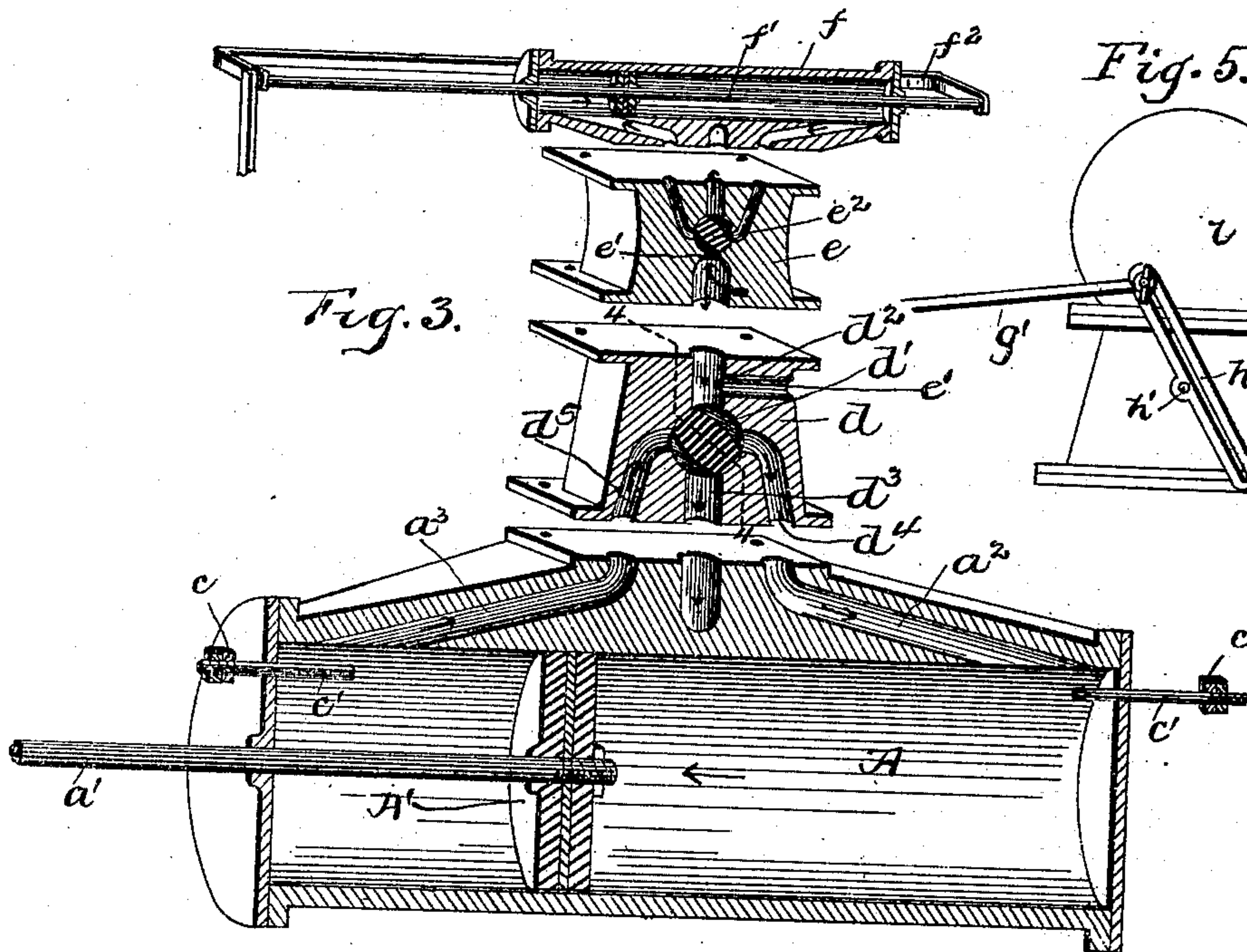
