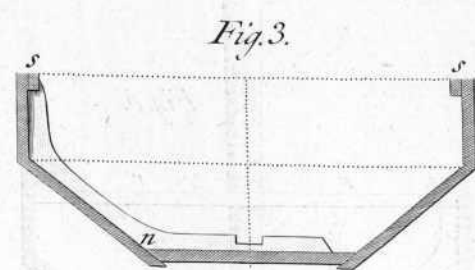
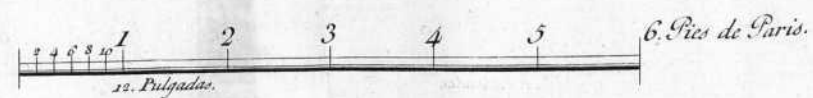
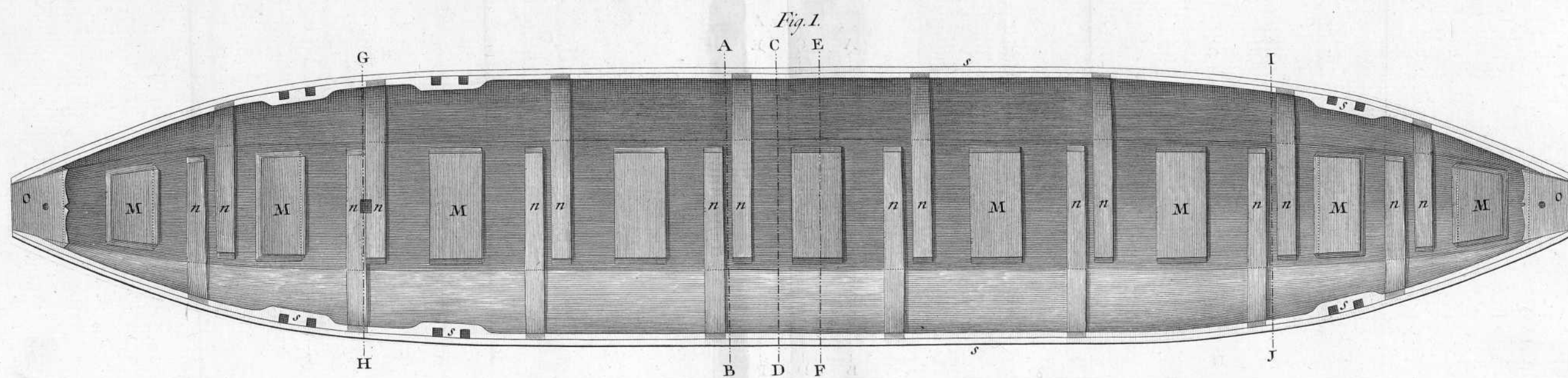
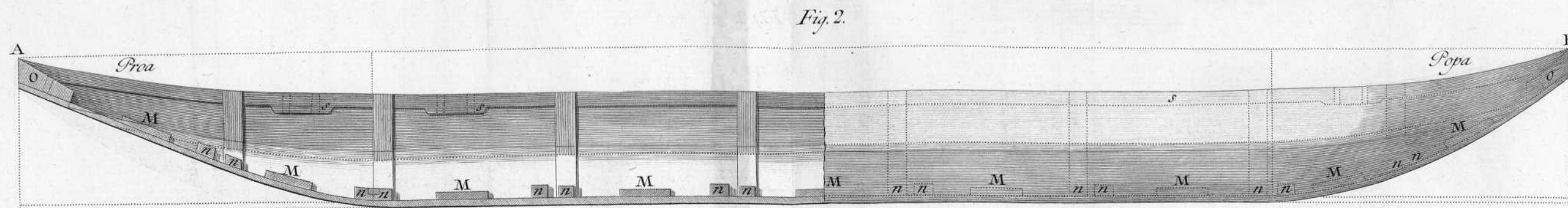


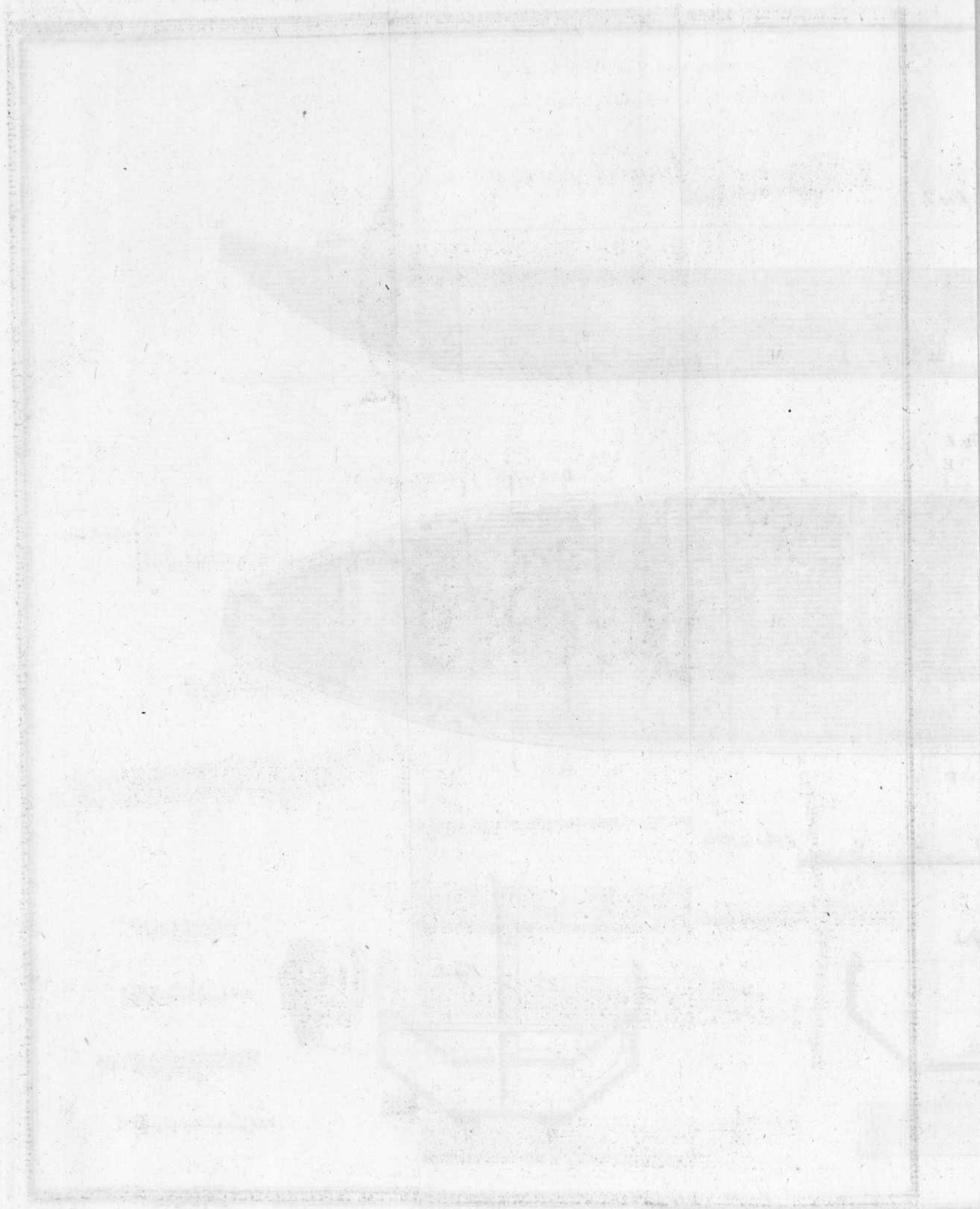


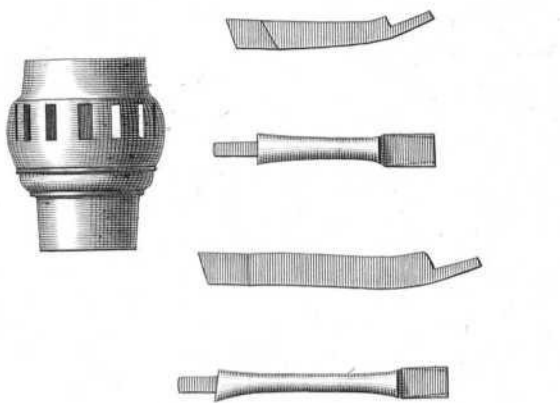
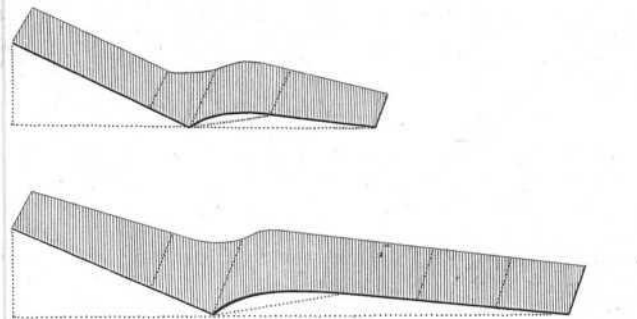
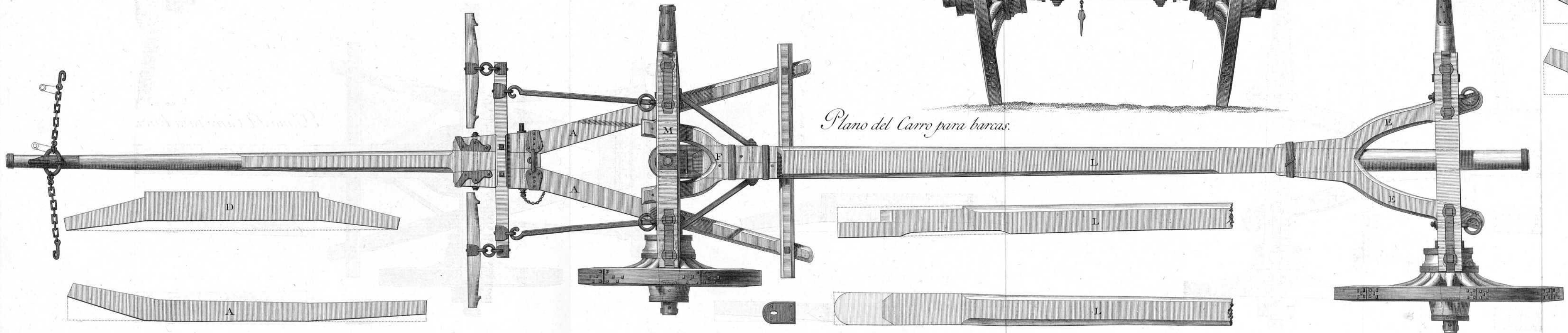
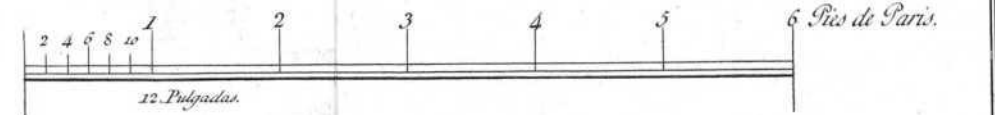
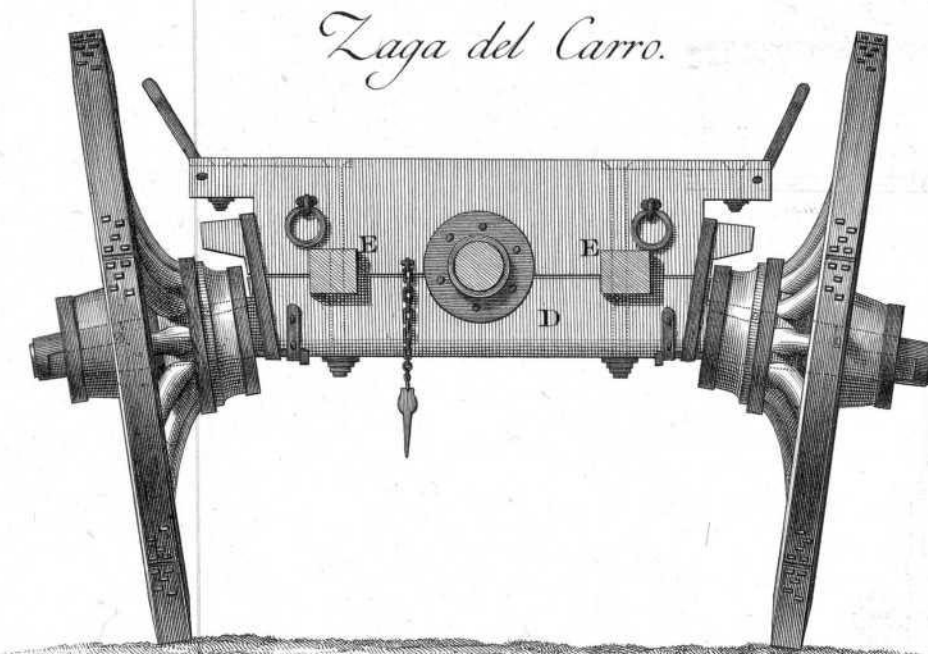
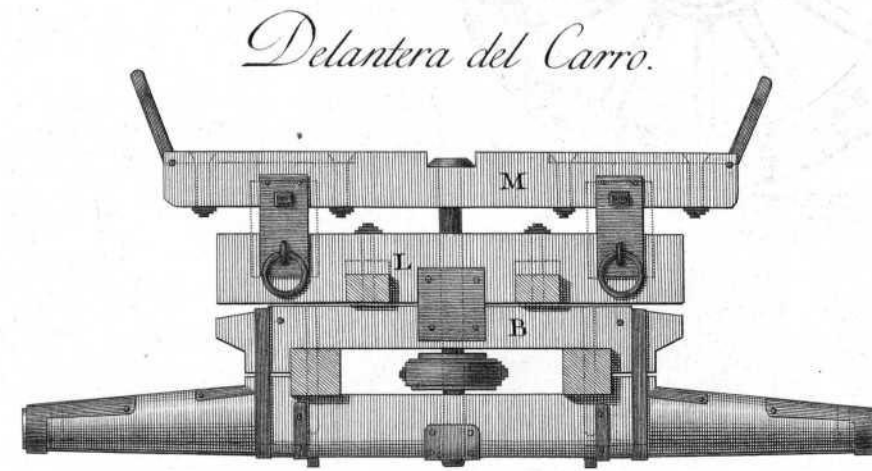
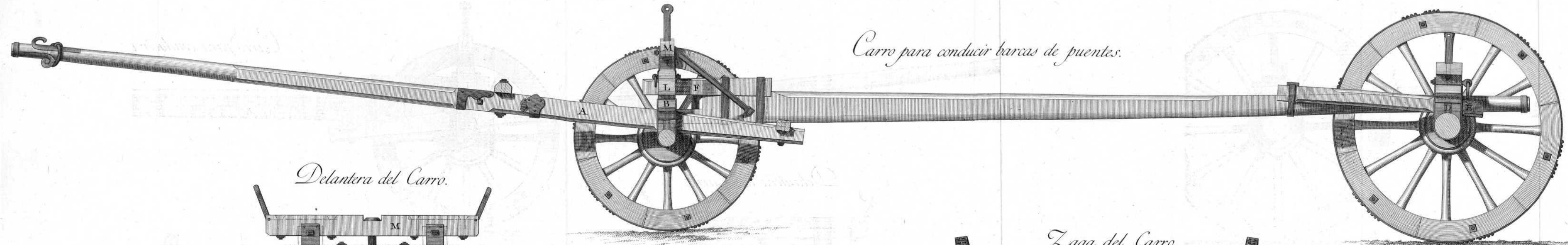






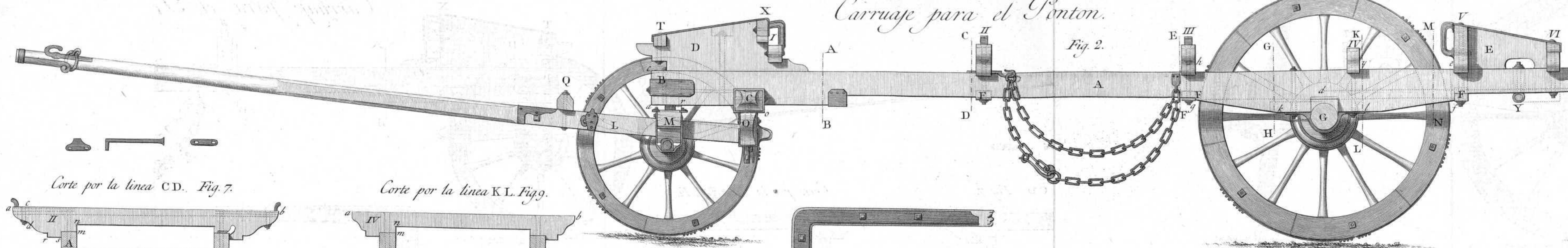






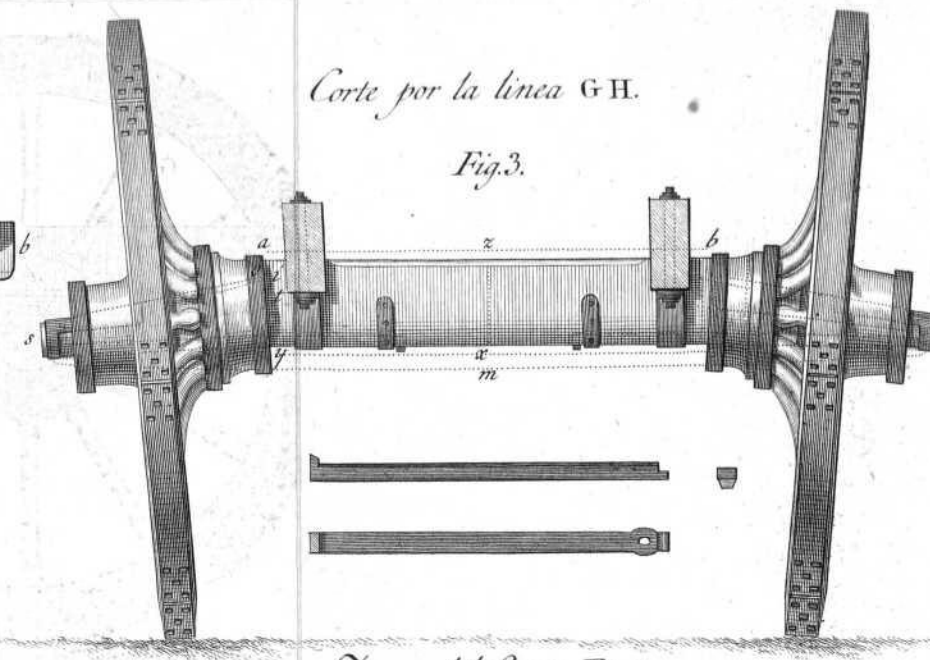
Carruaje para el Ponton.

Fig. 2.

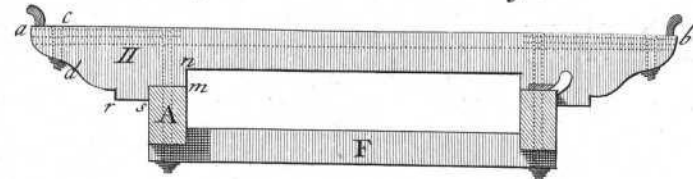


Corte por la linea G.H.

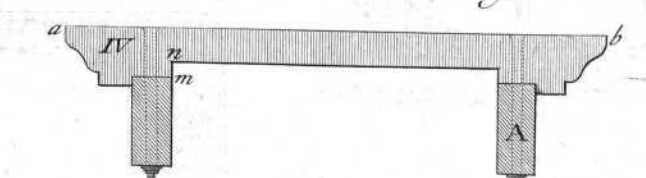
Fig. 3.



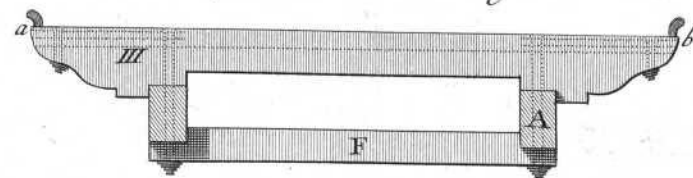
Corte por la linea C.D. Fig. 7.



Corte por la linea K.L. Fig. 9.



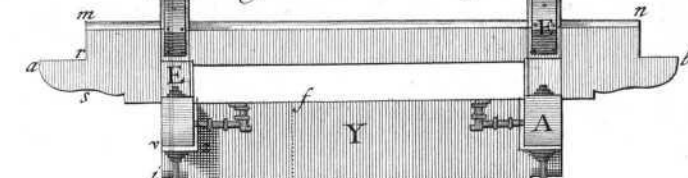
Corte por la linea E.F. Fig. 8.



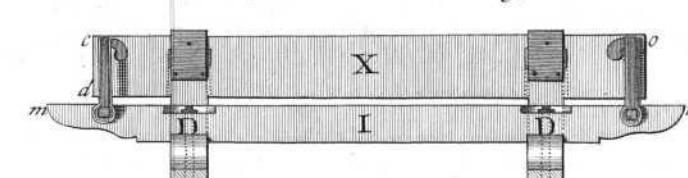
Corte por la linea M.N. Fig. 10.



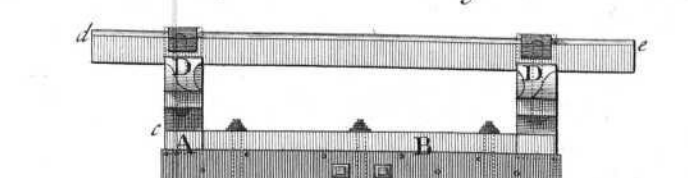
Laga del Carro. Fig. 4.



Corte por la linea A.B. Fig. 5.

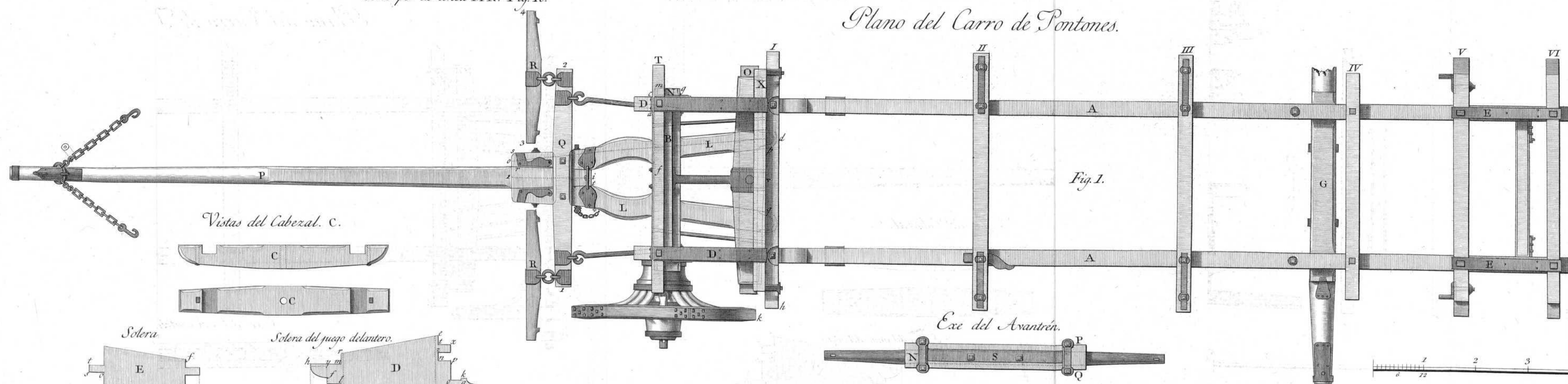


Frente del Carro. Fig. 6.

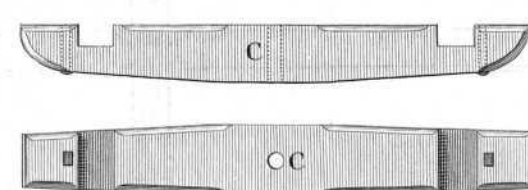


Plano del Carro de Pontones.

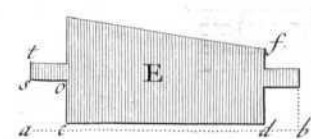
Fig. 1.



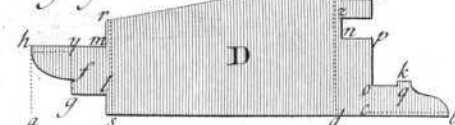
Vistas del Cabezal. C.



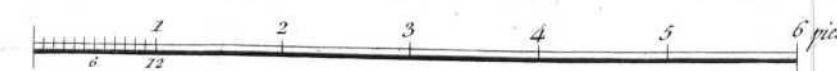
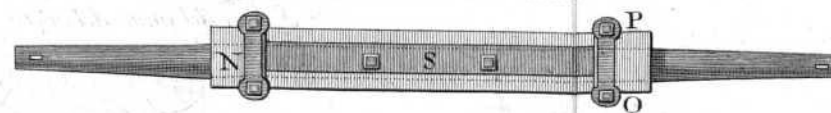
Solera



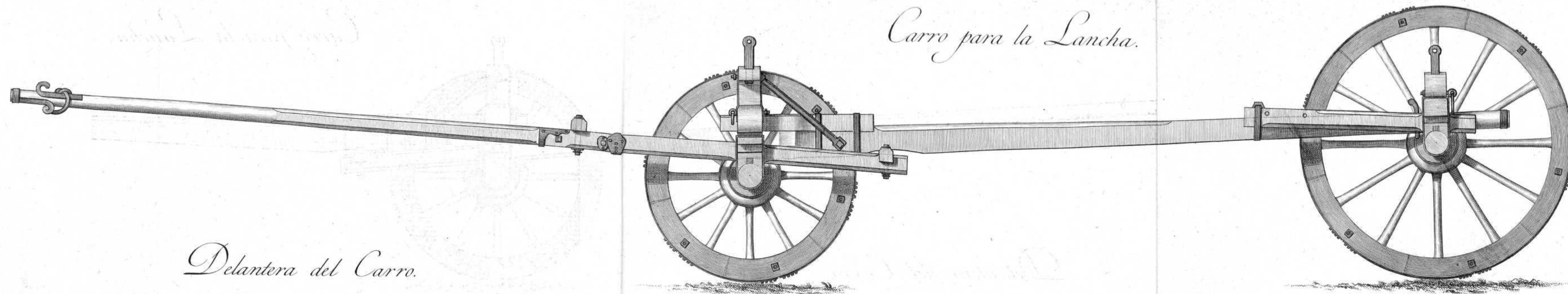
Solera del fuego delantero.



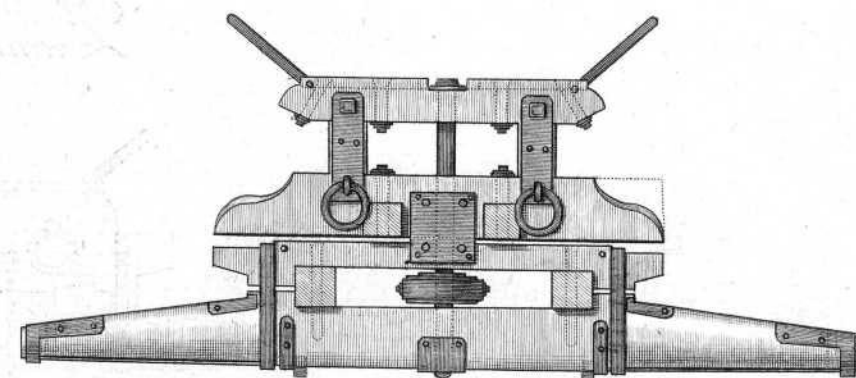
Eje del Avanzón.



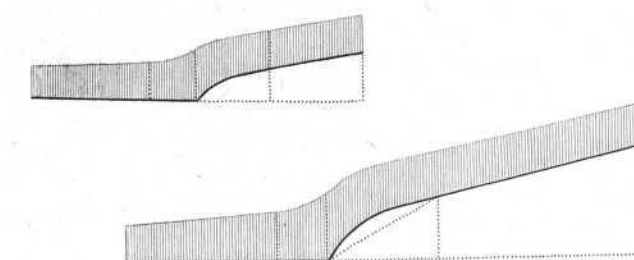
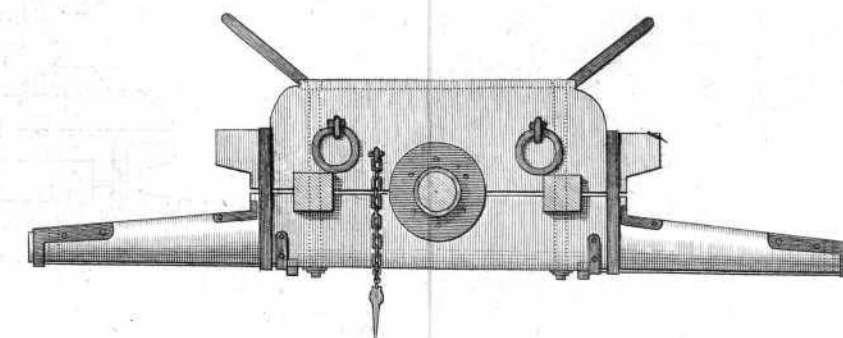
Carro para la Lancha.



