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CALLENDER & NORTHRUP.

Operating Ordnance.

No. 37,935.

Patented March 17, 1863.

Fig. 2.

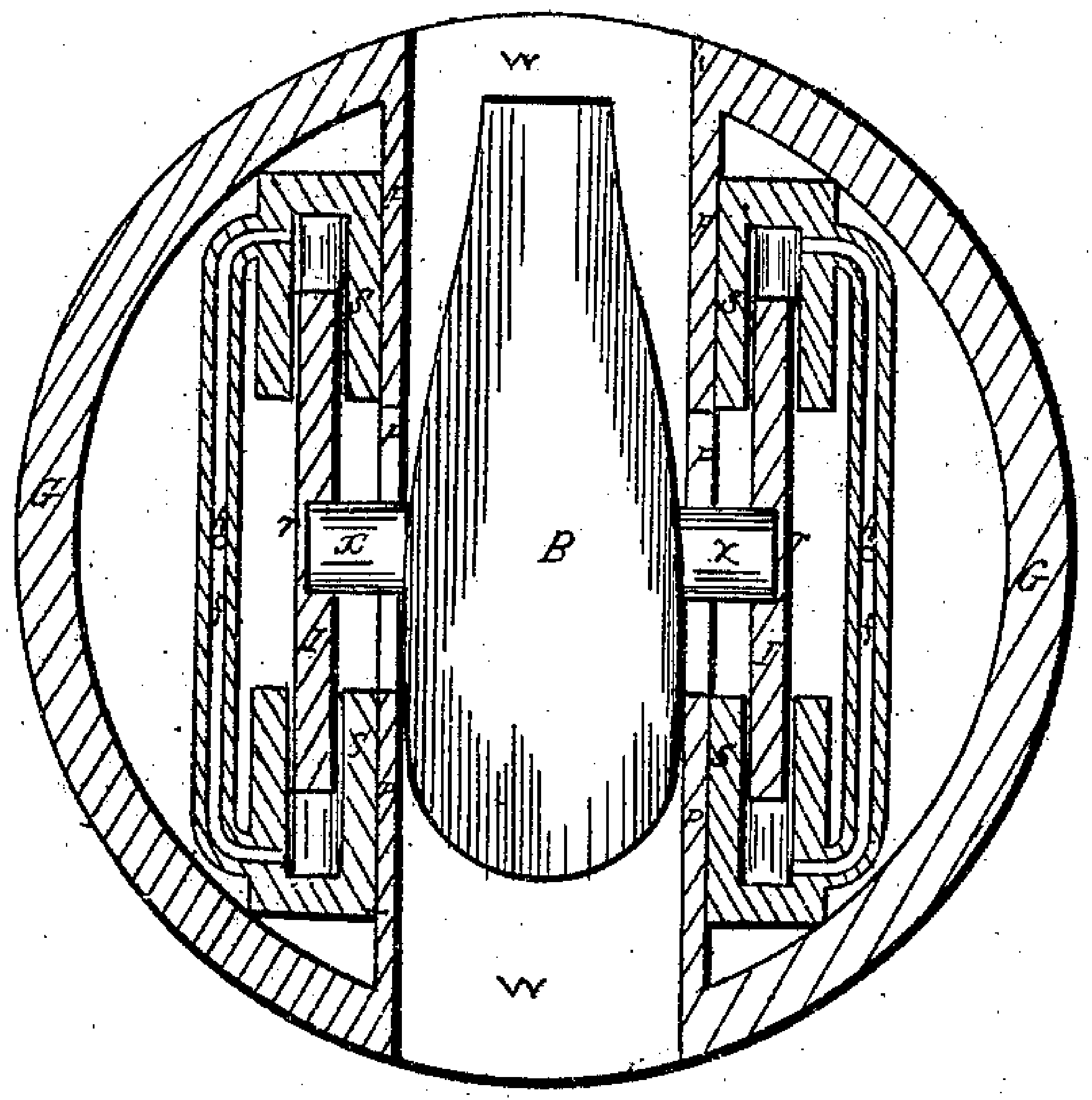

Fig. 1.

