

(No Model.)

3 Sheets—Sheet 1.

C. A. VAUGHN.

POWER HAMMER.

No. 412,809.

Patented Oct. 15, 1889.

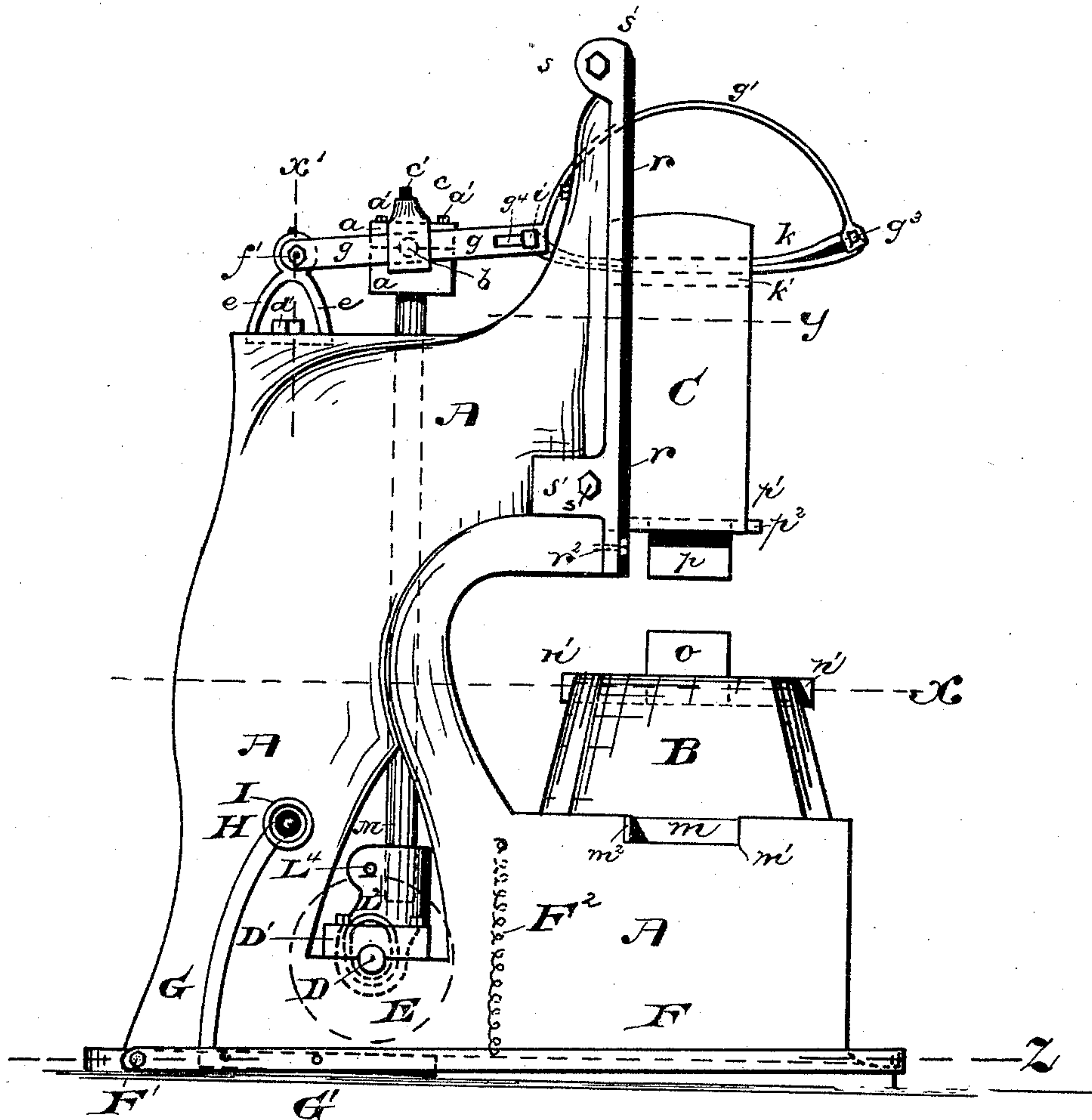


Fig. 1.

