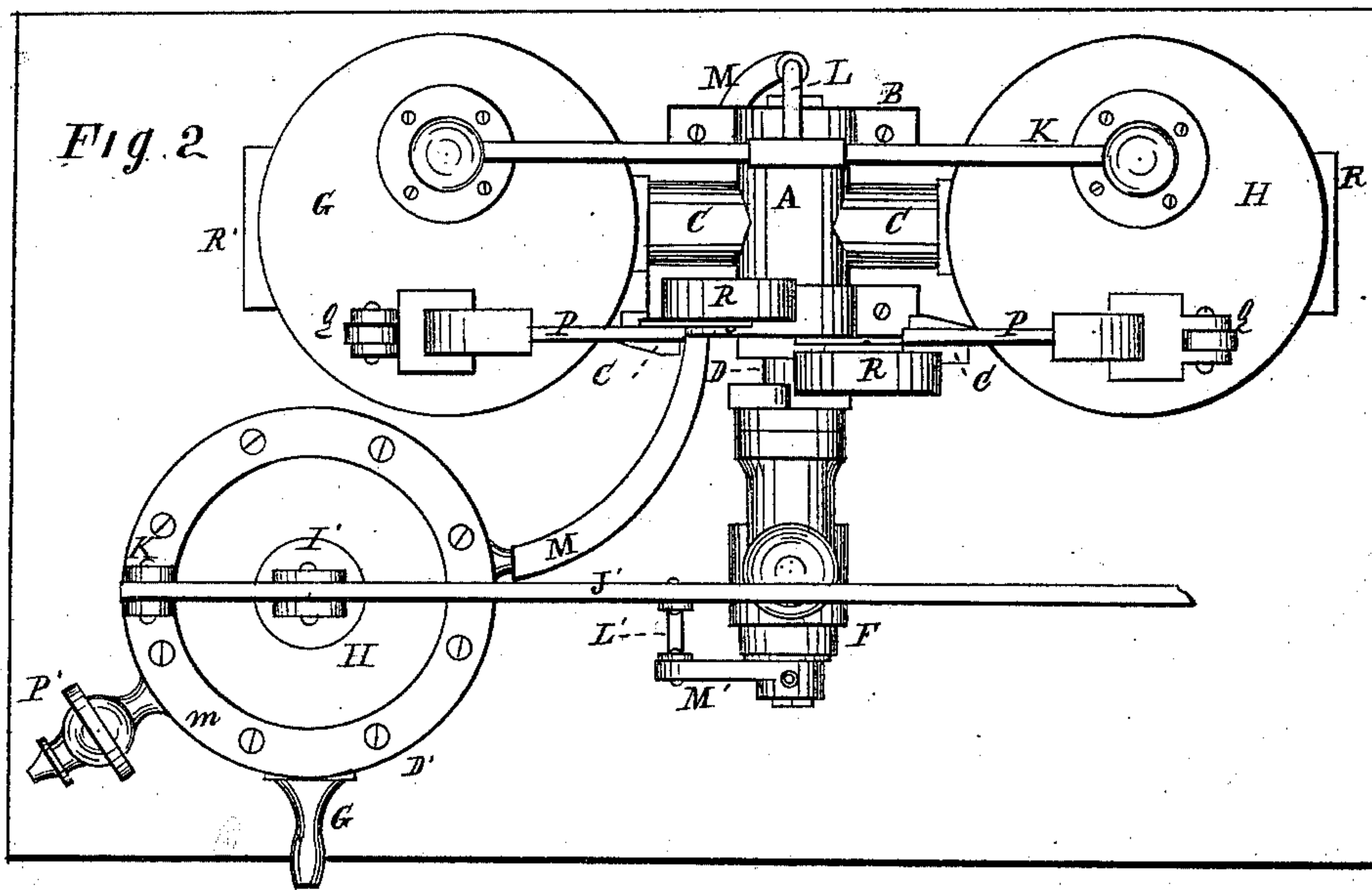