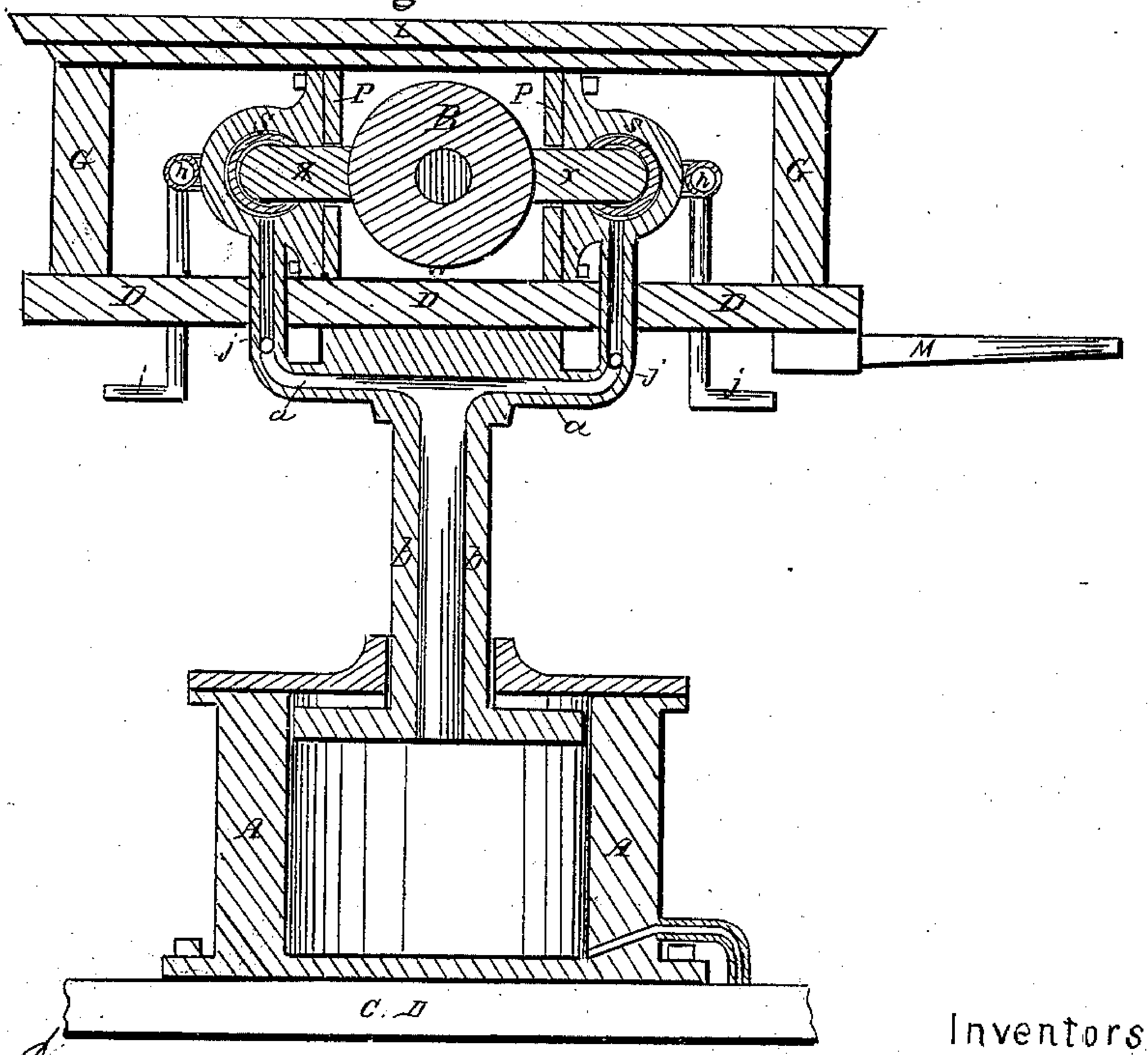

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Fig. 3.

