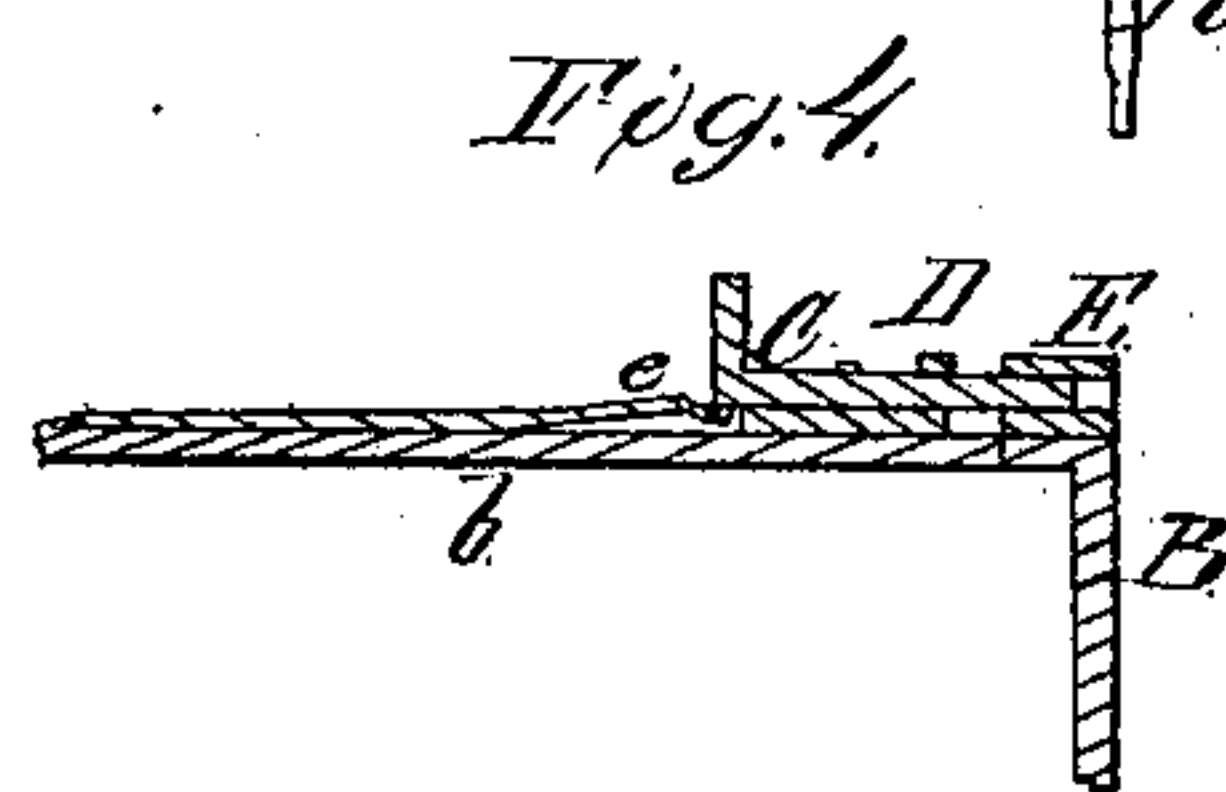