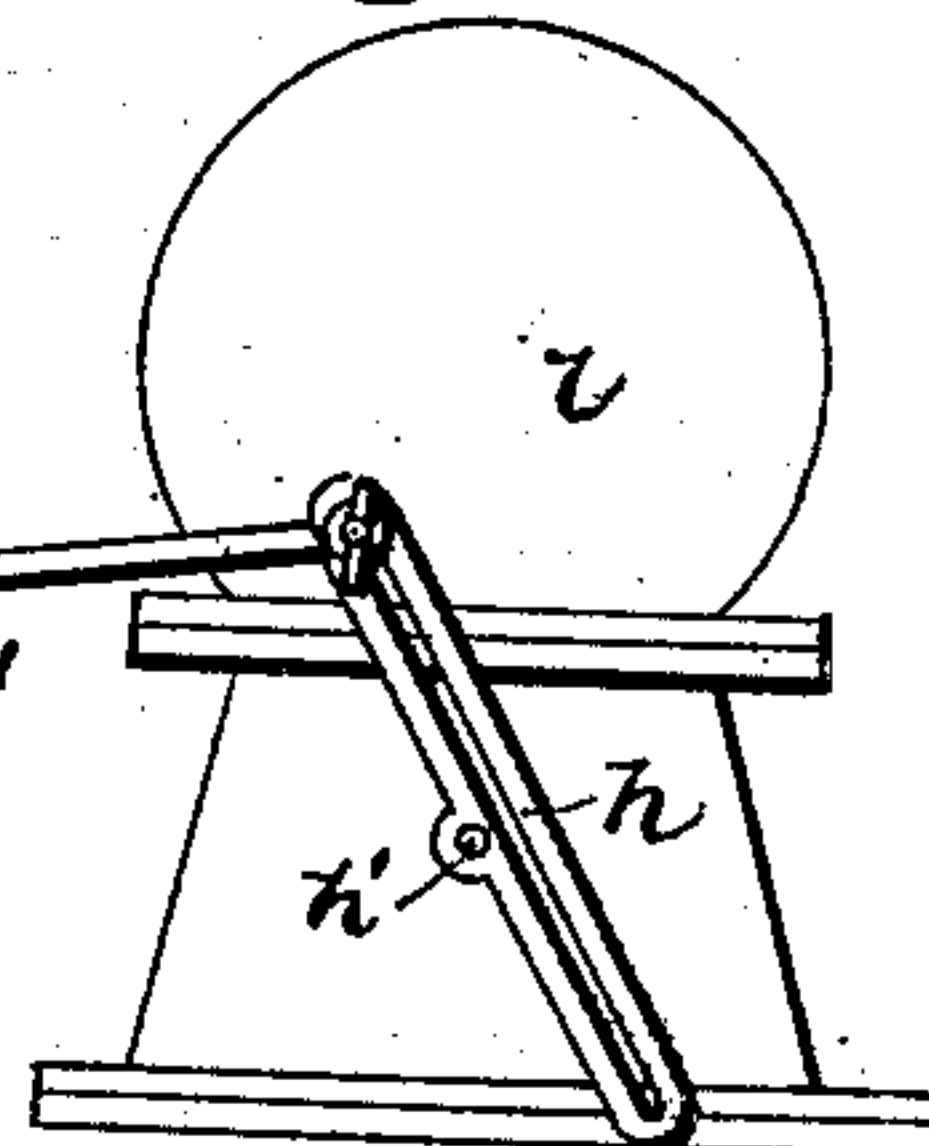
