

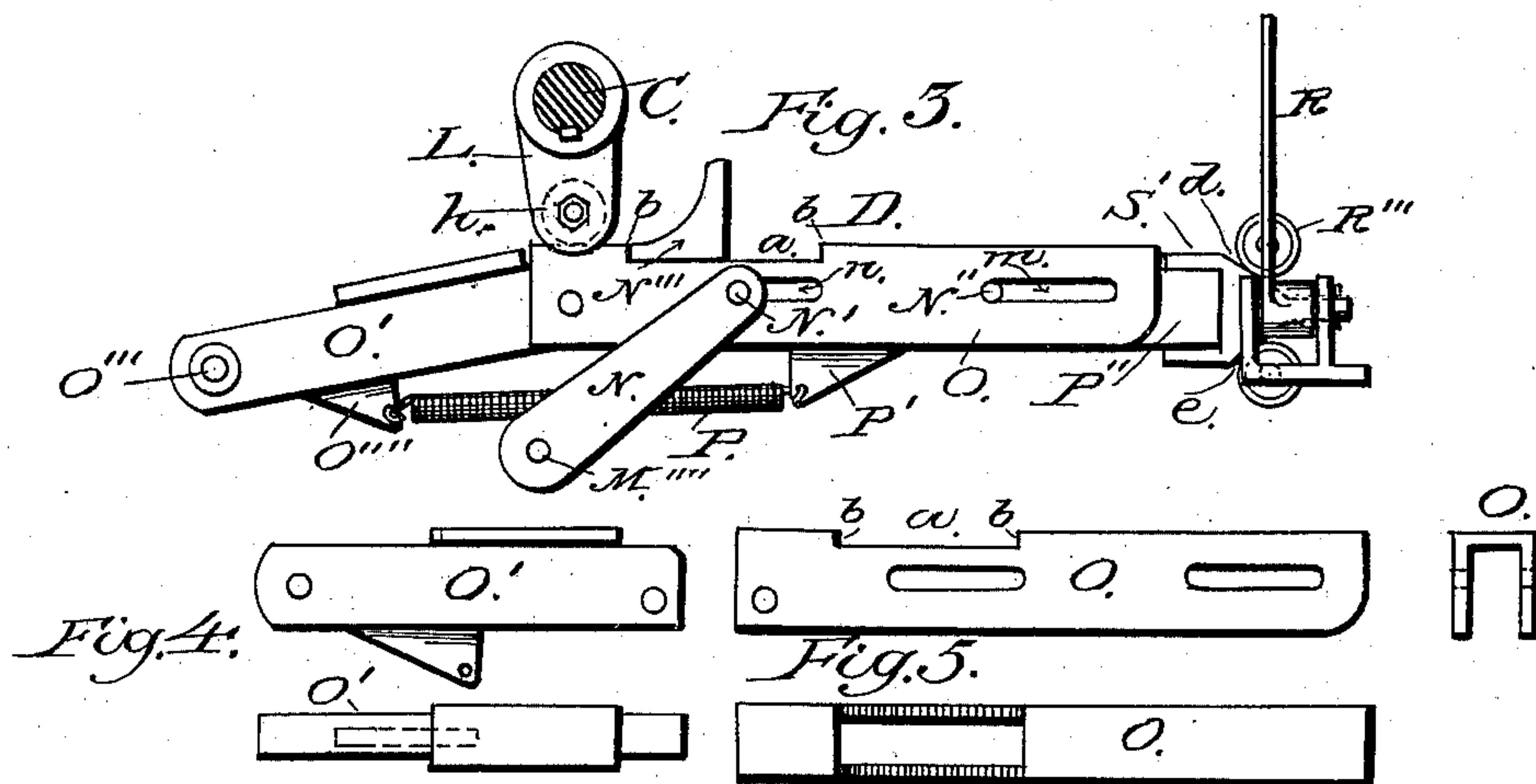