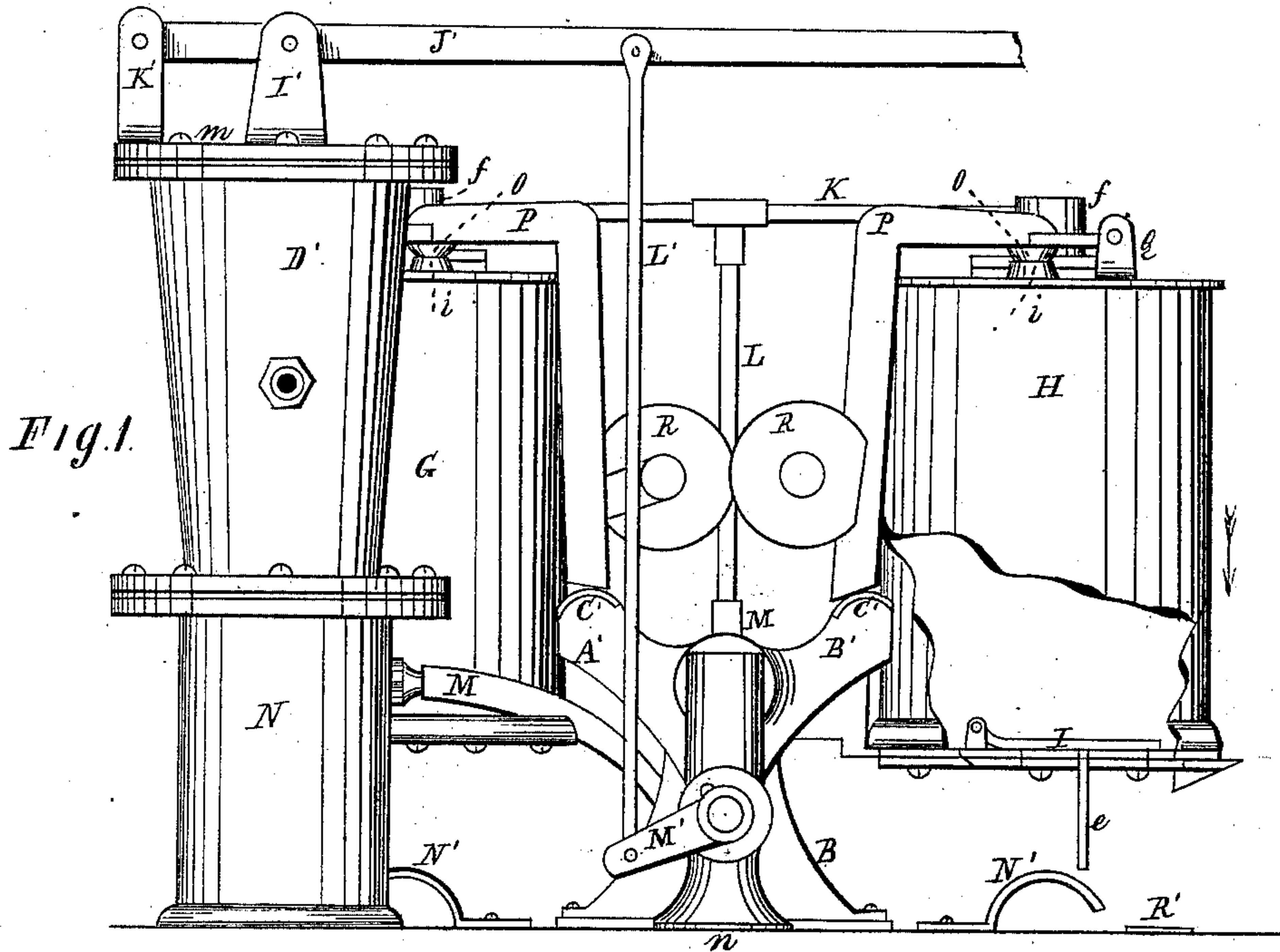