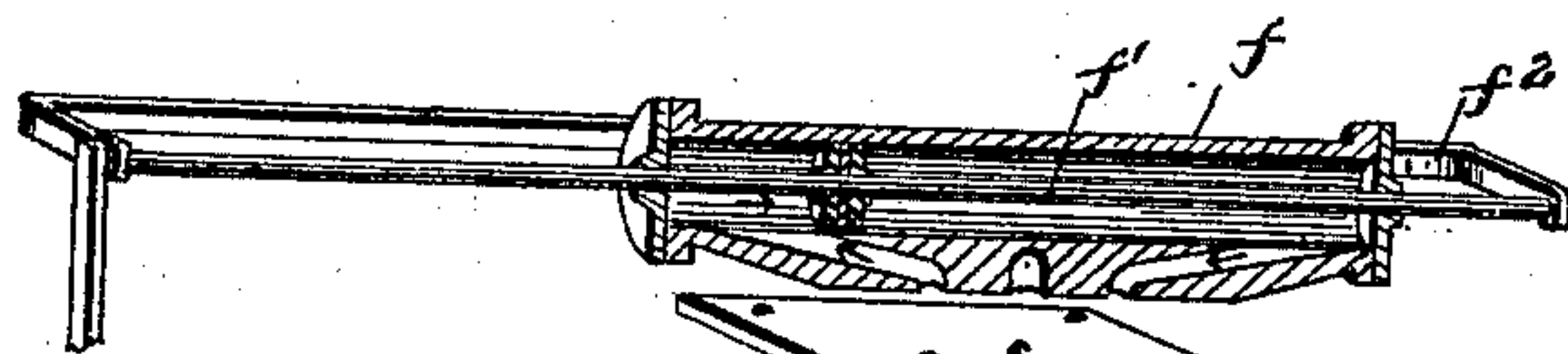
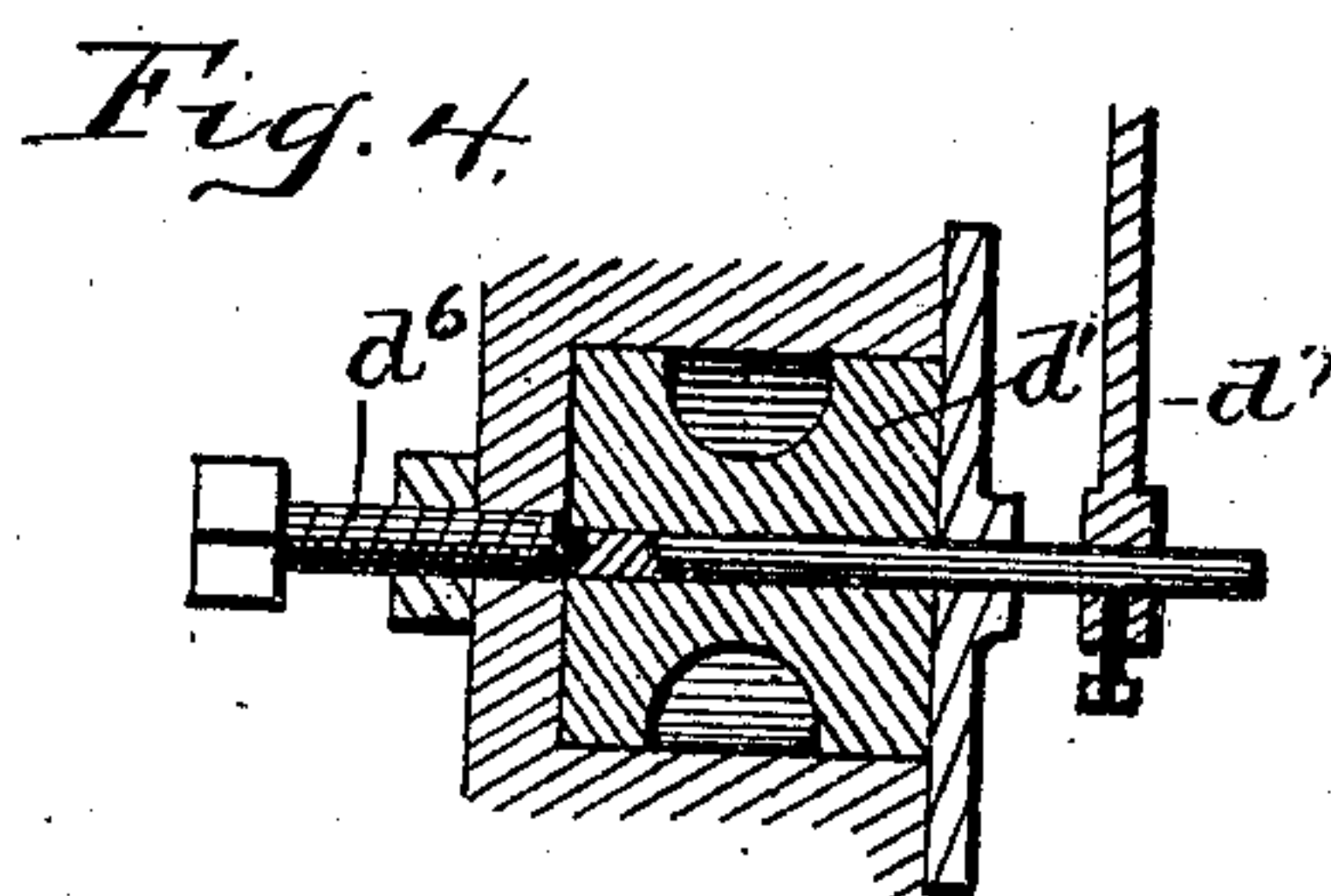