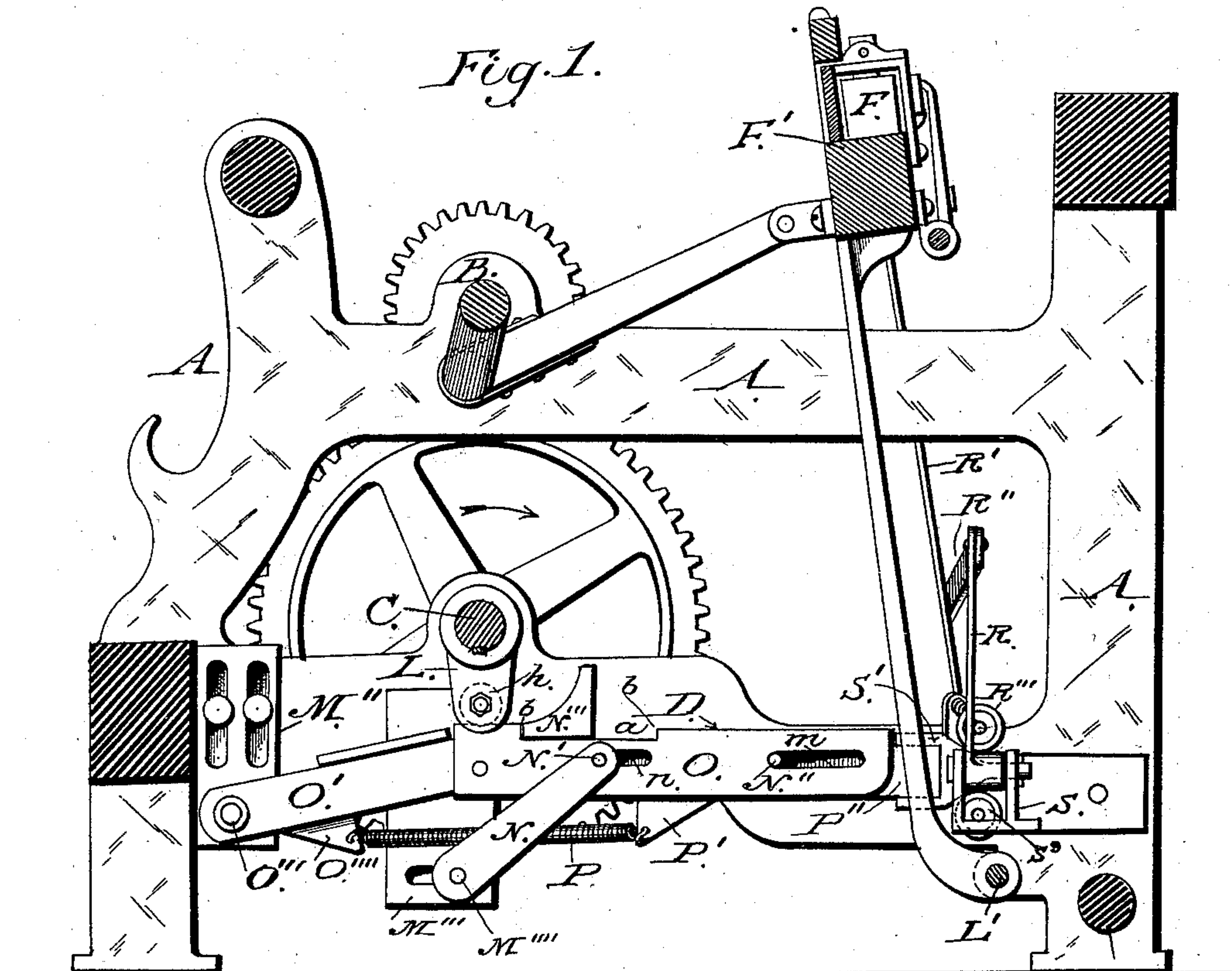
(No Model.)