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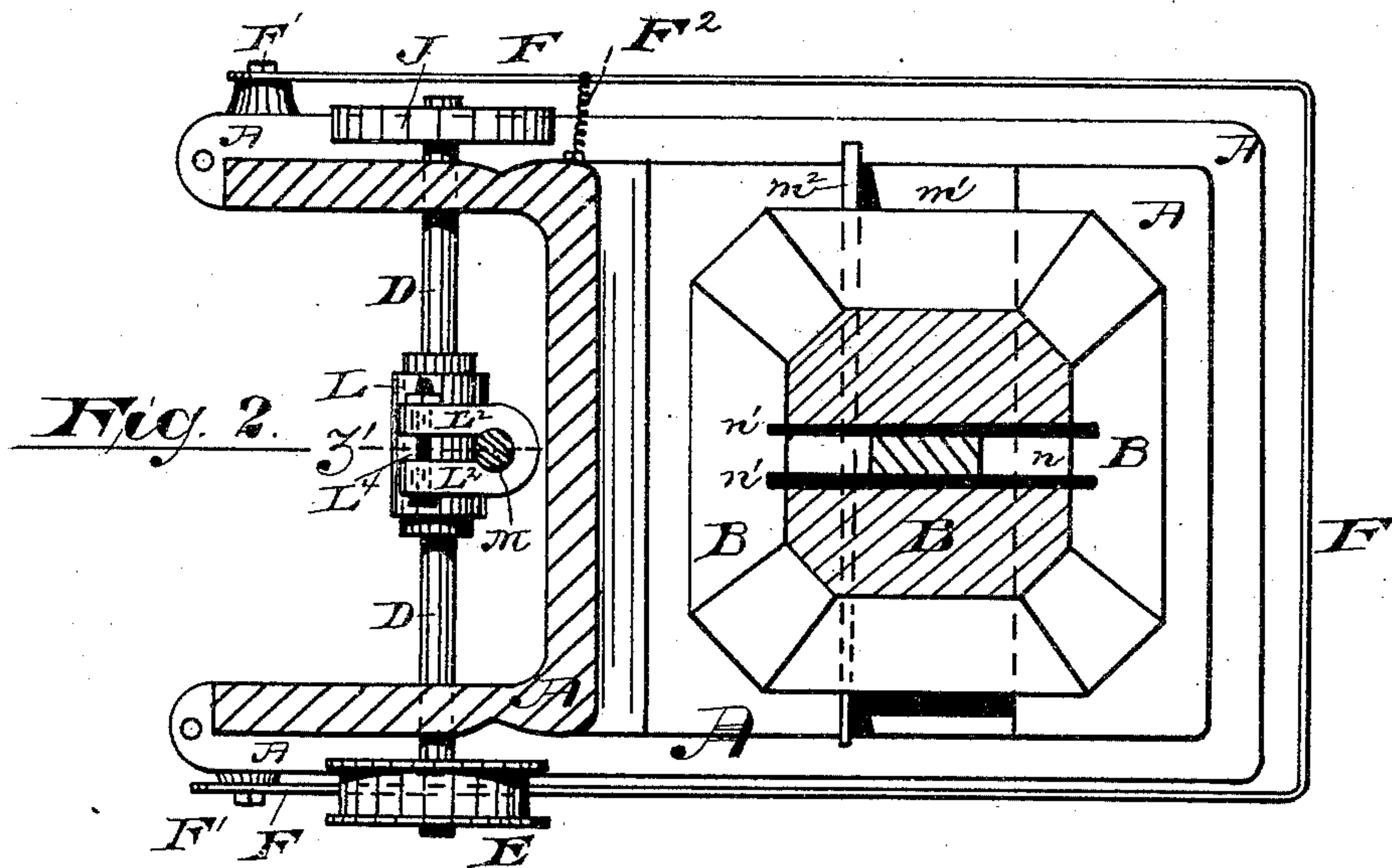


Fig. 3.