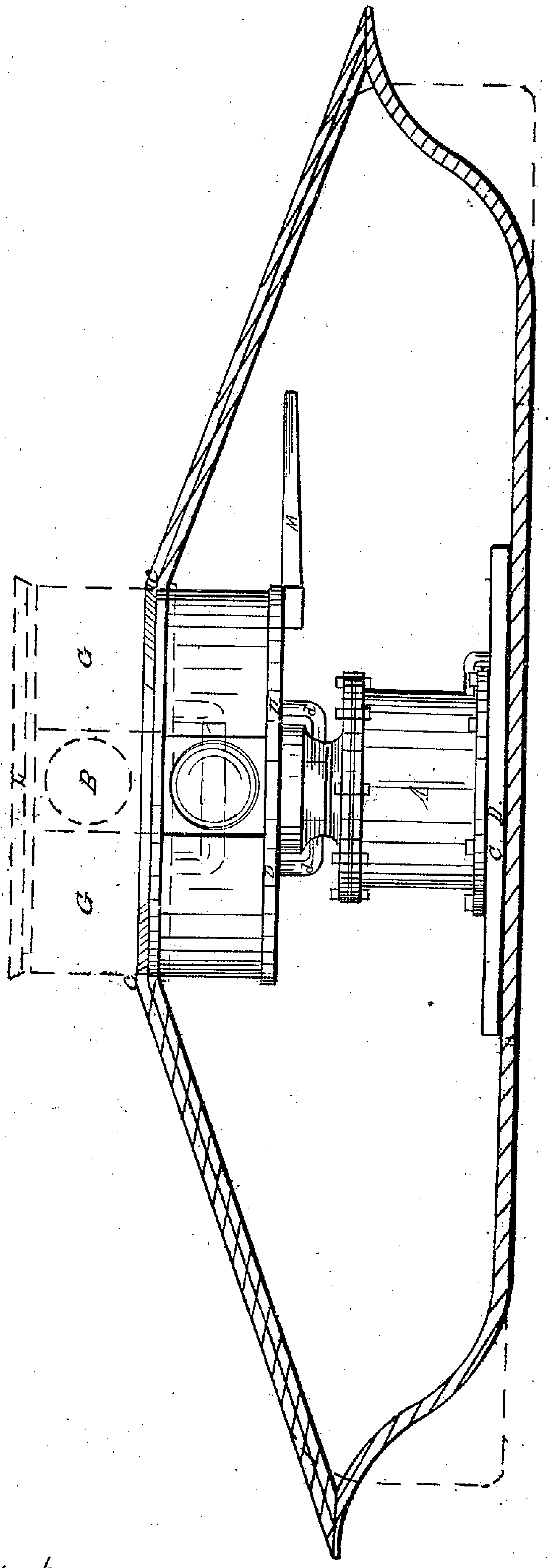

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Fig. 5.

