

A. G. WOLFGRAM.
Caissons.

No. 145,039.

Patented Nov. 25, 1873.

Fig. 1.

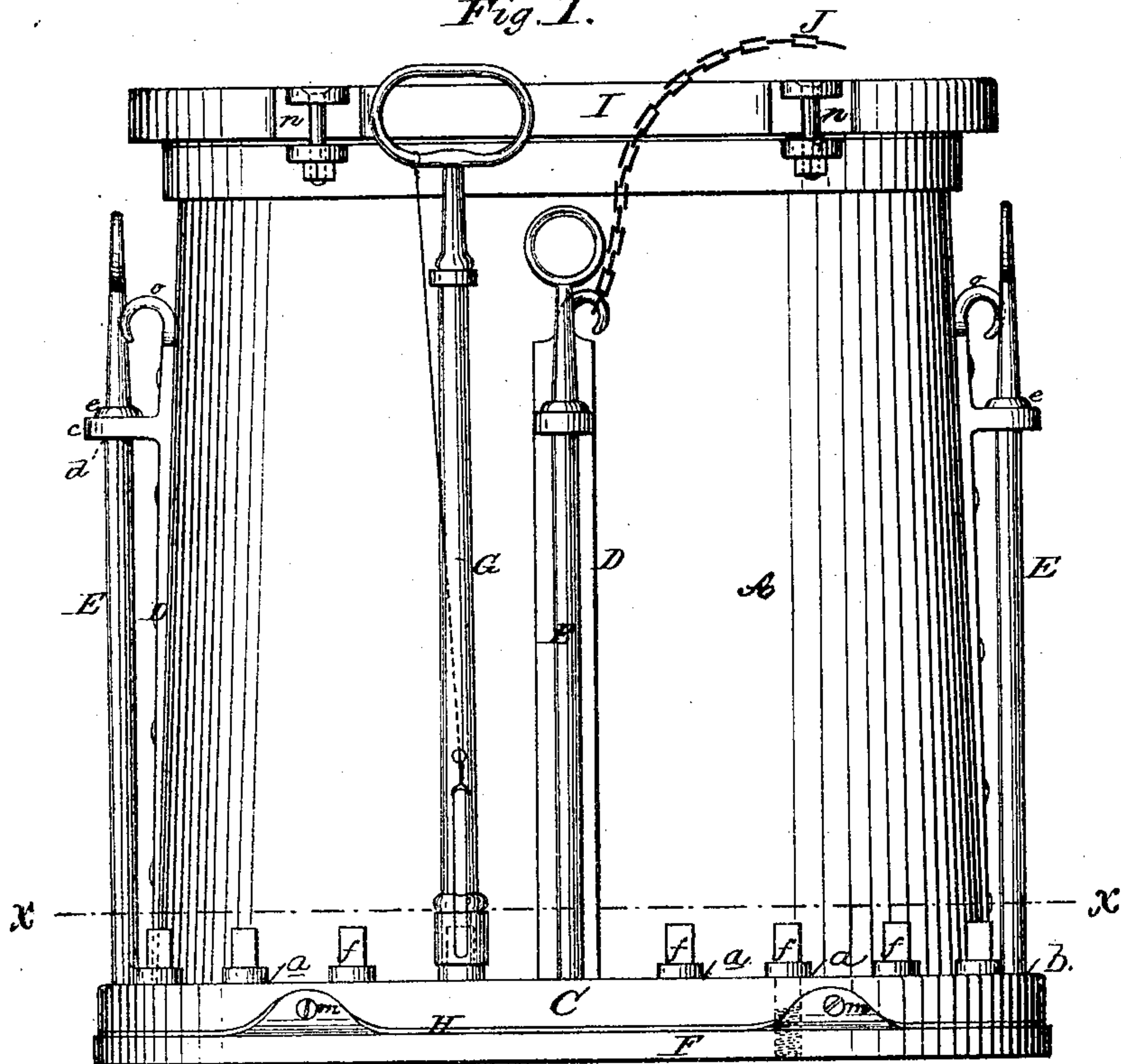
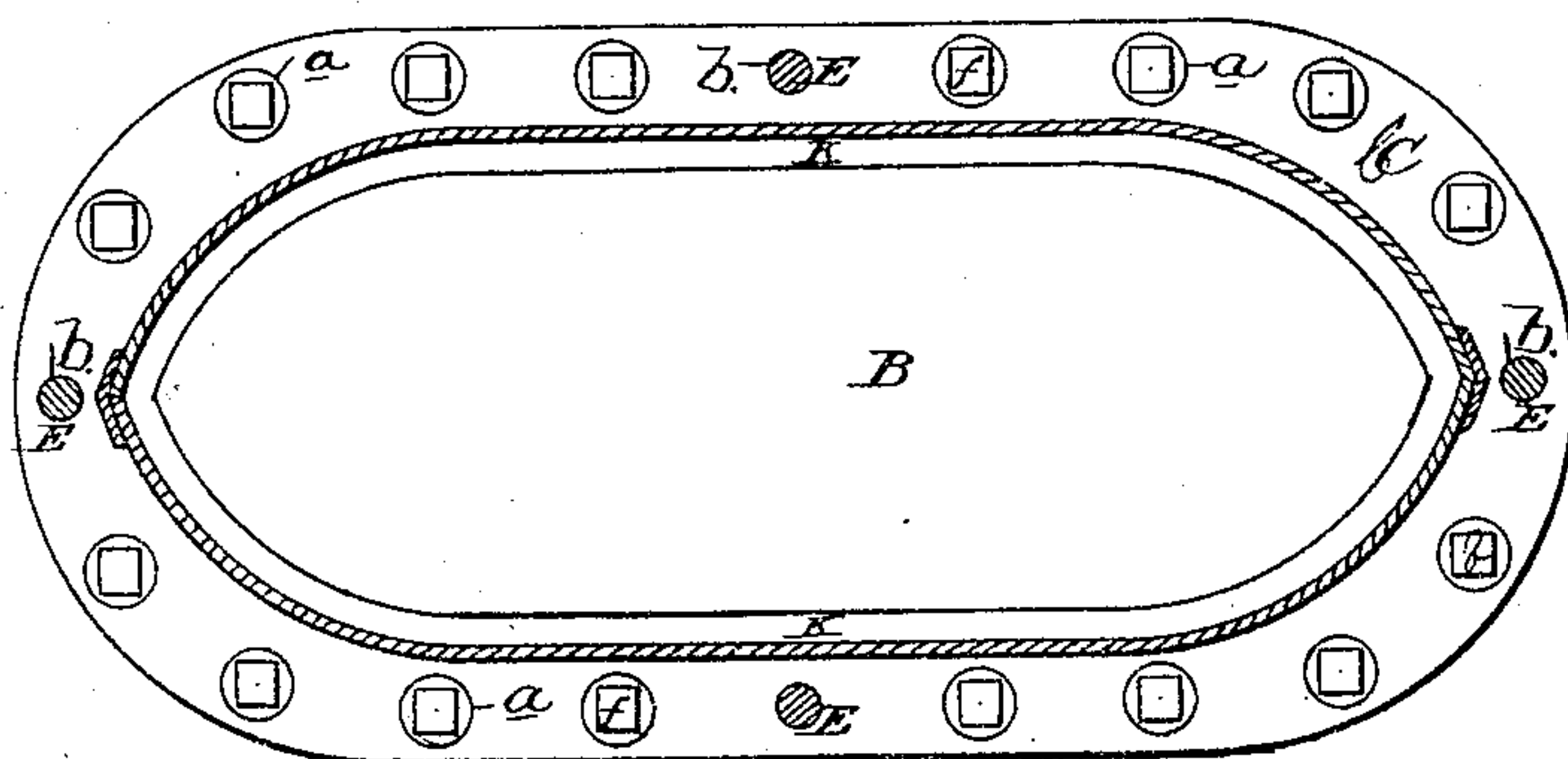