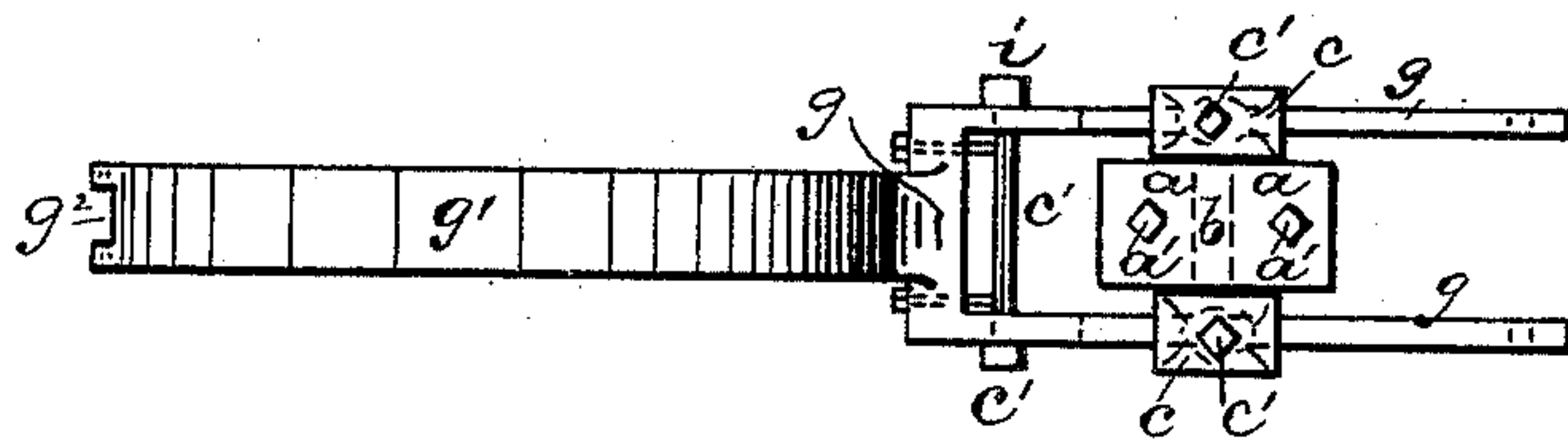