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Hydraulic Motor.

No. 223,707.

Patented Jan. 20, 1880.



WITNESSES.
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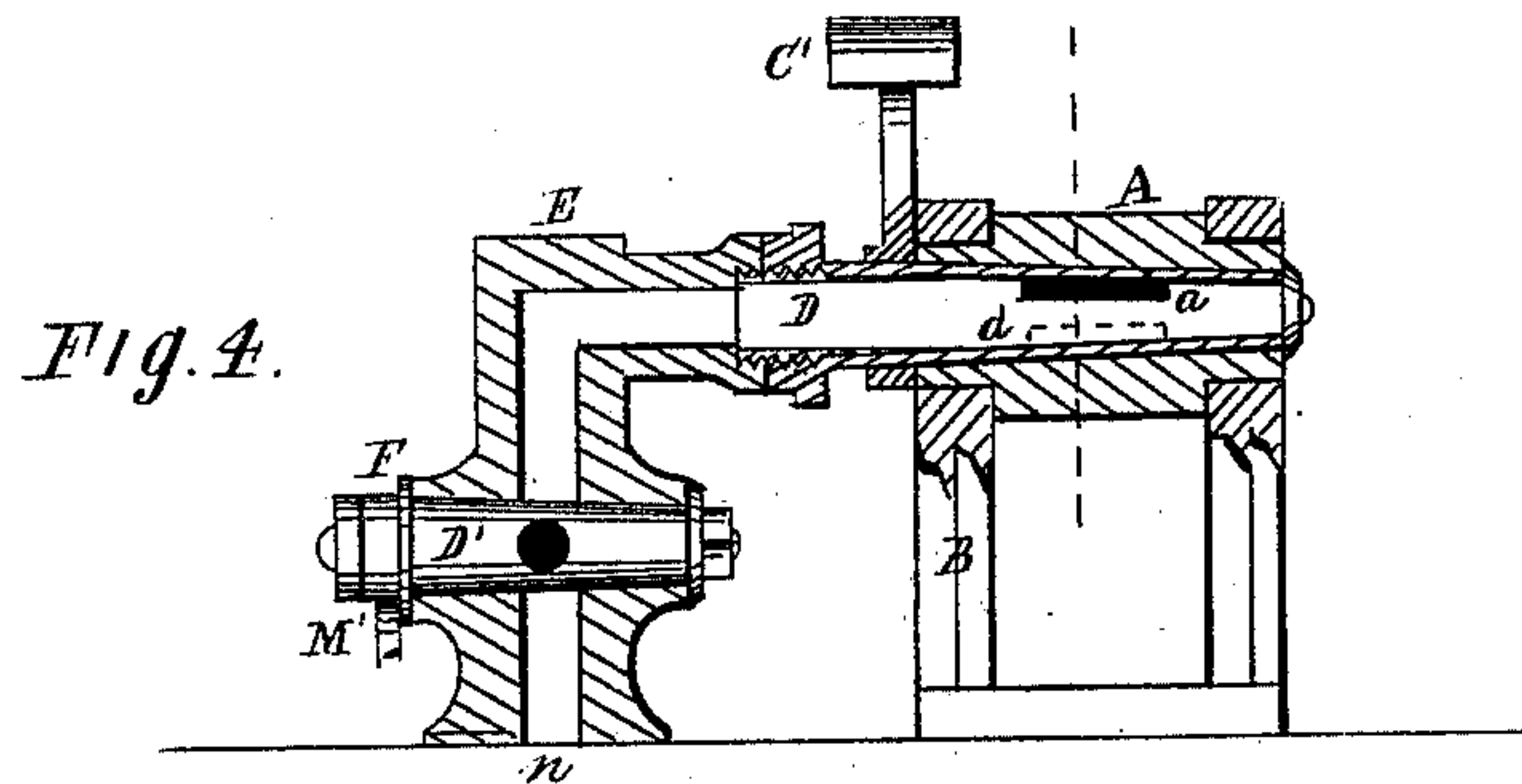