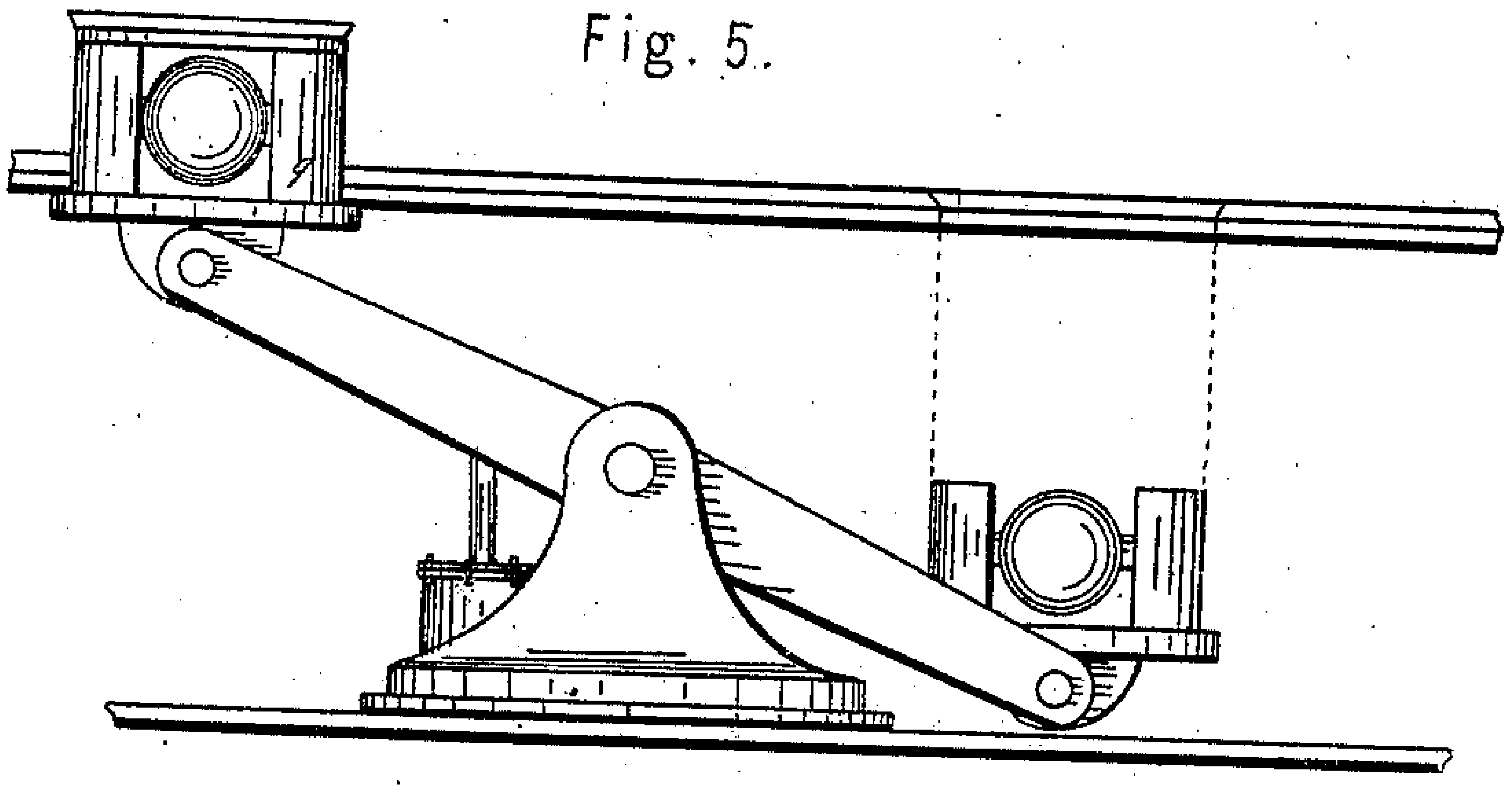

Fig. 4.