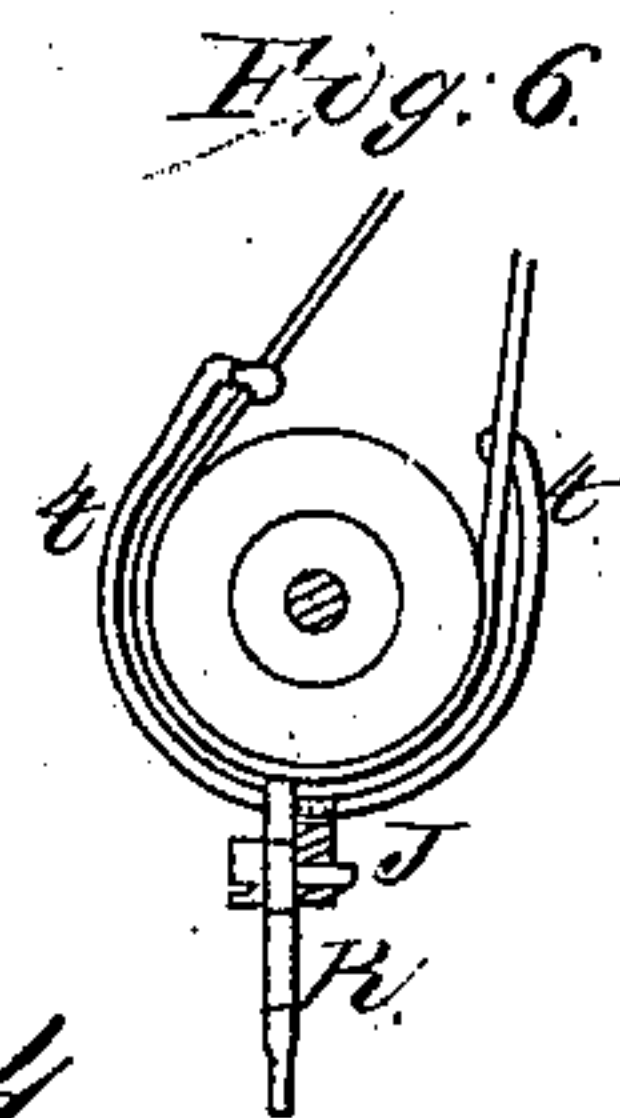
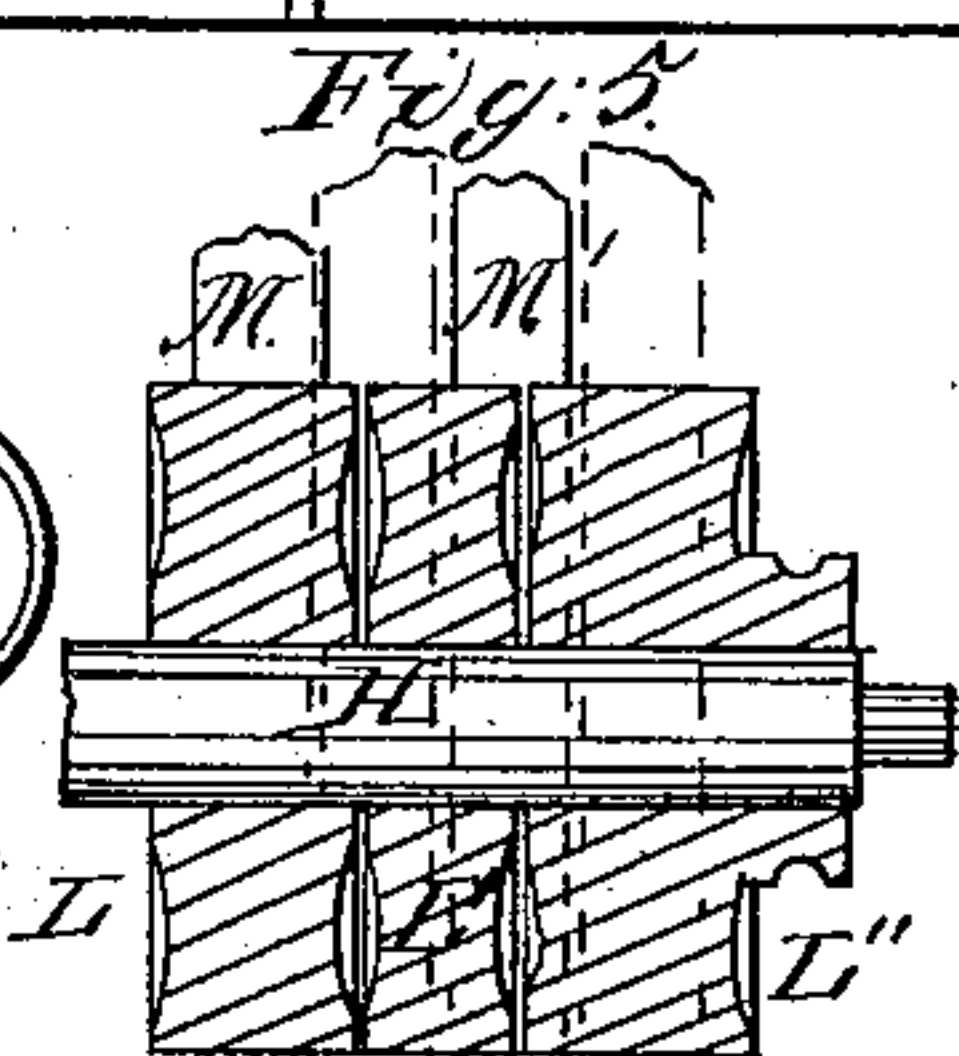