Fig. 2.



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Inventor:

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by
James L. Norris,
his Atty.

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Fig. 3.

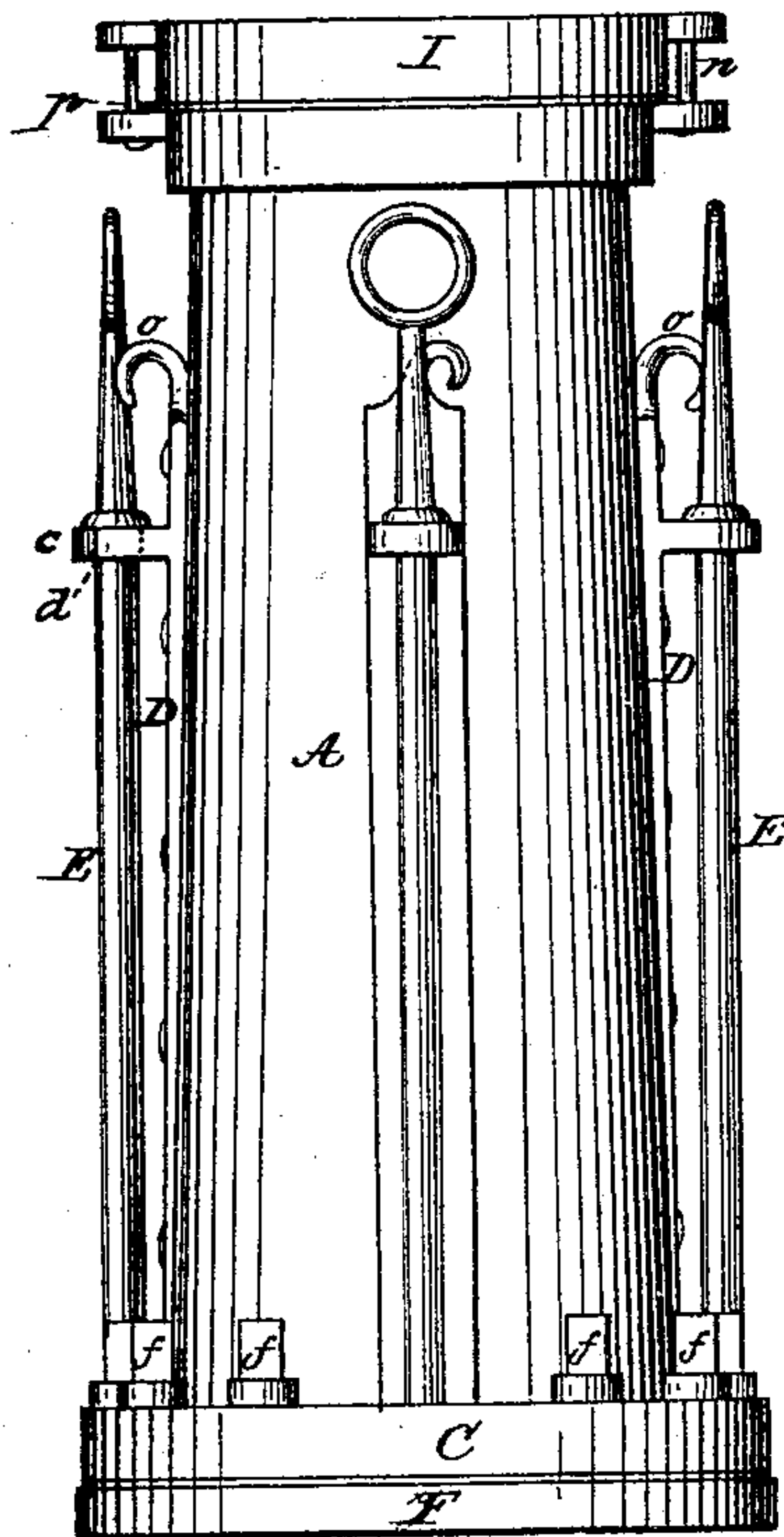


Fig. 4.