2 Sheets—Sheet 1.

J. T. CREE.
SHUTTLE MOTION FOR LOOMS.

No. 406,506.

Patented July 9, 1889.



WITNESSES

P. H. Fowler
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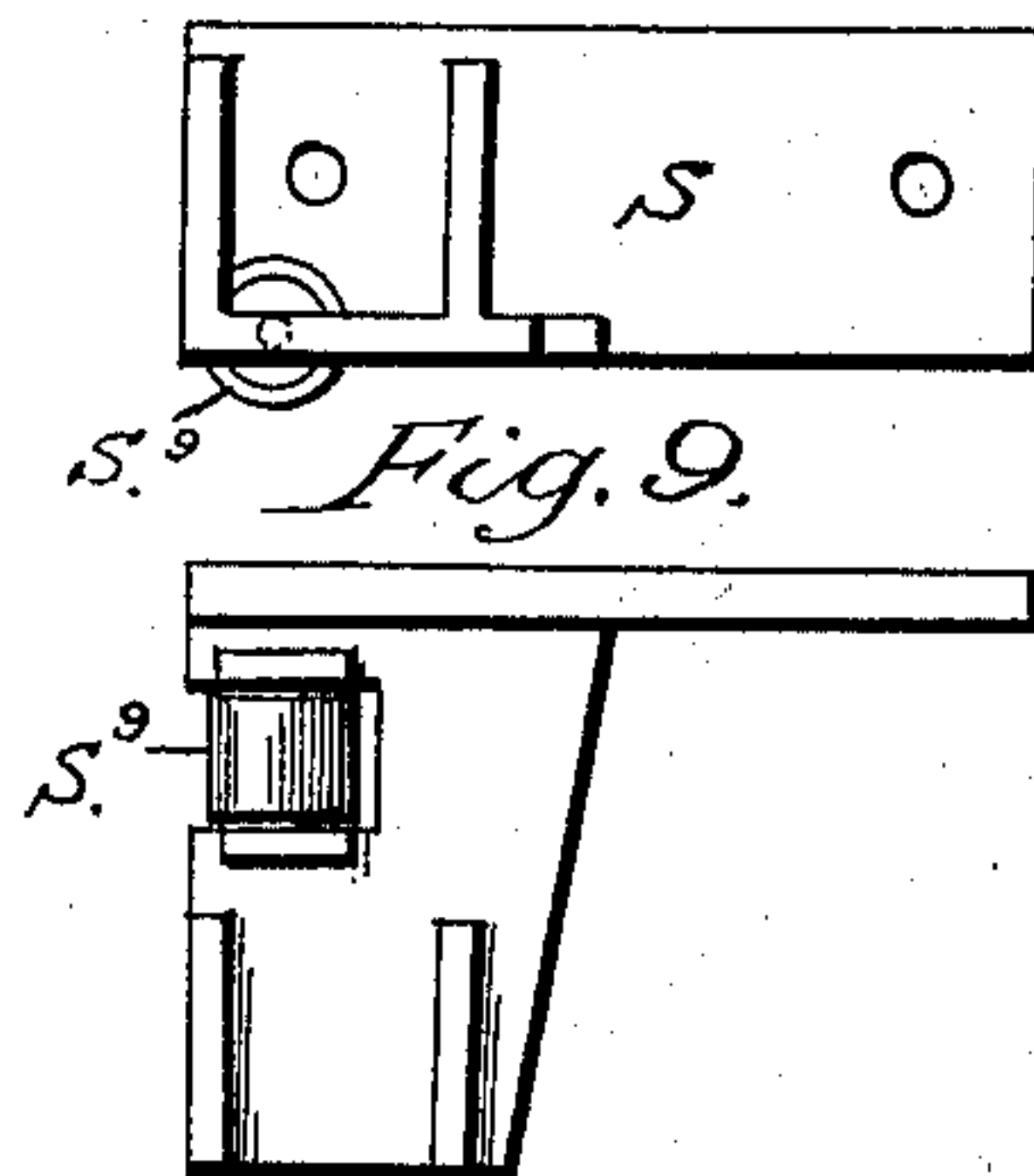