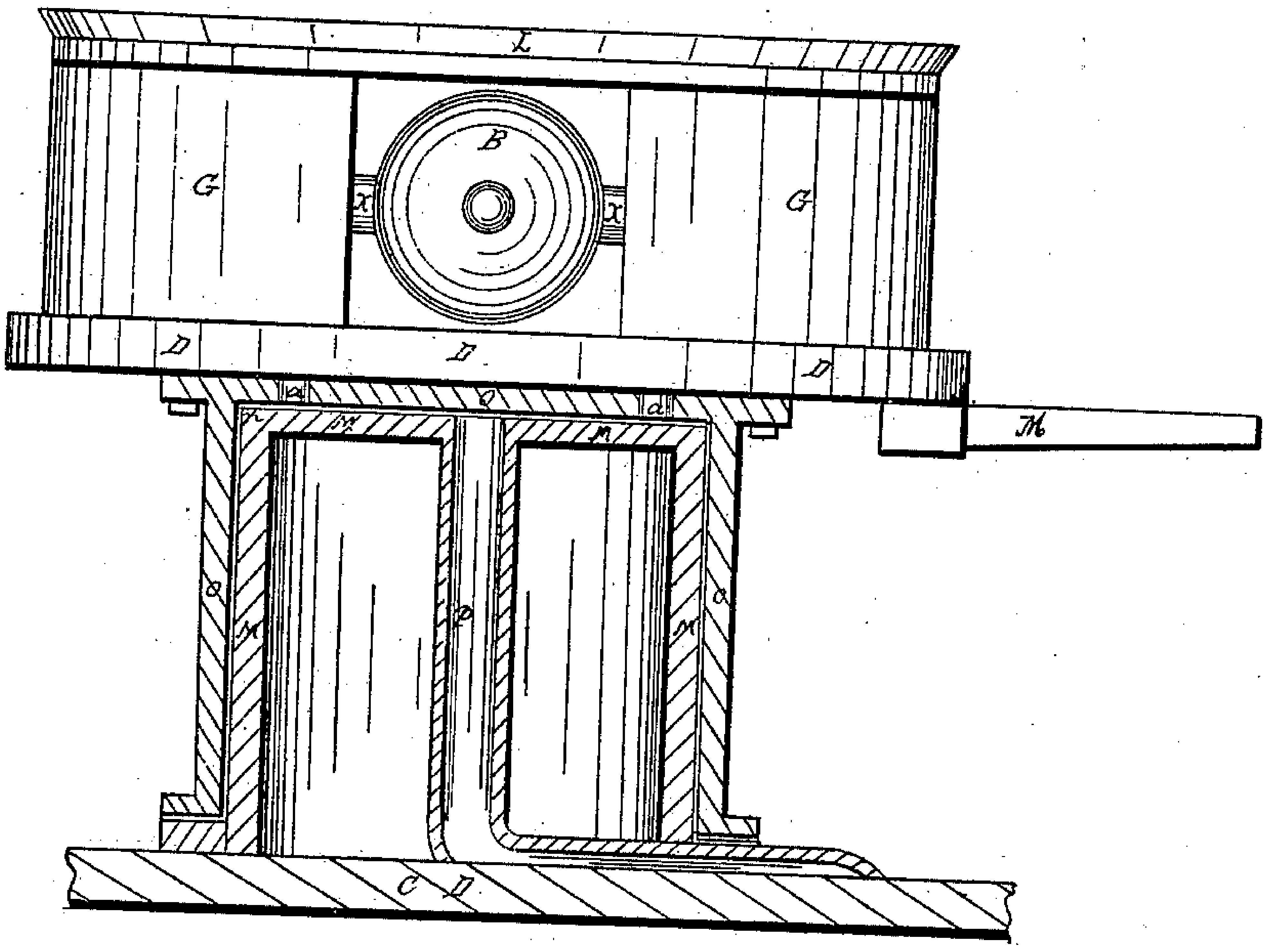

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Fig. 7.