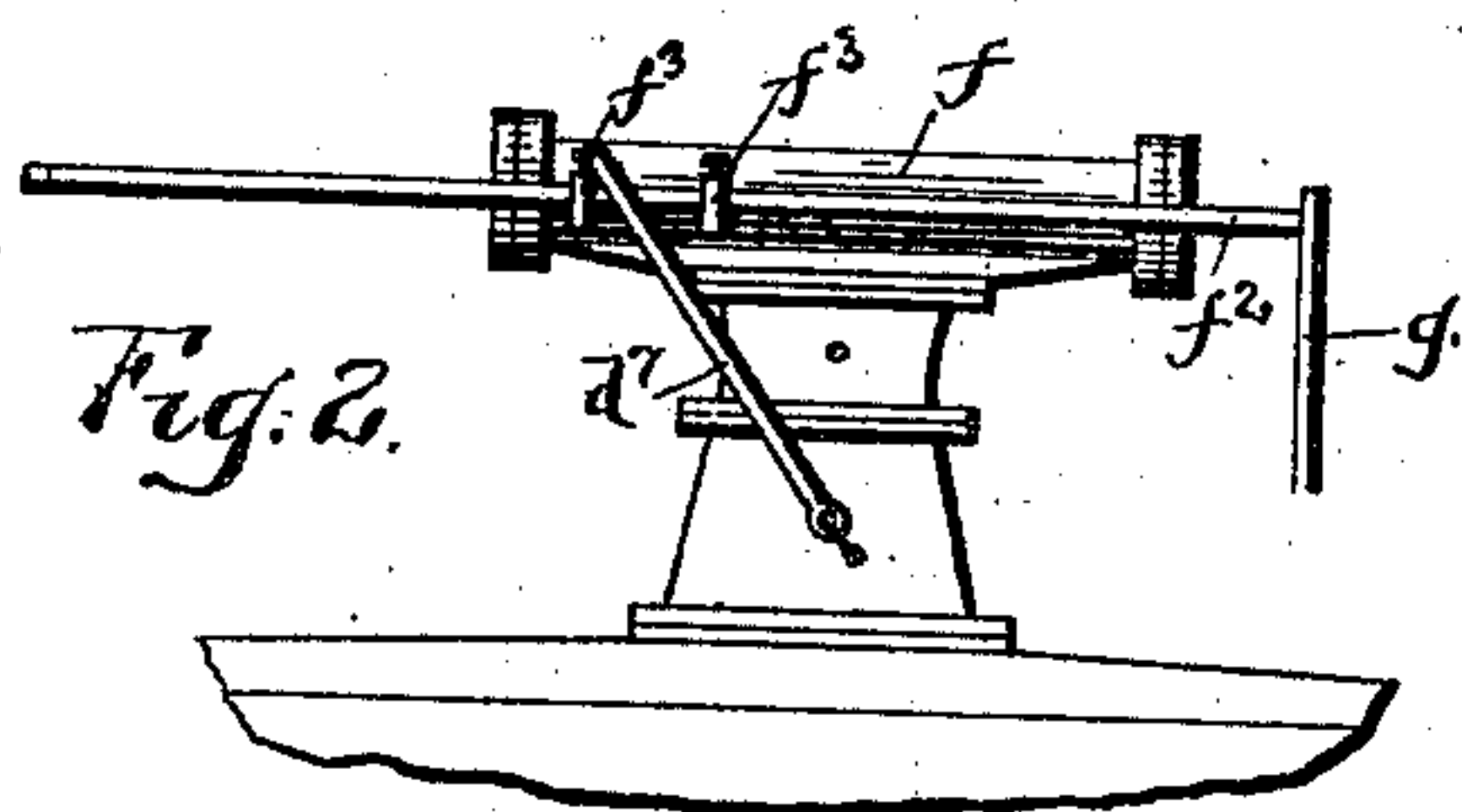