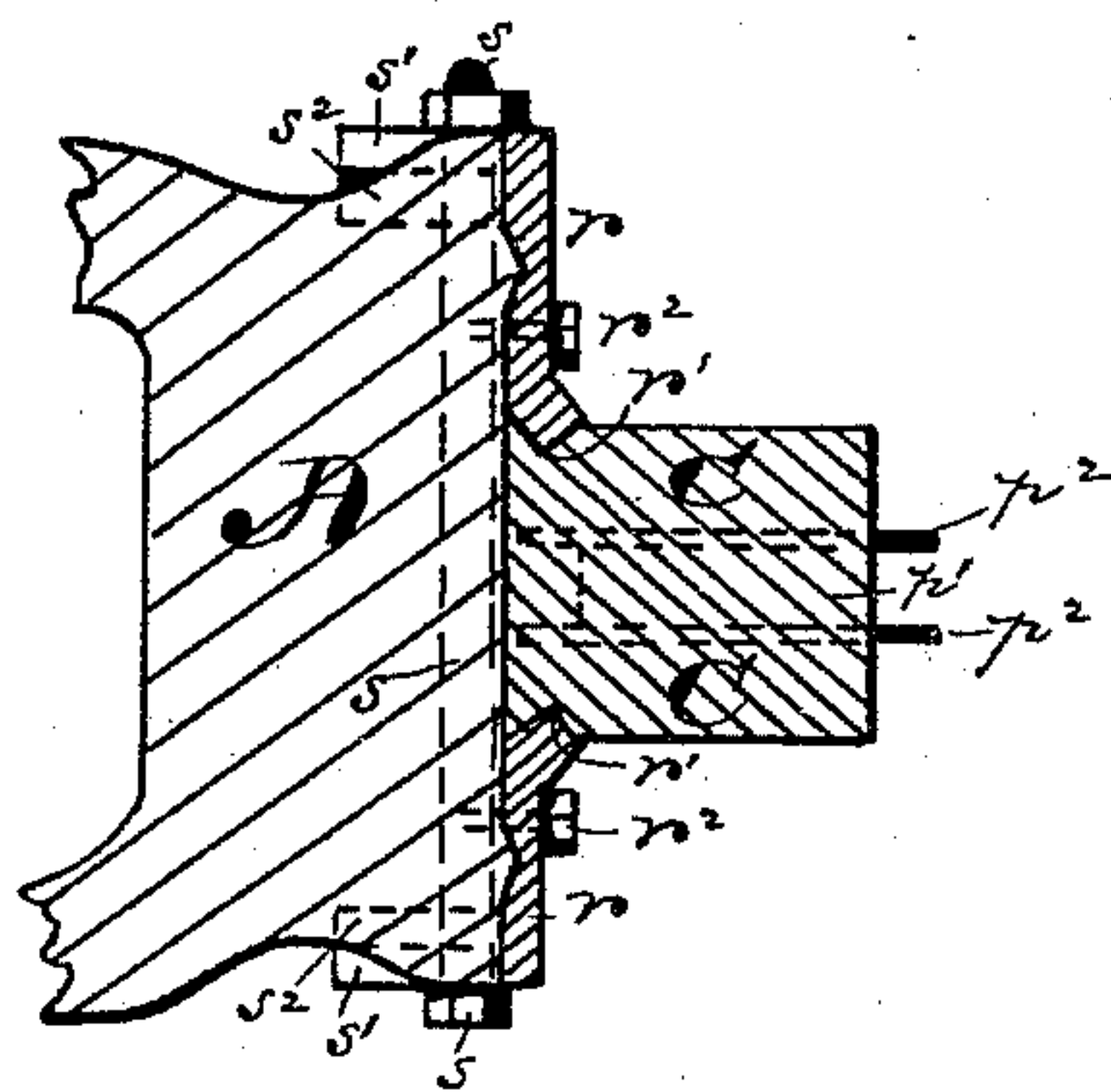