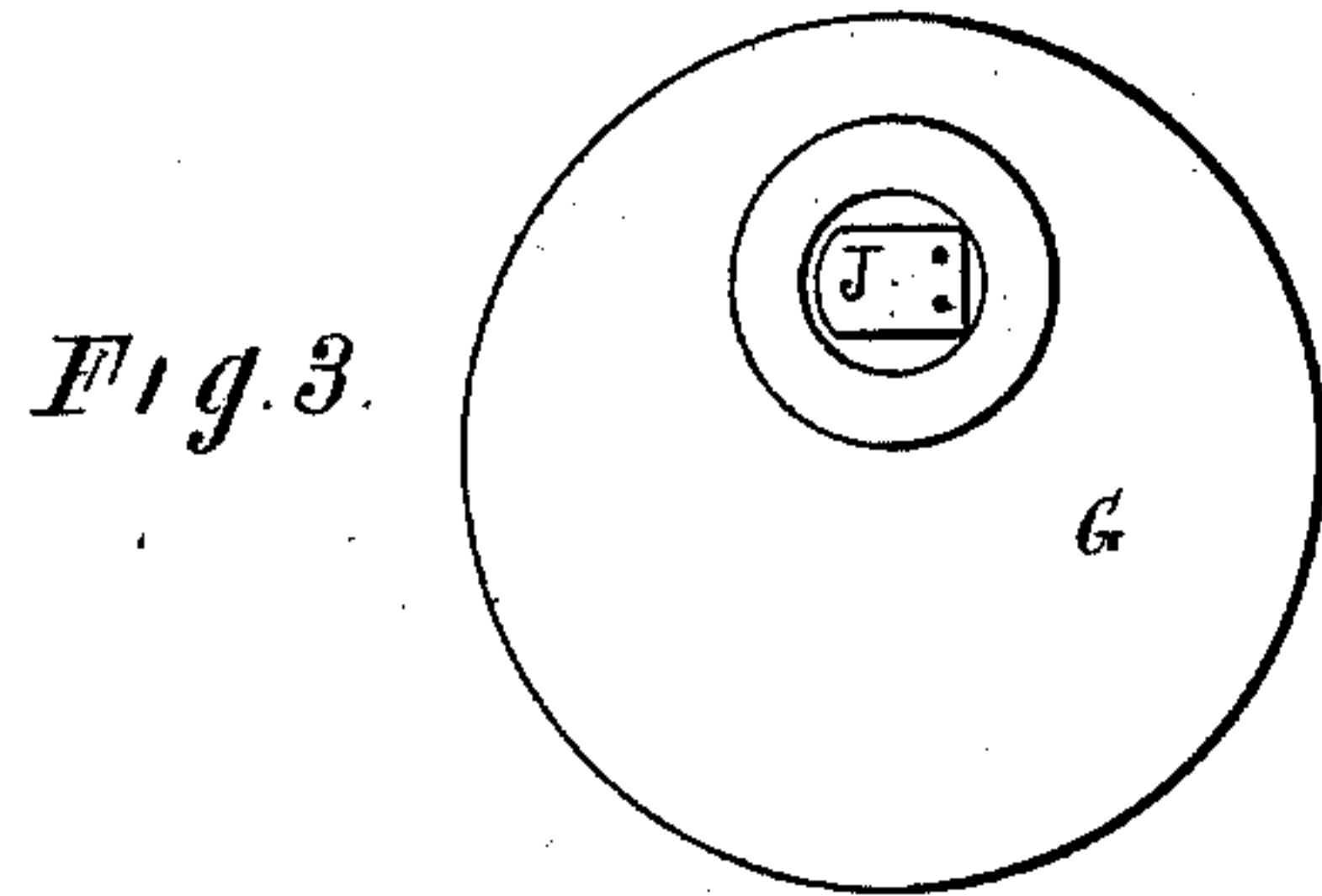
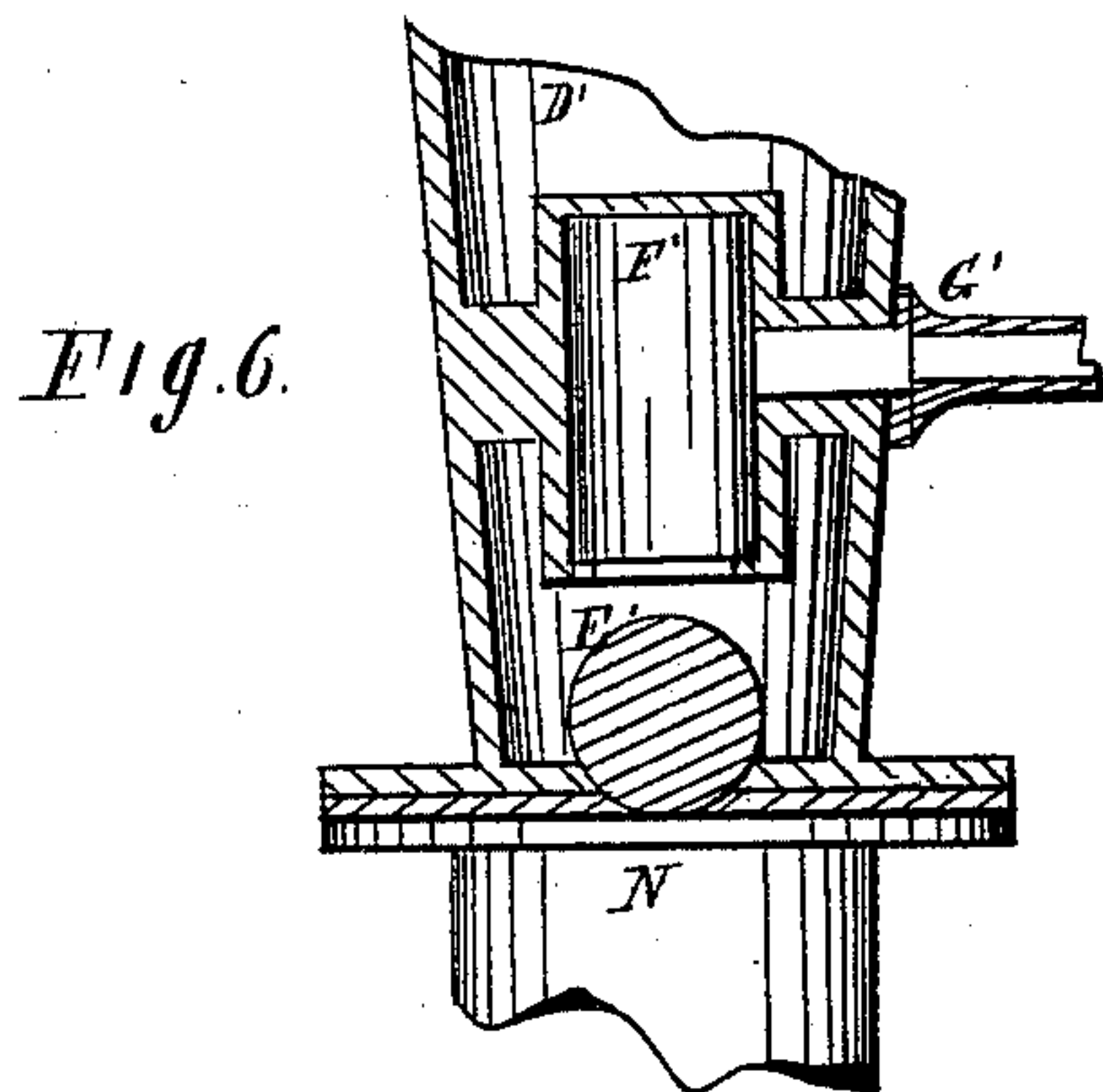
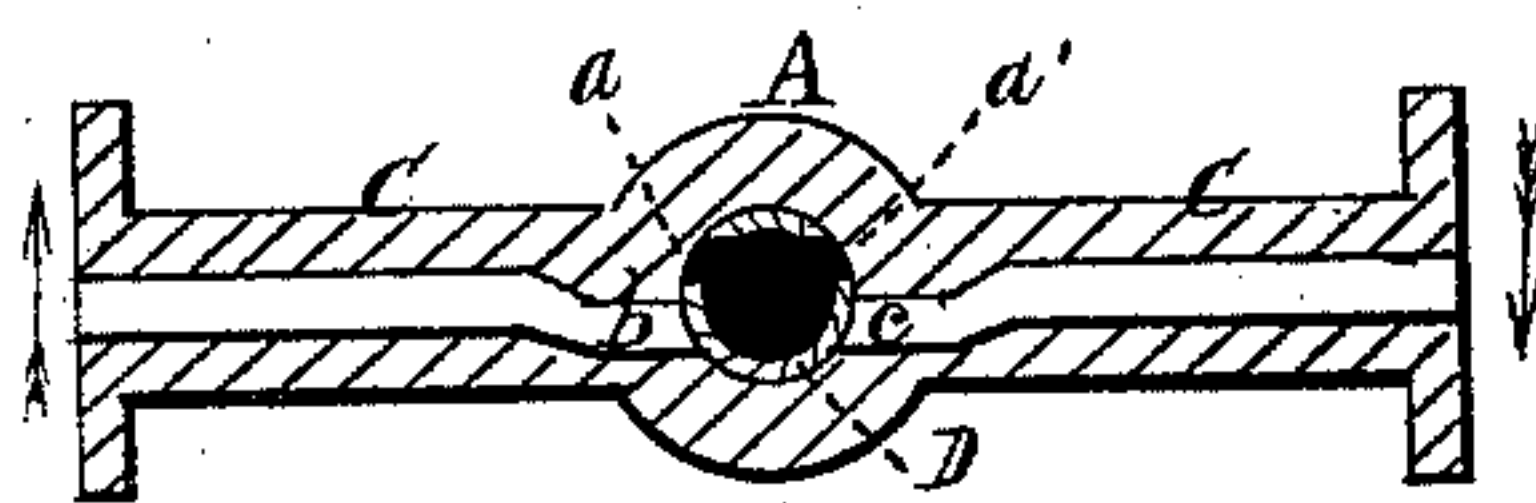