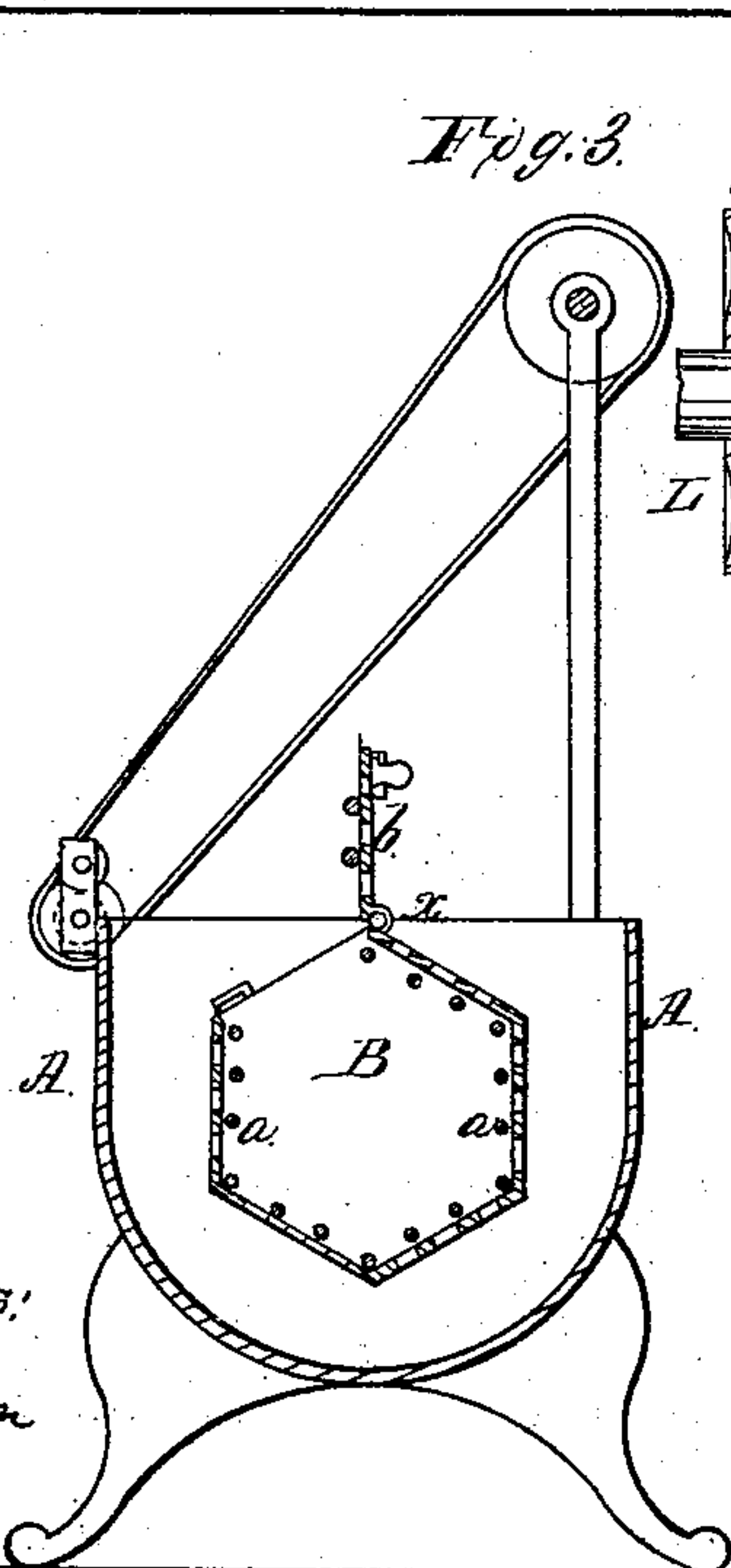