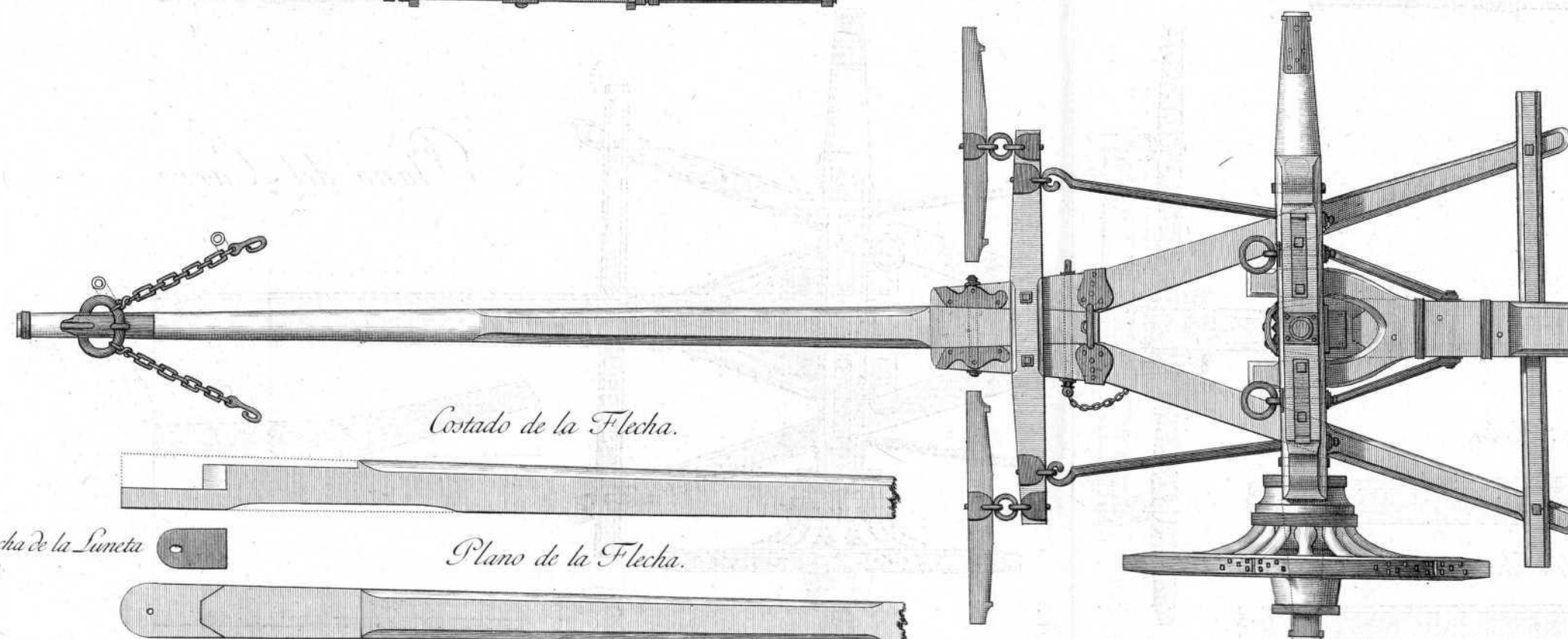
Delantera del Carro.



Zaga del Carro.



Plano del Carro.



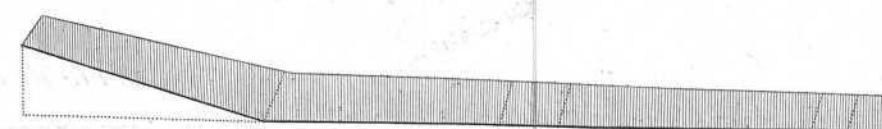
Costado de la Flecha.



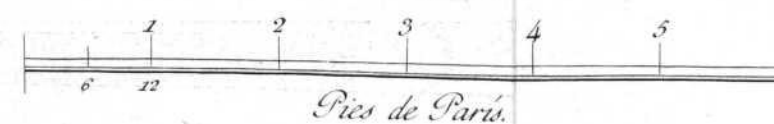
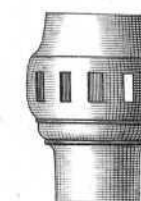
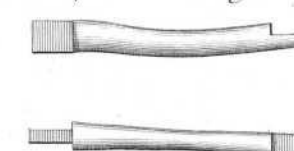
Plancha de la Luneta



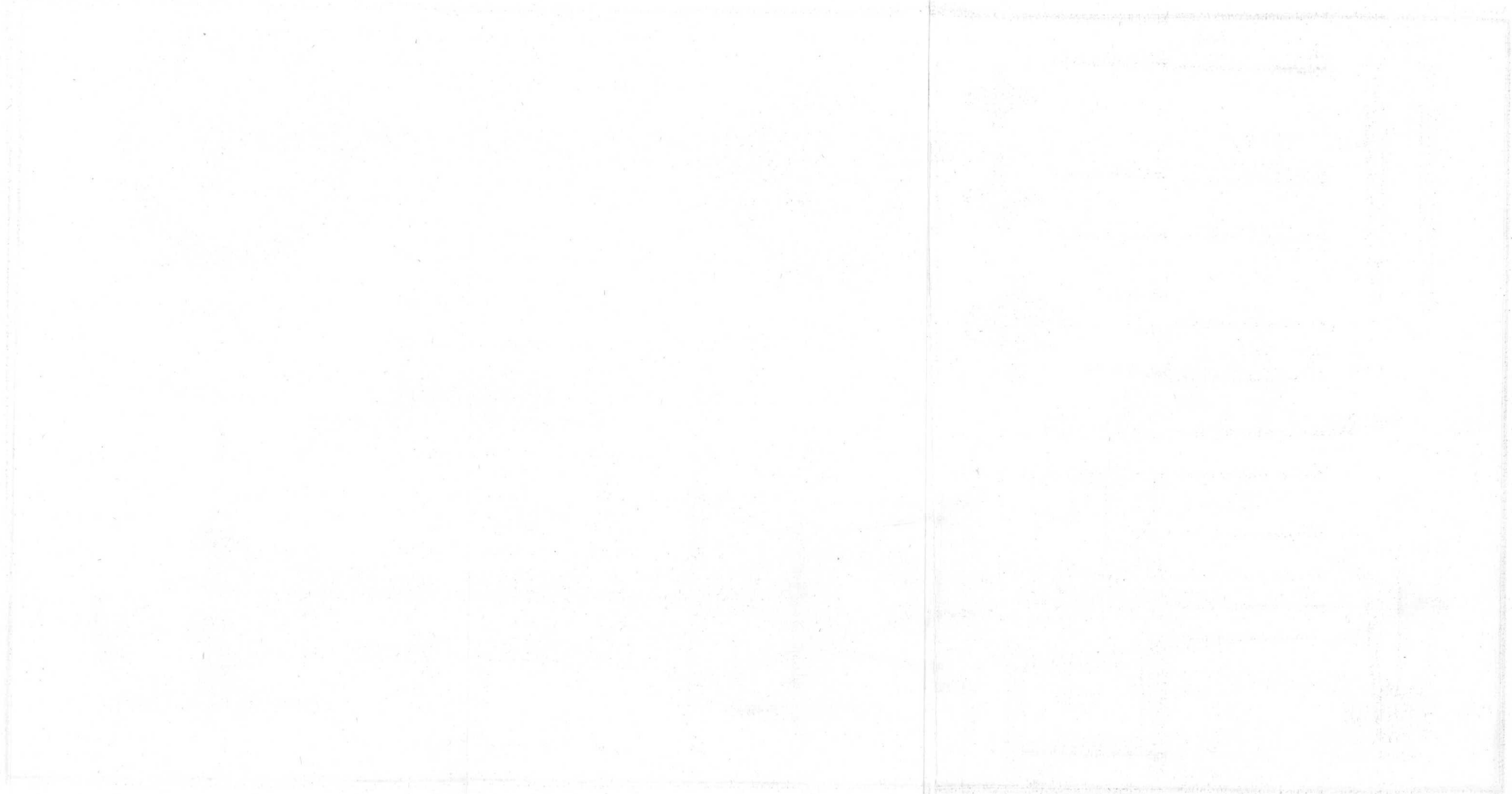
Plano de la Flecha.

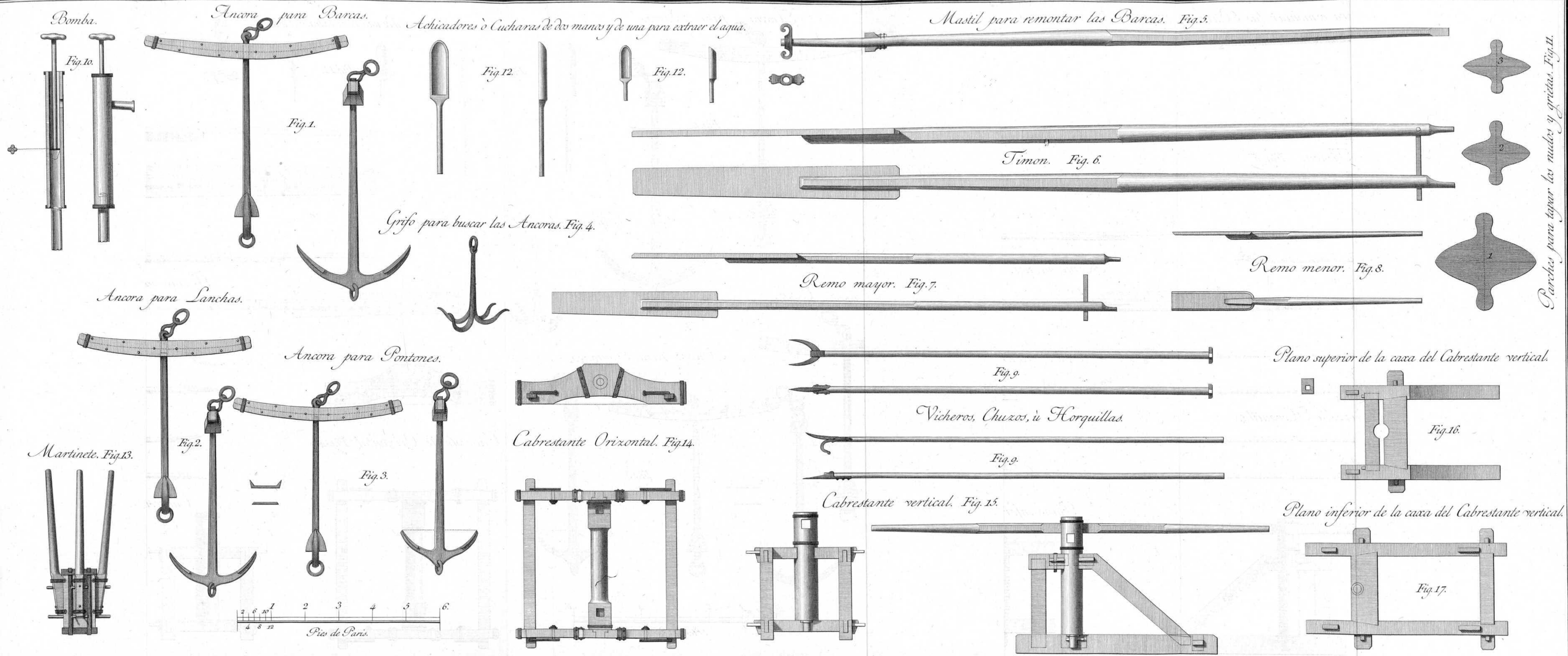


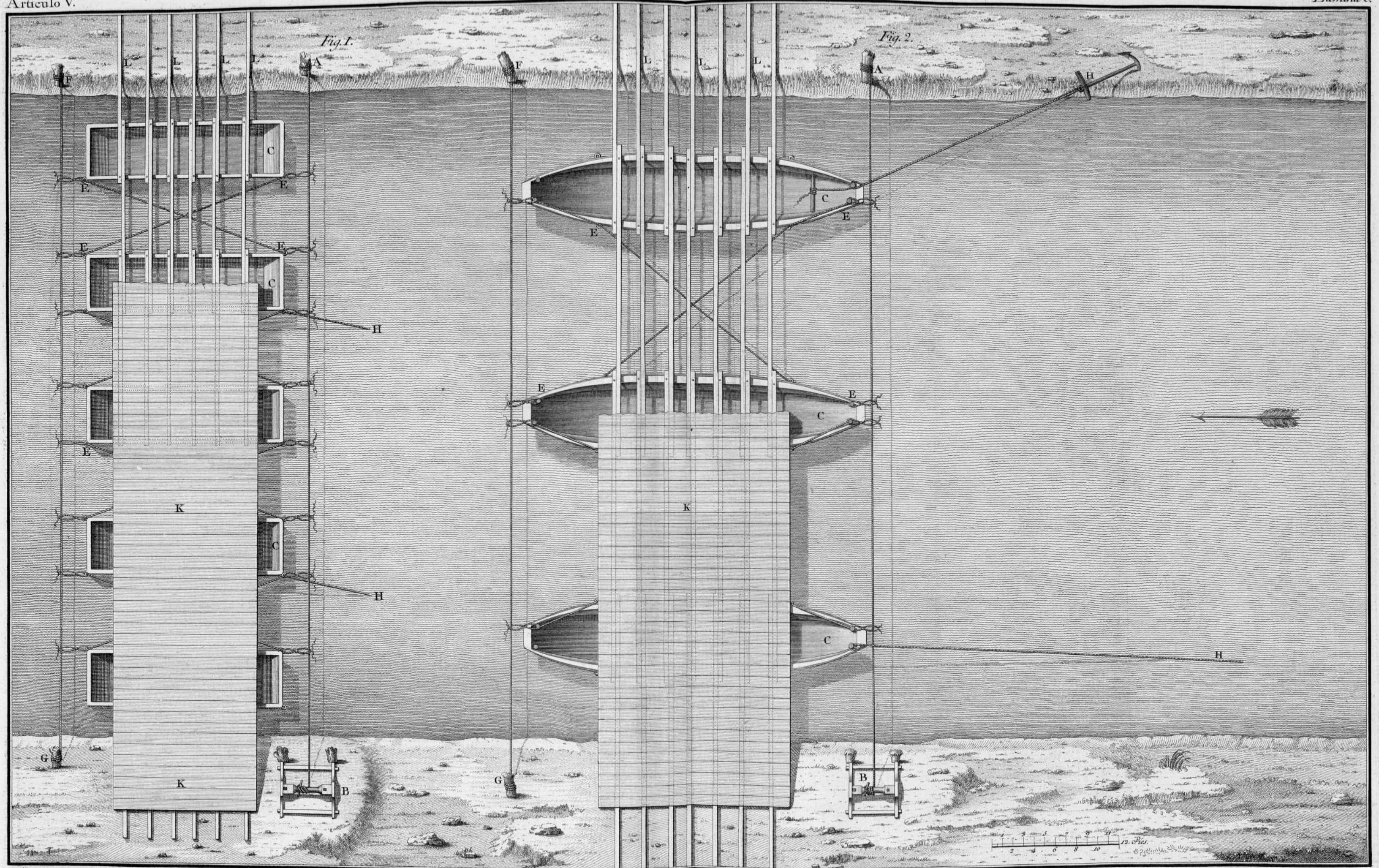
Rayos de la rueda grande.



Pies de París.







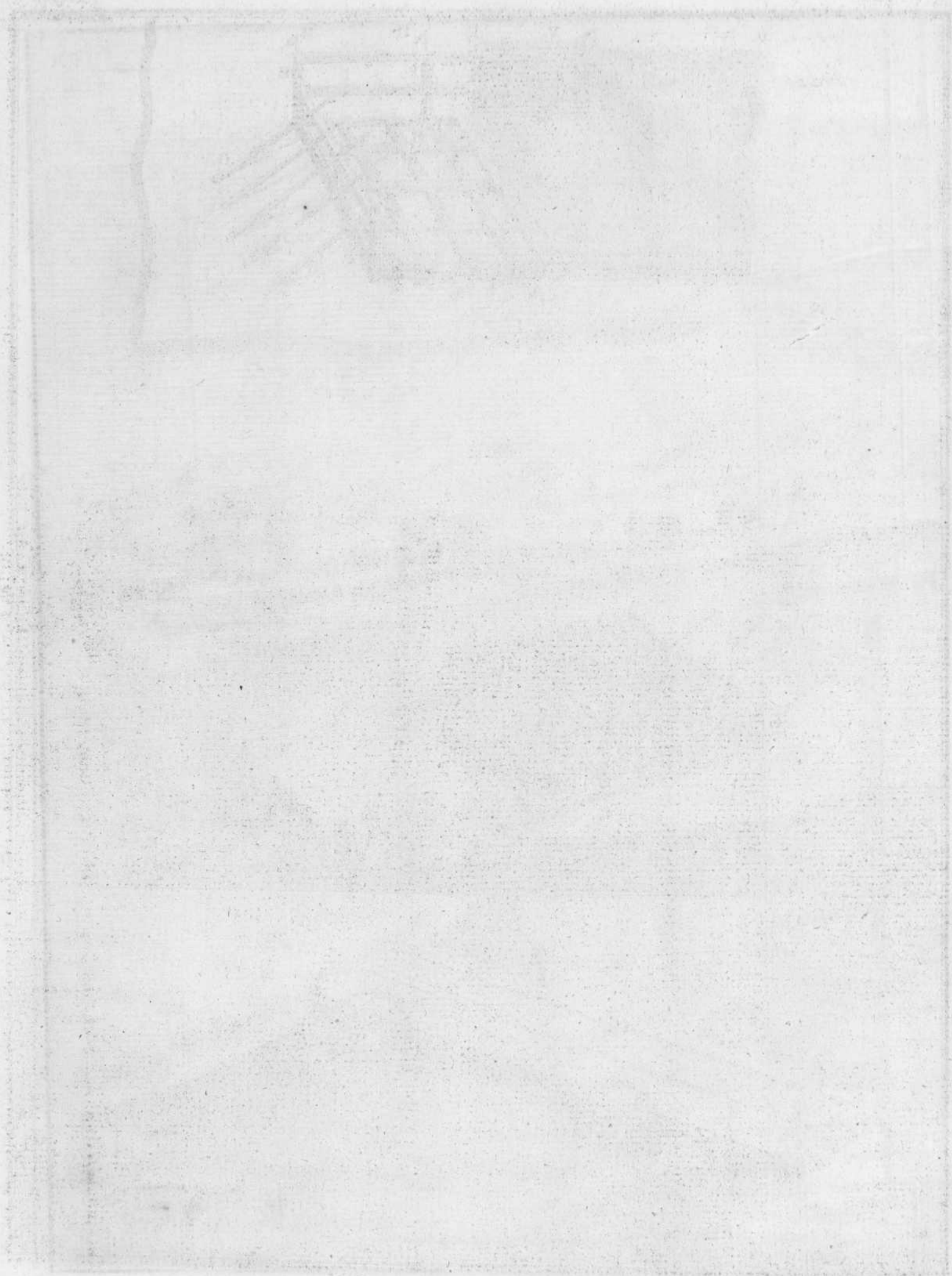


Fig. 1.

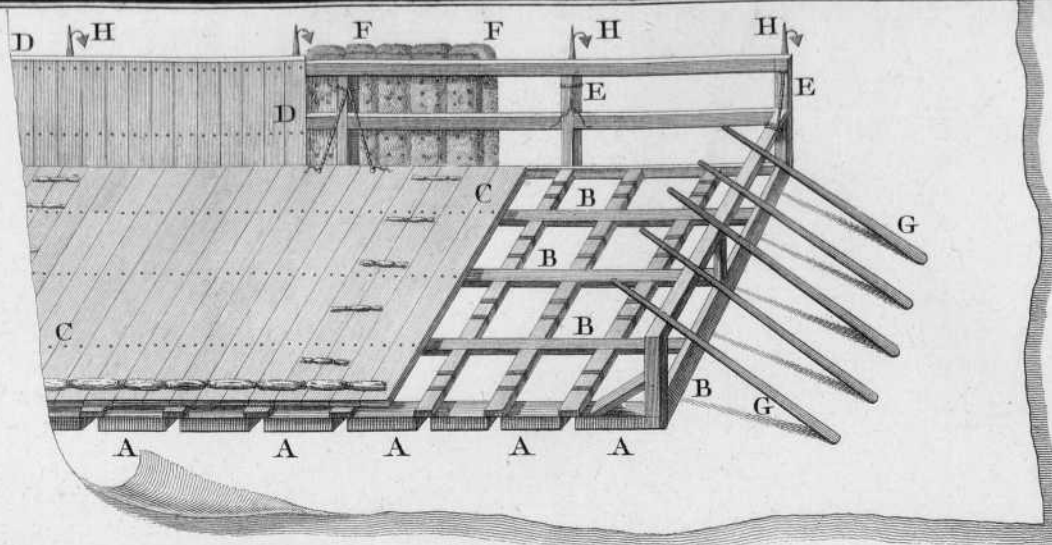


Fig. 2.

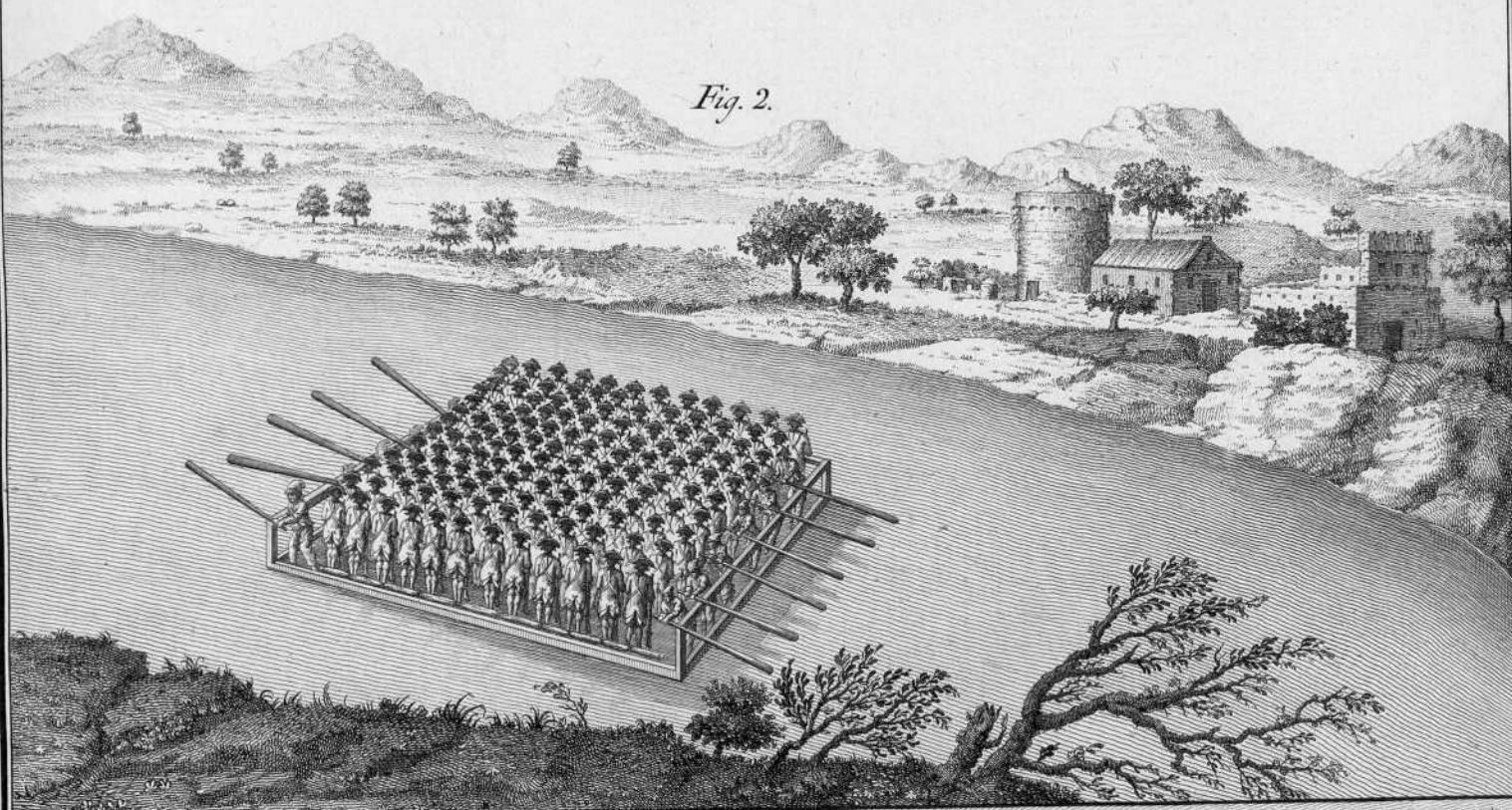
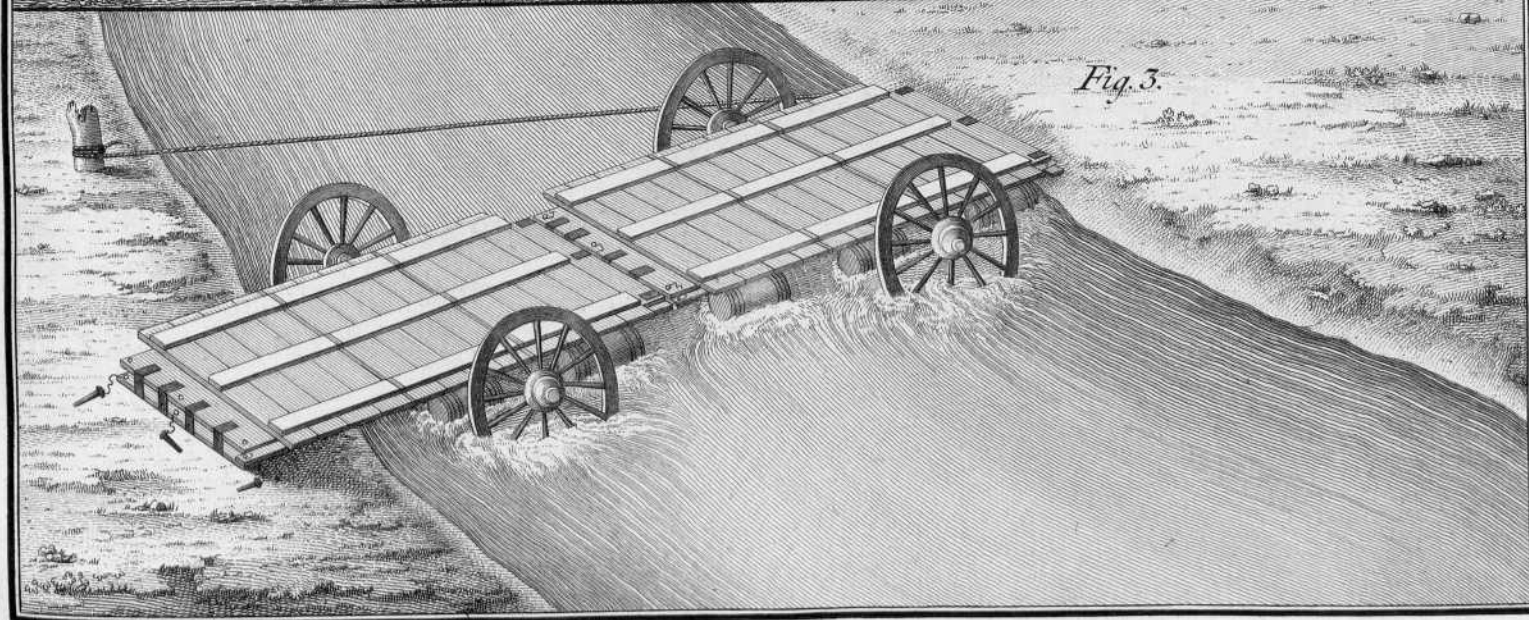
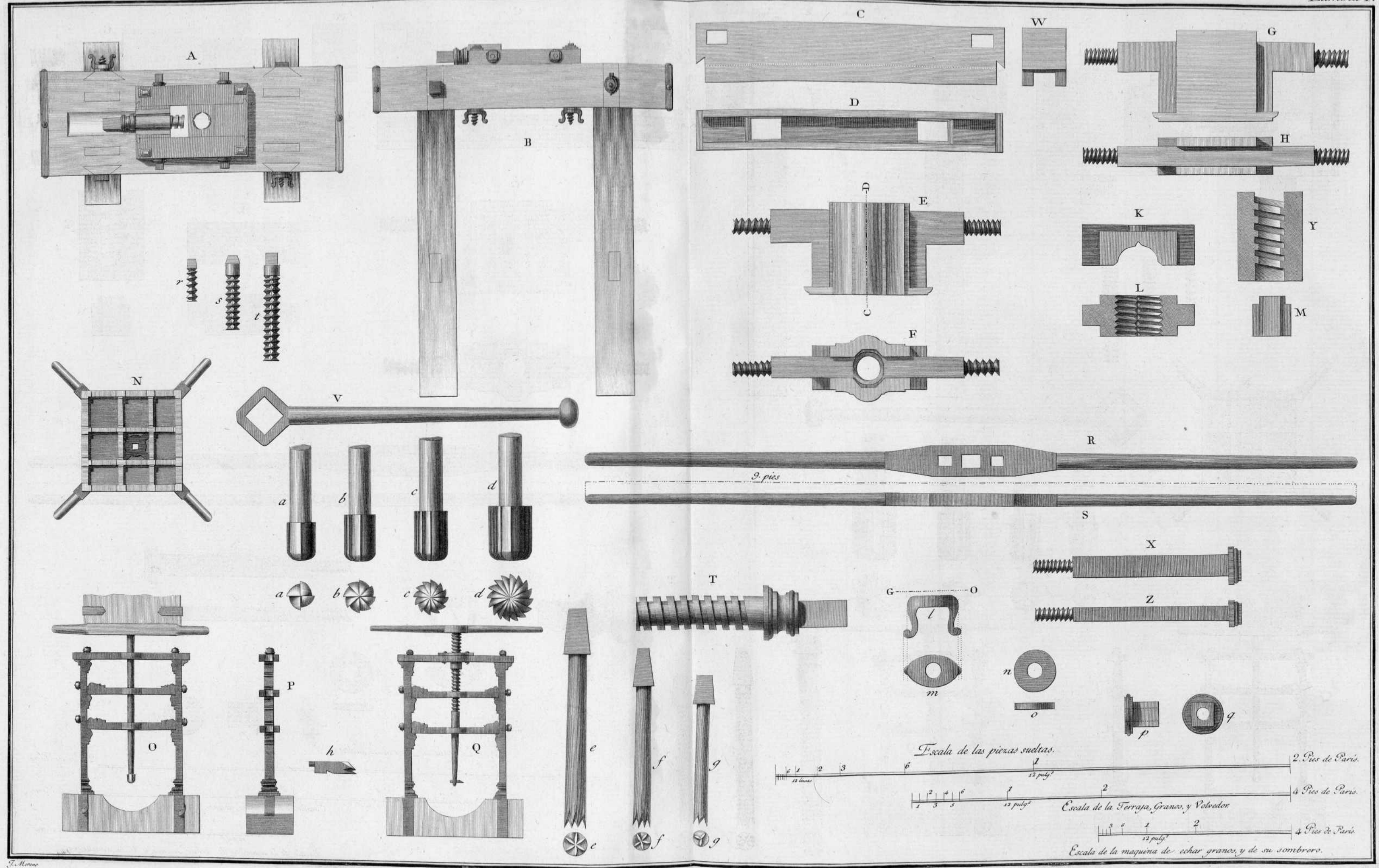


Fig. 3.