Fig. 4.

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(No Model.)

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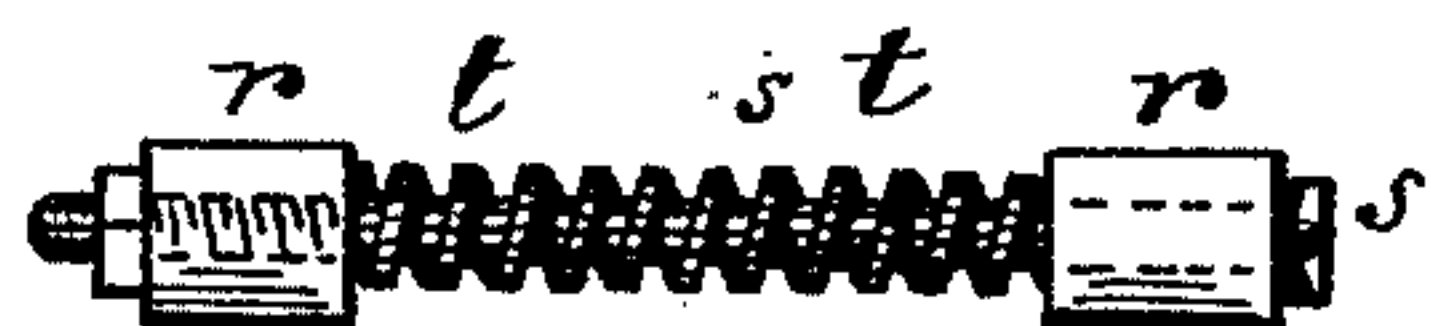
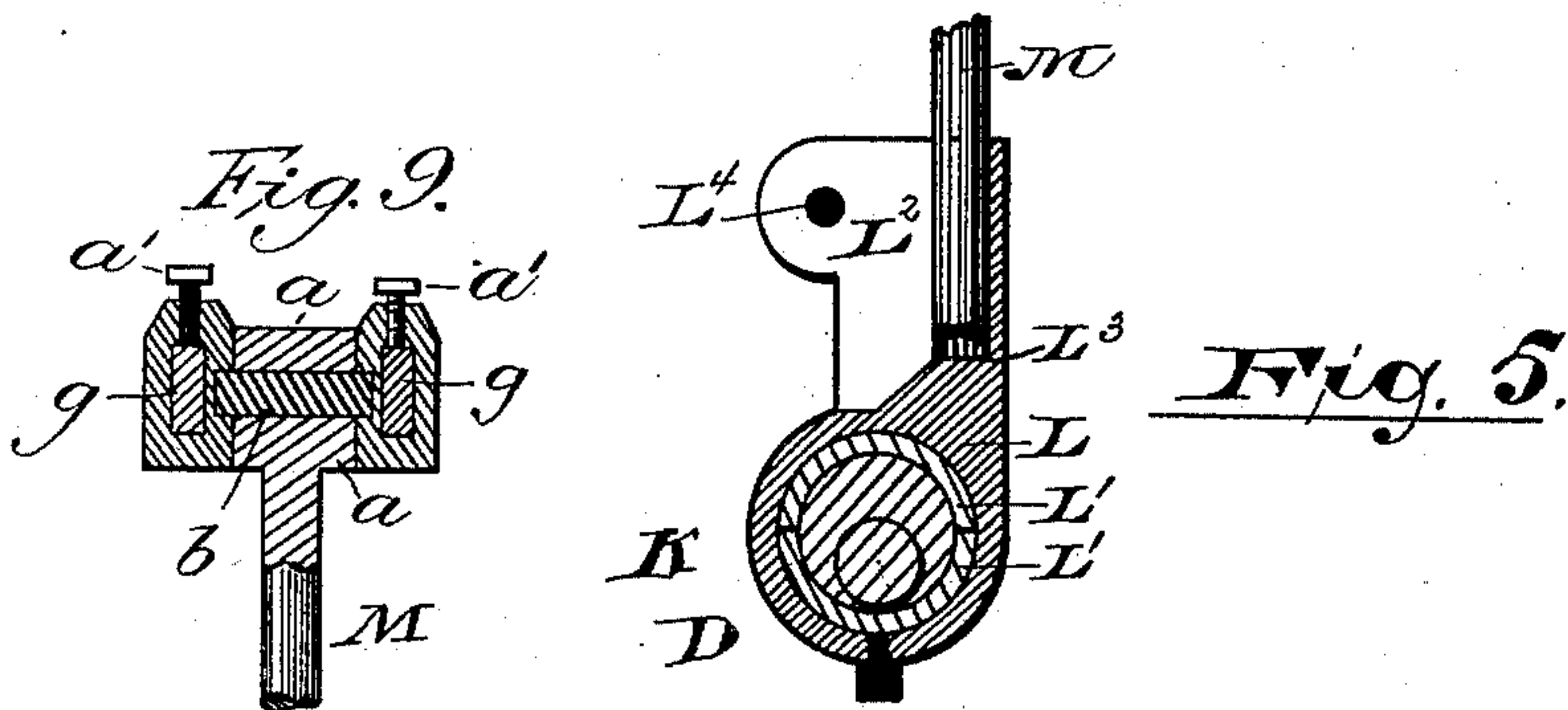


Fig. 6.