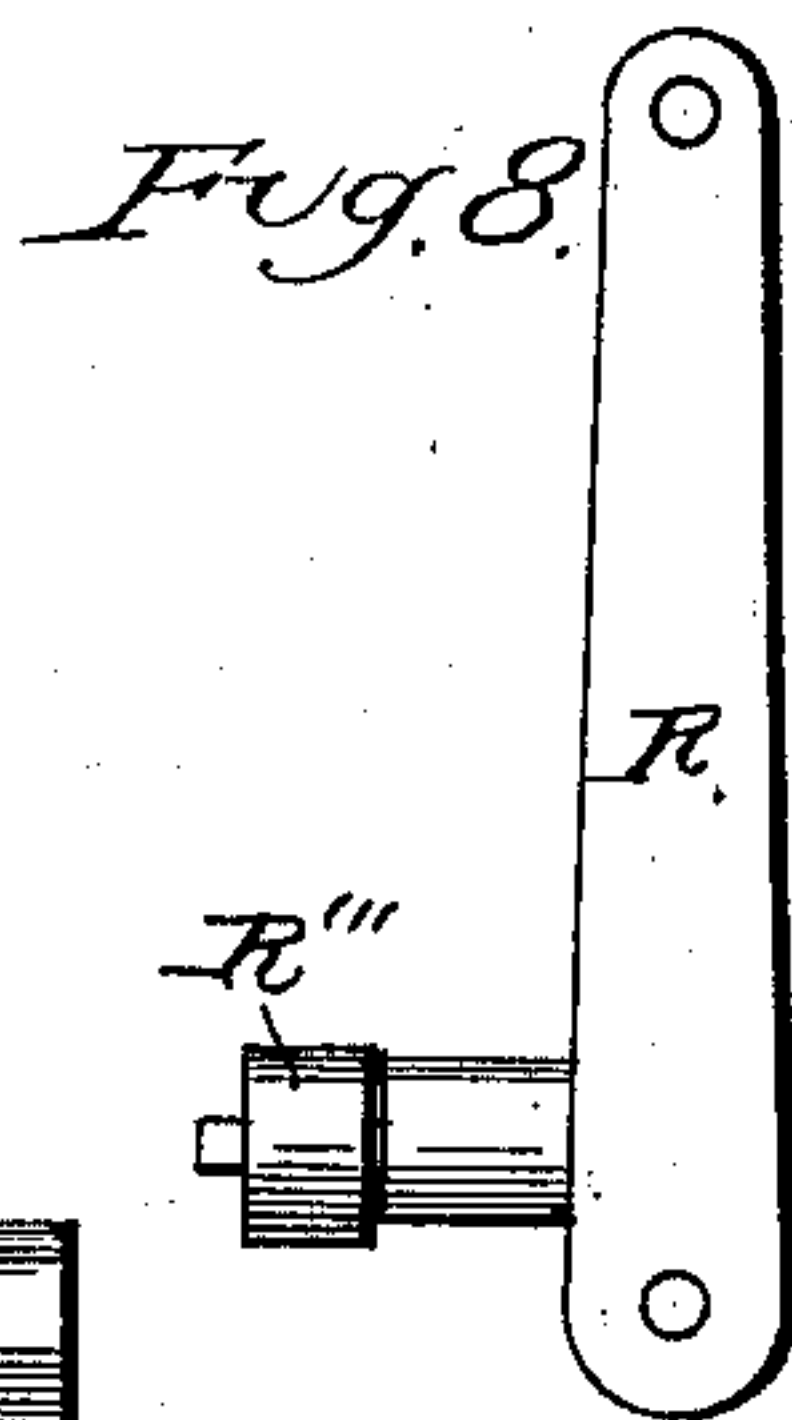
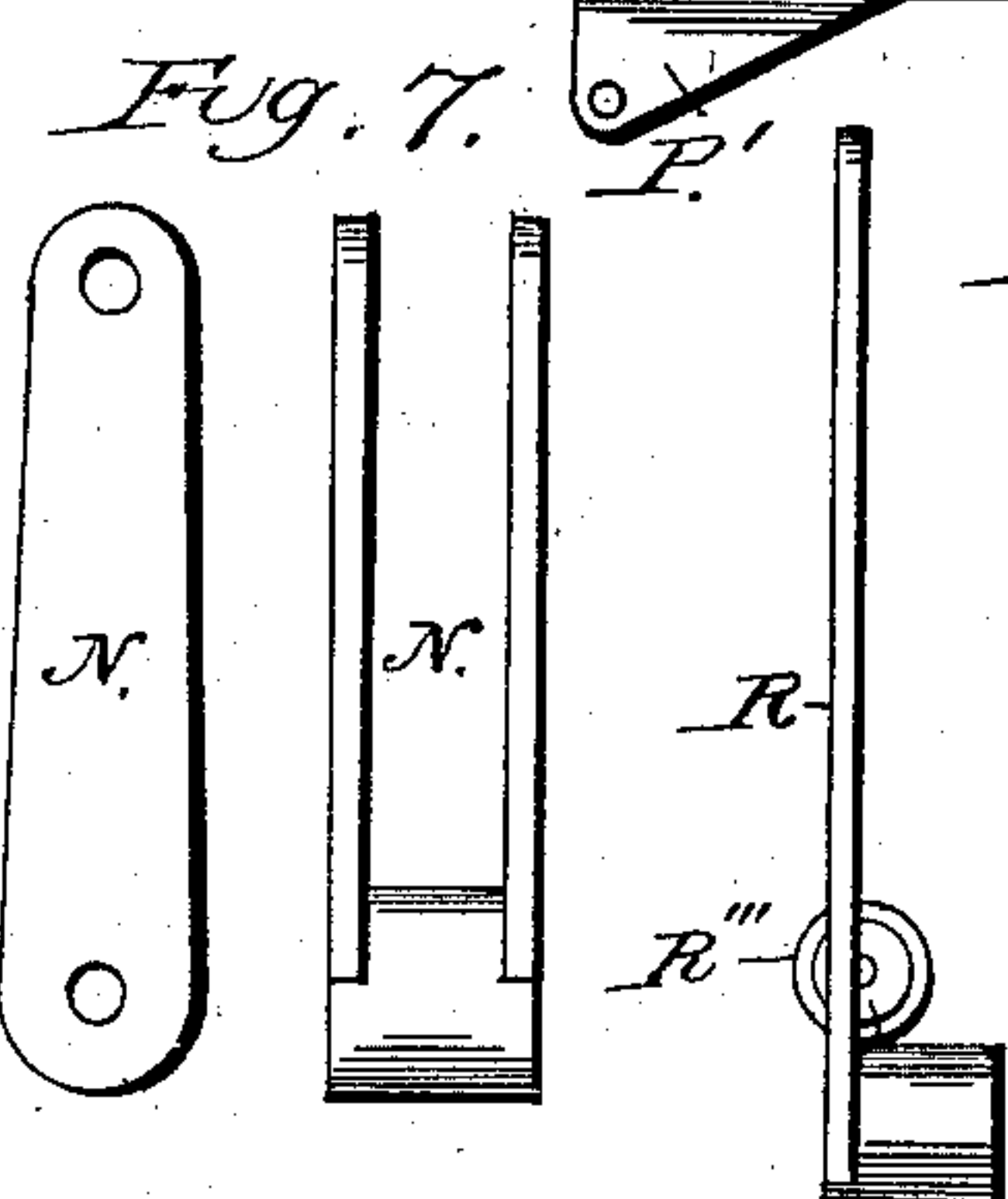
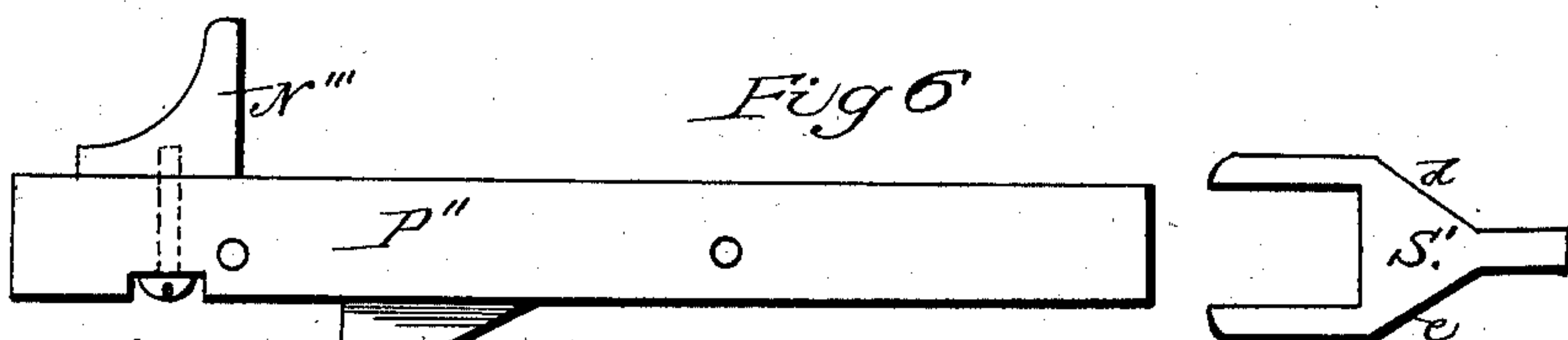