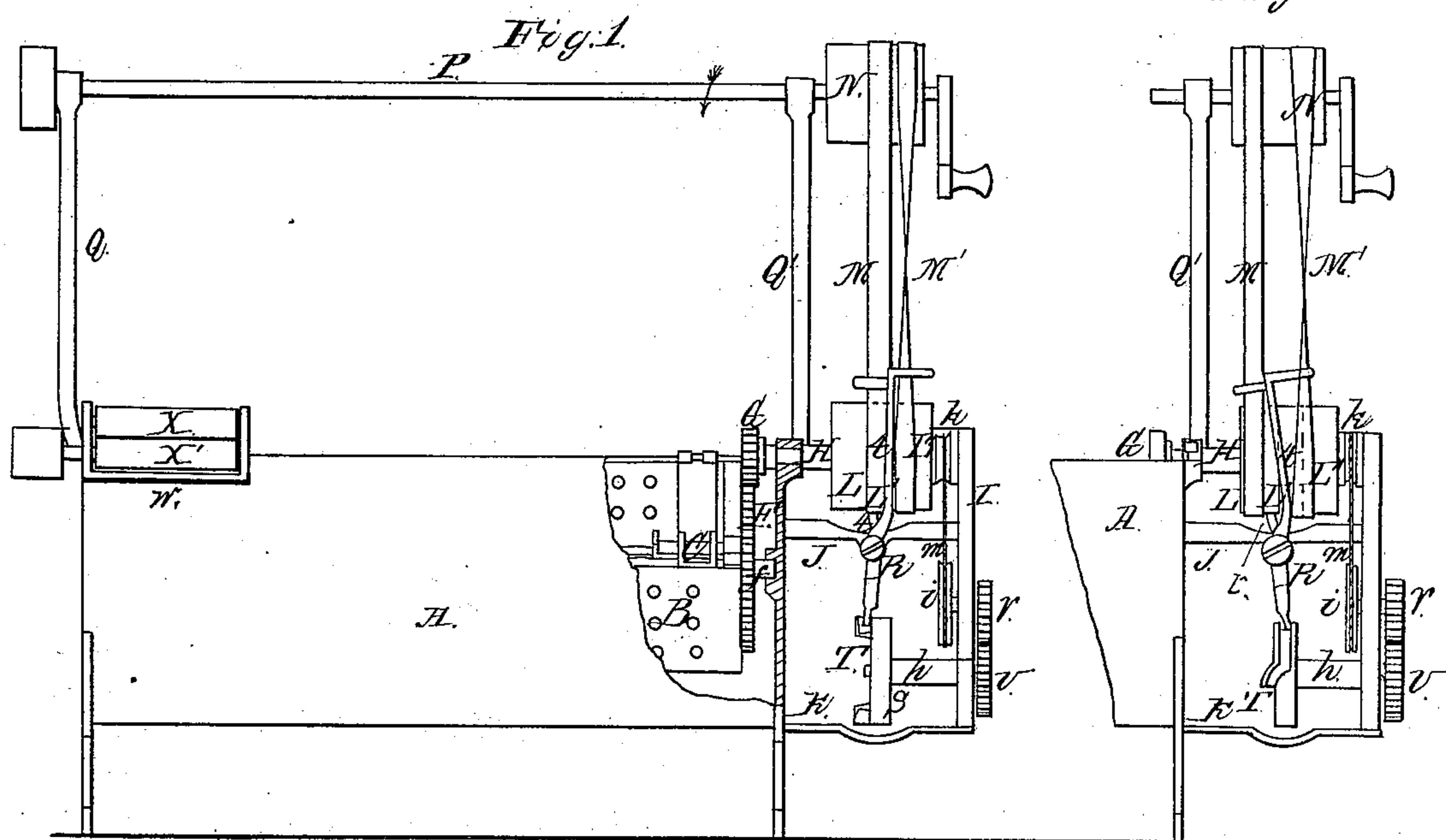