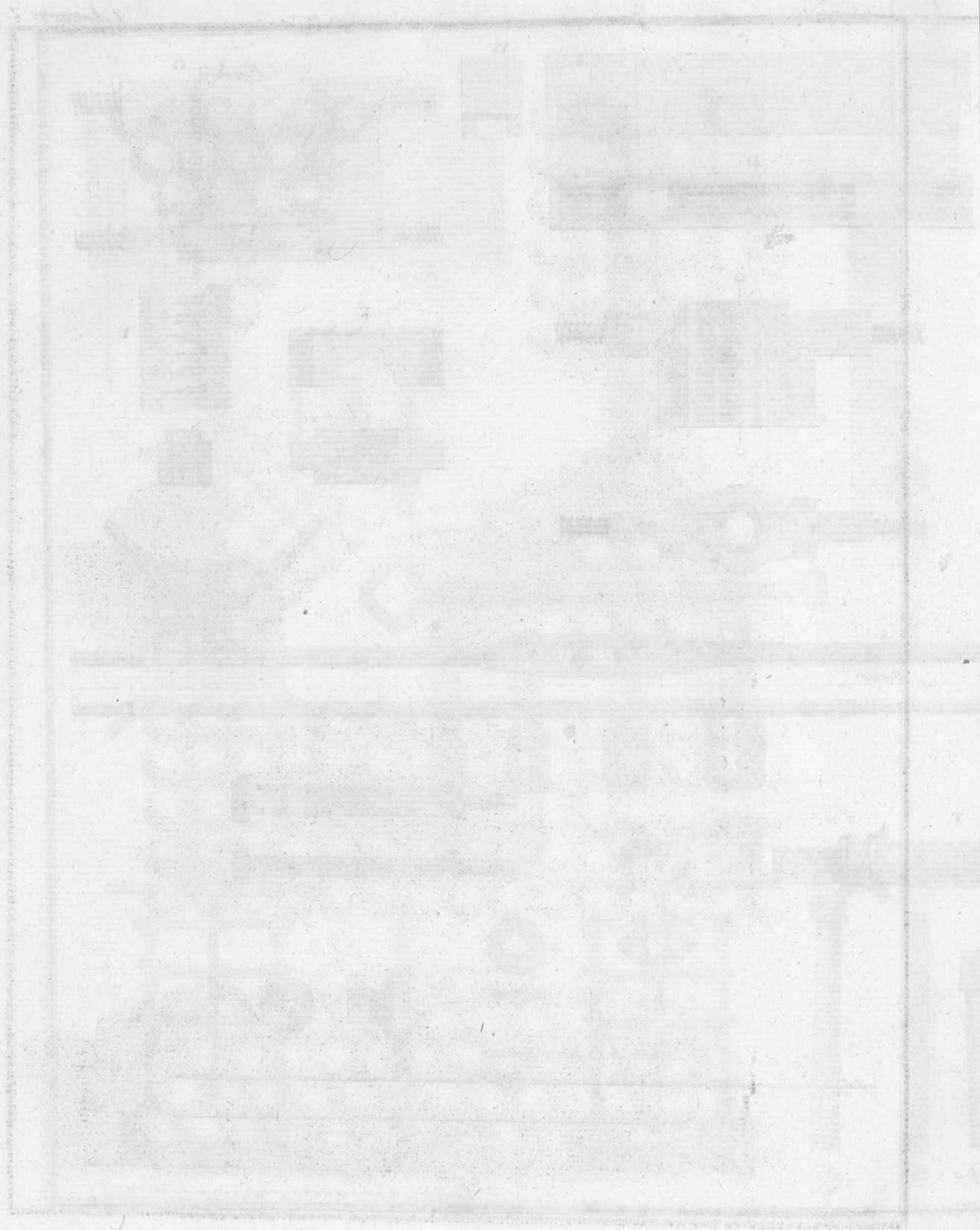


Fig. 1.

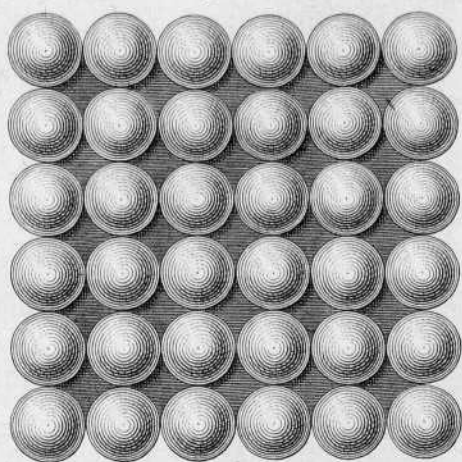


Fig. 3.

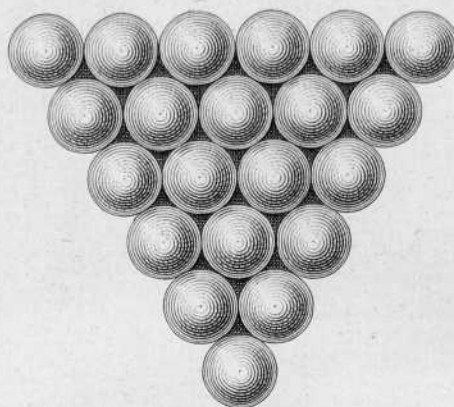


Fig. 2.

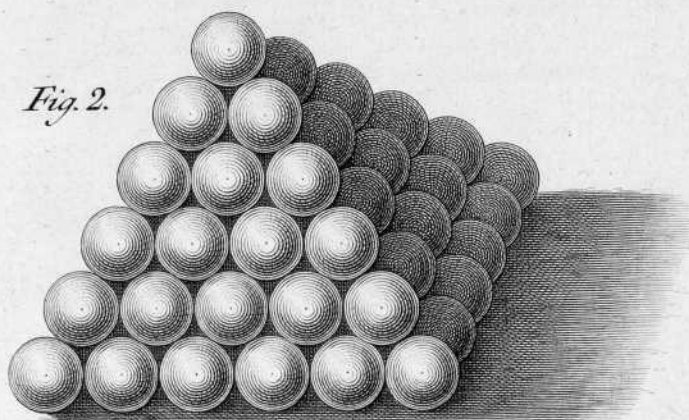


Fig. 4.

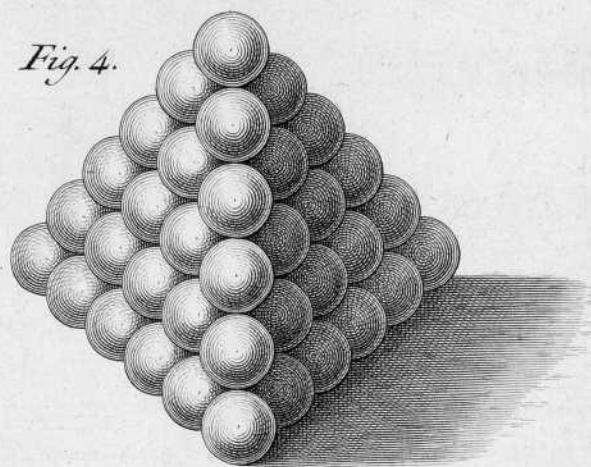


Fig. 5.

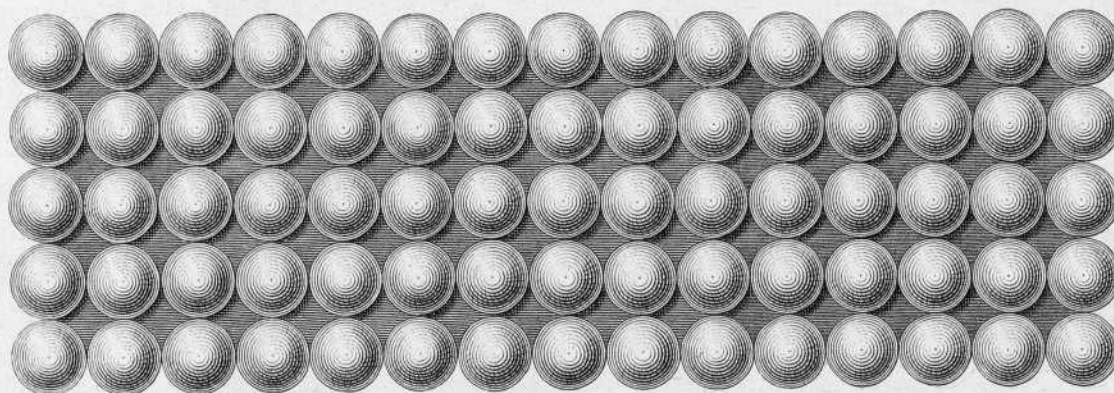
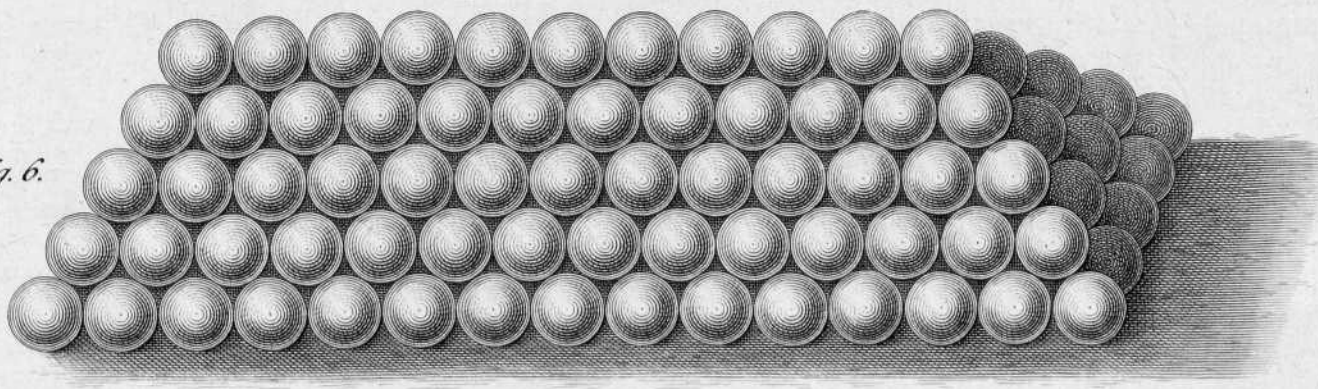
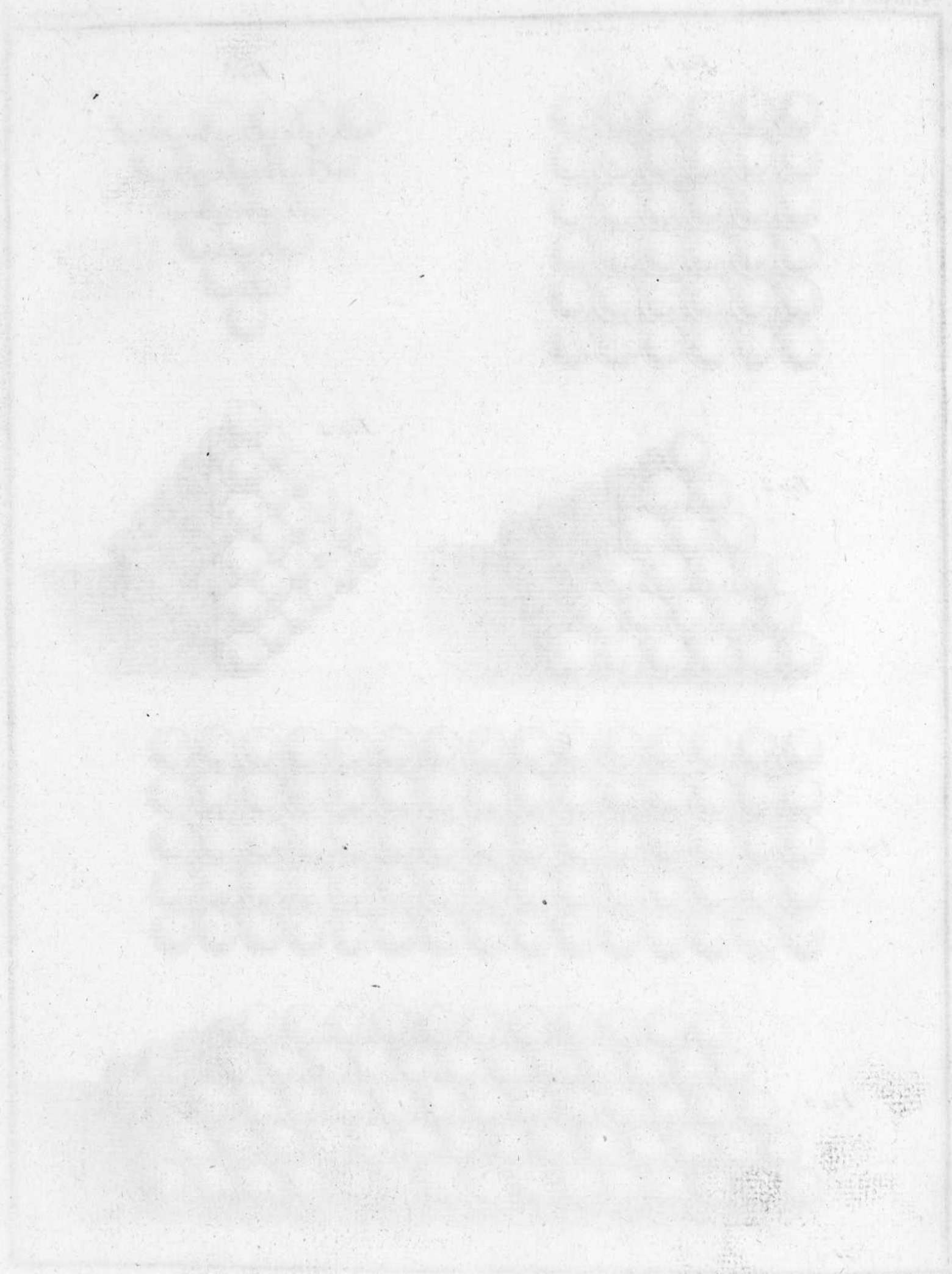
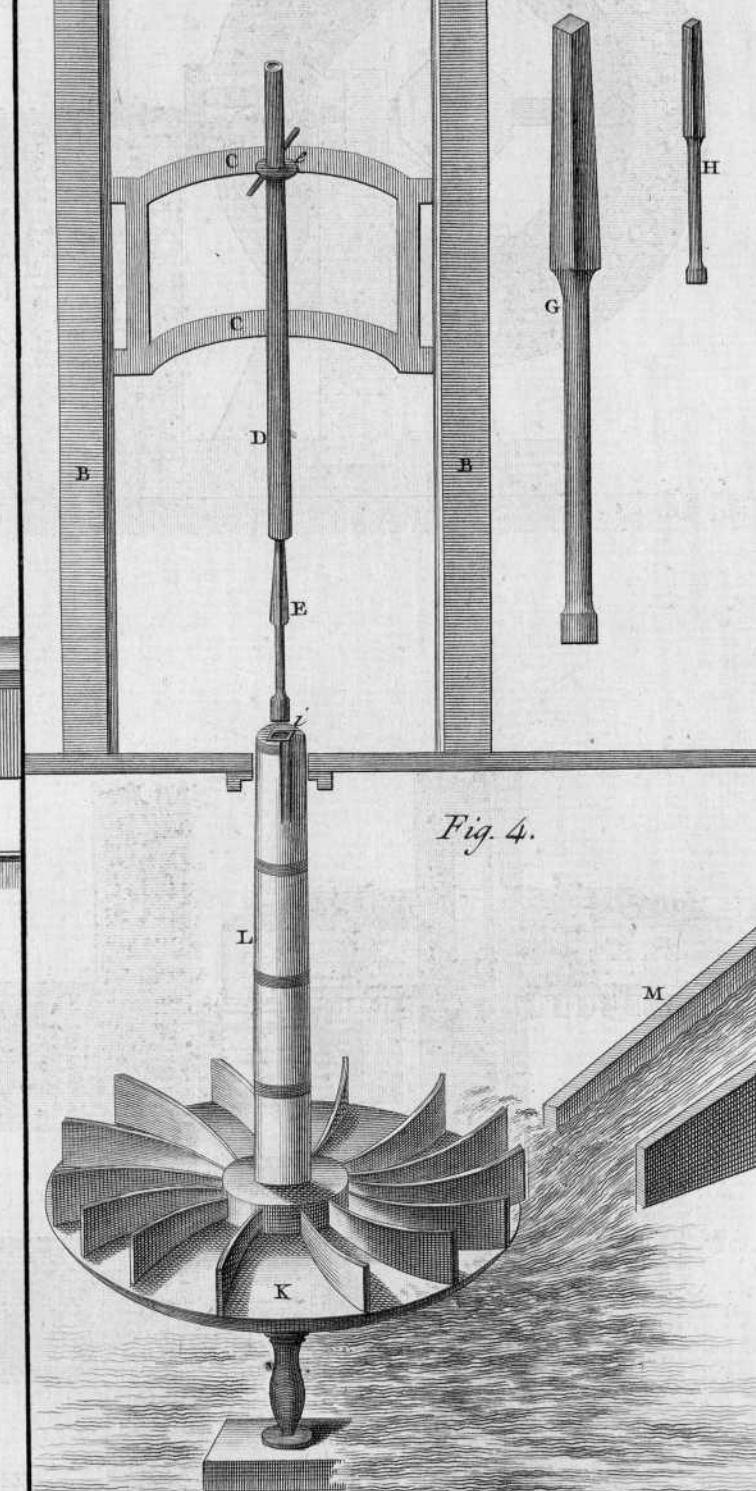
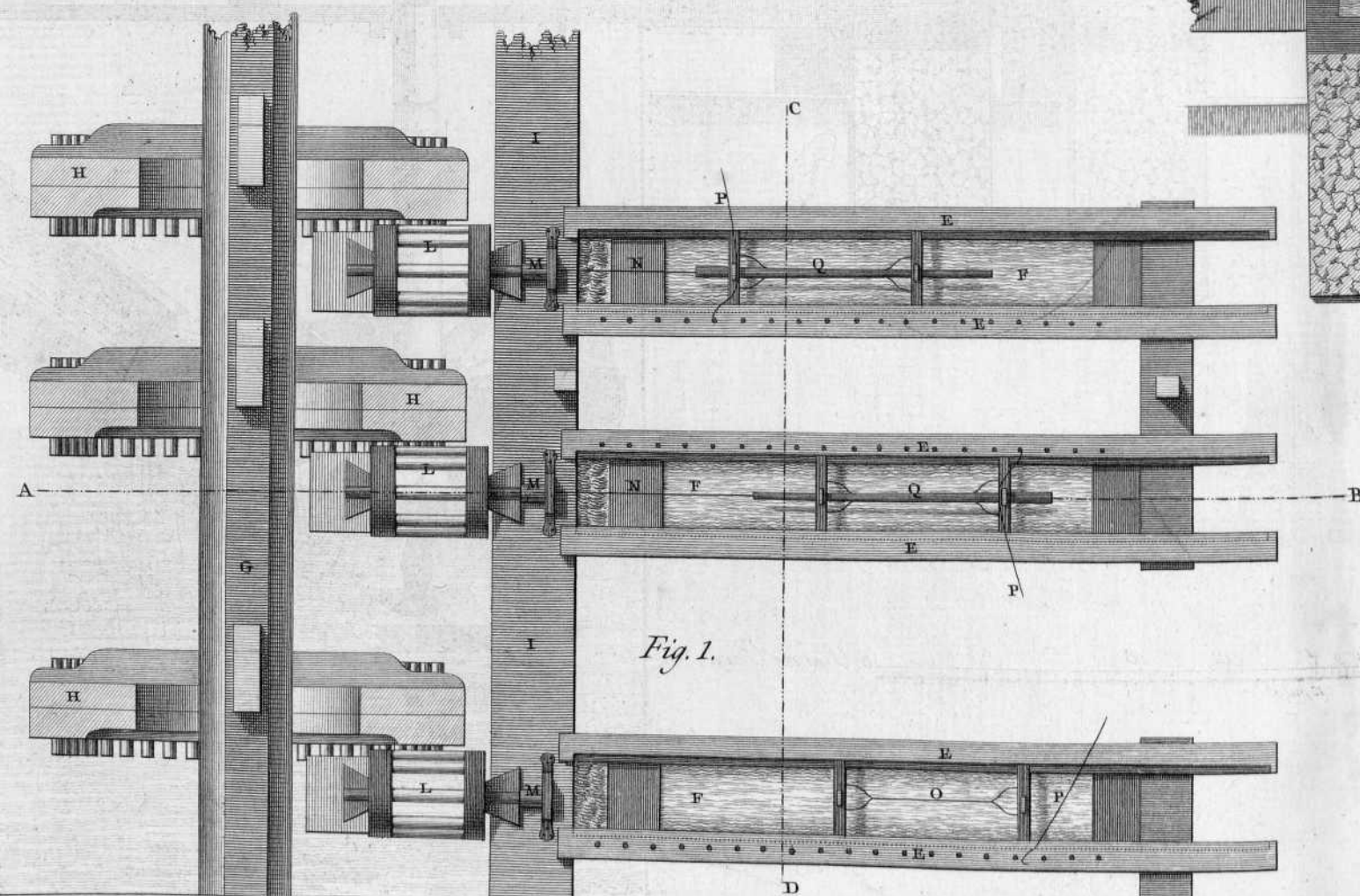
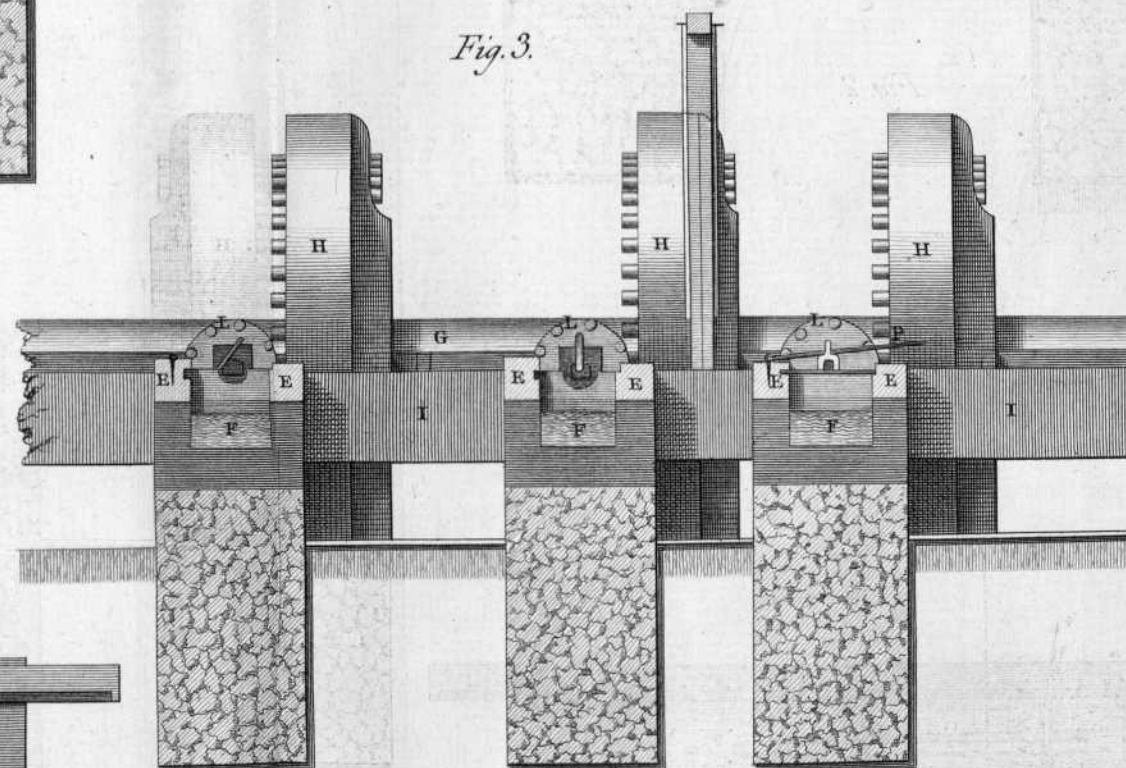
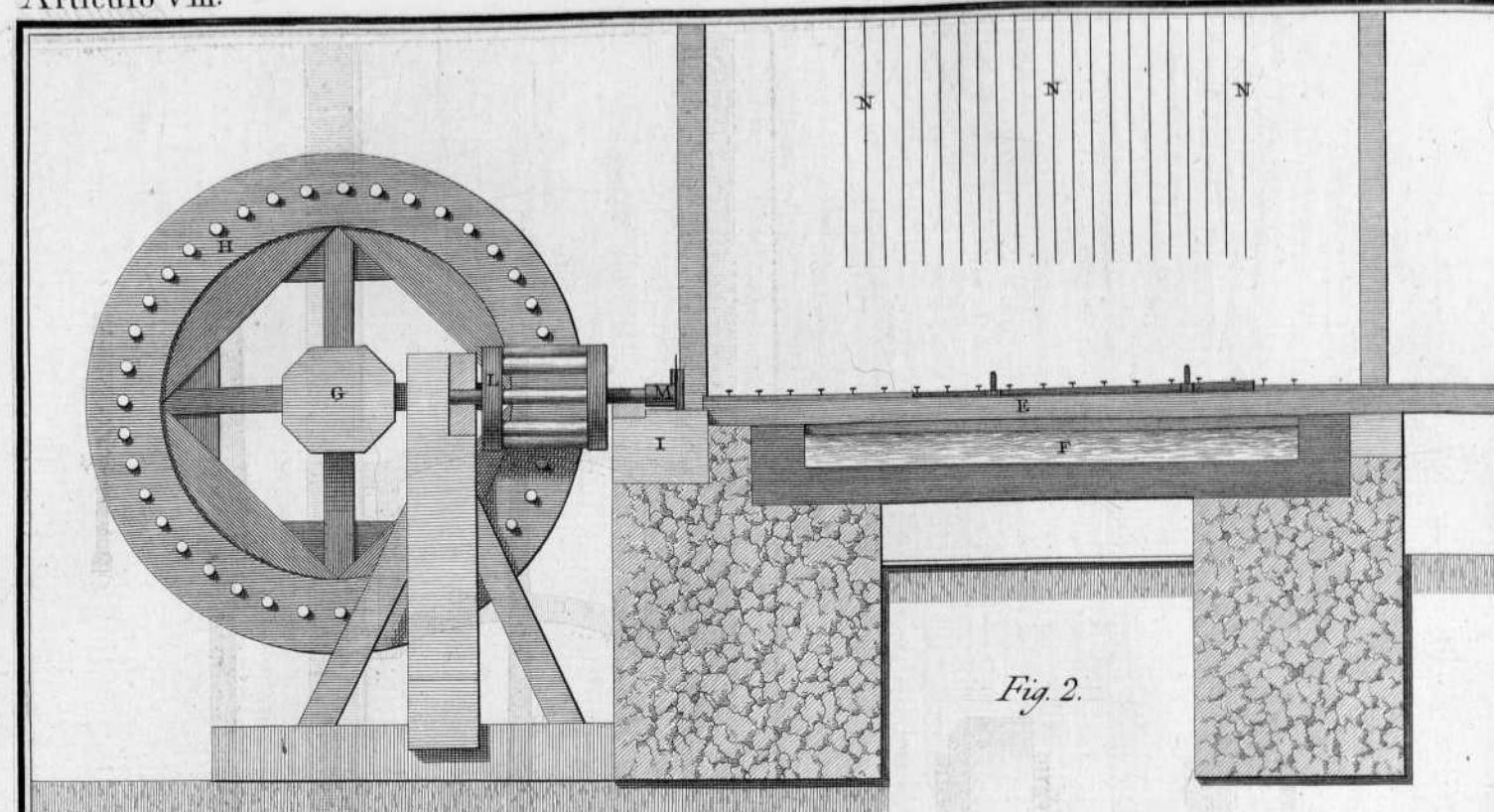


Fig. 6.