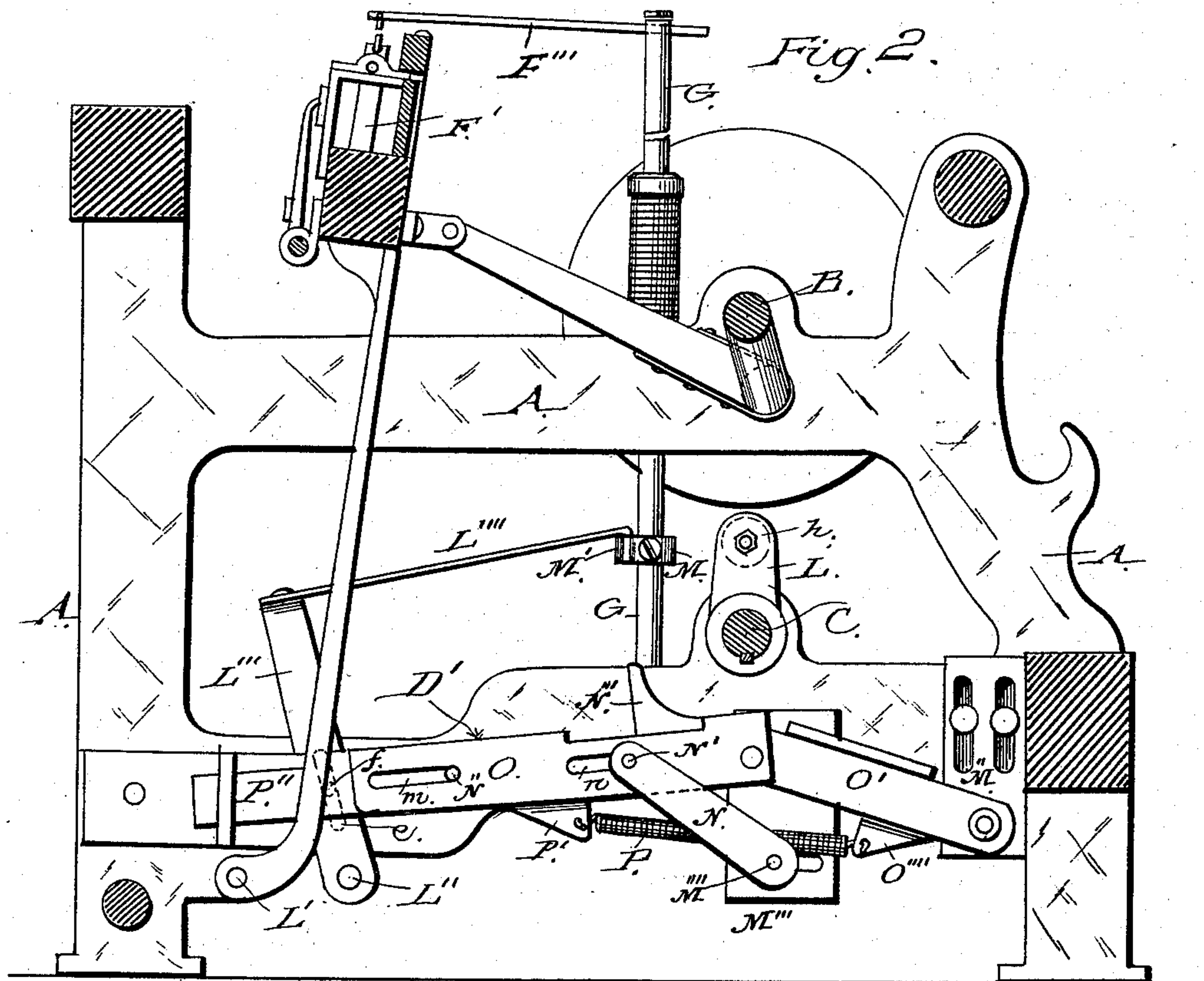
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UNITED STATES PATENT OFFICE.