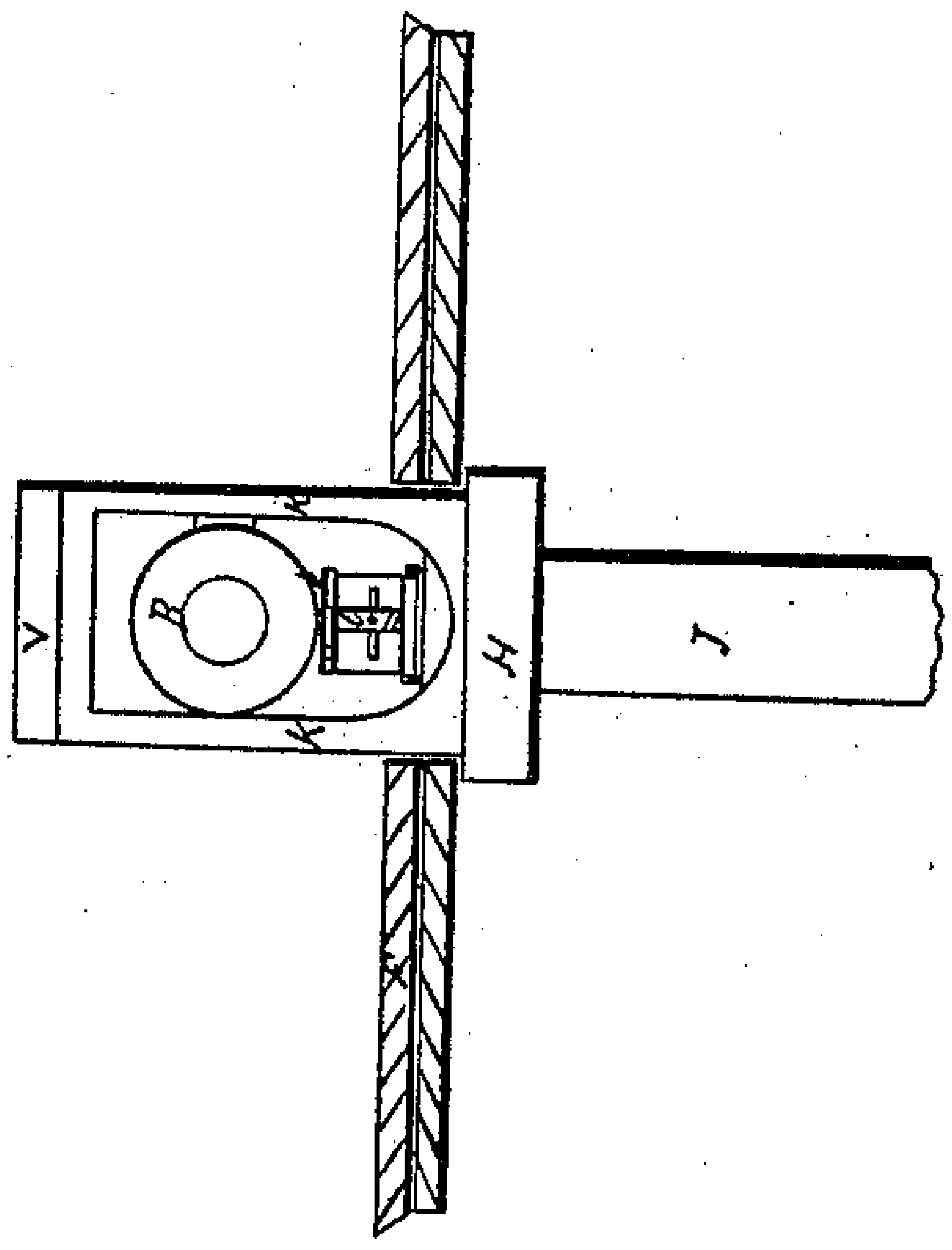
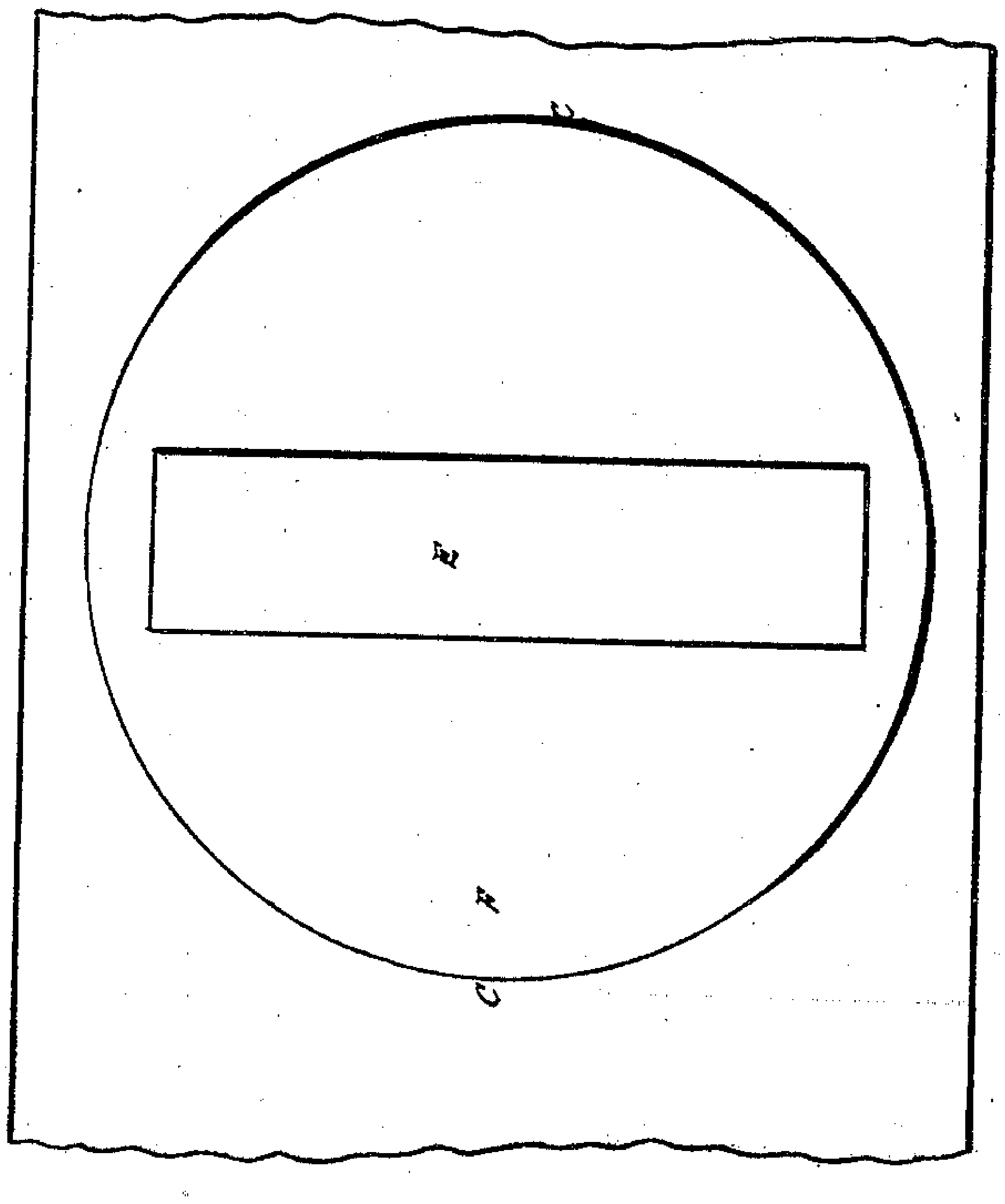