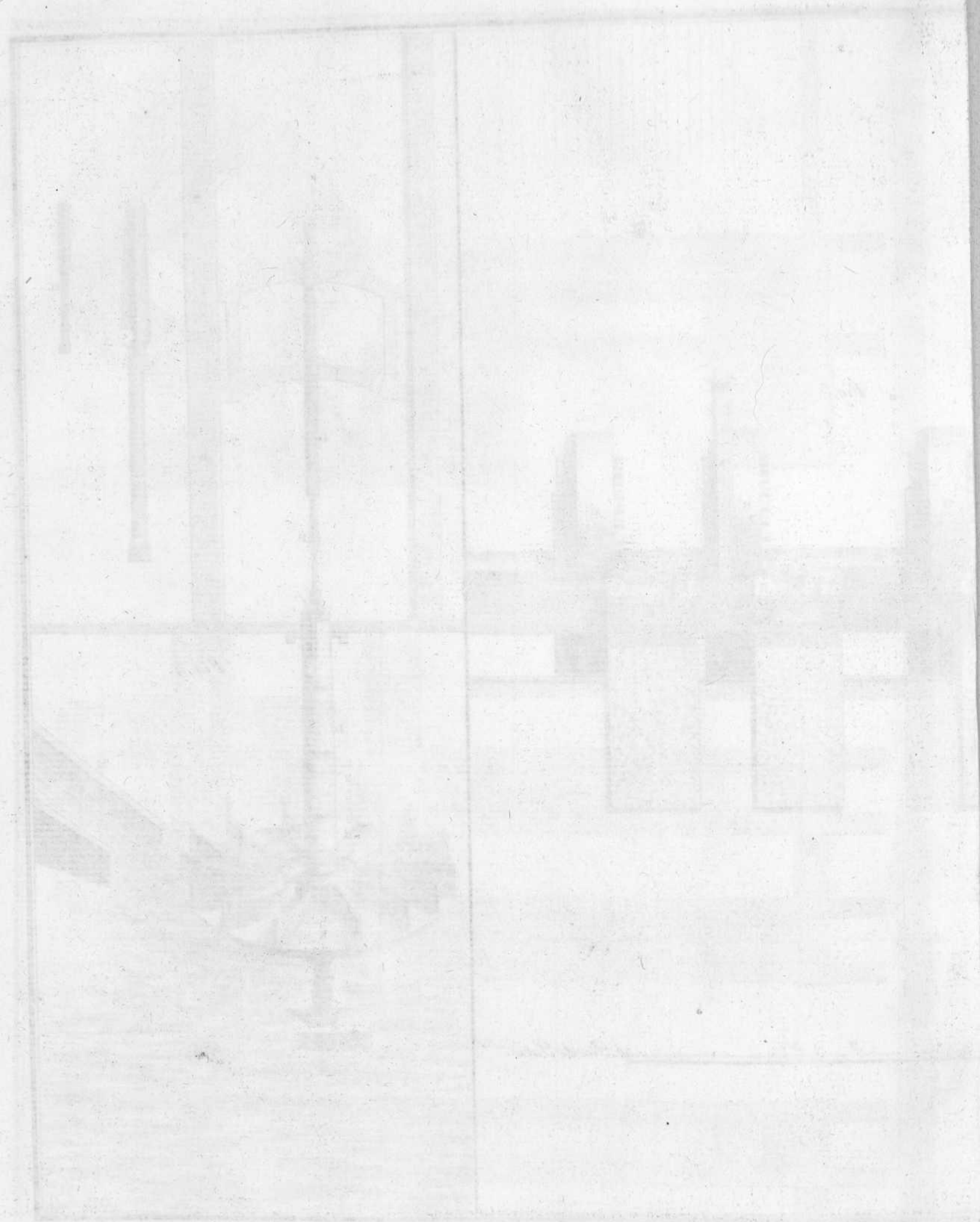


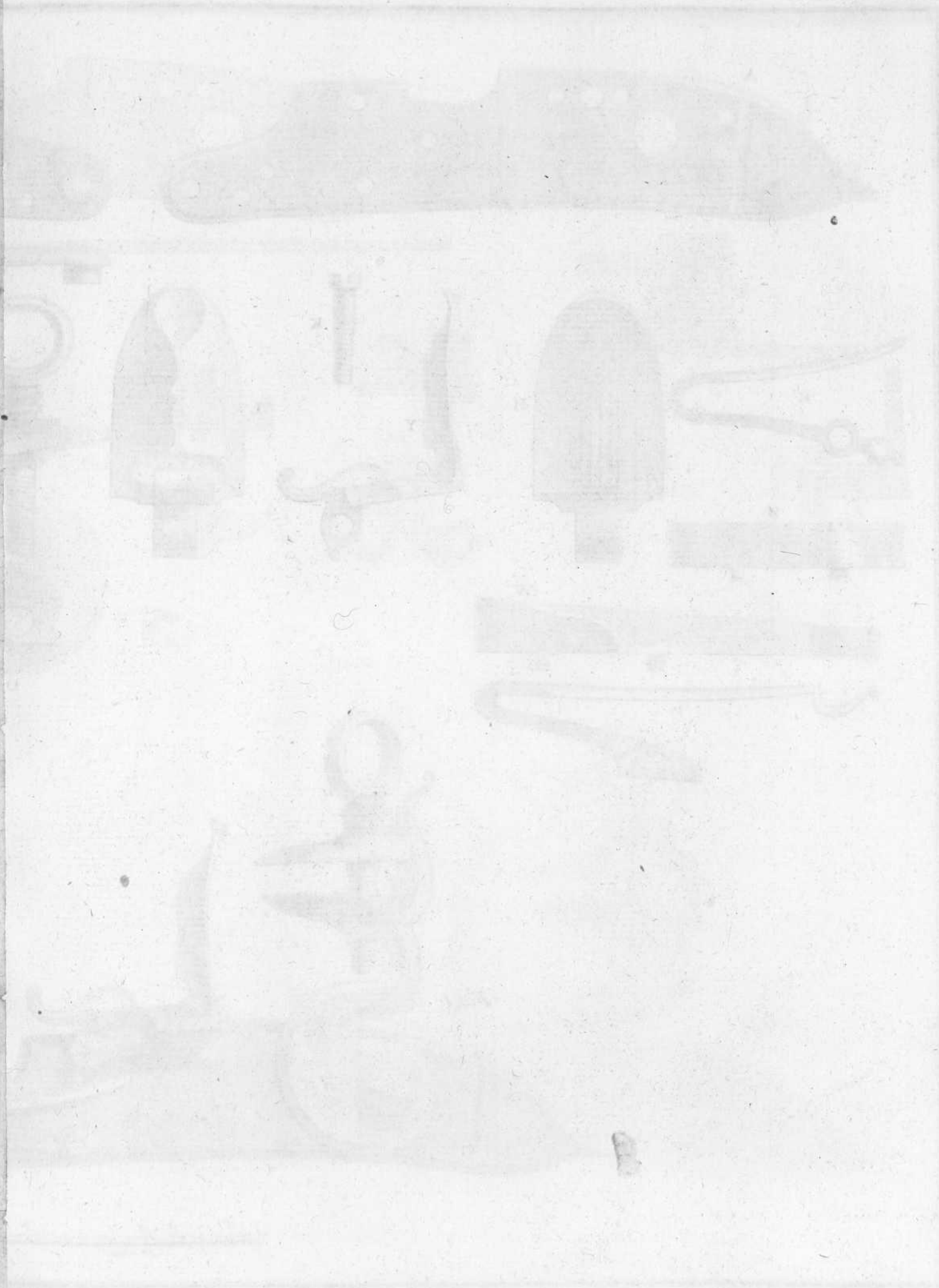


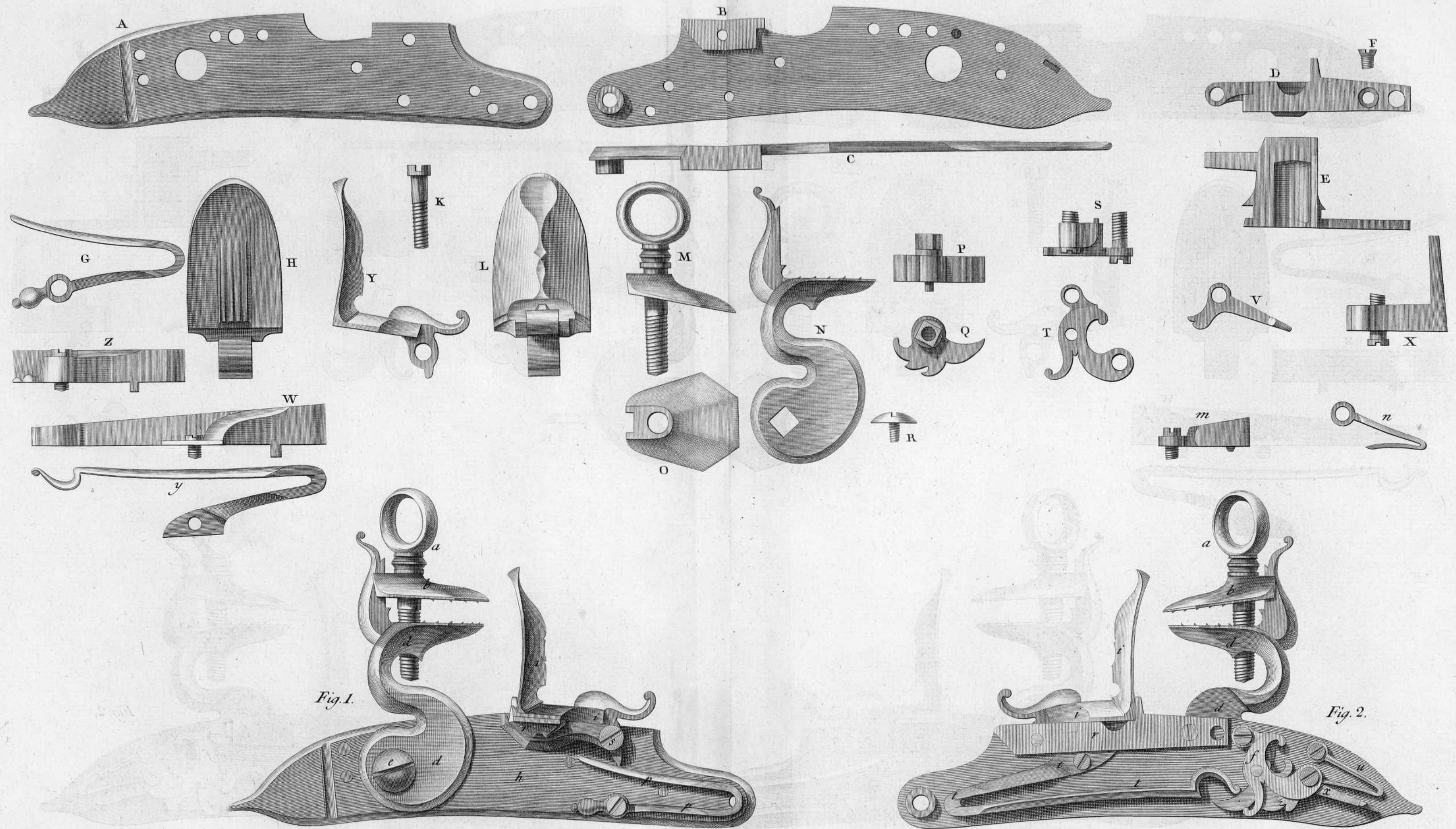


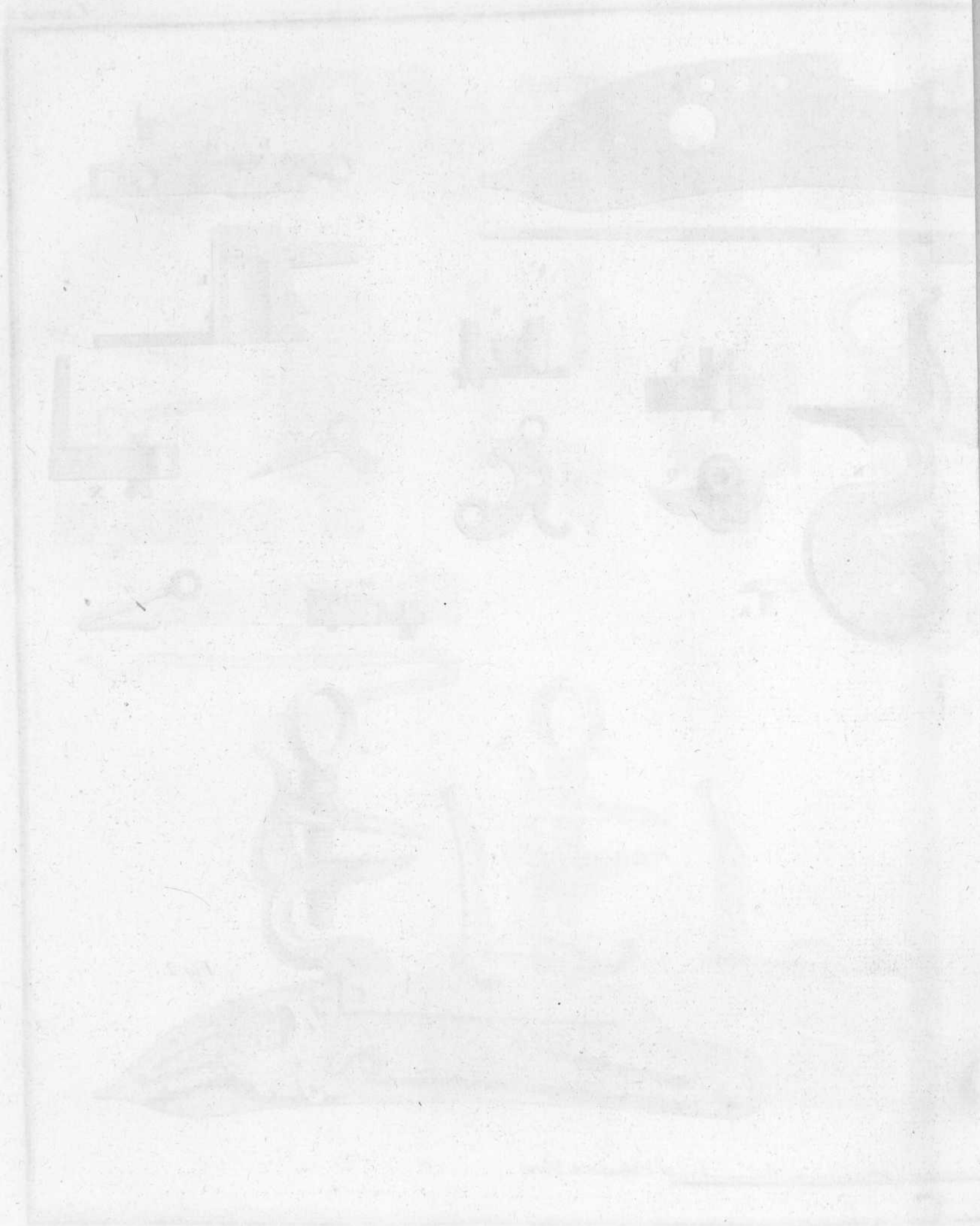


6. Pies de París.
12 pulg.











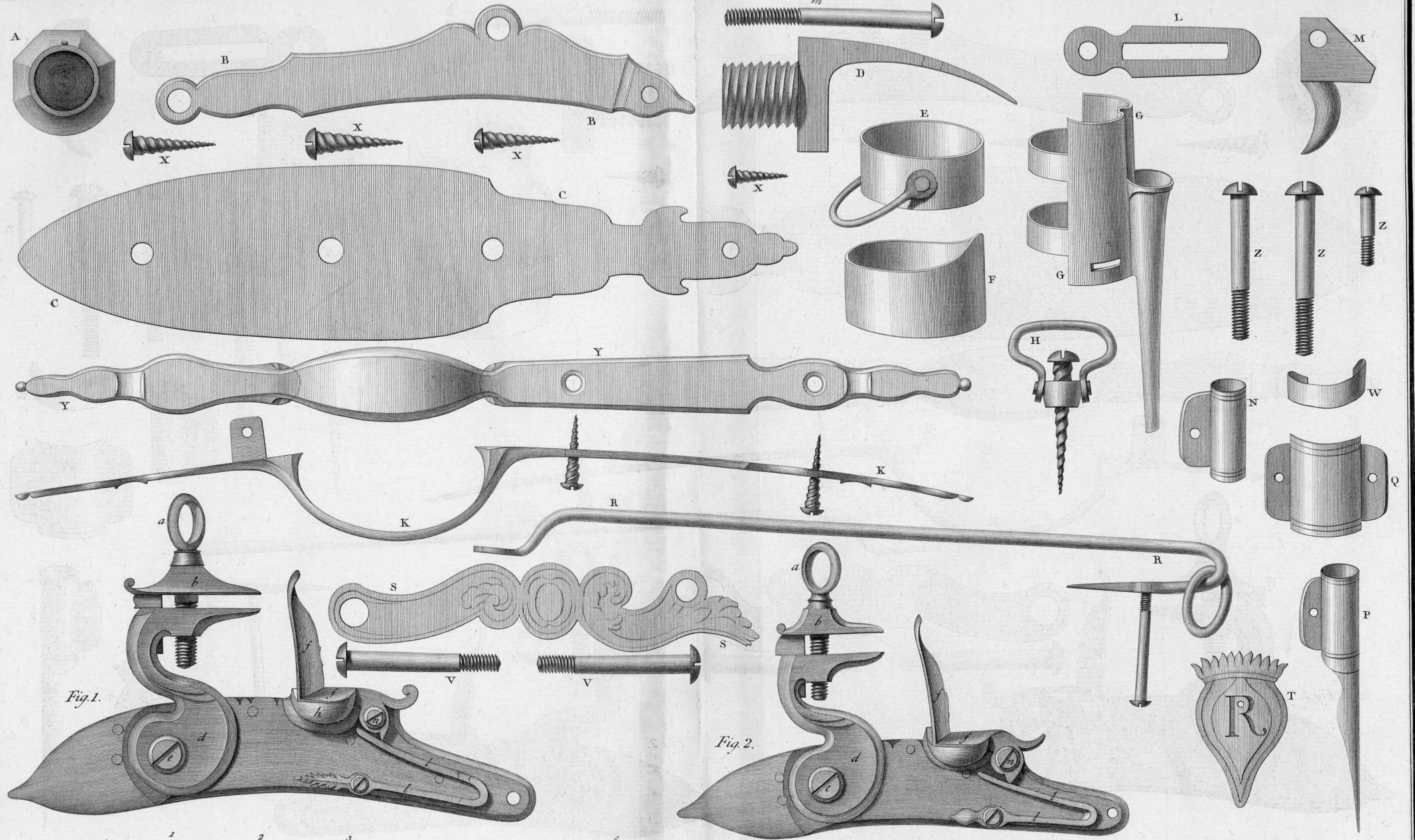


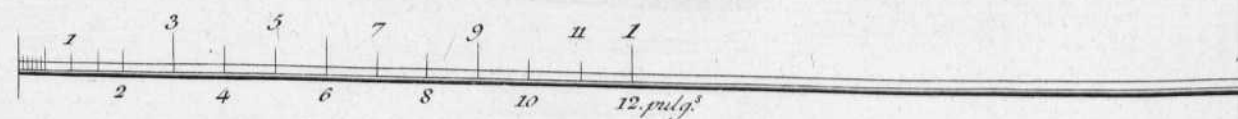
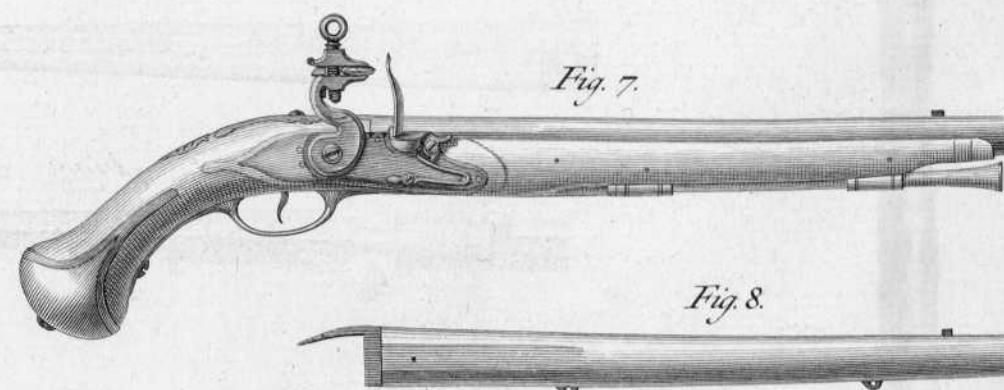
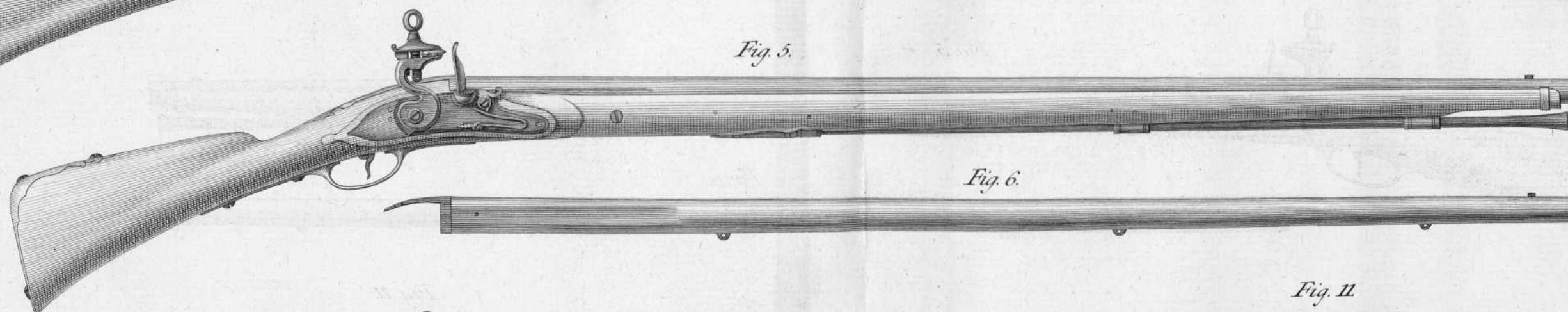
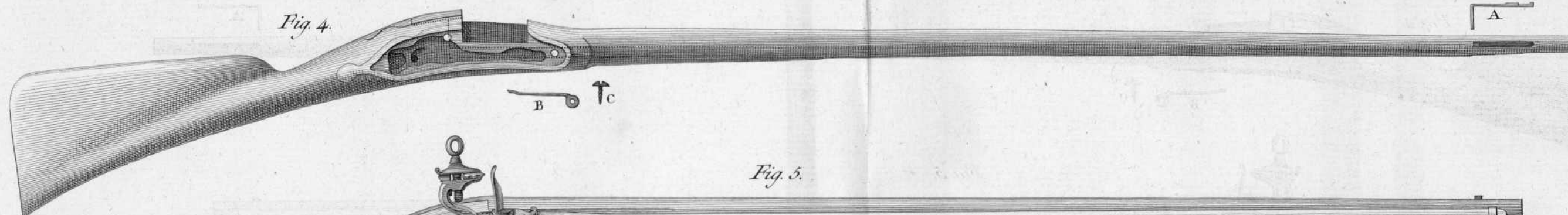
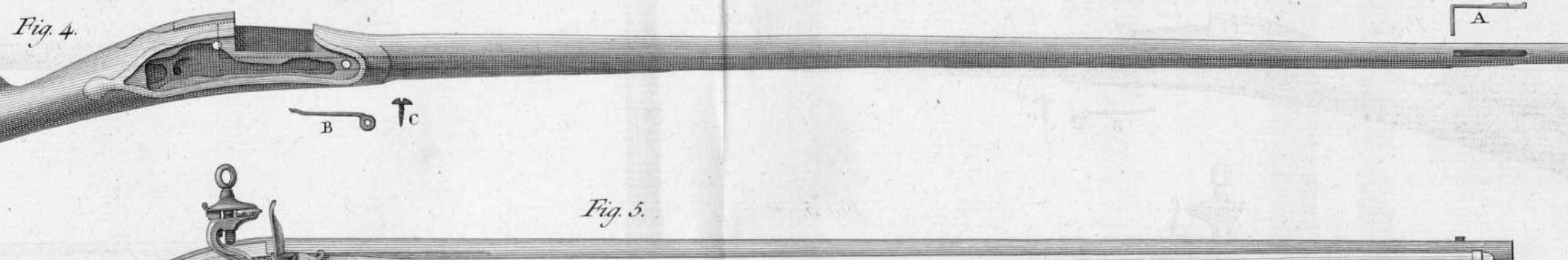
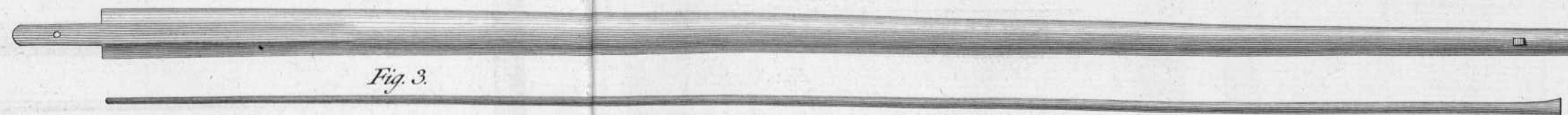
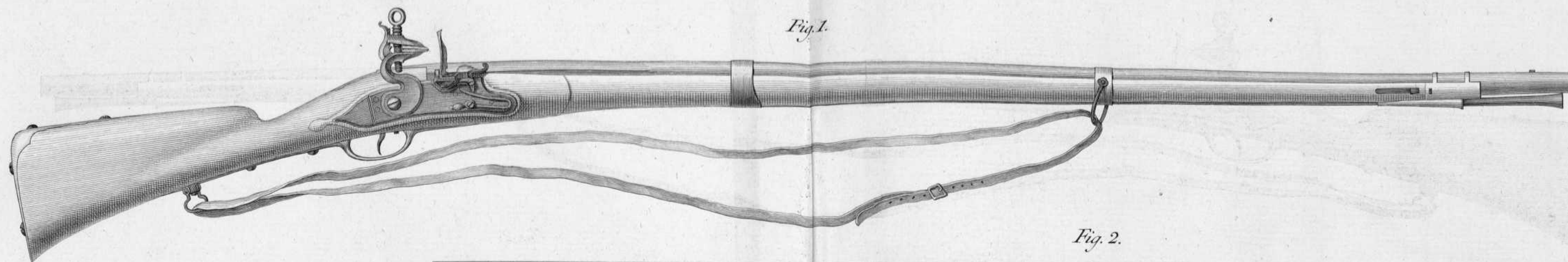
Fig. 1.

Fig. 2.

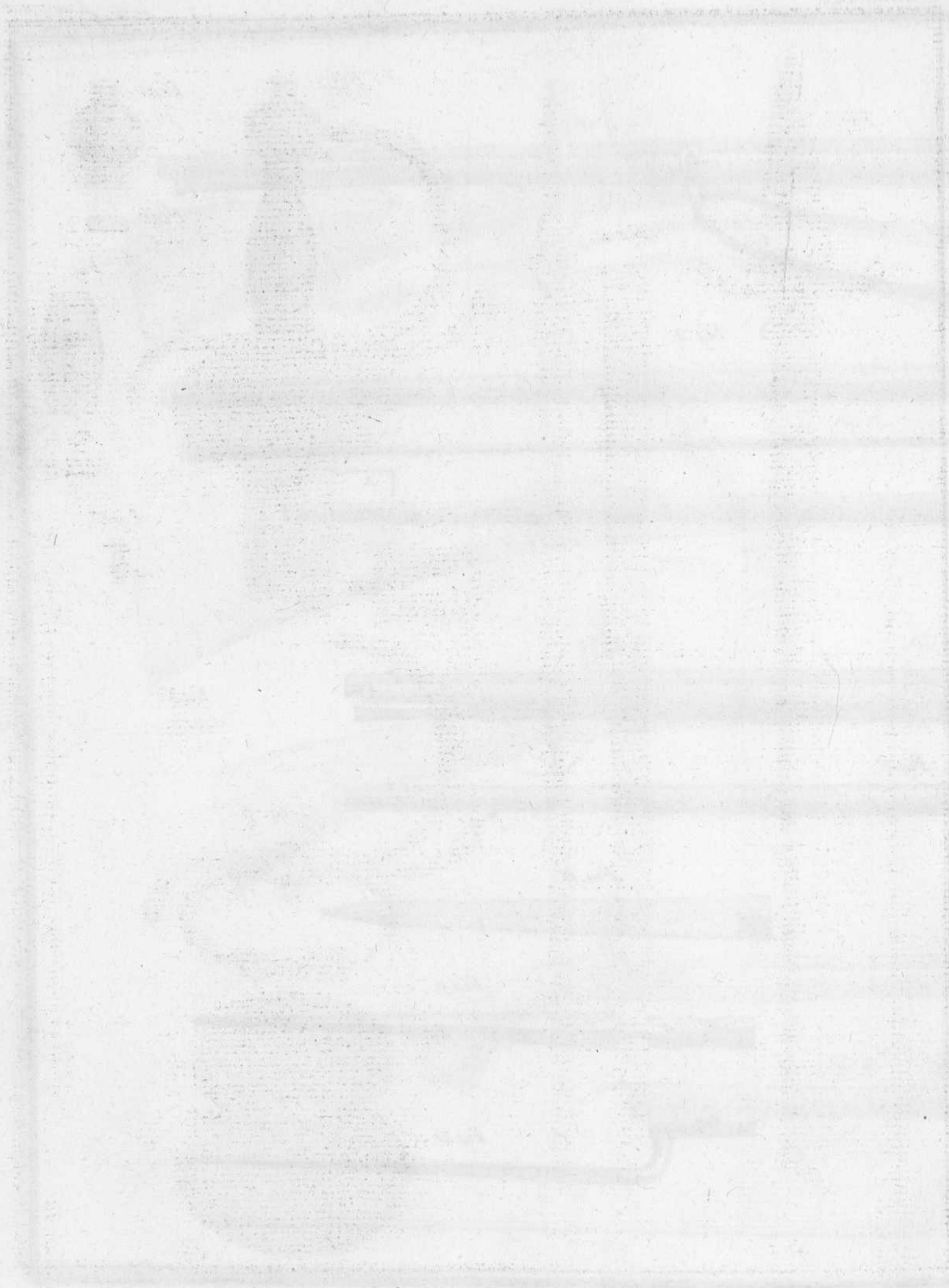
12 Pulgadas de pie de París.