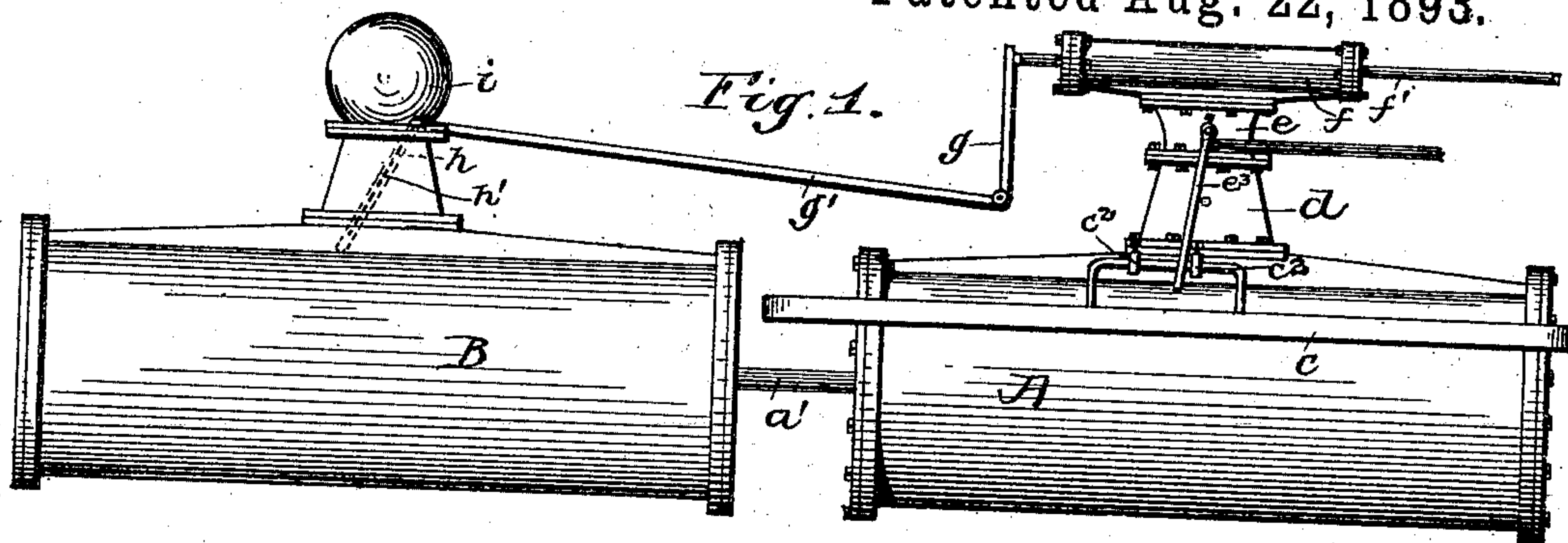