JAMES THOMPSON CREE, OF WORCESTER, MASSACHUSETTS.

SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 406,506, dated July 9, 1889.

Application filed June 28, 1888. Serial No. 278,391. (No model.)

To all whom it may concern:

Be it known that I, JAMES THOMPSON CREE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Shuttle-Motions for Looms, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view taken across the loom and illustrating my invention. Fig. 2 is a similar view illustrating a modification to be hereinafter referred to. Fig. 3 is a side elevation of one of the jointed and extensible treadles and adjacent parts. Figs. 4 to 9, inclusive, represent details of the treadle shown in Fig. 1.

My present invention relates to certain new and useful improvements in the shuttle-motions of looms; and my invention consists in the constructions and combinations of devices, which I shall hereinafter fully describe and claim.

To enable others skilled in the art to which my invention appertains to make and use the same, I will now describe a preferred construction and indicate the manner in which the same is intended to operate.

In the said drawings, A represents the frame of the loom, which may be of any well-known and approved construction. B is the crank or lay shaft, and C the lower or cam shaft, both of said shafts being of the usual construction and forming no part of my invention.

The shaft C has keyed or otherwise secured to it, near each of the inner sides of the main frame, an arm L, the outer end of which carries a roller *h*, which, during the rotation of said shaft, is adapted to bear upon a jointed treadle secured to one of the inner sides of the main frame and operate the devices for driving the shuttle across the machine. These jointed treadles D D' are of peculiar construction, and are arranged below the cam-shaft, as shown. The short arm O' of each treadle is secured at one end to a bracket M'', by the pin or bolt O''', and its opposite end is jointed to the long arm O of the treadle, as shown in Figs. 1, 2, and 3, the said long arm being hollow and open at the bottom for the reception

of an internally-placed horizontally-sliding bar P'', carrying at its outer end a shoe S', having upper and lower inclined planes *d* and *e*, the purpose of which I will hereinafter fully disclose.

The sides of the long arm O of each treadle are slotted at *m* and *n*, and the internal sliding bars P'' are provided with pins or studs N' N'', which pass into the slots and serve as the means for guiding the sliding bars in their movements. The said sliding bars and short arms O' are formed with lugs P' O'''' for the attachment of the opposite ends of springs P, the purpose of which is to return the sliding bars to their normal positions within the hollow arms O, and also to break the joints between the long and short arms of the treadles, and cause the bearing-faces of the arms O at the joints to assume positions where they will contact with the rollers *h* during the succeeding movements of the arms L. The upper face of each long arm O is cut away at *a* to form stops or abutments *b*, and the inner end of each internal sliding bar P'' is provided with a shoe N''', having a curved face which serves as a track or guide for the roller *h*.

From this description it will be seen that when the shaft C is rotated it carries with it the arms L and the rollers *h*, and when said rollers strike the curved faces of the shoes N''' they force said shoes and the bars P'' forward, thereby lengthening the treadle. As the roller *h* leaves the curved face of its shoe, it rides upon the upper faces of the arm O of the treadle at the joint or hinge, and thereby causes the treadle to straighten out and assume the position shown in Fig. 3. Journaled on a pin or stud M''', projecting from a slotted bracket M'', secured to each inner side of the main frame, is an arm N, whose upper end is pivotally secured on the pin N', projecting from the sliding bar P'' through the slot *n* in the hollow arm O. As the treadle is forced downward by the roller *h*, this arm N will cause the sliding bar to be forced still farther. The forward movement of the bar P carries the shoe S' under a roll R'', to be hereinafter referred to.

Within a suitable bracket S, secured to each of the inner sides of the frame, and at the front portion thereof, is pivotally secured

the whipping-stick R, which carries an outer friction-roller R'', a similar roller S⁹ being mounted in the bracket S, the two rollers being adapted for engagement with the inclined faces of the shoe S', as shown in Figs. 1 and 3, whereby, when the sliding bar P'' of the treadle has been projected by the movement of the shaft C and its arm L and roller h, the upper roller R'' is pushed upward to throw the upper end of the whipping-stick backward, in which position it remains until the sliding bar P'' is retracted to permit the roller R'' to ride down the upper inclined face of the shoe.

In Fig. 1 the upper ends of the whipping-sticks are connected in any suitable manner with one end of links or arms R'', whose opposite ends are connected with the "picking-staffs" R', mounted at their lower ends on shaft L' and having their upper ends connected with the pickers F. From this description it will be seen that the prolongation of the treadles operates the whipping-sticks R, and the latter, through the medium of the arms R'', actuate the picking-staffs R' and pickers F to impart to the shuttle a short, sharp, and effective blow, which is necessary, in order to drive the shuttle home into the opposite shuttle-box before the "shed" closes.