Fig. 6.



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UNITED STATES PATENT OFFICE.

MILLS L. CALLENDER, OF NEW YORK, AND NELSON W. NORTHRUP, OF GREENE, N. Y., ASSIGNORS TO THEMSELVES AND CHAS. H. WELLING, AND, BY MESNE ASSIGNMENTS, TO JAMES B. EADS.

IMPROVEMENT IN OPERATING ORDNANCE.

Specification forming part of Letters Patent No. **37,935**, dated March 17, 1863.

To all whom it may concern:

Be it known that we, MILLS L. CALLENDER, of the city, county, and State of New York, and NELSON W. NORTHRUP, of the town of Greene, in the county of Chenango, State of New York, have invented new and useful improvements in the construction and arrangement of mounting heavy ordnance and the method of protecting and operating the same; and the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 shows a vertical central section of a steam-cylinder, hollow piston-rod, steam-pipes, and view of cannon, platform, and shield elevated. Fig. 2 represents an open top view of platform and piece of ordnance mounted. Fig. 3 shows a cross-section of a gun-boat with cylinder, the gun depressed in position for loading, and elevated for firing shown in red lines. Fig. 4 represents a vertical section of an improved steam-cylinder, the outer case answering to confine the steam between the heads to elevate the shield and ordnance. Fig. 5 shows the operation of elevating and depressing ordnance by steam, two guns being mounted on a balanced frame. Plate No. 2, Fig. 6 shows a top view of an oblong opening through the rotating plate to admit the ordnance. Fig. 7 is an end view of a cannon elevated up through the oblong opening.

The object of our invention is to protect both the ordnance and gunners from being injured; and it comsists in the construction and arrangement of the platform, shield, and covering to protect the ordnance and allow it to swivel so as to bear upon any point, while the weight is supported on the steam in the cylinder directly underneath and central with the platform and cover, which closes the opening in the top of the gun-boat both when the ordnance is elevated and depressed; also, in the method substantially herein described for transmitting steam to both the front and rear of the trunnions of the cannon without interfering with the free rotation of the gun-platform.

To enable others skilled in the art to make and use our invention we will describe it more fully, referring to the drawings, and to the letters of reference marked thereon.

Like letters indicate like parts in all of the several figures.

We place the bed-plate C D upon the bottom of the boat Q, and secure one or more of them in such central positions as to balance the boat. To the bed-plate C D is secured the vertical steam-cylinder A A, as seen in Figs. 1 and 3, having a head and hollow piston-rod *b b*, with two pipes, *a a*, branching off at the top and extending out at right angles on both sides a sufficient distance to pass up through the gun-platform D D D, so as to connect with the two steam-boxes S S, into which the sliding bars I I are fitted steam-tight at both ends, leaving a space in the middle between the steam-boxes S S open and free. The sliding bars I I, being square and faced off at both ends, form friction-heads for the steam to operate against, so that they can be slid either way or held in any position by the action of the steam passing up through the piston *b b* and steam-pipes *a a* to the steam-boxes S S S′ S′, the action being regulated by opening and closing the throttle-valves *h h* and *i i* in the connecting steam-pipes *a a* and *f f*. The throttle-valves *h h* are operated by rock-shafts *j j*, extending down through the platform D D. The valves *i i* are also controlled from underneath.