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM F. CLASS AND JOHN C. BRIEGLER, OF CLEVELAND, OHIO.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 223,707, dated January 20, 1880.

Application filed June 23, 1879.

To all whom it may concern :

Be it known that we, WILLIAM F. CLASS and JOHN C. BRIEGLER, of Cleveland, in the county of Cuyahoga and State of Ohio, have
5 invented a certain new and Improved Hydraulic Motor; and we do hereby declare that the following is a full, clear, and complete description of the same.

This invention is an apparatus for compressing air and forcing the same into apartments, closets, cellars, barrels, and other places where
10 fresh air is required for ventilation or a pressure of air needed.

A full and complete description of the invention and the operation of the same is as follows, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the machine.
20 Fig. 2 is a plan view. Figs. 3, 4, 5, and 6 are detached sections.

Like letters of reference refer to like parts in the several views.

In Fig. 2 of the drawings, A represents a
25 hollow head or shaft journaled in the cheeks of a frame, B. From either side of the head projects a tubular arm, C, communicating with the hollow of the head. Said arms, together with the head, vibrate in the frame, for a purpose further on explained.
30

In the head alluded to is fitted a faucet-key, D, Figs. 4 and 5, which, together with the said head, forms a faucet. The passage-way of the key is an oblong opening or openings,
35 *a a'*, Figs. 4 and 5, which, as will be seen in said figures, are above the axial line of the key, whereas the corresponding openings in the head or shell of the key are below the axial line, as shown at *b* and *c*, Fig. 5, also indicated
40 by the dotted lines *d* in Fig. 4. The relative position of the passage-way of the key to the openings in the head or shell B and arms thereof is such that when the arms C are in a horizontal position, as shown in Figs. 1 and 2,
45 the openings are closed in respect to each other, as seen in Fig. 5, whereas on vibrating the arms in the direction indicated by the arrows the opening *a'* of the key will be brought in open relation to the opening *c* of the head
50 and arm at the same time the openings *a* and *b* remain closed.

On vibrating the arms in the opposite direction the openings *a'* and *c* will be closed and the openings *a* and *b* will be brought in open relation to each other. The arms vibrate
55 on the key, the said key being a fixture, which is prevented from turning as the arms vibrate by its attachment by any suitable means to the elbow E of a stop-cock, F, in open relation to the key D, as shown in Fig. 4. The
60 stop-cock F referred to is essentially like those in ordinary use, and therefore needs no special description. Further reference will be made to it hereinafter.