(No Model.)

J. W. & J. L. TEMPLIN.  
VALVE MECHANISM FOR STEAM PUMPS.

No. 503,883.

Patented Aug. 22, 1893.



Witnesses

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Inventors:-

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their Attorney



# UNITED STATES PATENT OFFICE.

JOHN W. TEMPLIN, OF MARION, AND JAMES L. TEMPLIN, OF KOKOMO,  
ASSIGNORS TO J. G. TEMPLIN & SONS, OF MARION, INDIANA.

## VALVE MECHANISM FOR STEAM-PUMPS.

SPECIFICATION forming part of Letters Patent No. 503,883, dated August 22, 1893.

Application filed March 8, 1893. Serial No. 465,109. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN W. TEMPLIN, of Marion, in the county of Grant, and JAMES L. TEMPLIN, of Kokomo, in the county of Howard, State of Indiana, have invented new and useful Improvements in Valve Mechanism for Steam-Pumps; and we do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of our invention is to produce a valve mechanism for steam pumps and engines, which will automatically and quickly adjust the valves so that the water or steam will be suddenly reversed in order to entirely prevent liability of stopping on the dead-center.

Further objects of our invention are to improve various details of the mechanism as hereinafter described.

To these ends our invention consists in the construction and combination of parts as hereinafter described and claimed.

In the drawings which accompany and form part of this specification, Figure 1—is a side elevation of a steam cylinder and a pump cylinder arranged end to end, and showing so much of the construction of the same as is necessary to illustrate our invention. Fig. 2—is a side elevation of the steam cylinder and valve mechanism, looking from the side opposite to that shown in Fig. 1. Fig. 3—is a perspective sectional view of the steam cylinder and valve mechanism, from the side shown in Fig. 1, the parts being shown separated to more clearly illustrate the ports; and Fig. 4—is a detail section on line 4—4 of Fig. 3. Fig. 5—is a detail view showing the connection of the pump valve shaft with its operating rod.

Similar reference letters indicate the same parts throughout the several views.

A and B indicate respectively, the steam and pump cylinders, and A' the piston of the latter which connects through rod  $a'$ , with the piston of the pump cylinder (not shown). The rod  $c$  is mounted to have a short sliding movement parallel with cylinder A and has at each end a pin  $c'$ , the said pins being passed

through the heads of the cylinder and adapted to slide therein and be operated upon by the piston A' at each end of its strokes so that the rod  $c$  will be given a short reciprocating movement. The pins  $c'$  will have suitable packing where they pass through the heads of the cylinder.

Above the cylinder A is a valve chest  $d$  containing the rotary valve  $d'$ , the said chest having the steam inlet  $d^2$ , exhaust  $d^3$  (which may be connected to carry the exhaust steam to any suitable point) and the ports  $d^4$  and  $d^5$  which connect with the ports  $a^2$  and  $a^3$  of the cylinder. The rotary reciprocating valve  $d'$  is adapted, as is usual with such valves, to reverse the direction of movement of the live and exhaust steam.