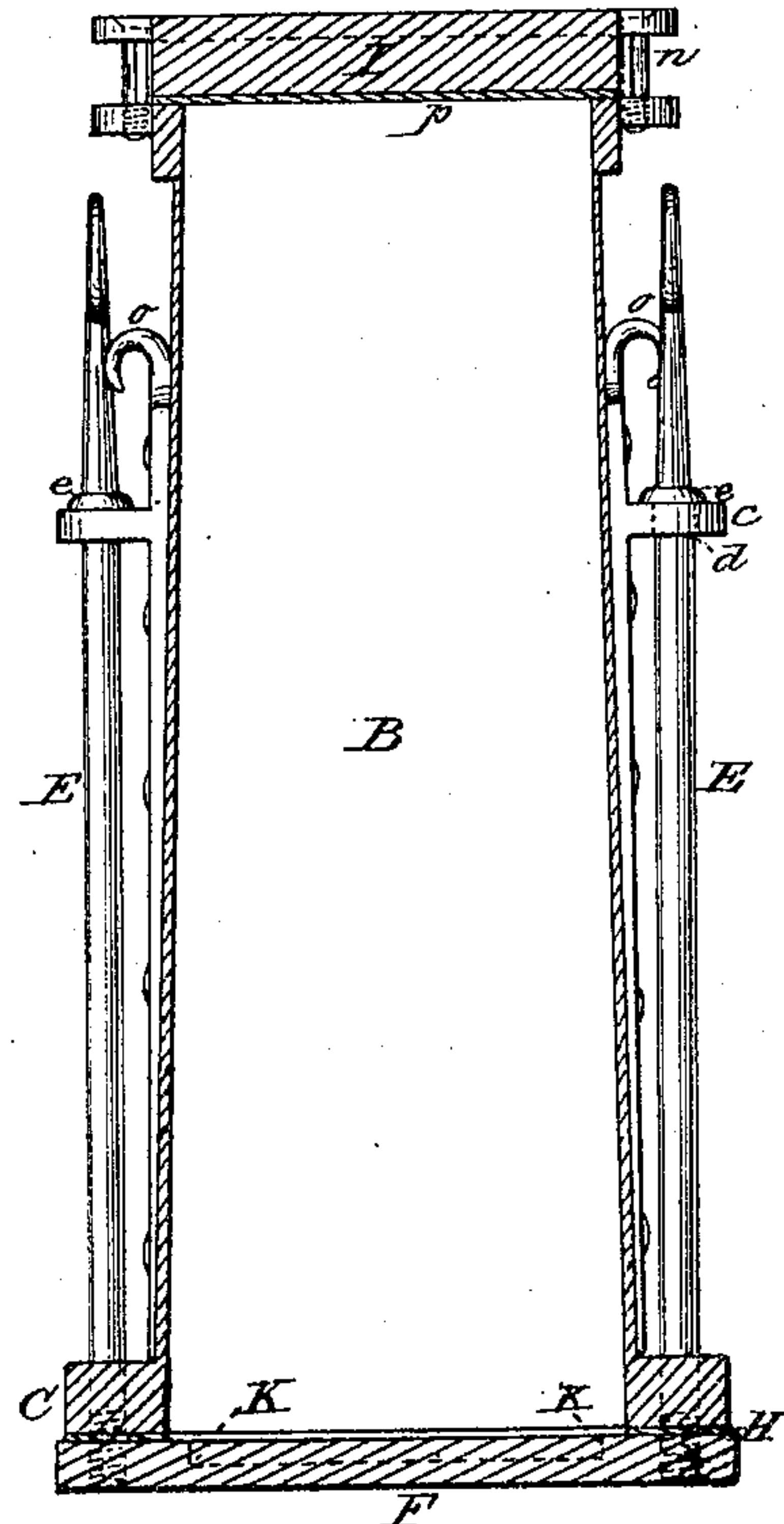


Fig. 5.

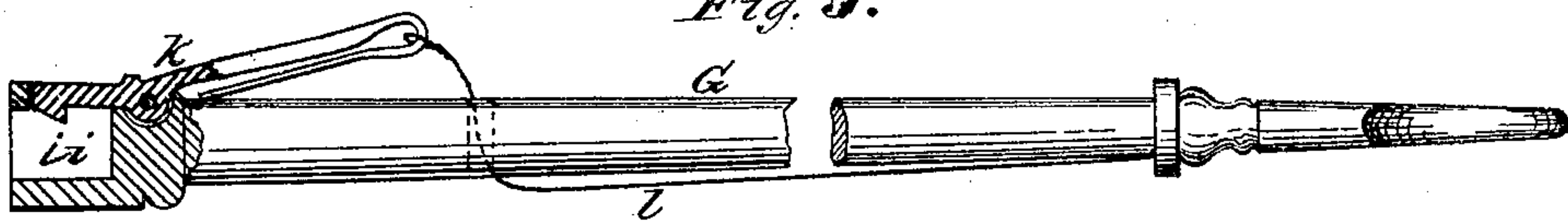
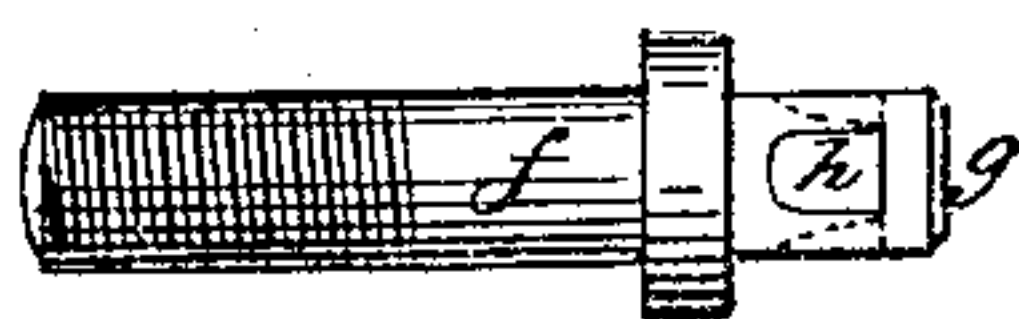


Fig. 6.