To the end of each of the arms C alluded to
65 above are secured, respectively, cylinders G and H, with which they have an open and direct communication. In the bottom of each of the cylinders is a valve, I, opening inwardly. To each of said valves is attached a pendent stem,
70 *e*, Fig. 1. Also, in the top of each of the cylinders is a valve, J, Fig. 3, opening outwardly. Said valve J is inclosed by a cap, *f*, Fig. 1, by which cap the two cylinders are put in communication with each other by a pipe, K, and
75 by a pipe, L, and hose M, leading from said pipe K, they are put in connection with a cylinder, N, substantially as shown in Figs. 1 and 2.

In the top of each of the cylinders is also an opening through a boss or valve-seat, *i*,
80 Fig. 1, of which O is the valve, opening outwardly. Said valve is secured to the under side of an arm or lever, P, hinged at Q to the top of the cylinder. Said valve is held down upon its seat by a weight, R, attached to the
85 pendent arms of the lever or levers, as shown in Fig. 1.

To the faucet-key D above referred to is fixed a pair of arms, A' and B', Fig. 1, each of which is provided with a head or cap, O', consisting of a projecting flange, as seen in Fig.
90 4, upon which the dependent ends of the levers P rest, respectively pushing them upward and opening the valves O when the arms C are in a certain position, for a purpose presently
95 shown.

To the top of the cylinder N above referred to is secured an air-vessel, D', made air-tight in its connection therewith by any suitable means. Said vessel and cylinder have com-
100 munication with each other by an opening in the bottom of the vessel forming the top of the

cylinder. Said opening is closed by a ball-valve, E', Fig. 6. Directly above said ball-valve is a chamber, F', open to the outside by an eduction-pipe, G'. The top H', Fig. 2, of the said vessel D', is flexible, and may consist of leather or other suitable material, the edge of which is secured to the rim of the vessel by a ring, m, bolted thereto, as shown in the drawings.

To the center of the flexible top or cover of the vessel is attached a standard, I', Fig. 1, in which is pivoted a lever or arm, J'. The short end of the arm is pivoted in a standard, K', on the edge of the vessel. To the free part of the arm is attached a rod, L', whereby it is connected to the arm M' of the key of the faucet F, for operating said key, as and for a purpose presently shown.

The practical operation of the above-described machine is as follows: As above said, the machine is for producing a current of fresh air, and for forcing the same into a place or places requiring a supply of air for ventilation or a continued pressure of the same. To this end the machine is attached to a hydrant or other source of water having a head-pressure. The connection is made by a hose leading from the hydrant to the stop-cock F, to which it is made fast at the point n, Figs. 1 and 4. The stop-cock F, as shown in Fig. 4, is represented as being closed, in order to show the passage in the key of the cock. Practically, however, the cock is open during the ordinary working of the apparatus, and is closed during certain times in the operation of it, as and for a purpose farther on explained.

The water passes from the hydrant through the cock F thence into the key D of the vibratory head or shell A.

In order that the water may flow from the key, thence through an arm, C, into one of the cylinders, said arms are turned to an oblique position. For illustration, let it be required to fill the cylinder G. To do this the cylinders are tilted in direction of the arrows in Fig. 5. This will bring the opening b of the arm C in open relation to the opening a of the key D, through which the water will be forced into the uplifted cylinder G. As the cylinder fills, the air therein is forced by the pressure of the water through the valve J in the top of the cylinder, thence along the pipe K to the pipe L, along which it flows into the cylinder N, pushing upward the trap-valve or ball E' and filling the vessel D' and chamber F' with air, from which the air is conducted to such place or places required by a hose attached to the eduction air-pipe G'. By the time the cylinder G is filled with water and the air it contained expelled therefrom into the vessel D' by the presence and pressure of the water, the cylinder will descend by the weight of its contents, thereby elevating the empty cylinder H. This movement closes the openings a and b and brings the openings a' and c into open relation to