Above the valve chest  $d$  is a smaller valve chest  $e$  having a passage way to be connected with the pipe for supplying live steam, and having also a cylindrical seat for a rotary reciprocating valve  $e^2$  which controls the passage of steam through ports and passage ways similar to those shown in chest  $d$  but said ports extending upward instead of downward. These ports in the chest  $e$  connect with a small supplemental steam cylinder  $f$  which is bolted or otherwise secured above said chest  $e$ . The inlet  $e'$  for live steam has passages therefrom to the seat of the valve  $e^2$  and to the inlet  $d^2$  of valve chest  $d$  so that steam may be supplied from one point of connection, in both directions, to the two cylinders. The supplemental steam cylinder  $f$  has its piston rod  $f'$  provided with a yoke bar  $f^2$  to which are adjustably secured as by set screws, two collars  $f^3$ . On the rod  $c$ , which is operated by the piston  $a'$  are adjustably secured two collars  $c^2$ . The rotary reciprocating valve  $d'$  has its axis at one end supported by a tapered or pointed screw  $d^6$  which passes through the valve chest, and from the opposite side of the said valve a stem thereof extends out from the chest and has connected to it an arm  $d^7$  which passes between and is operated upon by the collars  $f^3$  carried by the yoke bar  $f^2$  of the supplemental cylinder. The valve  $e^2$  may be similarly supported and its stem is provided with an arm  $e^3$  the end of which passes between and is operated upon by the collars  $c^2$  on the rod  $c$ . The yoke bar  $f^2$ , at its end to-



ward the pump cylinder has a rigid arm *g* extending downwardly to a point in line with the axis of valve *d'* and to the lower end of this arm is hingedly connected a link or connecting bar *g'* the opposite end of which is secured by a clamping screw or other suitable means in a slot formed in a bar *h* (see Fig. 5) which extends in opposite directions from the stem *h'* of the rotary reciprocating valve which controls the passage of water through the pump cylinder. The valve of the pump cylinder is preferably of the same construction as the valve *d'* above described; and the object of the connection of the link *g'*, as above described, is to enable the direction of the pumping action of the pump to be quickly reversed by sliding the end of the link *g'* to the opposite end of the bar *h*.

*i* indicates an air chamber of ordinary or suitable construction.

From the foregoing it will now be readily understood that the operation is as follows: Steam being admitted at *e'* and passing to either end of the cylinder A, the piston A' will move until it strikes either one of the pins *c'* and thus gives the rod *c* a movement sufficient to cause its collars *c'* to act on the arm *e<sup>3</sup>* and operate the valve *e<sup>2</sup>* so as to admit steam to the supplemental cylinder *f* and cause its piston to move. The collars *f<sup>3</sup>* on the yoke bar *f<sup>2</sup>* operate upon the arm *d'* to quickly and suddenly throw the valve *d'* and thus reverse the direction of the passage of steam through the steam cylinder. By this construction it is impossible to get the valve on a "dead center" for the reason that at the moment the piston A' moves far enough to cause any reversing of the valve at all, it moves far enough to cause the admission of steam to either end of the supplemental steam cylinder which will then cause the immediate complete throw of the valve *d'*.

While we have referred to the cylinder A as a steam cylinder, it is to be understood that our improvements are not limited to

use in connection with an engine employing steam, but that they are equally applicable to air or gas engines. Such claims as include a steam cylinder we intend to cover air or gas cylinders as well. By positively operating the valve of the pump through connections with the steam cylinder, such as described we are enabled to dispense with check or lift valves which are always liable to become partially or wholly inoperative by becoming clogged.

Having now described our invention, what we claim is—

1. The combination with a main cylinder and a supplemental cylinder and their pistons, of a bar parallel with each of said cylinders and adapted to be reciprocated by the pistons, adjustable collars on said bars and arms connected with the valves of the two cylinders and adapted to be operated by said collars, substantially as described.

2. The combination with a steam cylinder and a pump cylinder having their pistons directly connected together, of a positively actuated valve mechanism for the pump comprising the slotted bar *h* and the bar *g'* connecting said bar *h* with the steam cylinder valve mechanism, whereby the direction of flow through the pump may be reversed, substantially as described.

3. The combination with the main and supplemental steam cylinders of the two interposed valve chests and valves, connections from the piston of each cylinder to the valve of the other cylinder, and a single live steam entrance port between the two valves, substantially as described.

In testimony whereof we affix our signatures in presence of two subscribing witnesses.

JOHN W. TEMPLIN.  
JAMES L. TEMPLIN.

Witnesses:

H. G. SEITZ,  
CHAS. W. BLACKWOOD.