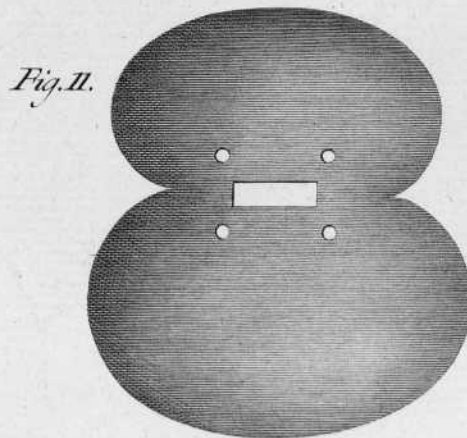
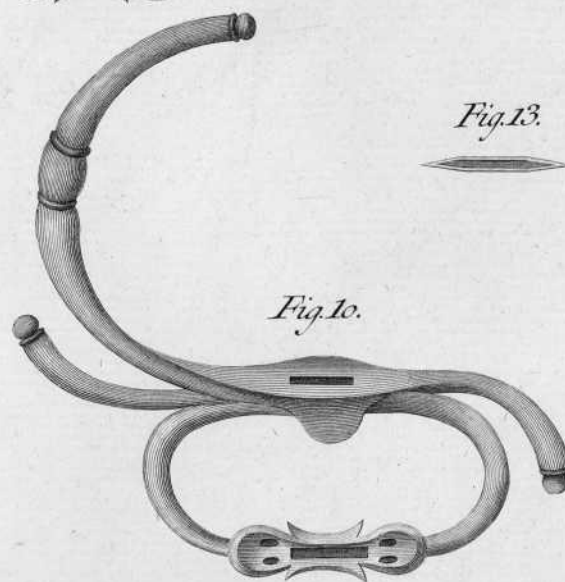
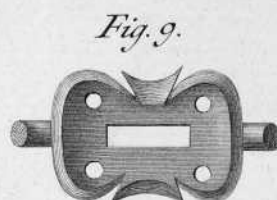
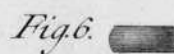
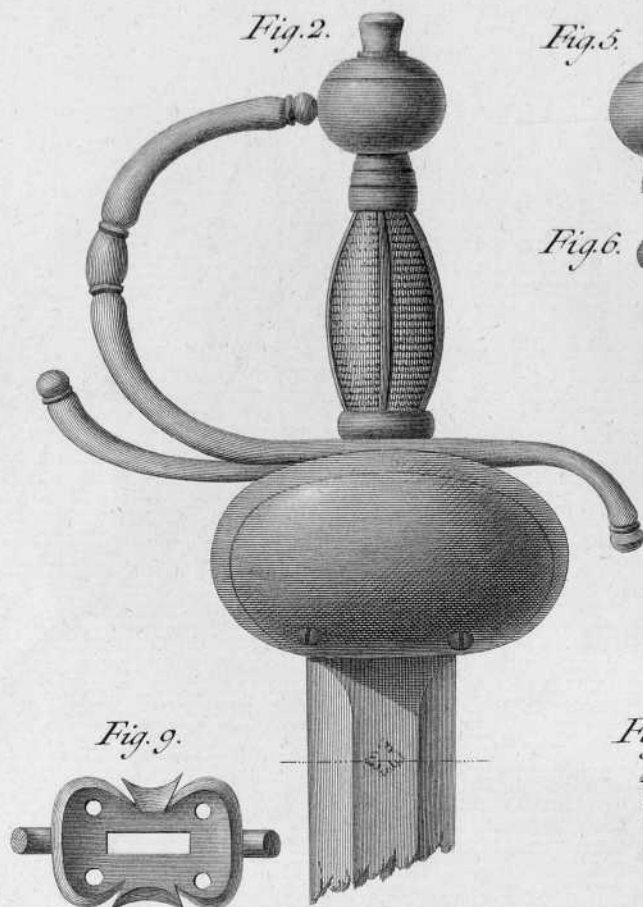
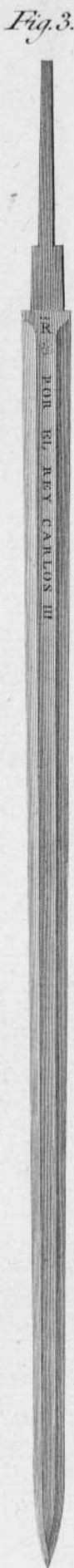
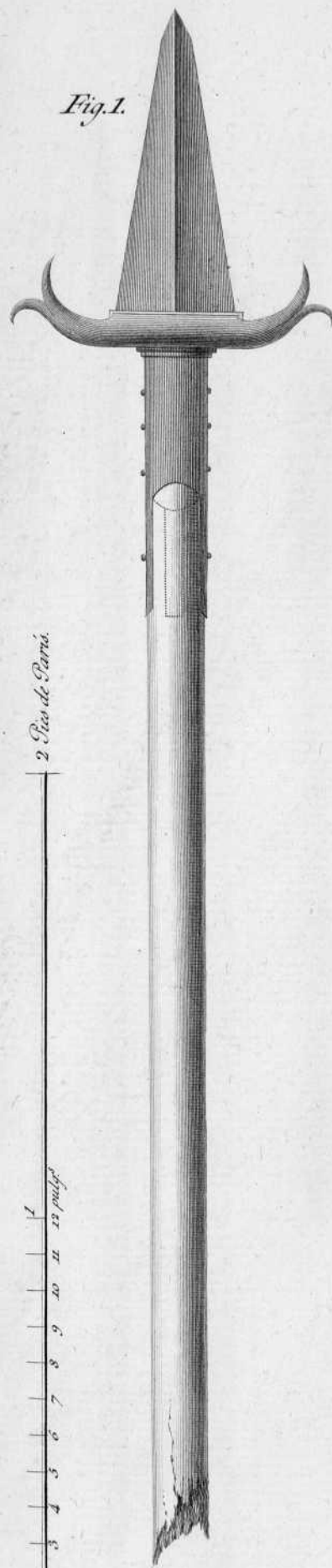






2. Pies de Paris.





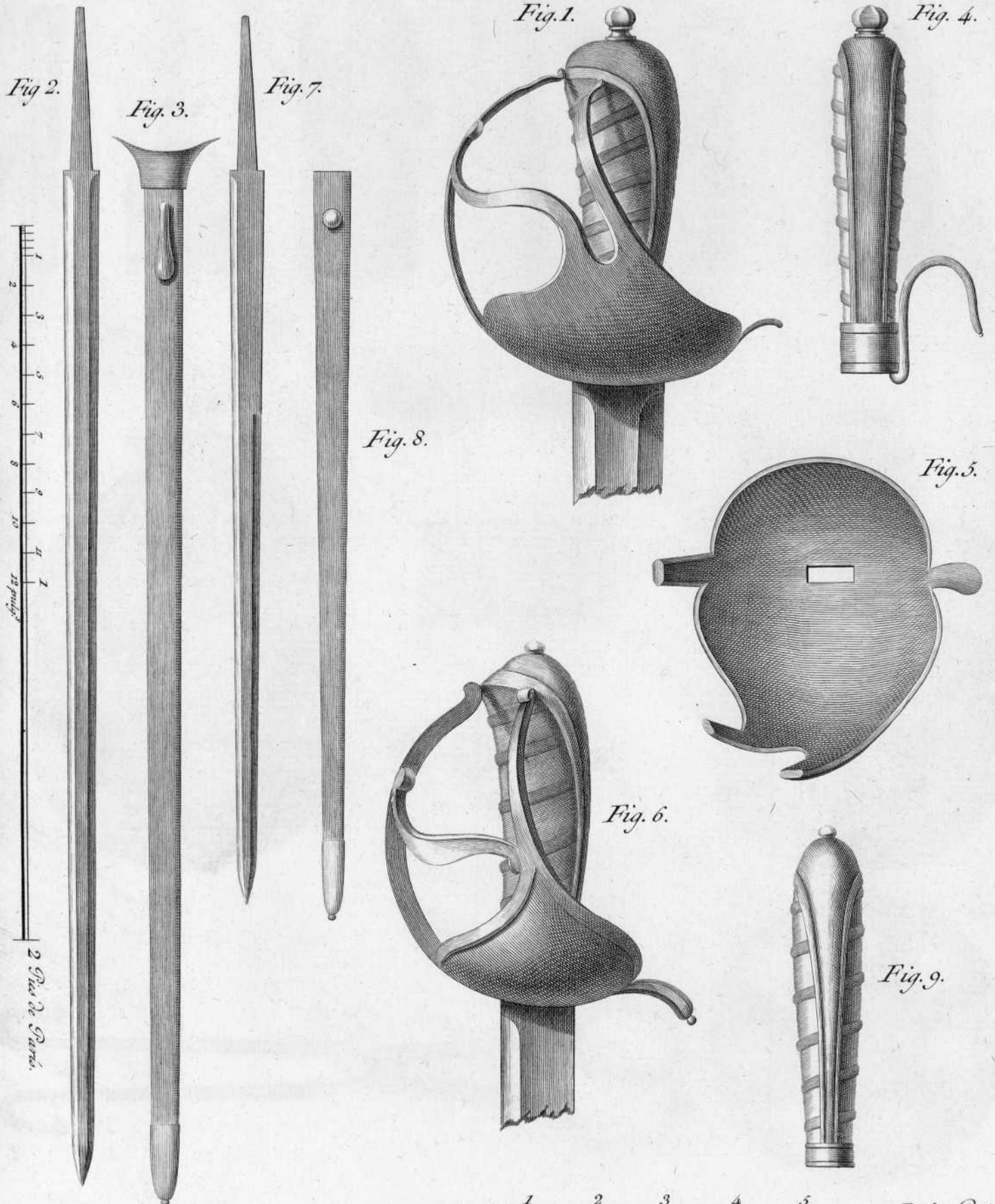




Fig. 1.

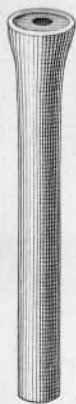


Fig. 2.

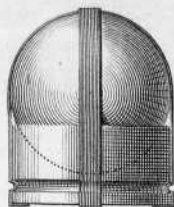


Fig. 3.

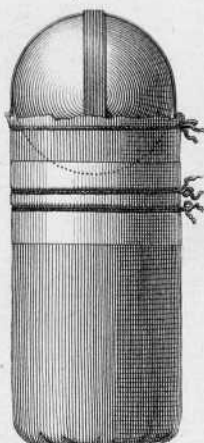


Fig. 4.

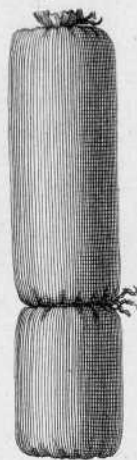


Fig. 5.



Fig. 6.

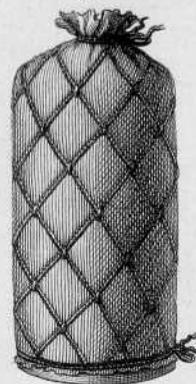


Fig. 7.

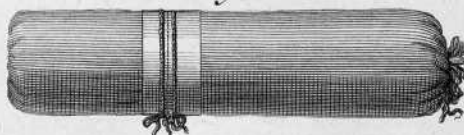


Fig. 8.



Fig. 9.

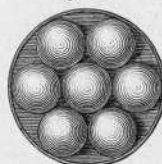


Fig. 11.

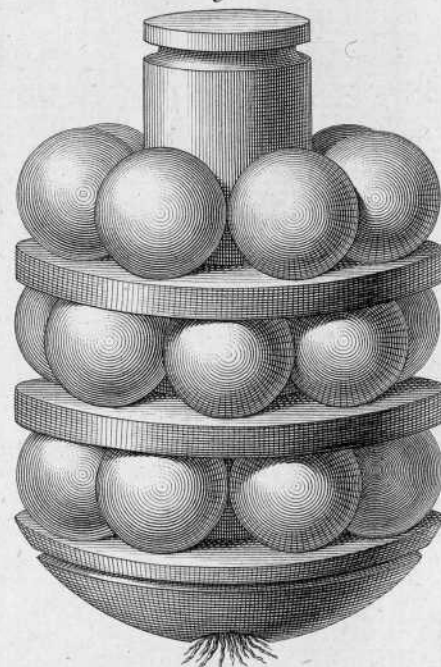


Fig. 10.

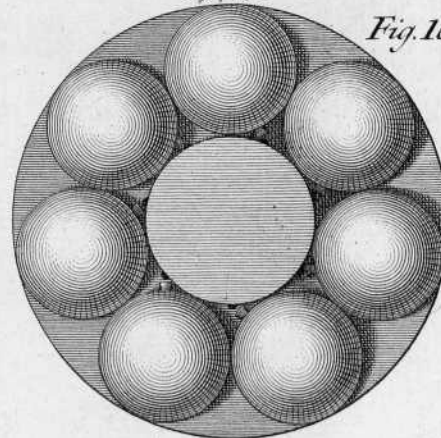
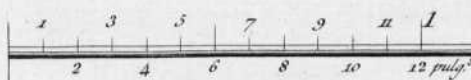
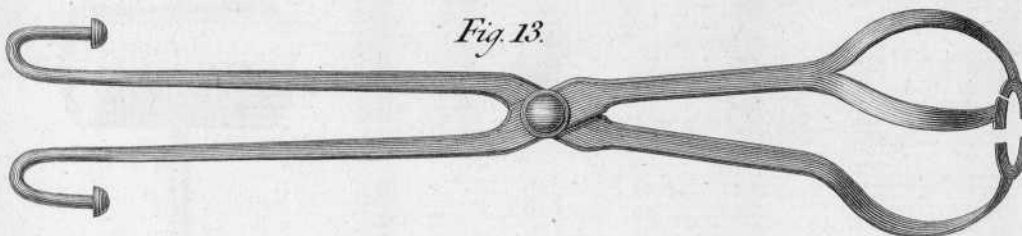
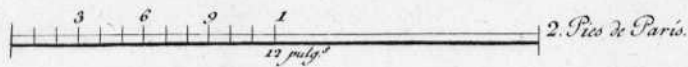
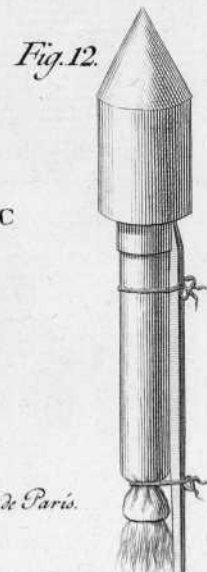
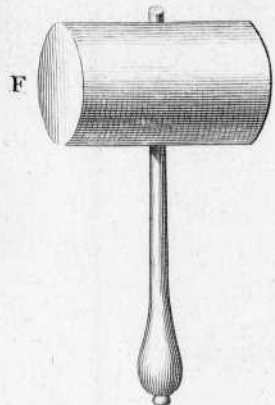
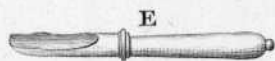
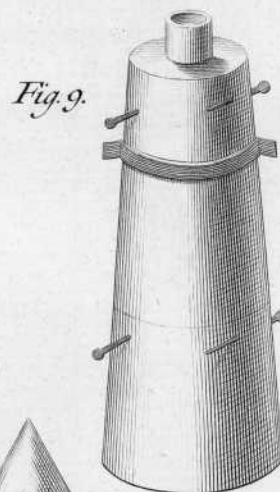
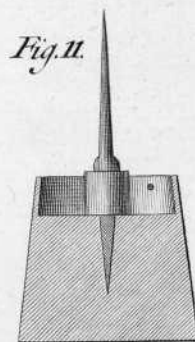
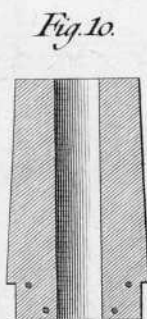
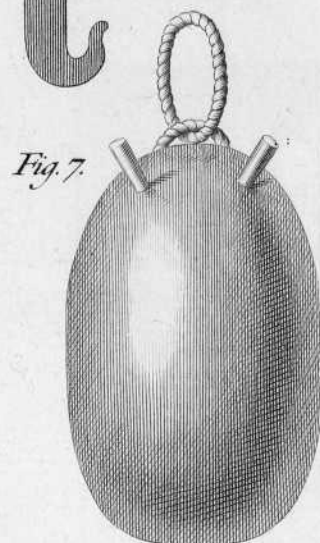
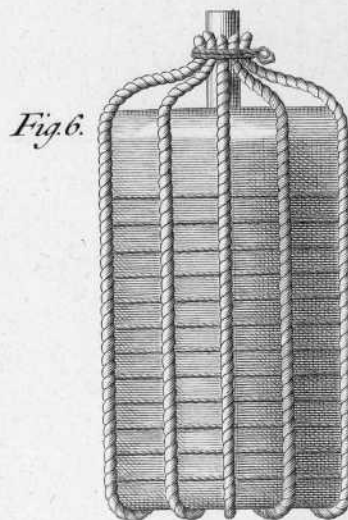
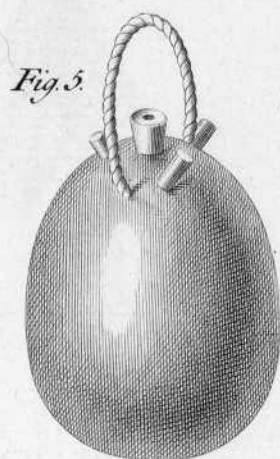
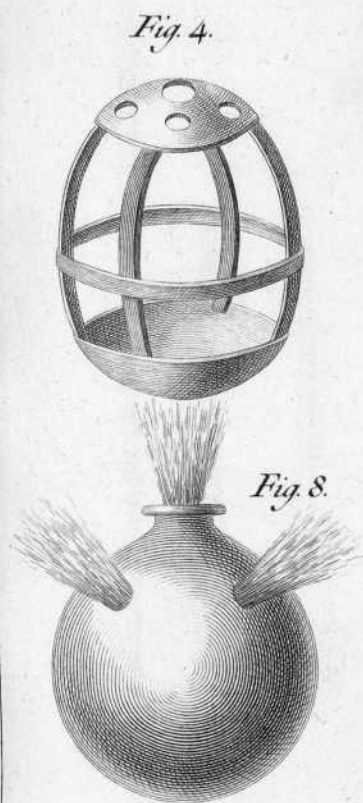
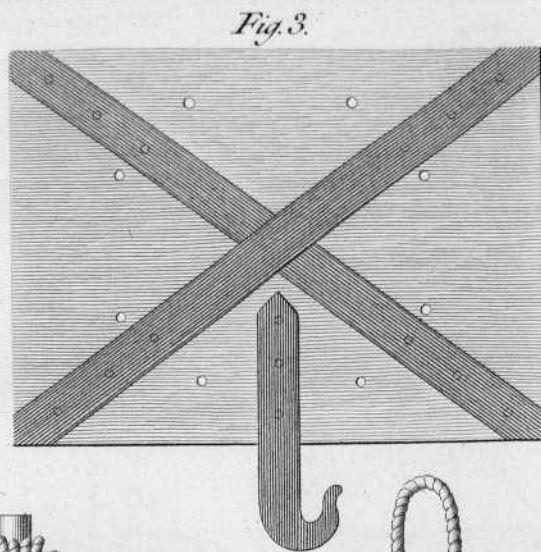
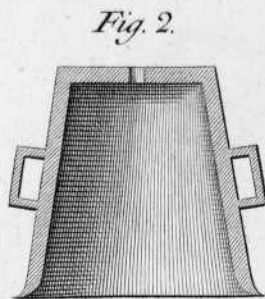
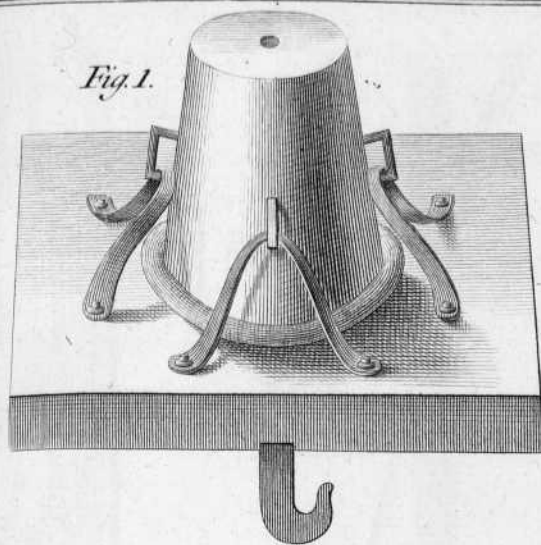


Fig. 13.



2 Pies
de Paris.





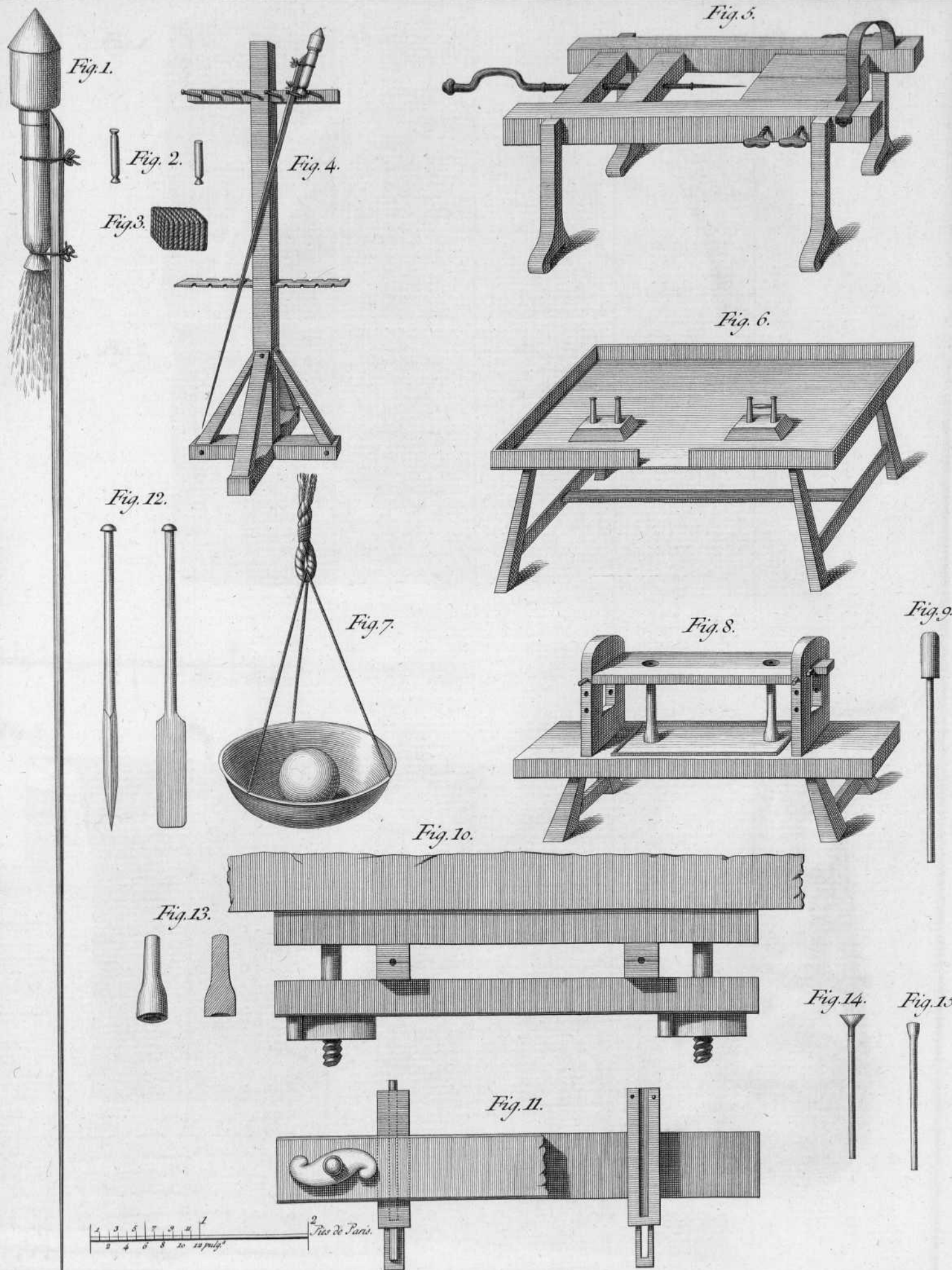


Fig. 1.

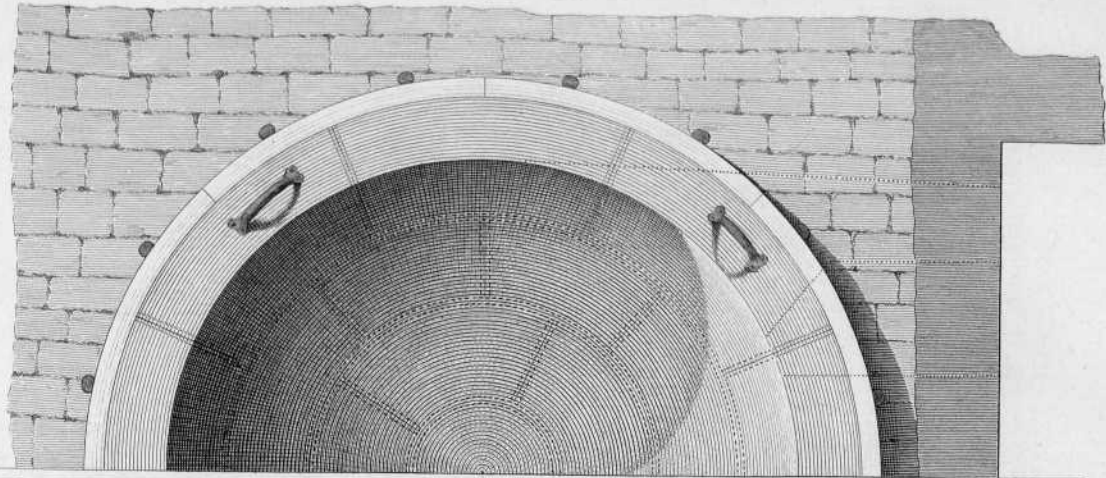


Fig. 2.

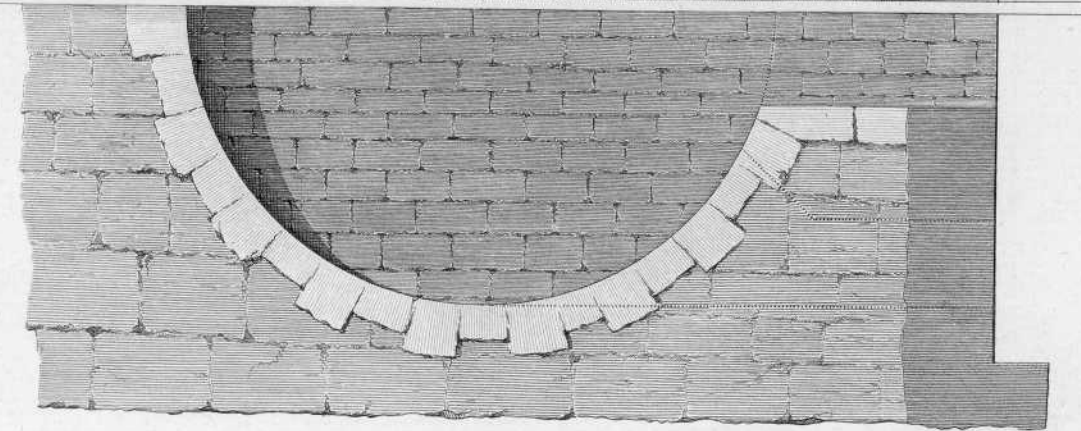


Fig. 3.