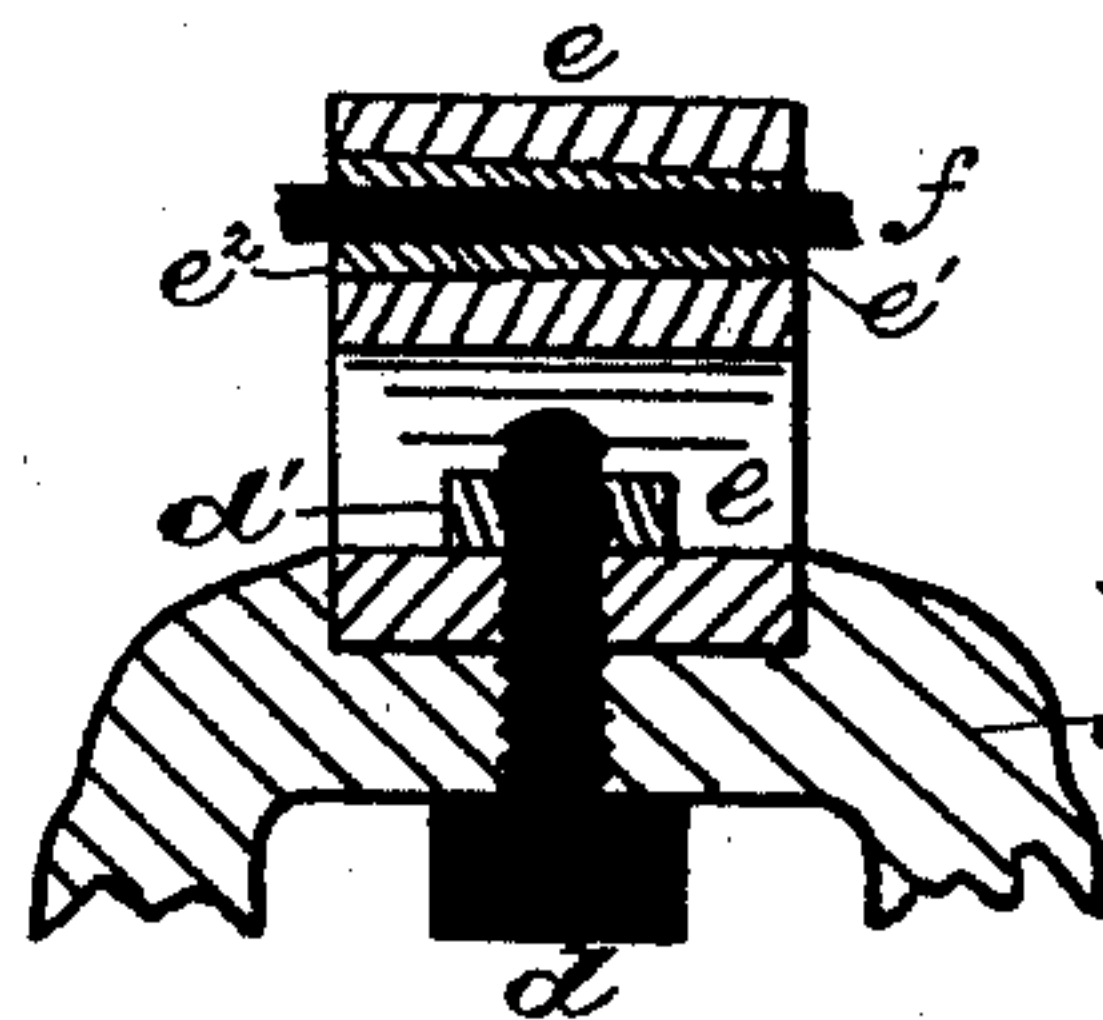


Fig. 7.