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UNITED STATES PATENT OFFICE.

ADOLPH G. WOLFGRAM, OF APEX, NORTH CAROLINA.

IMPROVEMENT IN CAISSONS.

Specification forming part of Letters Patent No. **145,039**, dated November 25, 1873; application filed October 2, 1873.

To all whom it may concern:

Be it known that I, ADOLPH GUSTAV WOLFGRAM, of Apex, in the county of Wake and State of North Carolina, have invented certain new and useful Improvements in Caissons for Constructing Piers or Foundations of Bridges, Buildings, Wharves, &c., of which the following is a specification:

This invention has for its object the production of an improved caisson designed for use in constructing piers or foundations for bridges, buildings, wharves, and analogous purposes, the construction and arrangement of the parts being such that, when the caisson is sunk in the water and its base caused to rest upon the bottom of a river or other stream, a perfectly dry interior surface is secured and retained, whereby the workmen are enabled to construct a pier or foundation of masonry in the open air, and the progress of the work can at any moment be inspected with perfect ease, accuracy, and facility. To this end, my invention consists, among other things, in constructing the body of a caisson of strips or sheets of metal which are fashioned and united together in such a manner as to impart to the caisson a shape approximating or corresponding to the form desired to be imparted to the pier or foundation, the bottom edge of the caisson being provided with a base connected with it by bolts in such a manner that, when the caisson is sunk in the water and a pier or foundation built within the same upon its base, the caisson can readily be disconnected from its base, and the latter remain a permanent fixture and a substantial basis for the pier or foundation, whereby undue settling of the masonry work is avoided. My invention further consists in connecting the body of the caisson with its base by means of short screw-bolts having angular-shaped heads formed with recesses, to which is adapted a socketed key having a spring-jaw which interlocks with the angular head and recess, so that the key can be passed down into the water and, when connected with the screw-bolts, be operated above the surface of the water, so as to detach the body of the caisson from its base after the pier or foundation has been completed. Another feature of my invention consists in arranging upon the outer surface of the caisson vertical

rods, which pass down through openings in lugs attached to the caisson, while their lower ends engage with screw-threaded openings formed in the flange at the bottom edge of the caisson in such a manner that said rods serve to strengthen the caisson, and, at the same time, serve as a means for the workman to seize the caisson and guide it in its descent in the water, and thus enable it to be arranged at the spot and in the position desired.

In the accompanying drawings, Figure 1 is a side elevation of my improved caisson complete, the top being in position. Fig. 2 is a horizontal section on the line *x x* of Fig. 1. Fig. 3 is an end view. Fig. 4 is a vertical transverse section. Fig. 5 is a side view, partly in section, of the operating-key. Fig. 6 is a side view of one of the short screw-bolts.

In the several figures like letters of reference indicate corresponding parts.

Referring to the drawings, the letter A designates the body of the caisson, which, in the present instance, is of oblong form. This body is made up of a series of strips or sheets of strong, stout sheet metal, such as boiler-iron, or of such sheet metal as will withstand the external pressure of the water when sunk therein. The strips or sheets of metal composing the body are wrought or fashioned and united together in such a manner that the interior or chamber B will, as a general thing, correspond in shape with the shape or contour of the pier or foundation desired to be constructed, the object being that the interior surface of the caisson will serve as a guide to the workman; thus, when the pier or foundation is completed, its external surface will conform to the shape of the caisson, whether the latter be of a square, rectangular, triangular, circular, oblong, or other geometrical form. At the lower edge of the caisson is arranged a lateral flange, C, having a series of openings, *a a b b*, the former, *a*, to receive short screw-bolts, the latter, *b*, to receive the screw-threaded ends of guiding-rods, as will be mentioned hereinafter. To the exterior surface of the caisson are rigidly secured braces or uprights D, near the top of which are formed lugs *e*, having eyes or openings *d*, down through which pass rods E, said rods, in the present instance, being arranged upon the sides and ends of the caisson