H. E. Smith, Washing Machine.

N^o 39,360.

Patented July 28, 1863.



Witnesses:
Charles Brown
W. Albert Steel.

Inventor:
Henry Houser
Atty H. E. Smith

UNITED STATES PATENT OFFICE.

HAMILTON E. SMITH, OF PITTSBURG, PENNSYLVANIA.

IMPROVED WASHING-MACHINE.

Specification forming part of Letters Patent No. 39,360, dated July 28, 1863.

To all whom it may concern:

Be it known that I, HAMILTON E. SMITH, of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented certain Improvements in Washing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to washing-machines in which the clothes are deposited in a perforated vessel driven by steam or other power; and my invention consists in causing the vessel to revolve first in one direction and then in the other; also, in mechanism for reversing the motion of the vessel.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a front view, partly in section, of my improved washing-machine; Fig. 2, part of Fig. 1, showing the operation of the strap-shifter; Fig. 3, a transverse section of the machine; Fig. 4, a detached sectional view of part of the machine; Fig. 5, a detached sectional view of the driving-pulleys, drawn to an enlarged scale; and Fig. 6, a view of the strap-shifting arms.

Similar letters refer to similar parts throughout the several views.

A is a trough or reservoir containing the water, suds, &c., and within this trough revolves a perforated vessel, B, which, in the present instance, is of the hexagonal form represented in Fig. 3, a series of longitudinal rods, *a*, extending from end to end of the vessel, one side of which is hinged at *x*, so as to form a door, *b*, which can be elevated, thereby leaving an opening through which the clothes are deposited in the vessel. The method of securing this door so that it cannot become loosened by the revolutions of the vessel will be best observed on reference to Fig. 4.

A latch, C, is arranged to slide in guides situated near each end of the door, the outer end of each latch being adapted to a staple, E, secured to the perforated vessel B near the end of the same. A spring, *e*, bears against the opposite end of the latch, which cannot be withdrawn from the staple E without first de-

pressing the said spring. To one of the journals *f* of the perforated vessel B is secured a cog-wheel, F, which gears into a pinion, G, on a shaft, H, the latter turning at one end in the edge of the trough A, and at the opposite end in a frame, I, secured to the trough by cross-bars J and K. On this shaft H are three pulleys, L, L', and L'', the middle pulley, L', being fast and the other pulleys loose. Two belts, M and M', the former being straight and the latter crossed, pass round the pulleys on the shaft H and round a broad pulley, N, on the driving-shaft P, which is shown, in the present instance, as turning in standards Q and Q', secured to the trough, but which may turn in hangers or brackets secured to the roof or wall of the building in which the machine is situated. To the cross-bar J is hung a lever, R, having two curved arms, *t* and *t'*, the upper end of the arm *t* being formed into a guide for the cross-belt M', and the upper end of the arm *t'* into a similar guide for the straight belt M. The short arm of the lever R projects into an irregular groove formed in the edge of a cam-wheel, S, on a shaft, T, which turns in a projection, *h*, on the frame I, the shaft being furnished with a cog-wheel, U, which gears into a pinion, V, on a shaft which turns in the frame I, and which has a pulley, *i*, round which, as well as round a smaller pulley, *k*, attached to or forming a part of the pulley L, passes a cord or band, *m*. A bracket, W, is secured to the trough near one end of the same, and in this bracket turn the two wringing-rollers, X and X', the lower one of which is driven by a belt from the driving-shaft P. Supposing this driving-shaft to be turning in the direction of the arrow and the belts to be in the position shown in Fig. 1, the straight belt M passing round the fast pulley L' and the crossed belt passing round the loose pulley L'', the strap-guides of the lever R, owing to the peculiar form of the groove in the cam-wheel T, serving to maintain the straps in the position indicated, it will be evident that as the crossed belt is the driving-belt for the time being the perforated vessel B must revolve in a contrary direction to that of the driving-shaft.

As the perforated vessel continues to turn, however, a slow rotary motion is imparted to the cam-wheel T, the groove of which is of such a form that at one point in its revolution

the arm R will be suddenly moved from the position shown in Fig. 1 to that seen in Fig. 2, thereby causing the guide-arms *t* and *t'* to move the crossed belt M' to the fast pulley L' and the straight belt M to the loose pulley L, in which case the latter belt must be the driving-belt, and the motion of the perforated vessel must be reversed.

The width of the pulley L'' is such in relation to the width of the strap M' that the latter never leaves the said pulley L'', so that in whatever direction the vessel B may revolve the cam-wheel T never changes its course but continues to revolve in the same direction.

It should be understood that the vessel B turns at the rate of about fifty revolutions per minute, and that the cleaning of the clothes is for the most part effected by centrifugal force, which causes them to adhere to the sides of the vessel and the water to penetrate the interstices of the fabric.

The importance of sudden and repeated reversals of the motion of the perforated vessel B will be readily understood when it is borne in mind that at every reversal the clothes are

suddenly turned over and the position of the entire mass changed.

Without confining myself to any specific form of vessel or trough, I claim as my invention and desire to secure by Letters Patent—

1. The perforated vessel B, hung within a trough, A, and actuated from any adjacent driving-shaft through the medium of the devices herein described, or any equivalent to the same, for the purpose of reversing the motion of the vessel at intervals.

2. Operating the strap-guides *t* and *t'* by means of a cam-wheel, T, or its equivalent, to which a continuous rotary motion is imparted by means of the loose pulley L'' and strap M' and any desired system of intermediate gearing, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HAMILTON E. SMITH.

Witnesses:

HENRY HOWSON,
JOHN WHITE.