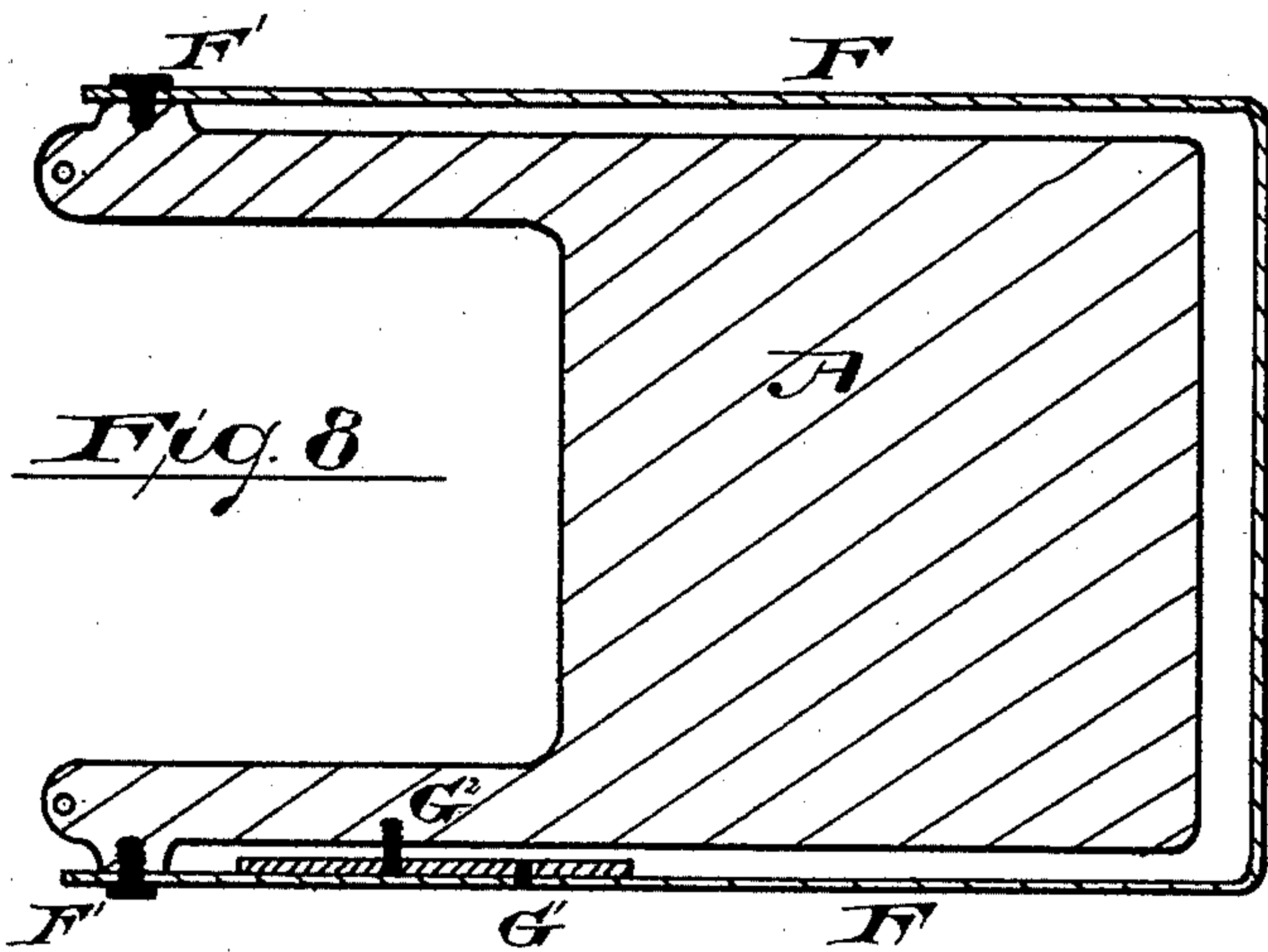


Fig. 8.