directly opposite each other, and, passing down into screw-threaded openings in the flange, are firmly secured in place, their downward motion or undue bending being prevented by the collar *c* abutting against the upper face of the lugs *e*. These rods serve to strengthen the body of the caisson, but their most important office is to afford a medium for workmen to seize hold of the caisson and guide it in its descent in the water, and enable the caisson to be deposited upon the selected spot and position upon the bottom of the river or stream, without which it would be difficult to effect this result, owing to the tendency of the caisson to float or be turned by the current of the water. To the bottom edge or flange, *C*, of the caisson is connected a base, *F*, which is secured in position by means of short screw-bolts or other fastenings, *f*, in such a manner as to be attached when desired, the object of the removable base being that, when a pier or foundation is built upon the same, within the chamber *B* of the caisson, the body of the caisson can be detached, and the base remain a permanent basis or bottom for the pier or foundation, the body of the caisson being thus recovered, to which is readily applied another base, and the whole fitted for further use with but slight expense. The short screw-bolts *f* are formed with an angular-shaped head, *g*, having one or more recesses, *h*, upon which head is adapted a key, *G*, having a socket, *i*, corresponding to the shape of the head *g* of the bolt, so that the bolt can be unscrewed and the caisson be detached from its base while in the water, the key being passed down in the water, but operated above its surface. In order to retain connection between the key and bolt when established, I provide the key with a spring-jaw, *k*, which has a projection or nib formed so as to enter the recess *h*, and thus remain in contact with the screw, unless the spring-jaw be opened by pressing upon the extended lever of the jaw, or drawing upon the cord *l*. In some instances the guide-rods *E* can be made to pass entirely through the flange *C*, and screw down into the base-plate *F*, and thus aid in securing the same upon the body of the caisson. Between the bottom edge or flange of the caisson-body *A* and the base-plate *F*, I interpose a packing of rubber, felt, or other suitable water-proof packing, *H*, in such a manner as to secure a perfectly water-tight joint or union between the parts, so as to prevent the entrance of water into the chamber *B* of the caisson while the same is immersed in the water, during the building of the pier or other foundation. So as to recover the packing *H*, when the caisson is detached from its base-piece, I connect said packing with the caisson in any practical way,

preferably by means of screws *m*. In practice, the body of the caisson will be made of a slightly-tapering form from its base to its top, and likewise the thickness of the metal composing its walls will gradually decrease in thickness from the bottom strips or sheets toward the top, the object of which is to secure lightness and lessen the cost of construction. I designate a cover or cap, arranged upon the top of the caisson, and secured in position by lugs and bolts, or other suitable fastenings, *n*, the prime and essential office of the cover being to protect the uncompleted masonry in rain or stormy weather; and to prevent water from entering at the top of the caisson in high water I interpose a packing of rubber, felt, or other water-proof material between the top edge of the caisson and the cover, which cover, when screwed down, will create a perfectly water-tight joint. Chains or ropes *J* are connected with the body of the caisson at suitable points, preferably upon hooks *o* fixed upon the braces or strips *D*, the chains serving to connect the caisson with suitable hoisting and lowering mechanism. In some instances I form a flange, *K*, upon the top surface of the base or bottom *F*, so as to form a shoulder or guide for the first layer of masonry, as shown in dotted lines, Fig. 4, of the drawings.

Having thus fully described my invention, what I claim is—

1. The body of the caisson, *A*, made in the form described, and provided with the flange *C*, to receive the screw-bolts *f* for securing the base *F* in position, substantially as and for the purpose specified.

2. The base *F* and body *A*, connected together by screw-bolts having recessed heads to receive the key *G*, substantially as described, whereby the body *A* can be detached from the base when a pier or foundation is built thereon, as set forth.

3. The guiding-rods *E*, connected with the outer surface of the caisson and its flange *C*, to operate substantially as and for the purpose specified.

4. The guide-rods *E*, having a collar, *e*, in combination with the braces *D*, body *A*, and flange *C*, to operate substantially as and for the purpose specified.

5. The body *A* of the caisson, provided with the protecting-top *I* and a packing, *p*, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of October, 1873.

ADOLPH GUSTAV WOLFGAM.

Witnesses:

JAMES L. NORRIS,
WILLIAM J. PEYTON.