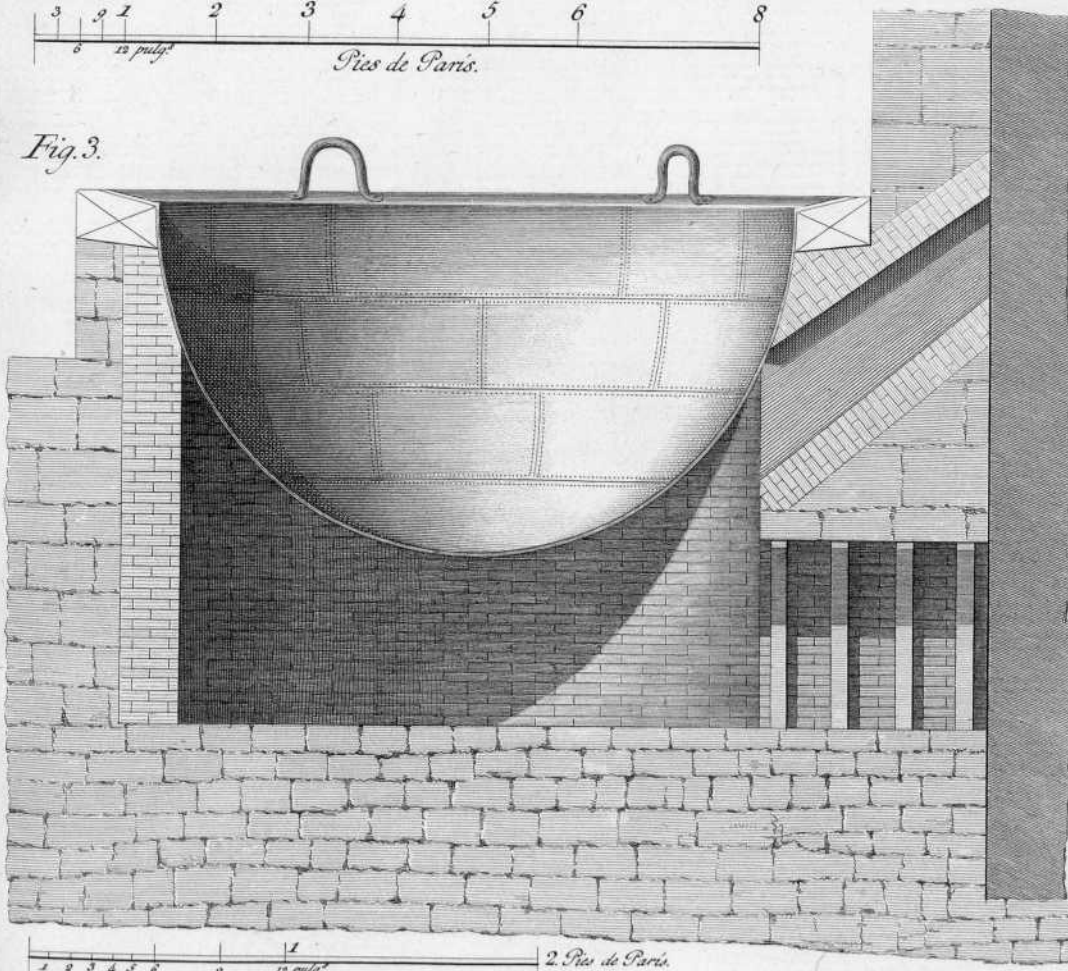
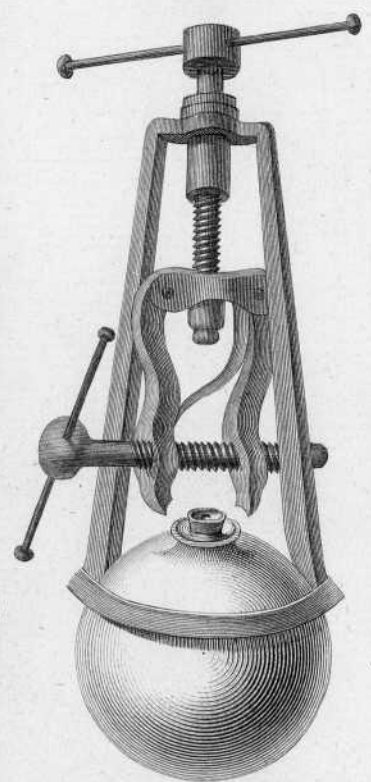
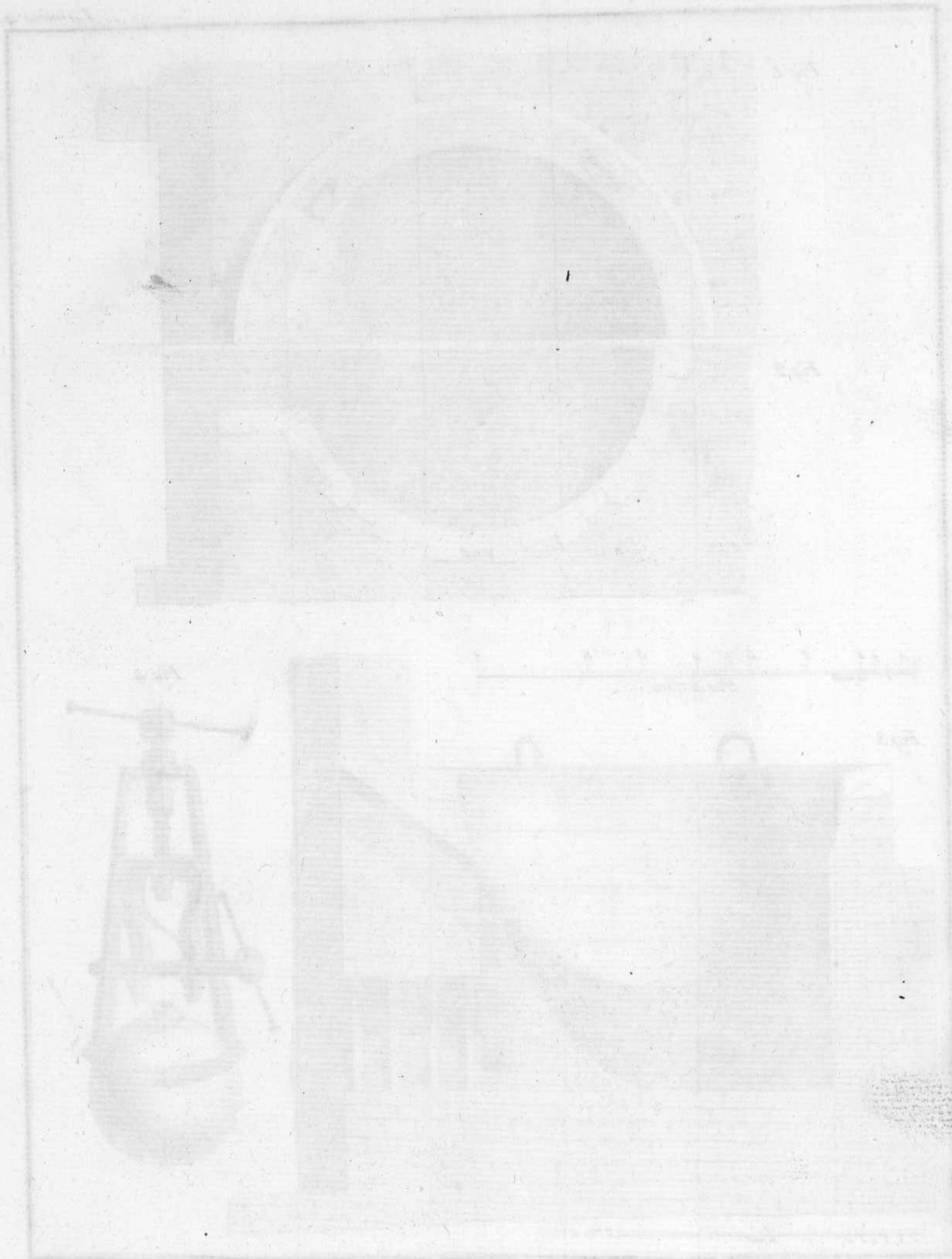


Fig. 4.





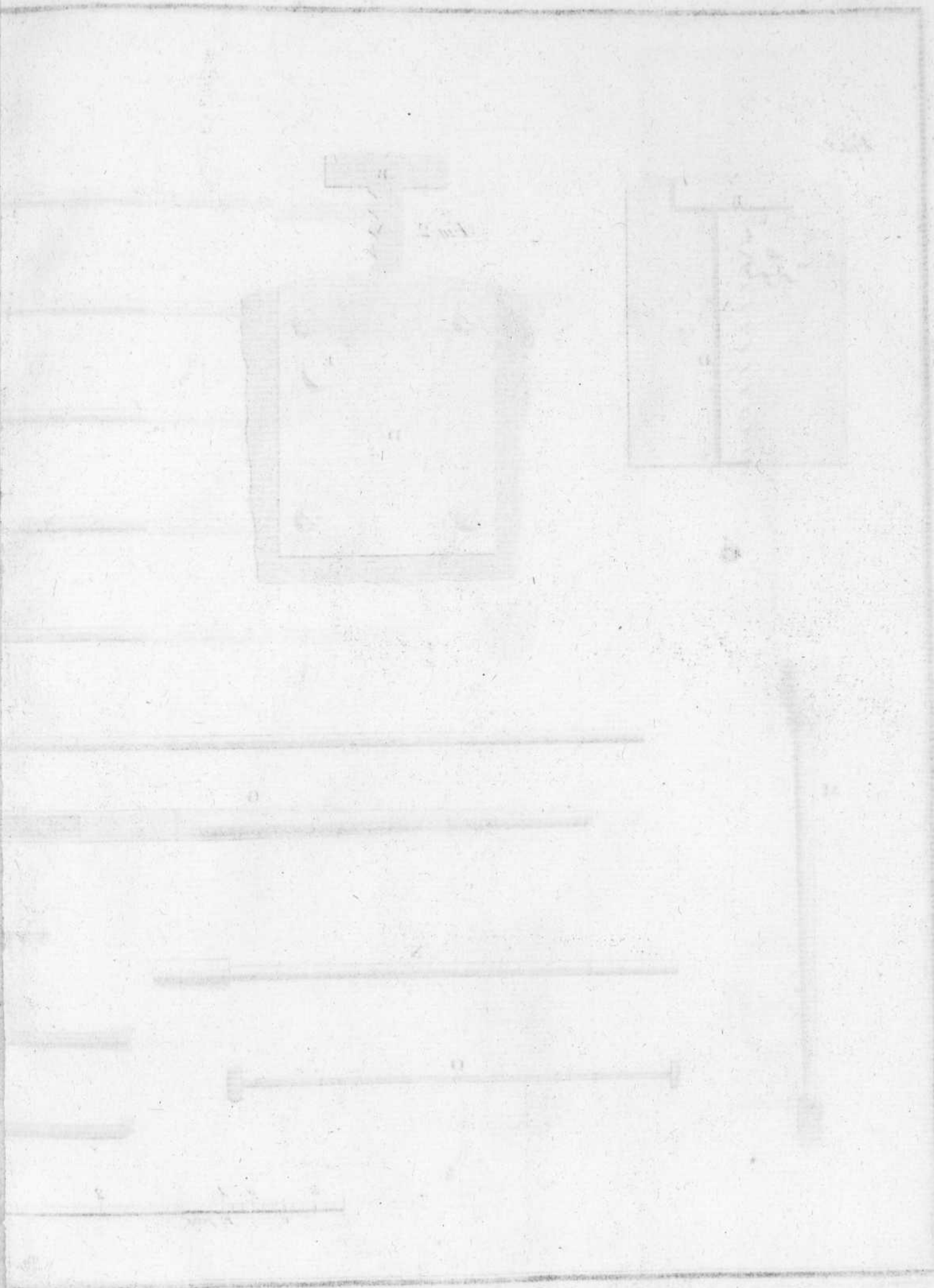


Fig. 1.

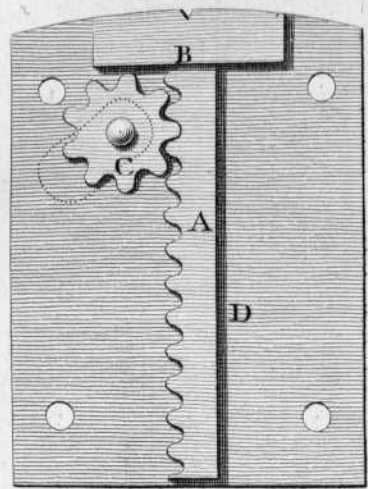
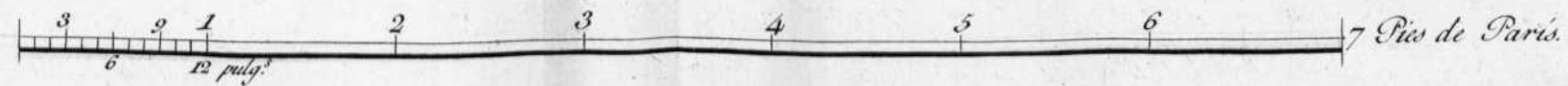
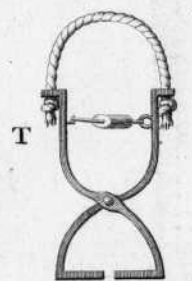
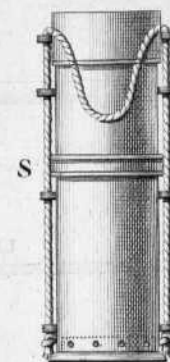
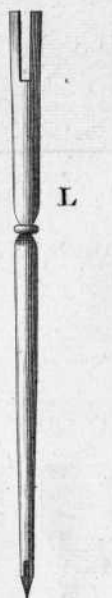
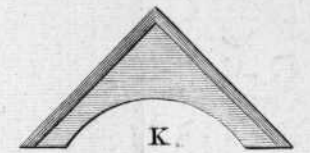
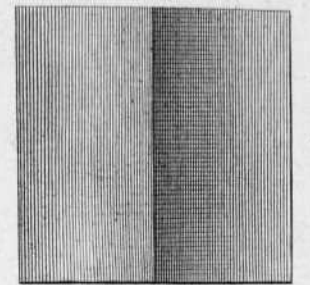
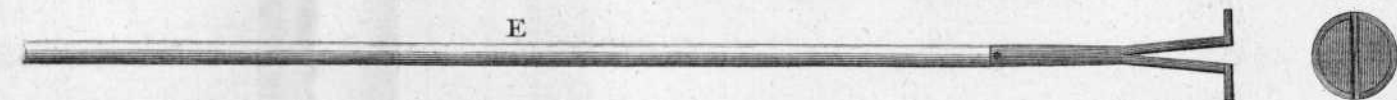
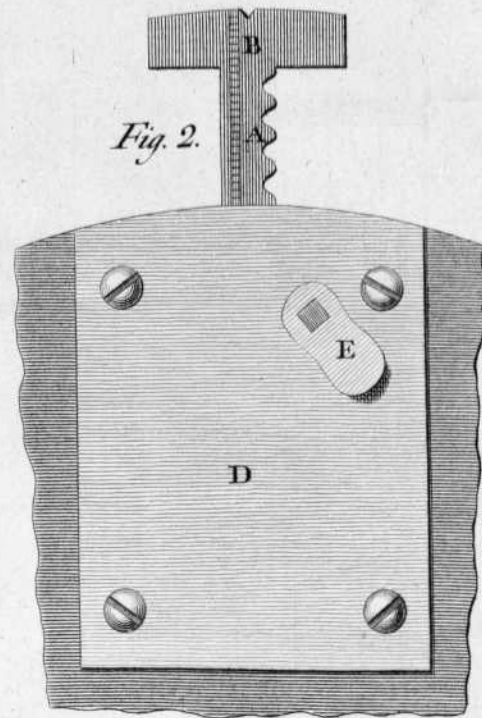
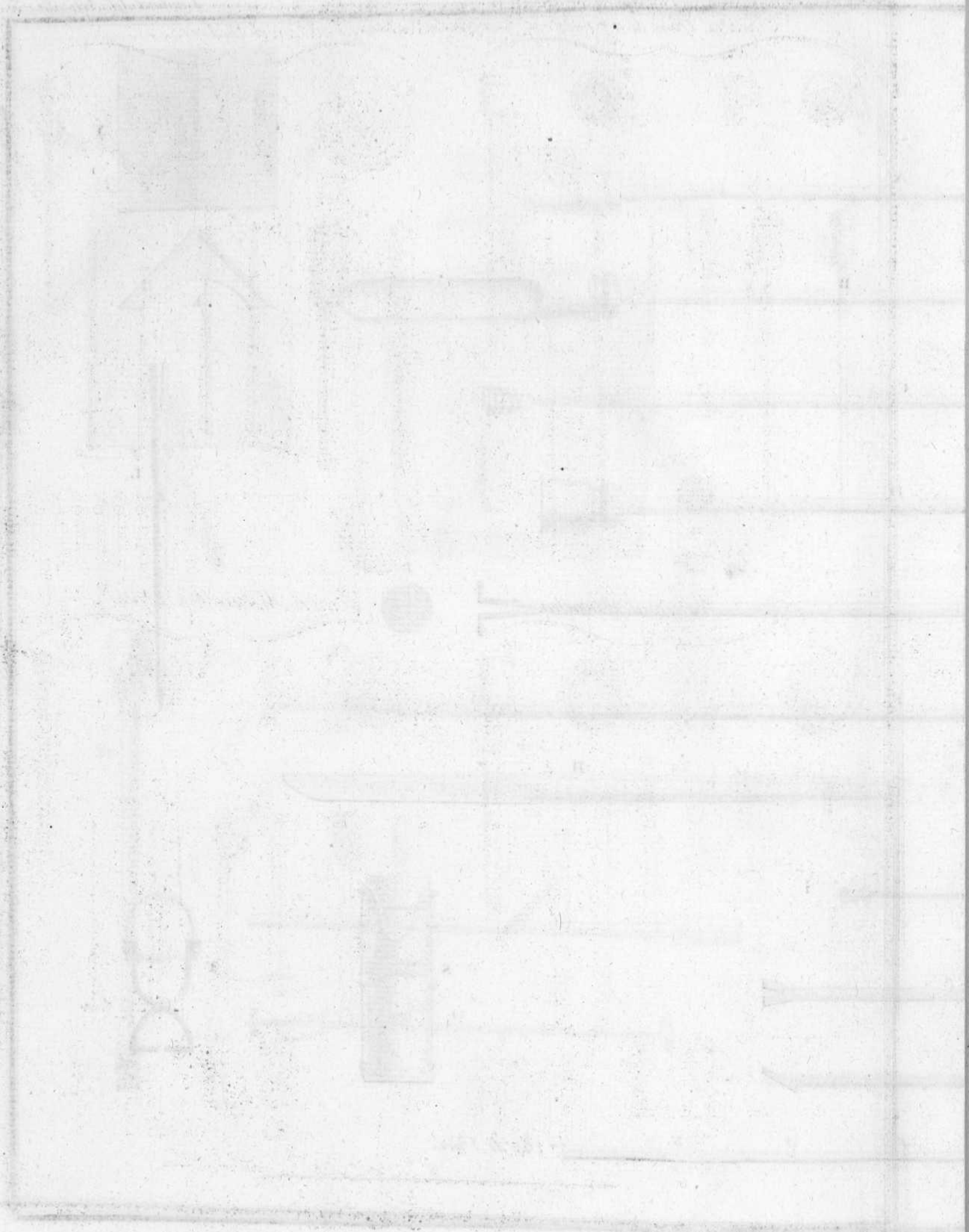
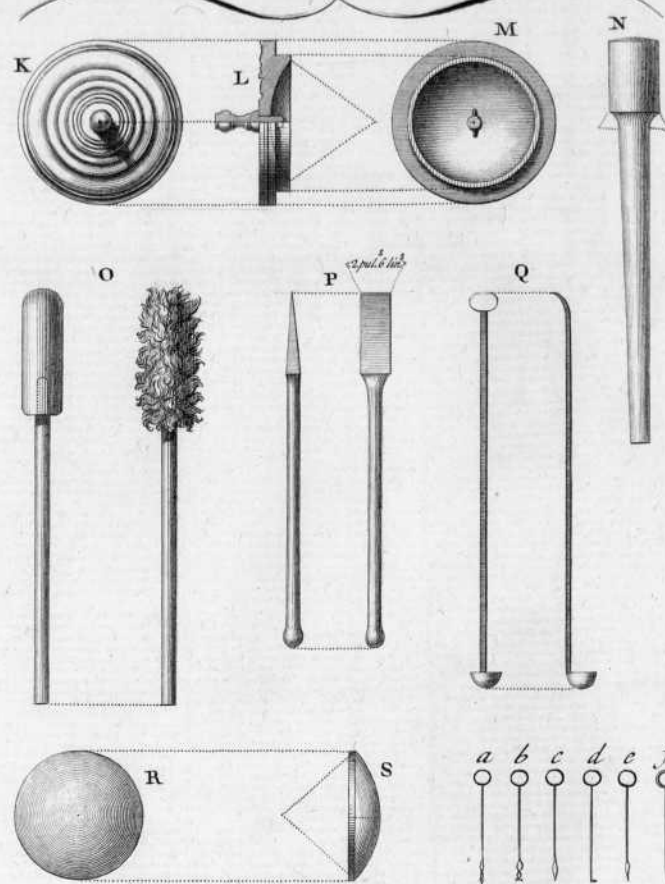
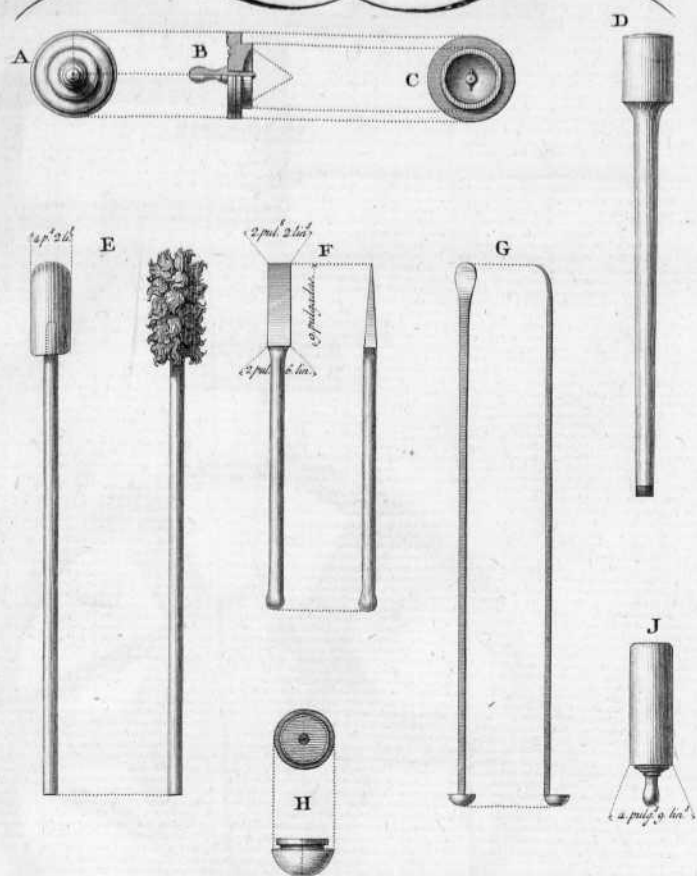


Fig. 2.

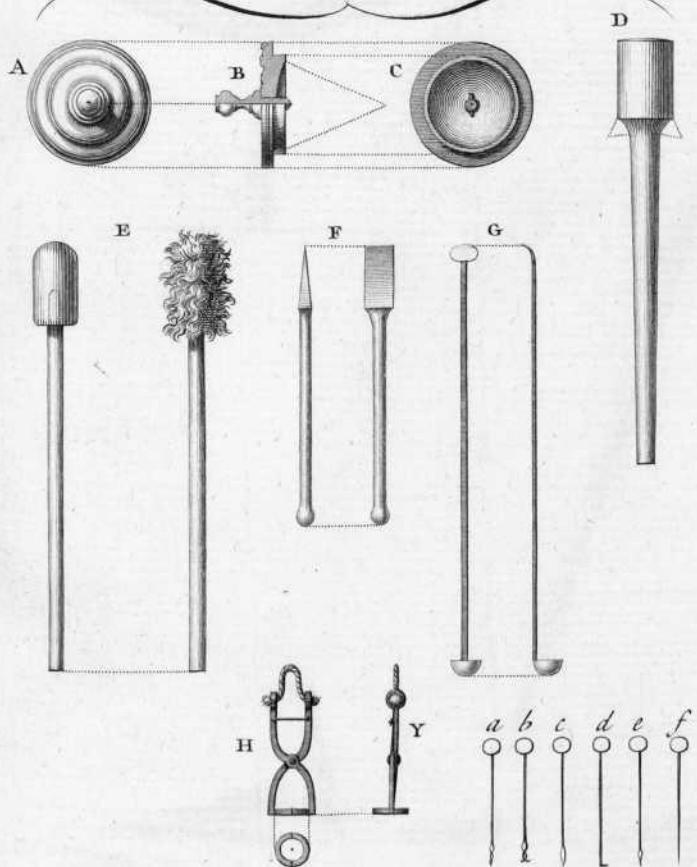




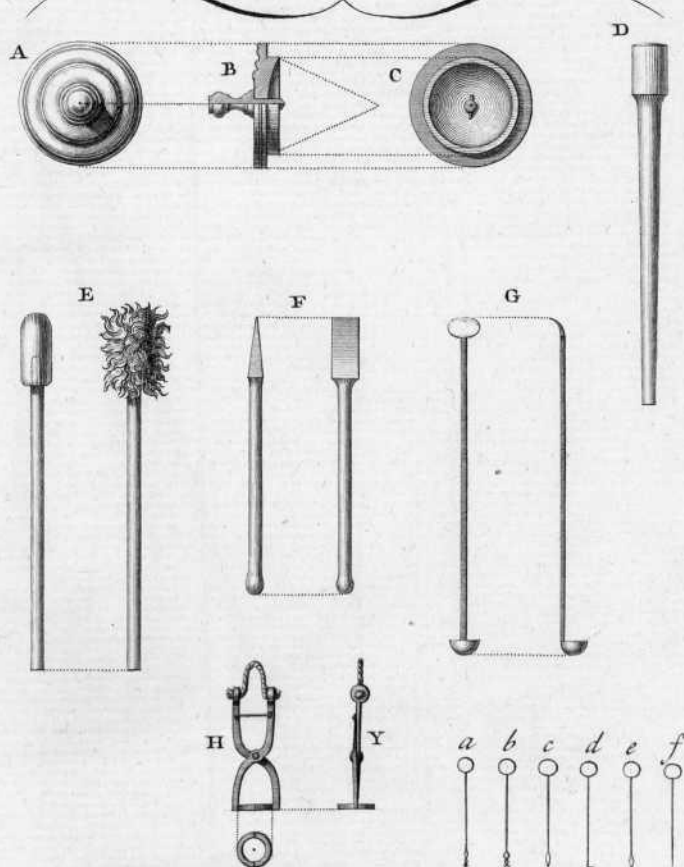
Para el Obuz de á 8 pulg.^s (Juegos de Armas.) Para el Pedrero.



Para el Mortero de Plancha.



Para el Mortero de á 12 pulg.^s



3 4 5 6 Pies de Paris.



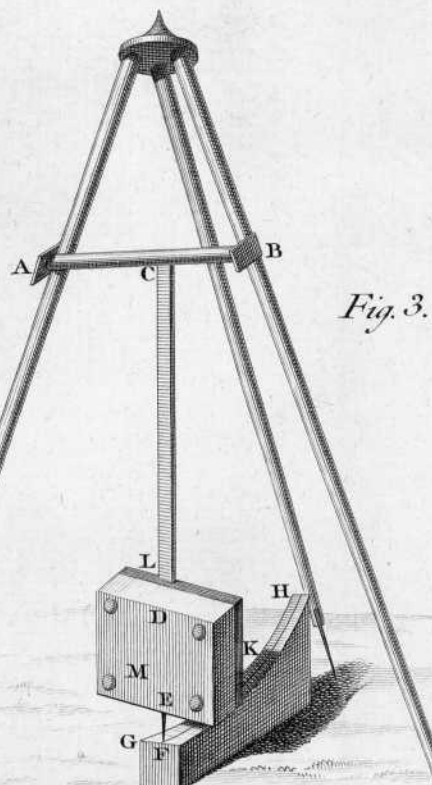
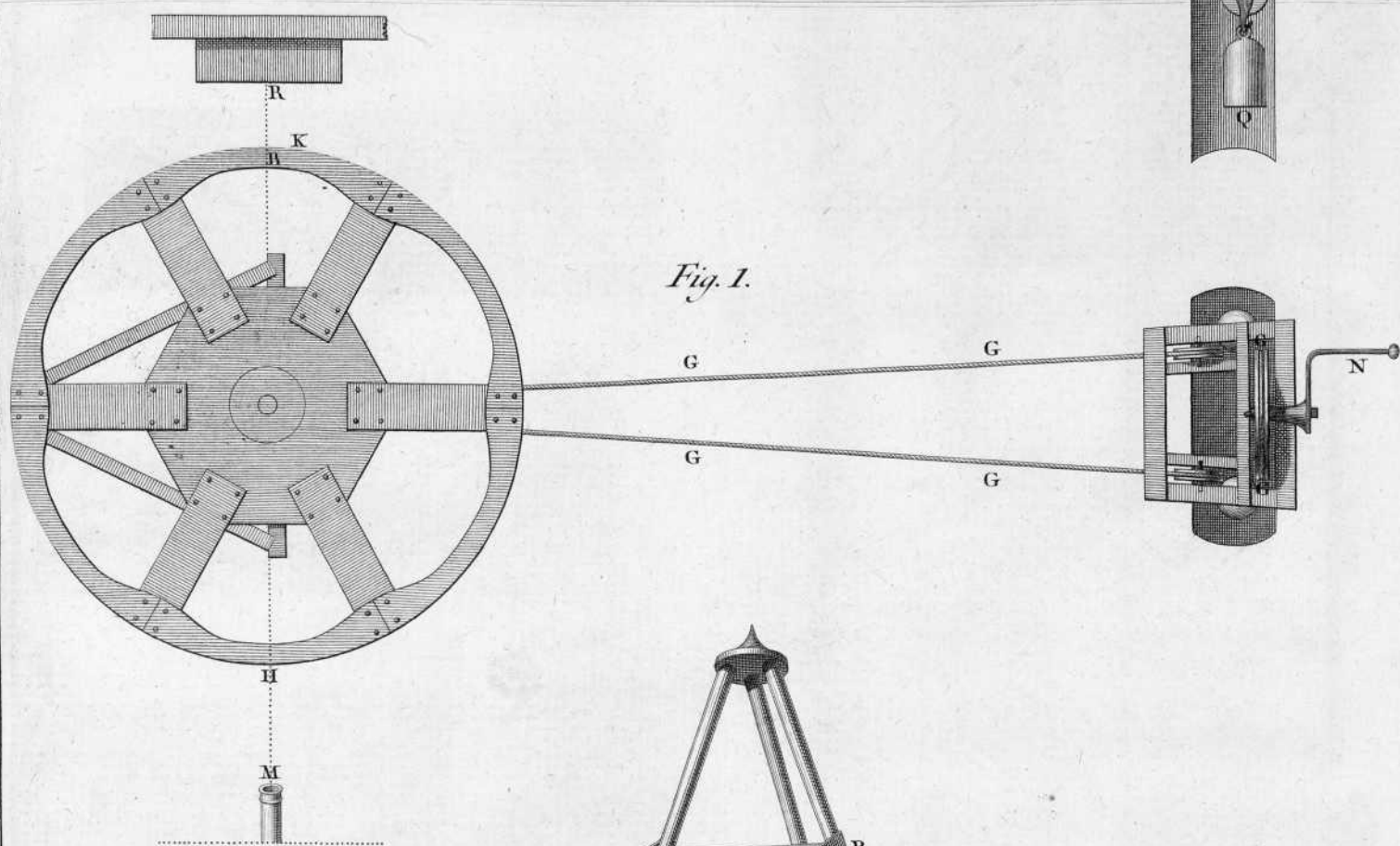
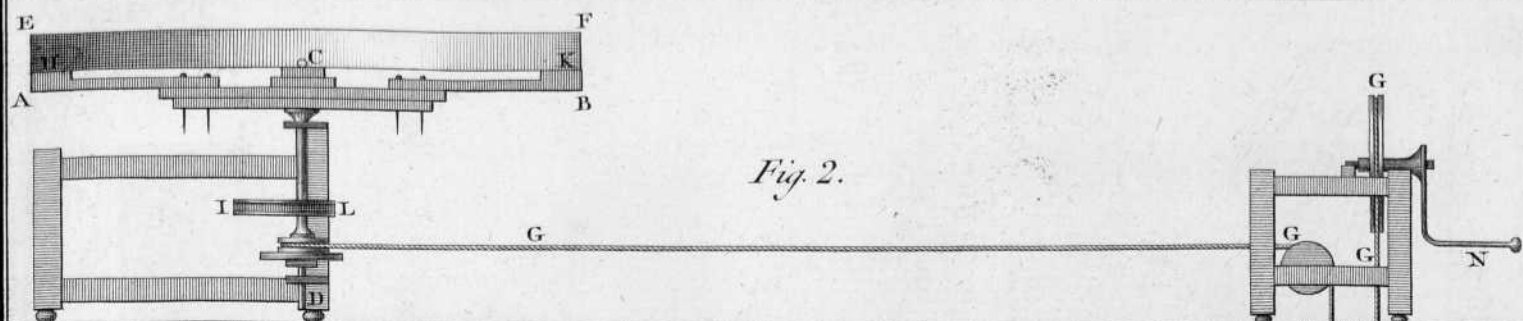


Figura 1.