In Fig. 2 I illustrate my jointed extensible treadle connected with a well-known form of shuttle-motion; but in this case I do not need the shoes S', for I preferably connect the sliding bar P'' with an arm L'', pivoted at L'' to the frame of the machine and having an elongated slot e, through which a pin f, projecting from the sliding bar P'', passes. In the sides of the frame A, I suitably mount vertical shafts G, on the lower portions of which are adjustably secured by set-screws collars M, having arms M', to which and the arms L'' connecting bars or rods L''' are secured, whereby when the treadles are actuated by the arms L on the shaft C and the inner arms P'' are pushed outward their movement is communicated, through the arms L'' and the bars L''', to the picking-shafts G, the said shafts carrying the usual horizontal arms F'', which are connected with and operate the pickers F to drive the shuttle across the lay.

It will be seen that the parts lettered O O' constitute in principle a toggle-jointed lever, and that, as is the case in the working of toggle-levers, the straightening of the parts O and O' into line separates the opposite ends of the treadle or lever O O'; or rather, inasmuch as the part O' is fixed or pivoted at one end to the loom-frame, a forward movement of the free end of the part O is occasioned.

I contemplate in some instances, in applying my invention to narrow looms, omitting the parts P'' N and applying the shoe S' directly to the end of the part O. In this case the extension of the treadle, resulting when it is straightened under the action of the

roller h, will force the shoe S' between the rollers S⁹ and R'' and effect the desired actuation of the shuttle. For broad looms, however, I prefer to use the double construction of treadle shown in Figs. 1, 2, and 3 of the drawings. In this construction the part P'' and the arm N constitute in effect a second toggle-lever, the angle between the parts N P'' being less than that between the parts O O'. This secures more rapid extension or forward projection of the part P'' than is communicated to the part O as the treadle is straightened, and consequently greater extent of movement of the part P''.

In the operation of the treadle constructed as shown the roller h first strikes the shoe N'', yielding a short, sharp, quick, and decisive blow for the propulsion of the shuttle, and then the roll, following down the side of the shoe and passing onto the surface of the part O, continues and completes the straightening and extension of the treadle, imparting thereby an accelerating impulse to the shuttle.

A treadle working on the principle of a toggle-lever and having one end thereof in connection with the shuttle-throwing devices is the feature which is the gist of my invention, and it is obvious that the connection of said treadle with the shuttle-throwing devices may be made in many ways without departing from the spirit of my invention.

Having thus described my invention and the manner in which it may be reduced to practice, I claim—

1. The combination, with the picking-staff of a loom and a rotating shaft carrying a tappet-arm, of a toggle-jointed lever arranged in position to be struck by the said tappet-arm in its rotation, and devices intermediate the free end of said lever and the picking-staff for actuating the latter to throw the shuttle.

2. The combination, with the picking-staff of a loom and a rotating shaft carrying a tappet-arm, of a toggle-jointed lever arranged in position to be struck by the said tappet-arm in its rotation, a shoe carried at the free end of the said lever, a lever carrying a roller in contact with the inclined side of said shoe, and a connection from the said lever to the picking-staff.

3. The combination, with the picking-staff of a loom and a rotating shaft carrying a tappet-arm, of a toggle-jointed lever arranged in position to be struck by the said tappet-arm in its rotation, a sliding piece mounted on one of the members of said lever, an arm jointed to said sliding piece and forming therewith a toggle-connection the angle of which is less than that between the parts of the carrying-lever, and a connection intermediate the said sliding part and the picking-staff for actuating the latter to throw the shuttle.

4. The combination, with the picking-staff and the shaft C, having the arm L, carrying the roller h, of the treadle O O', jointed, as

described, the sliding part P'', having the shoe N''' and carried by the part O, the arm N, having a toggle-connection with said sliding part, the spring P, and devices intermediate the part P'' and picking-staff for actuating the latter to throw the shuttle.

5 5. The combination, with the picking-staff and the shaft C, having the arm L, carrying the roller h, of the treadle O O', jointed, as
10 described, the sliding part P'', having the

shoe N''' and carried by the part O, the arm N, having the toggle-connection with the said sliding part, the spring P, the shoe S', the bracket S and its roller, the arm R and its roller, and the connection R''.

JAMES THOMPSON CREE.

Witnesses:

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