each other, so that the water will now flow from the key D into the cylinder H, shutting off the water from the said cylinder G while the cylinder H is filling with water, and forcing the air therefrom into the vessel D', as described in respect to the action of cylinder G. Said cylinder G is discharging its water through the bottom valve, corresponding to the valve I in the cylinder H, which, as the cylinder descends the stem of the valve, strikes upon the discharger N', forcing it upward and opening the valve so that the water may flow therefrom for emptying the cylinder. That the water may flow freely therefrom, the cylinder is ventilated by opening the valve O, which is effected by the pendent arm P. The end thereof, by resting upon the head c' of the arm A', pushes upward the arm P and opens the valve, permitting air to pass into the cylinder, for the purpose specified. By the time the cylinder G is discharged of its water the cylinder H is filled, the weight of which causes it to descend and elevate the empty cylinder G, which is now in open relation to the key D and the cylinder H closed. As the cylinder H descends its discharging-valve I is opened by the stem e impinging upon the discharger N'. At the same time the vent-valve O is opened by substantially the same means as was the vent-valve of cylinder G. While the cylinder H is being emptied cylinder G is filling and forcing the air therefrom into the vessel D', as hereinbefore described. Hence as one cylinder is elevated and filling with water and forcing the air therefrom into the vessel D' the other cylinder is discharging its contents. This alternating vibratory action of the two cylinders keeps a constant issue of air from the discharging air-pipe G', to be conveyed by a hose to such place or places as desired.

In the event of an overflow of water into the cylinder N the ball or float valve will be forced upward against the seat and shut the water off from flowing from the eduction-pipe G'. At the same time the excessive pressure produced on the air in the vessel D' forces upward the flexible top H' of the vessel and lifts the arm J', which will close the stop-cock F more or less, according to the pressure exerted upon the arm, and thereby shut off more or less of the water, causing a corresponding reduction of the pressure of water in the cylinder N and air-vessel. Water which may have accumulated in the cylinder N in consequence of any such excessive pressure or otherwise is drawn therefrom by the cock P'.

For regulating the amount of pressure to be exerted upon the air in the vessel D', a weight is to be hung on the arm J', which, if great pressure is required to be exerted on the air to force it at greater distance, should be hung near the end of the arm, to keep the cock open for a full flow of water to the cylinders. In the event a light pressure of air only is needed, the weight should be moved nearer to the air-vessel, so that less pressure will raise it and close the stop-cock accordingly. The press-

ure of the water on the air in the cylinders will be more or less, according to the volume of water allowed to pass through the stop-cock.

R', Fig. 1, is a cushion, upon which the cylinders strike in their vibratory action. Said cushion prevents noise and undue wearing of the cylinders as they strike upon the floor of the machine.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The air-vessel D', having a flexible top, and pivoted thereto a weighted lever or arm connected by a link to a stop-cock, in combination with an air-presser and cask, in the manner substantially as described, and for the purpose set forth.

2. In motors for producing currents of air an air-vessel having a flexible top and pivoted thereto a weighted arm or lever, and said air-vessel provided with an outlet, G, and ball or float valve, as and for the purpose specified.

3. In combination, respectively, with the cylinders, ventilating-valves attached to weighted levers P, and operated alternately by the heads of the arms A' and B', secured to the tubular key, on vibrating the tubular arms C and cylinders, substantially as and for the purpose set forth.

4. In motors for producing currents of air

and pressure of air, the combination of the cylinder N, air-vessel having a flexible top and pivoted thereto an arm or lever connected by a link to a stop-cock, and said air-vessel provided with an internal air-chamber having an outlet, G', and ball-valve, all adapted to operate in relation to each other as described, and for the purpose specified.

5. In motors for producing currents of air and pressure of air, the vibratory cylinders, with their respective valves, air-pipes, and arms, stationary key provided with openings above its axial line, shell or head provided with openings below its axial line, and corresponding to the openings in said key and arranged in relation therewith as described, stop-cock, cylinder N, and air-vessel connected therewith, and having therein an air chamber and valve, and an outlet leading from said chamber, and provided with a flexible top having attached thereto a lever or arm connected to said stop-cock by a link for operating the same, substantially as described, and for the purpose set forth.

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JOHN C. BRIEGLER.

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