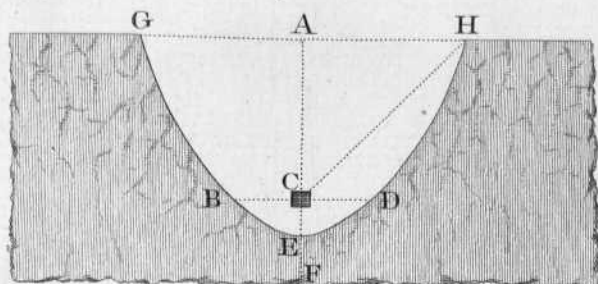


Fig. 3.

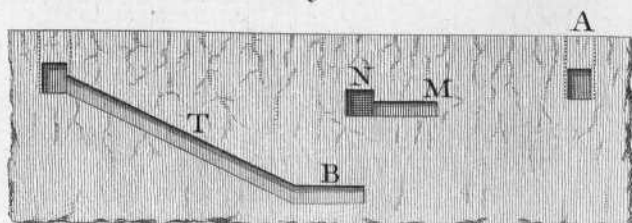


Fig. 4.
45 Pies.

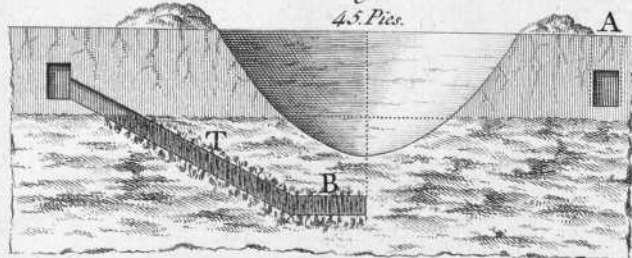


Fig. 6.

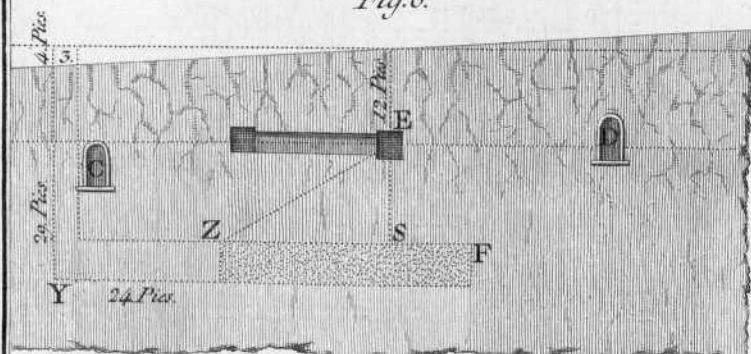
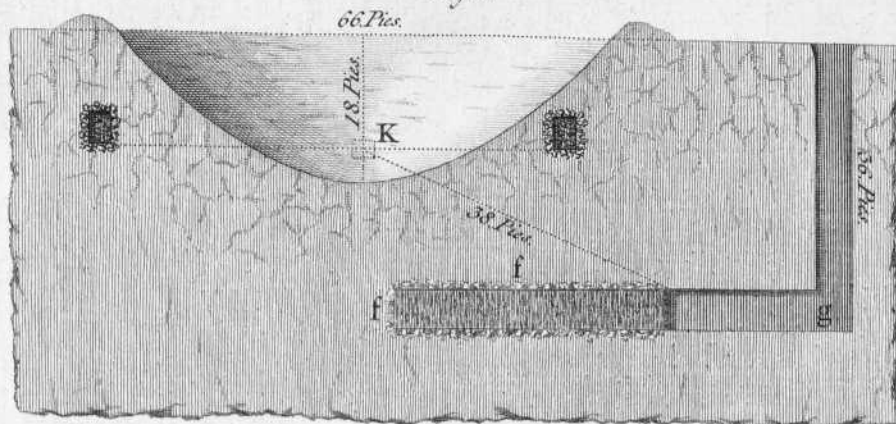


Fig. 8.



10 20 30 40 50 60 70 Pies de París.

Fig. 2.

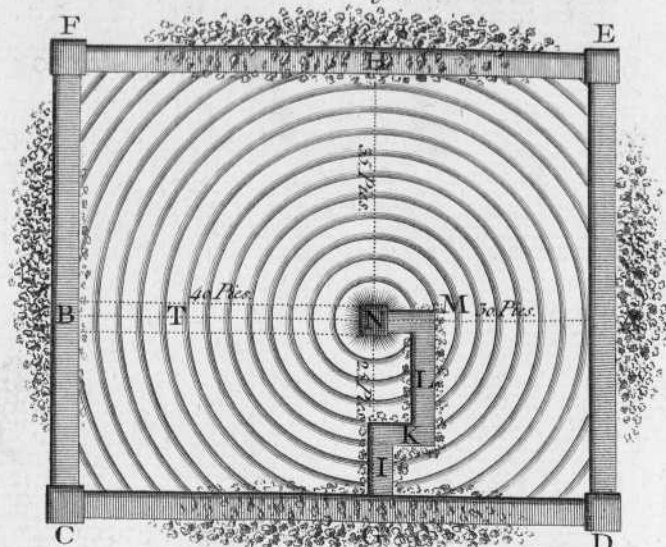


Fig. 5.

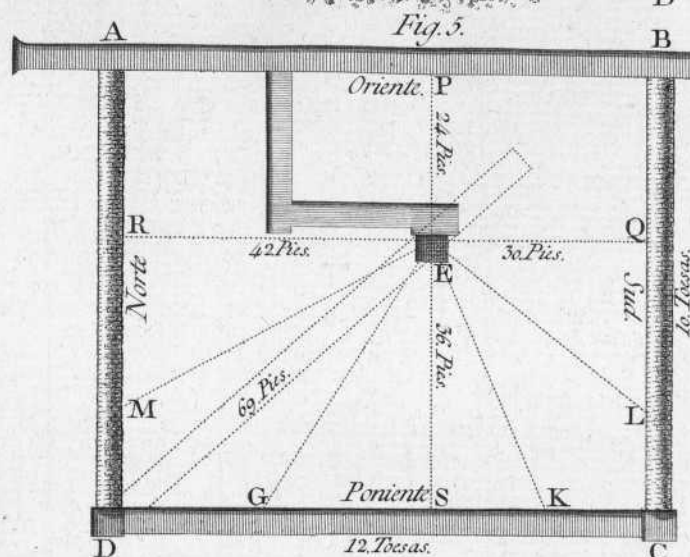


Fig. 7.

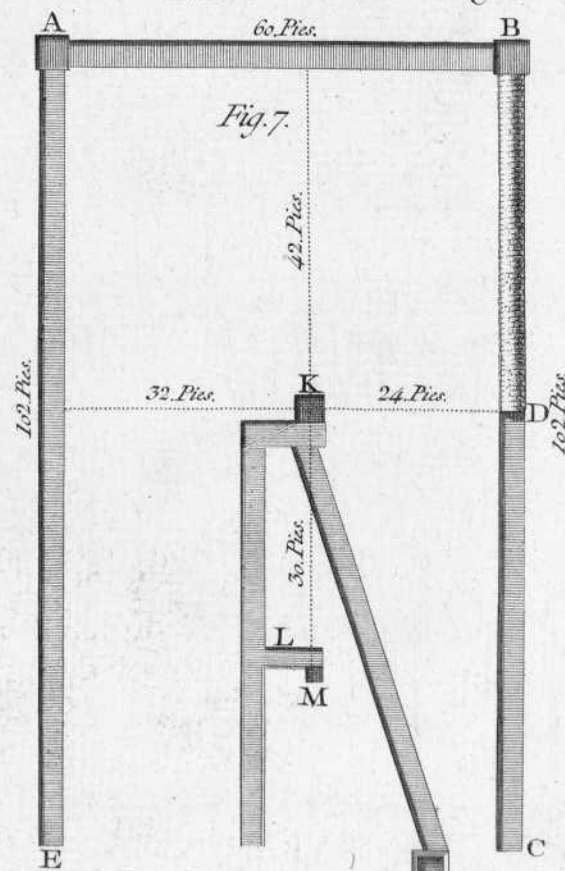


Fig. 9.

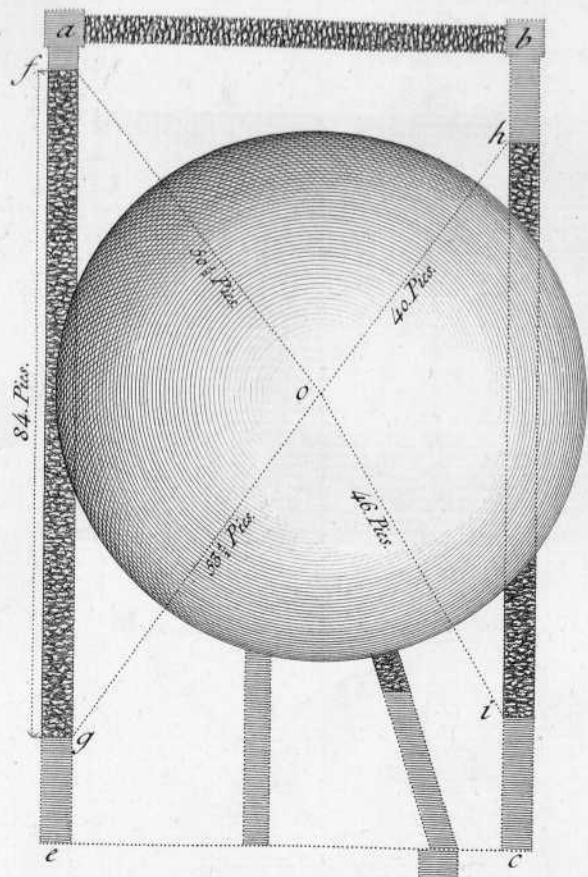


Fig. 10.

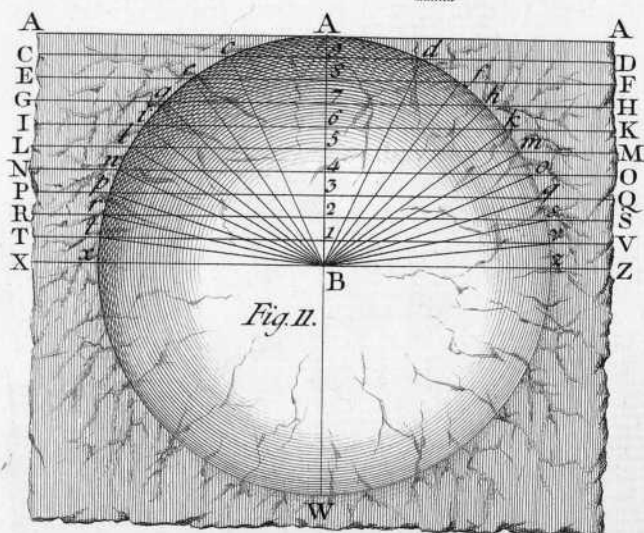
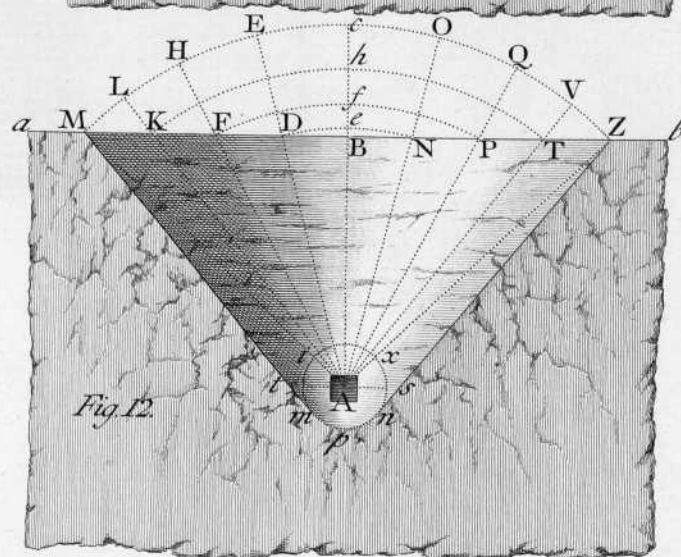
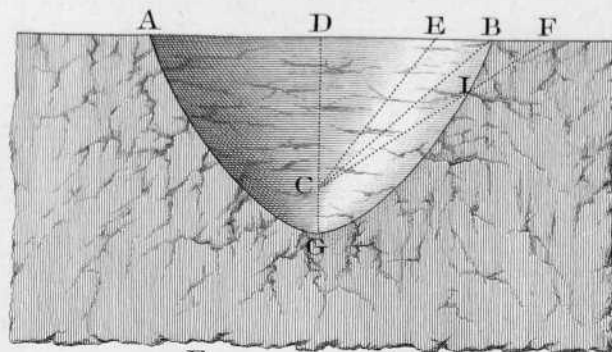


Fig. 14.

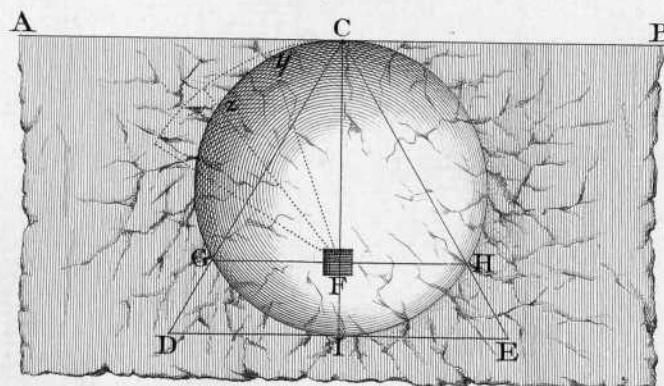


Fig. 15.

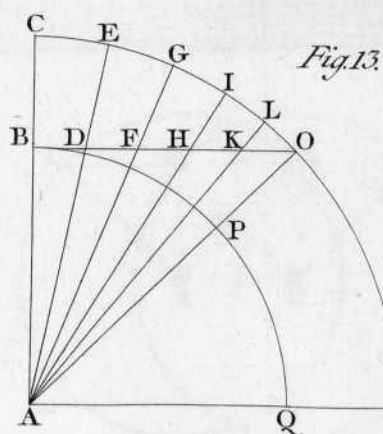
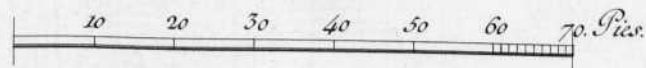
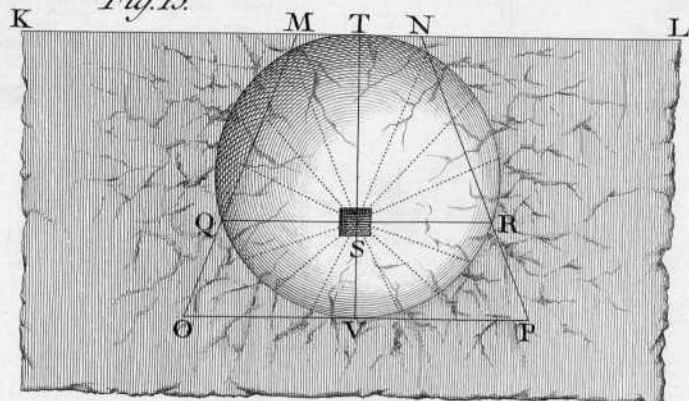


Fig.16.

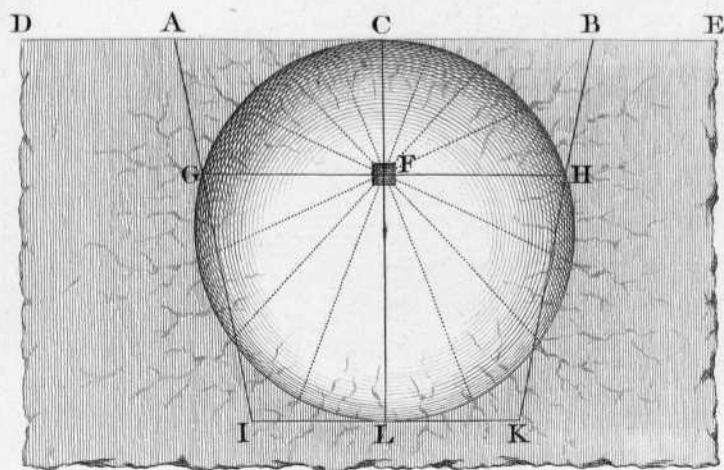


Fig.17.

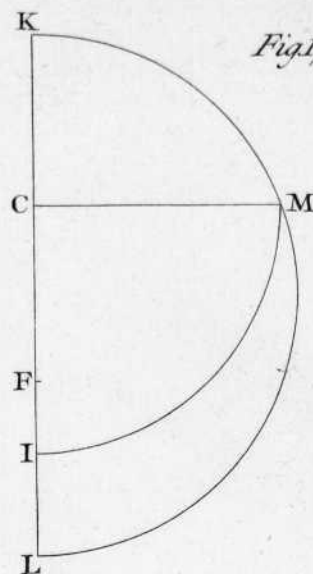


Fig.18.

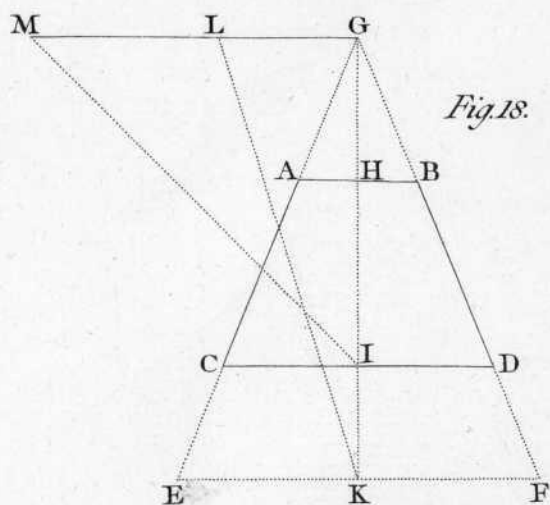


Fig.19.

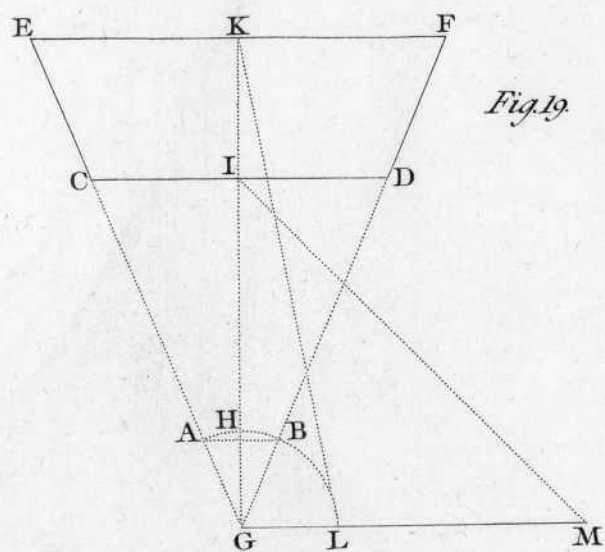


Fig.20.

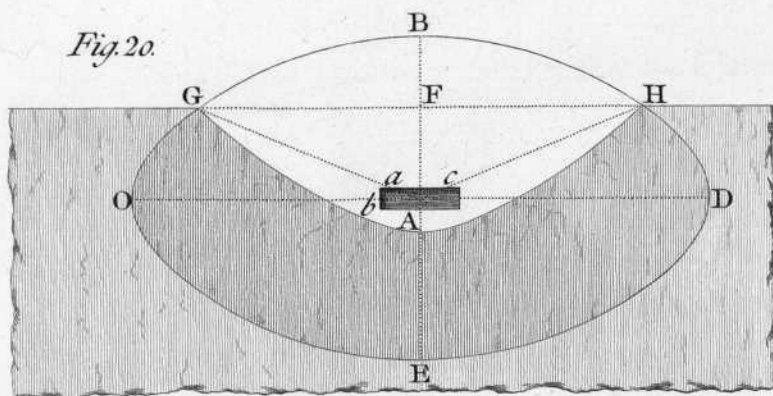


Fig.21.

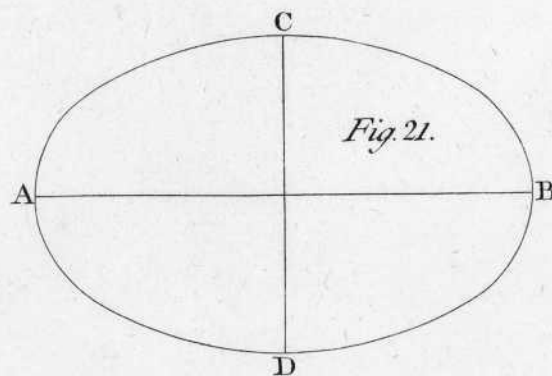


Fig.23.

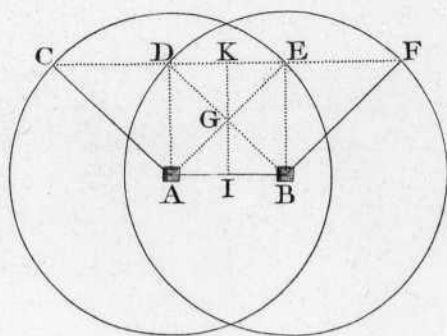
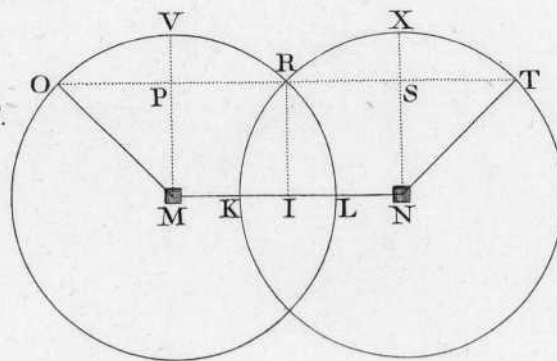


Fig.22.





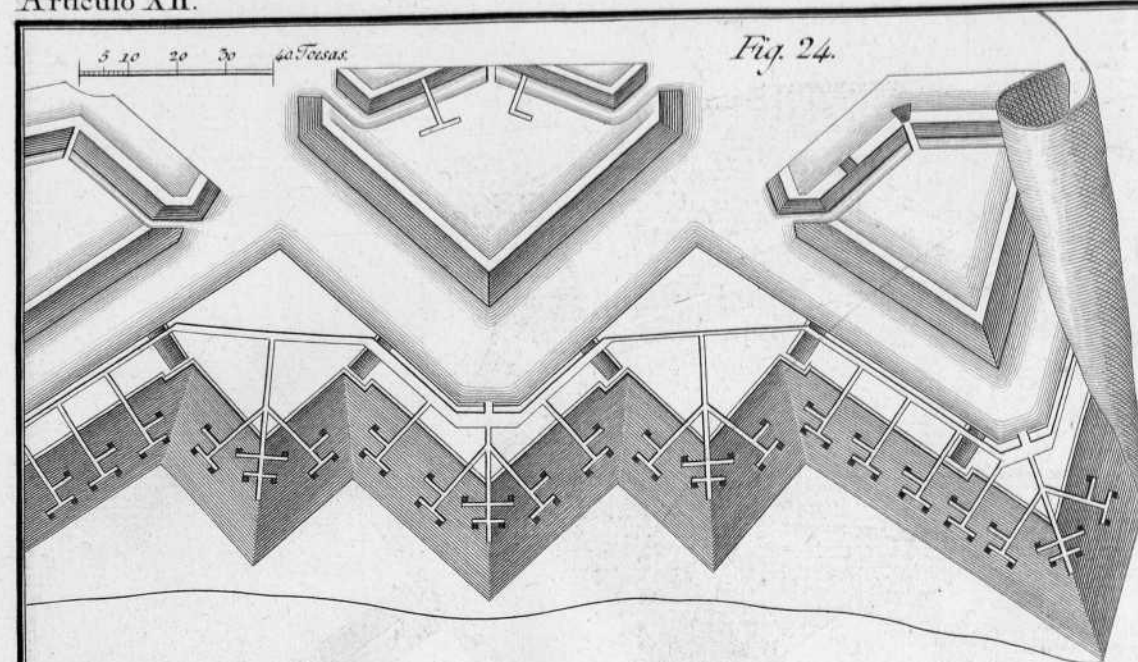


Fig. 24.

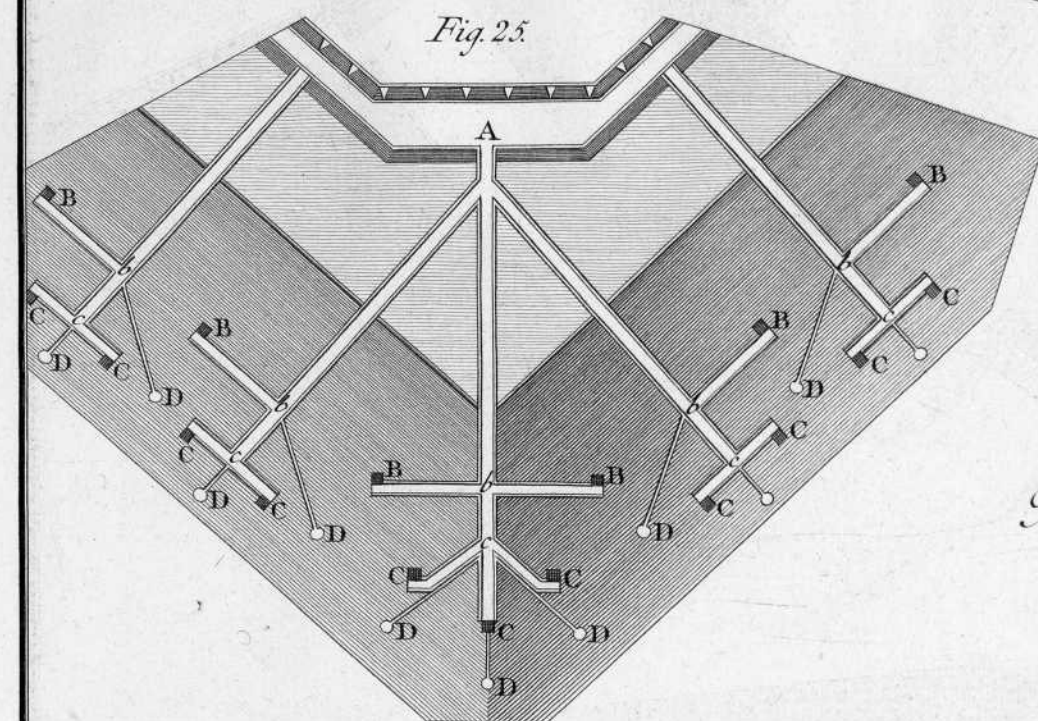


Fig. 25.

5 10 20 30 Toesas.

Perfil cortado por la linea IKL de la Fig. 27.