The piece of ordnance B is mounted, the trunnions X X fitting in boxes T T in the center of the sliding bars I I, which being cushioned at both ends by the pressure of the steam and controlled by the valves *h h* and *i i*, the cannon can be run forward and held with nearly the whole force of the steam in the boiler to act on the recoil; or the steam being pressed equally on both ends of the bars I I, upon which the gun is mounted, the recoil will simply be a vibration when the piece is discharged.

The platform D D is secured firmly upon the head of the piston *b b*, so that the whole connected therewith is elevated and depressed by the direct action of the steam in the cylinder underneath. The platform D D is made round and somewhat longer in diameter than the opening C in the top of the gun-boat Q, and is surrounded by a shield, G G, on both sides, with the exception of the passage *w w*, through which the ordnance B is placed, the trunnion-boxes and steam cylinders and pipes being incased on the sides by the partitions P P, and contained within the semicircles of the shields G G, the diameter of which is made to fit nicely in the opening C in the top of the boat, the shield sides being vertical and high enough to allow of getting the range and distance of the piece, the whole being covered with a cap, L, which exactly fits into and closes the opening C when the gun is depressed, leaving the top of the covering of the boat level and smooth, as if there were no armament on board that could be brought into use. When a little steam is let into the bottom of the cylinder, the whole armament will be relieved, and, resting upon the steam, it can be turned round to bring the gun to bear upon an object with the greatest ease by the lever M, and when the ordnance is elevated by steam to its highest point the platform D will effectually close the opening C in the boat, so that none of the gas and smoke can enter, and the noise and concussion of the report will be very much diminished in its effects upon those on board of the craft. Thus by the above-described construction and arrangement guns of the largest caliber can be operated by a very few efficient hands with the greatest facility and ease, the gunners at no time being in sight of the enemy or in the least exposed while loading, as that is always done when the gun is depressed and the top closed, and that may also be mainly done by steam machinery. The shield and gun are only exposed and in danger of being hit at just the moment they are elevated above the line of the top of the boat to discharge the piece.

Fig. 4 shows an improved mode of construction of a steam-cylinder for operating ordnance in the manner above described. As it is obviously necessary to secure a substantial base, and as large a bearing as possible to support the platform D D, we use for a steam-cylinder an inverted cup, the inside bored out perfectly smooth, so that the rim or sides *o o* will slide on a steam-tight packing, *n n*, around the top of another inverted cylinder or cup, *m m*, the induction of the steam being through the pipe *b* in the center, so that the heads of the two cylinders form the pressure-surface for the steam to elevate and operate the gun, the steam being conveyed to operate on the recoil of the gun by passing up the pipes *a a* through the head of the outside cylinder and the platform. Plate No. 2 shows another mode of construction of the opening in the top of the gun-boat to elevate ordnance, and saves the lifting of a great amount of the weight described in the foregoing. The opening E is made oblong through a circular plate, F, of sufficient diameter to admit the gun box or carriage K K, which fills the opening in plate when elevated the same as the shield does the round opening C in the other plate, No. 1. The armament K K, being balanced upon and secured to the piston J, is operated precisely like Fig. 1, the plate F turning with the armament to bring the gun in range and can be brought to bear upon any object the same as the round shield G G, and when the gun-carriage K is elevated the base or platform H comes in close proximity with the plate F, so as to close all of the opening while the gun is discharged, and when the gun is depressed the top V is closed level with the surface of the plate and boat. The breech of the cannon B rests upon a movable plate of metal, *k*, under which is placed the jack-screw *l*, so that when the gun recoils the plate *k* relieves the screw from any strain by sliding easily over it.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The construction and arrangement of the gun-platform and shield so that it may be freely revolved while supported on a cushion of steam within the cylinder, as described.

2. The method of transmitting steam-pressure to either or both sides of the trunnions without interfering with the free rotation of the platform and shield, substantially as described.

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Witnesses:
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