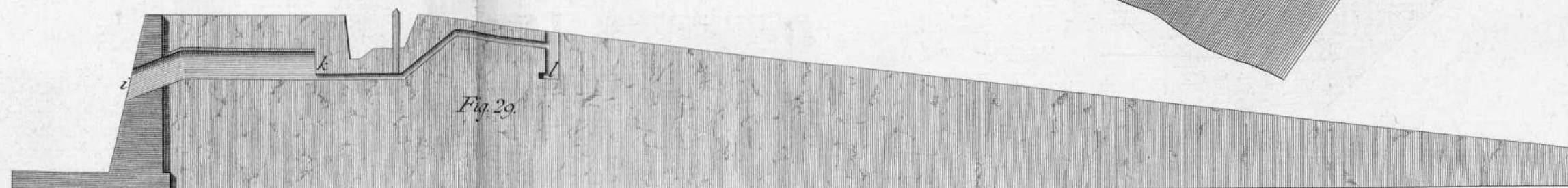


Fig. 29.

Perfil cortado por la linea A b c D de la Fig. 25.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Toesas.
Para los Perfiles.

Fig. 26.

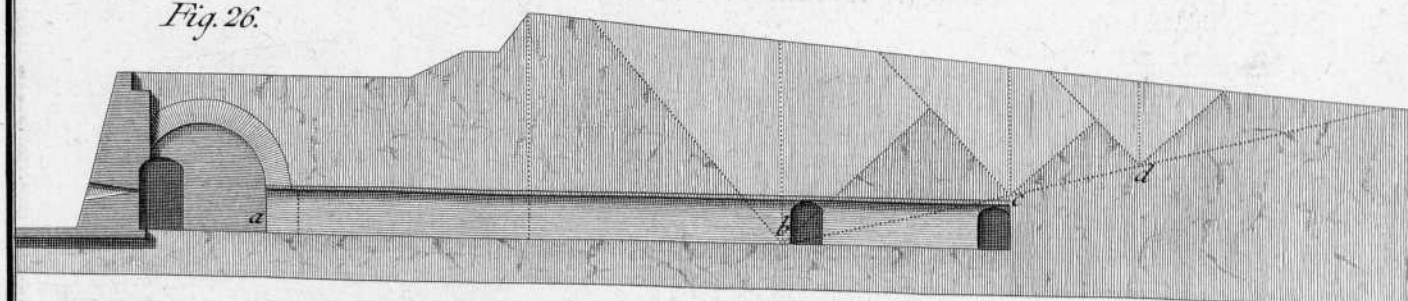
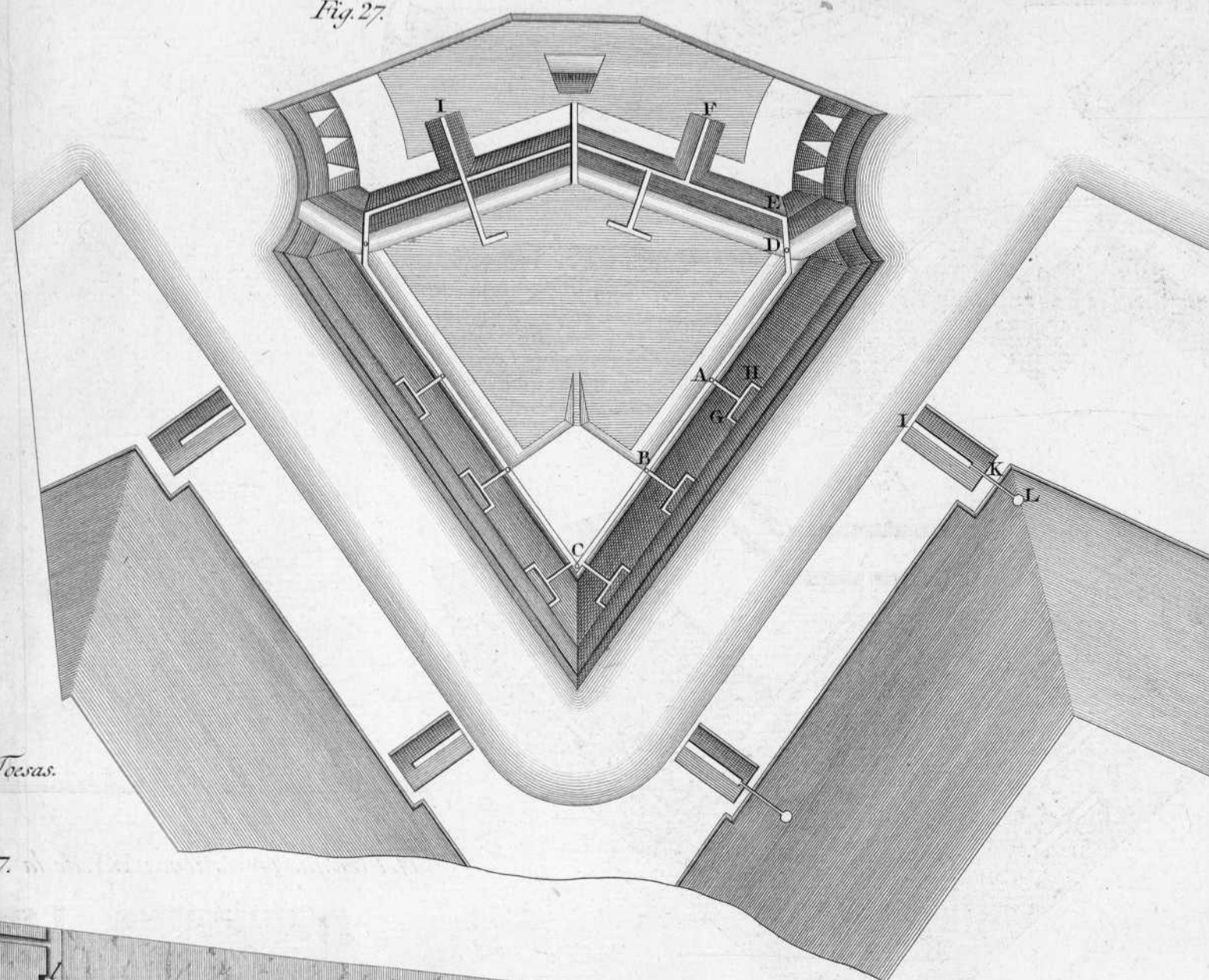
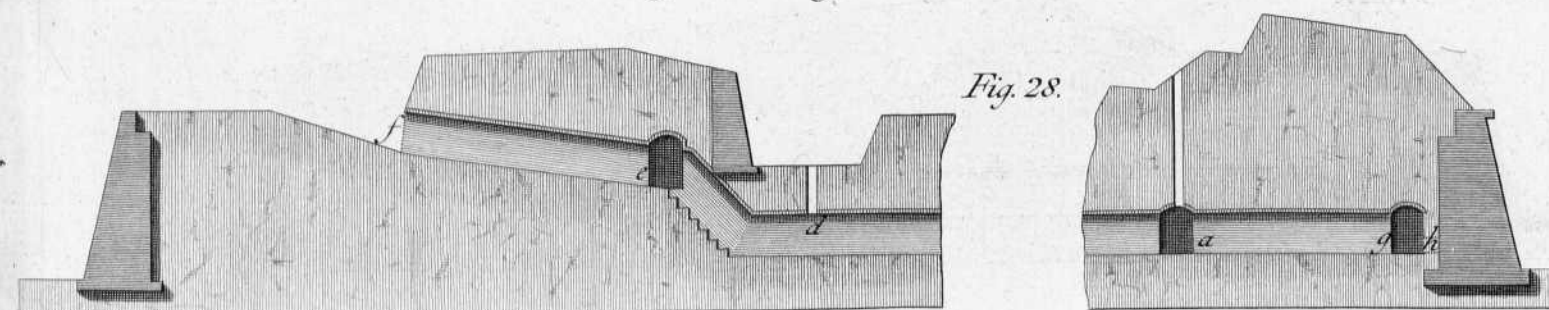


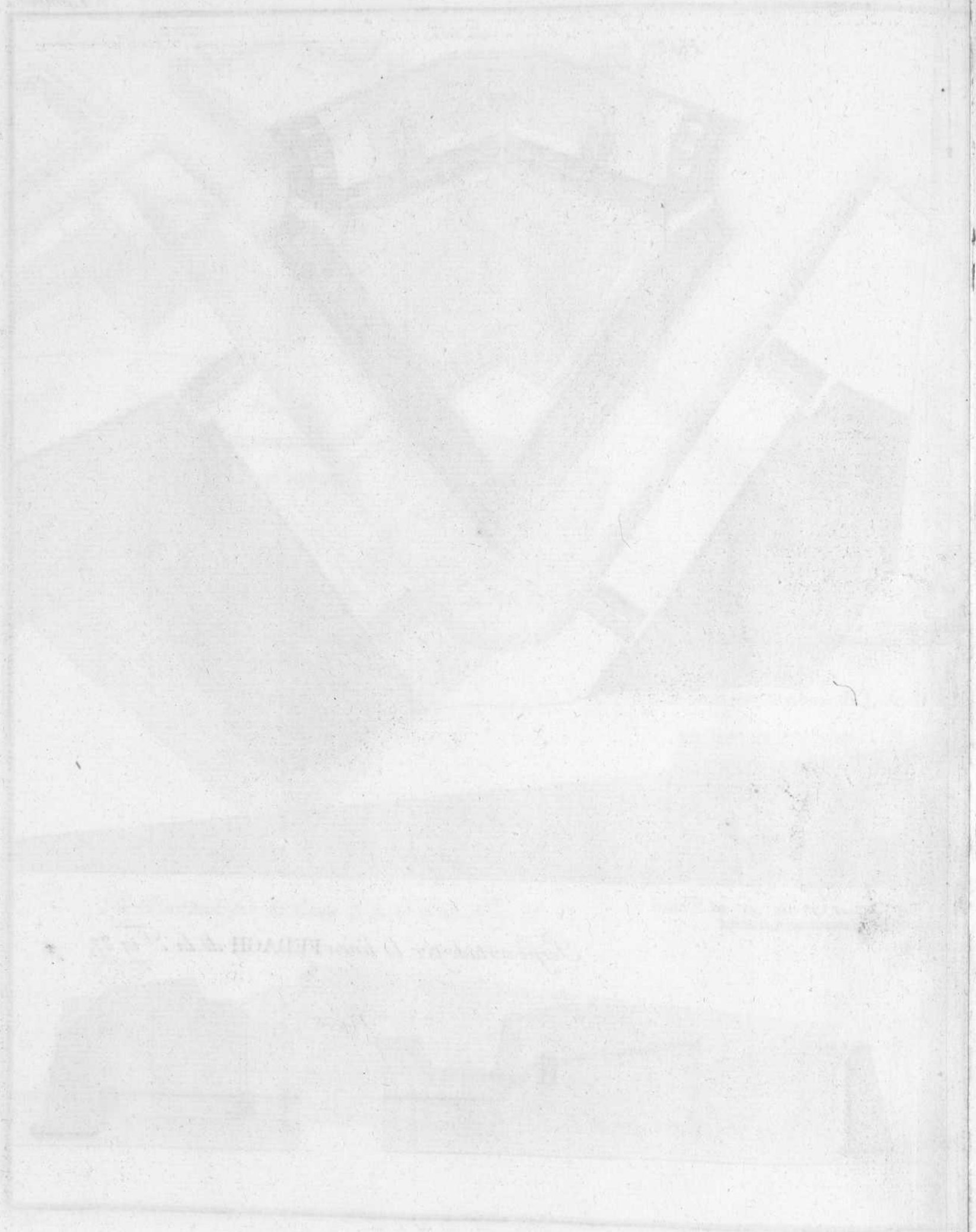
Fig. 27.

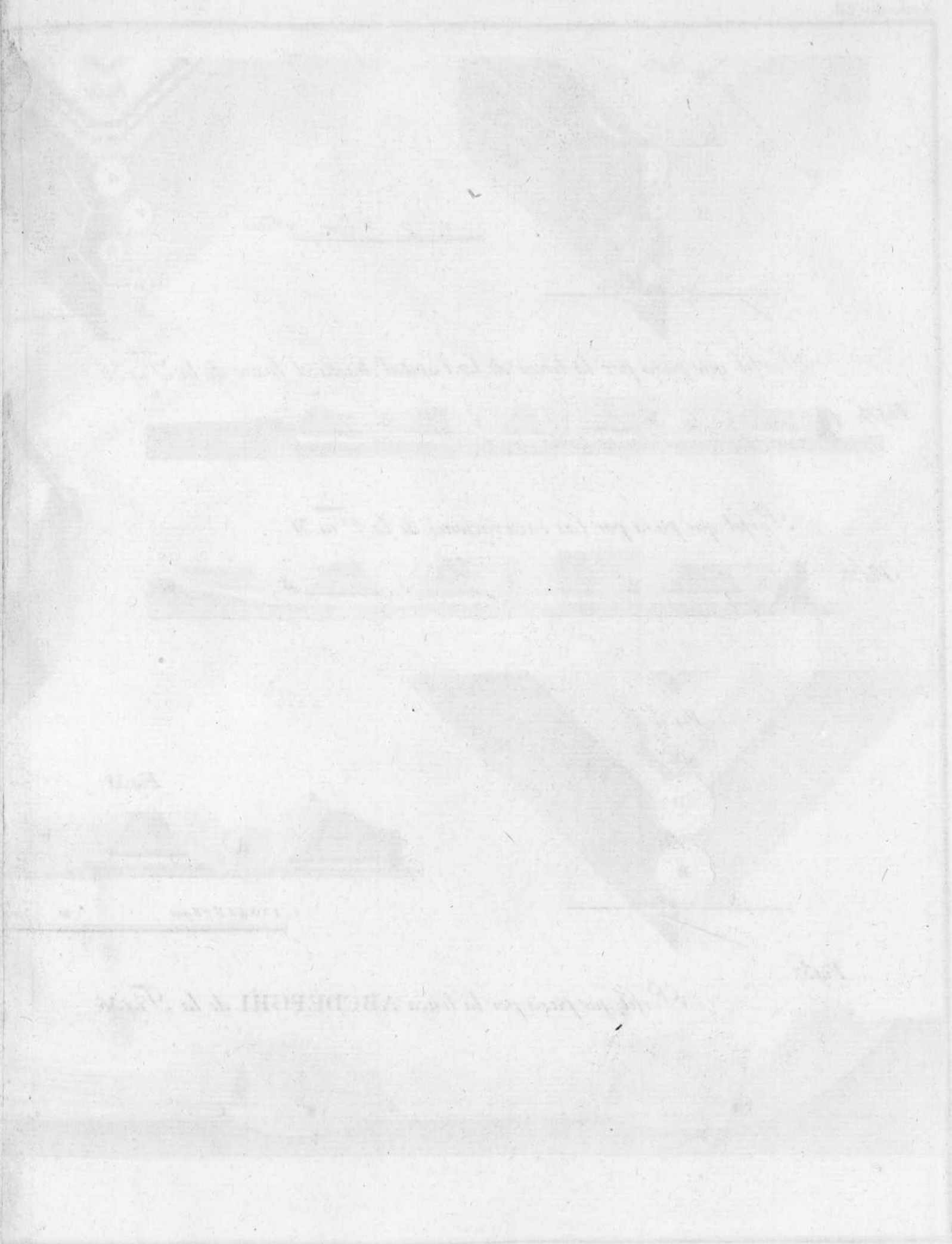


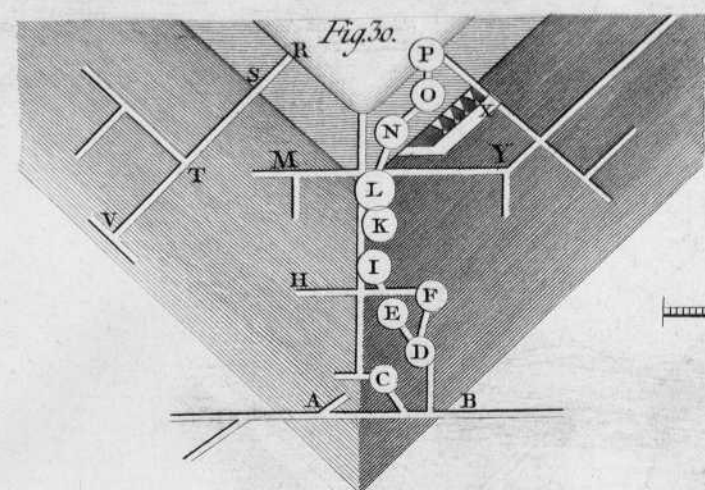
Perfil cortado por la linea FEDAGH de la Fig. 27.

Fig. 28.



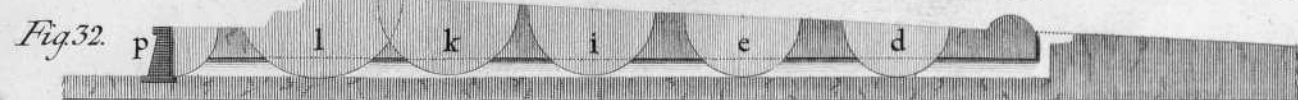






10 20 30 40 50 Toesas.

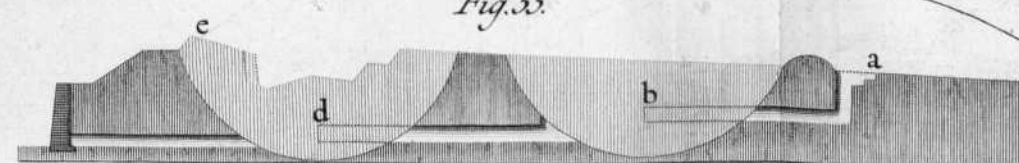
Perfil que pasa por la línea de la Capital, hasta el fosso de la Fig. 30.



Perfil que pasa por las excavaciones de la Fig. 31.



Fig. 35.



1 2 3 4 5 6 7 8 9 10 20 30 Toesas.

Fig. 34.

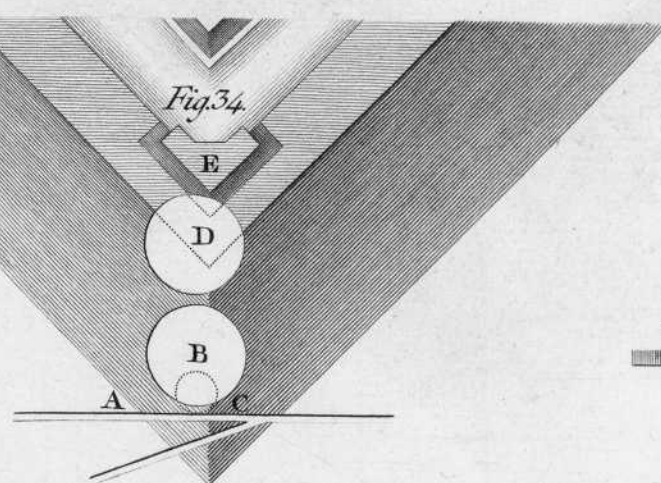
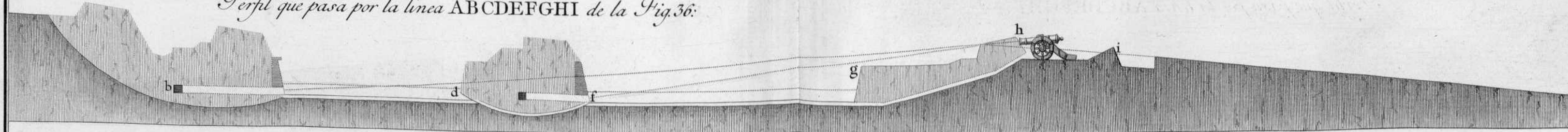


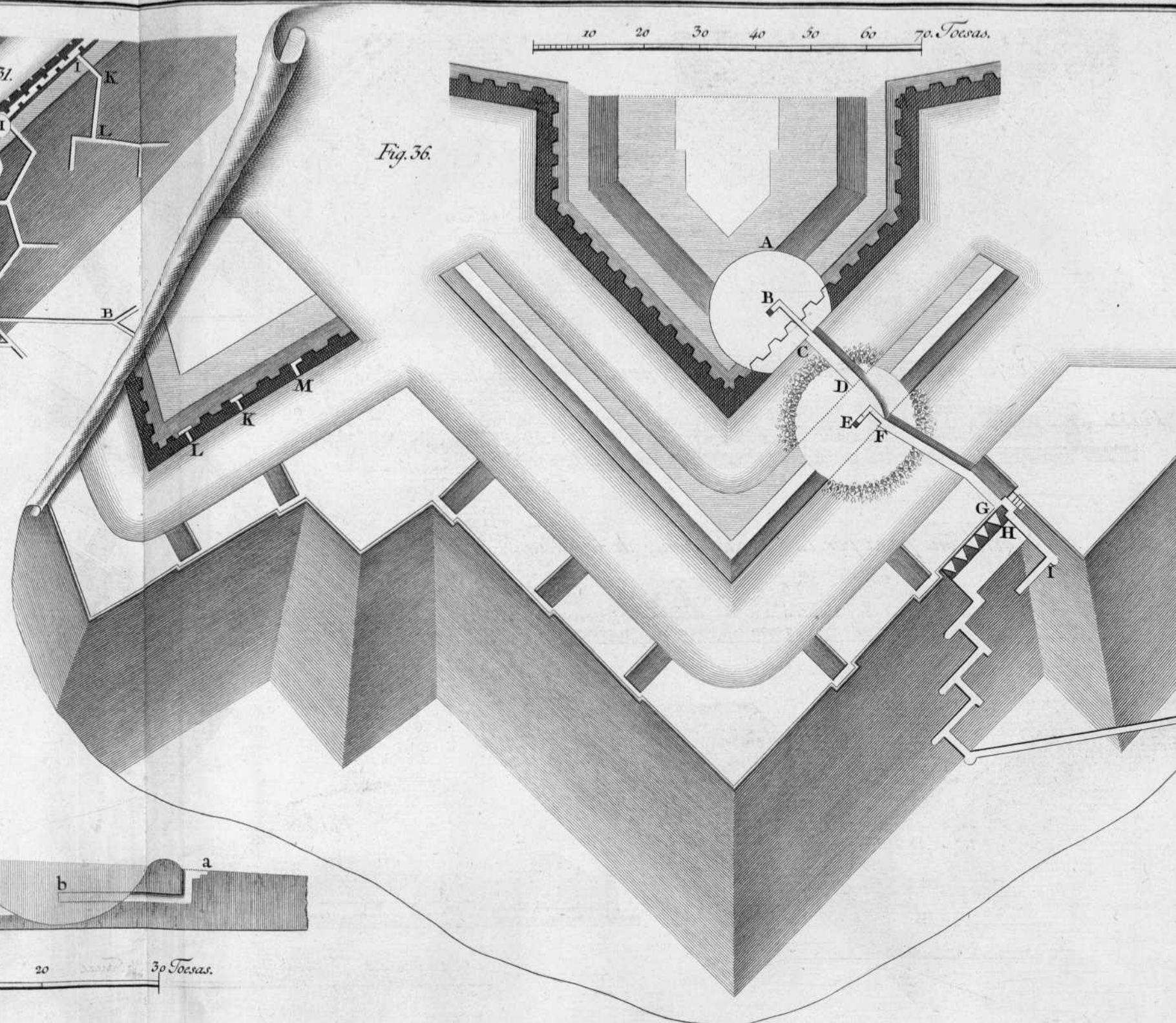
Fig. 37.

Perfil que pasa por la línea ABCDEFGHI de la Fig. 36:



1 2 3 4 5 6 7 8 9 10 20 30 Toesas.

Fig. 36.



10 20 30 40 50 60 70 Toesas.



Fig. 38.

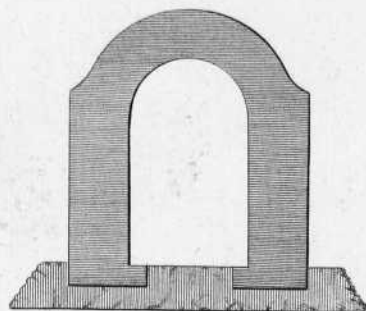


Fig. 39.

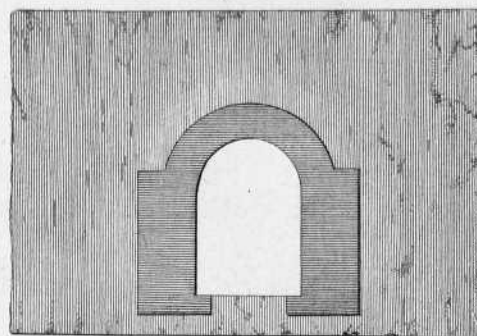


Fig. 40.

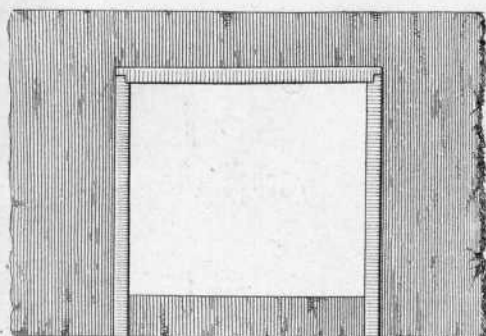


Fig. 42.

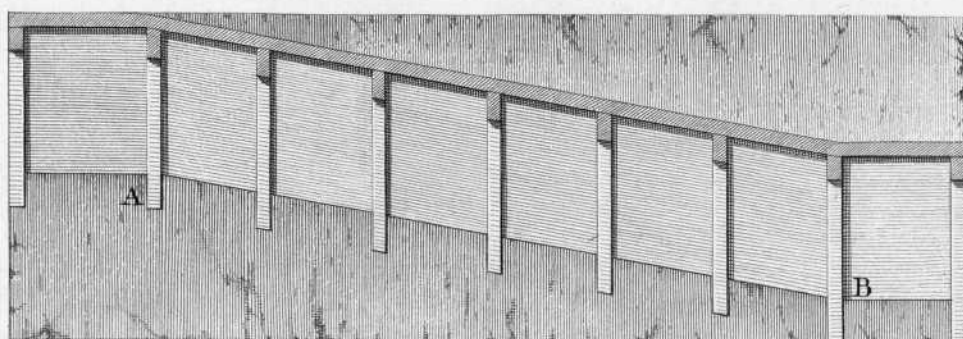


Fig. 41.

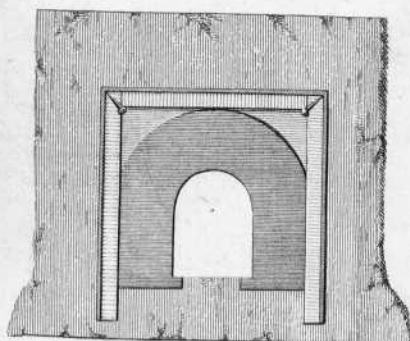
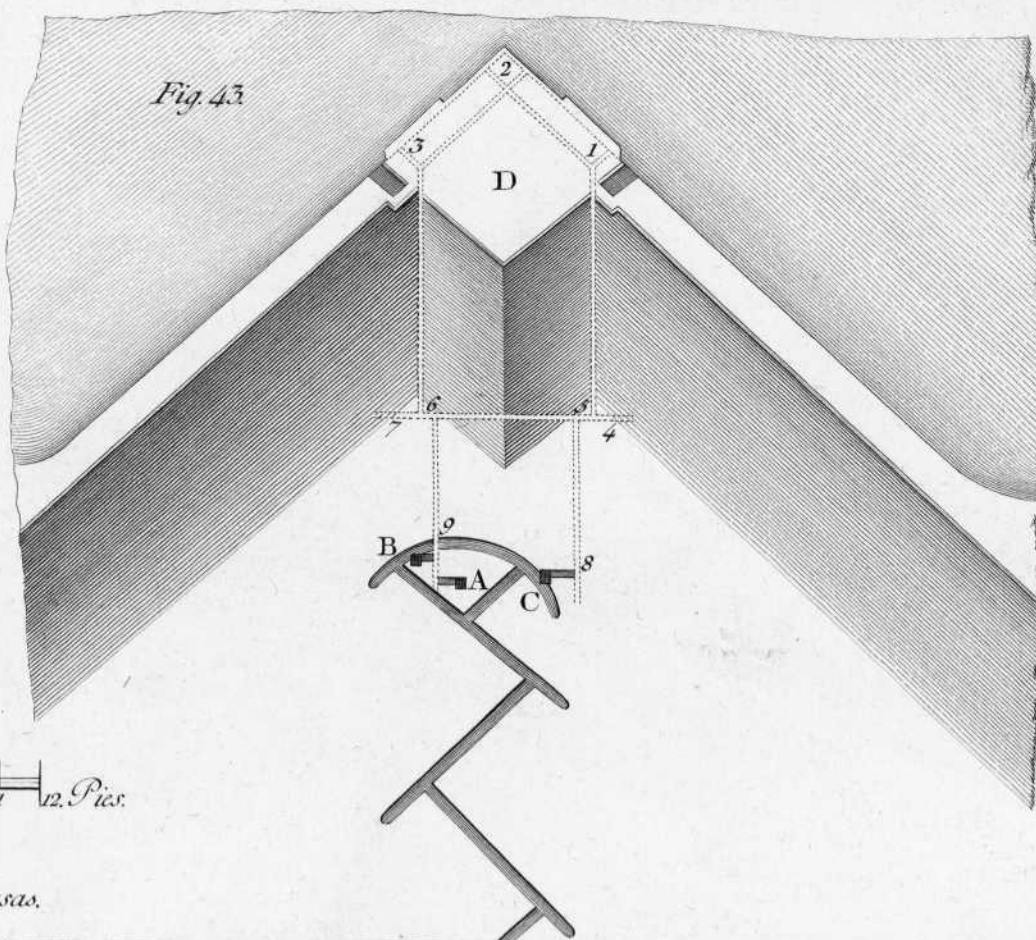


Fig. 43.



Escala de los Perfiles.



Escala del Plano.