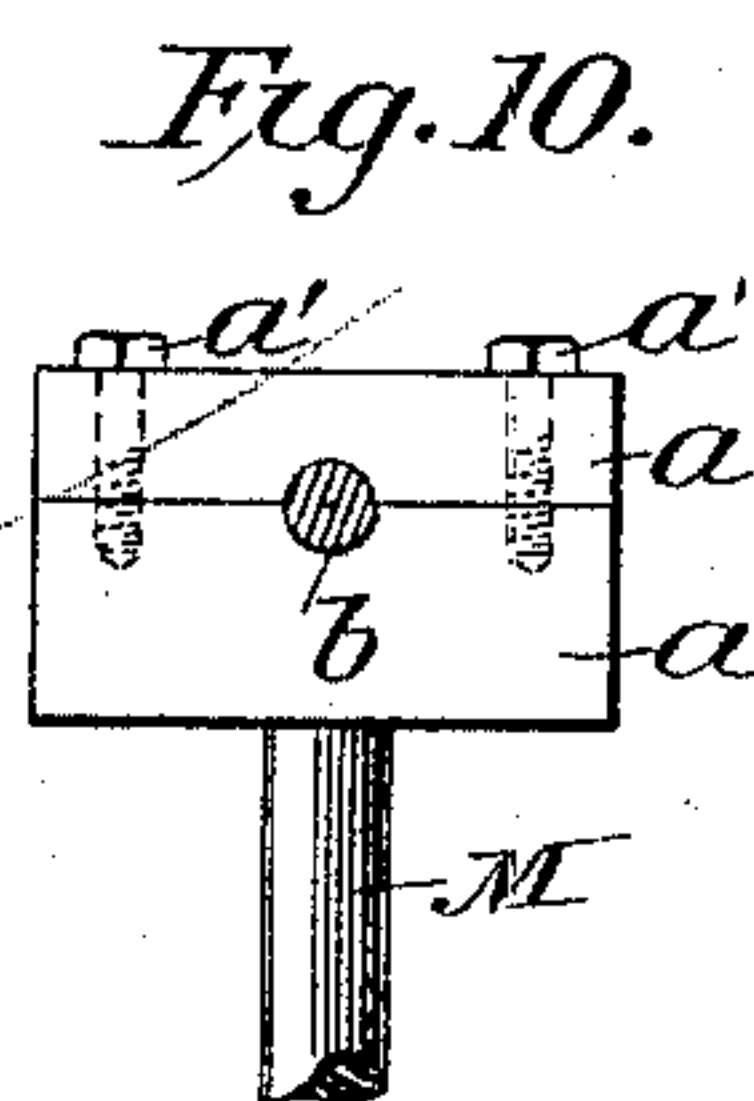


Fig. 10.

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UNITED STATES PATENT OFFICE.

CHARLES A. VAUGHN, OF NEWARK, NEW JERSEY.

POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 412,809, dated October 15, 1889.

Application filed November 14, 1888. Serial No. 290,796. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. VAUGHN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Power-Hammers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to increase the efficiency of a power-hammer adjustably regulated by the length of the drop of the hammer, so as to adapt it for various uses, simplify its construction, and reduce the cost of manufacture.

The invention consists in the improved power-hammer hereinafter shown and described and the combinations and arrangements of parts thereof, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a side view of a power-hammer embodying my improvement. Fig. 2 is a section of the same through line *x*. Fig. 3 is a section through line *y*, Fig. 1, showing the arrangement of the slides on the main frame and the hammer-stock. Fig. 4 is a top plan view of the helve. Fig. 5 is a cross-section through line *z'*, Fig. 2. Fig. 6 is a top view showing the spring between the tops of the two arms. Fig. 7 is a section through line *x'*, Fig. 1, showing the mode of pivoting the helve to the frame; and Fig. 8 is a section through line *z*, Fig. 1, showing the arrangement of the treadle and tightening device. Fig. 9 is a transverse sectional view of the adjustable bearing on the helve. Fig. 10 is a detail view showing the location of the bearings on the upper end of the connecting-rod.

In said drawings, A represents the frame of the machine. B is an anvil-support adjustable on said frame. C is a hammer-stock. D is a main shaft running in suitable bear-

ings D' on said frame, and carrying a driving-pulley E, over which passes a driving-belt connected with suitable driving mechanism.

F is a foot-treadle pivoted to the frame of the machine at F', and carrying a bell-crank lever G, pivoted to said treadle at G' and to said frame at G², as shown in Fig. 8, and said lever is provided at its upper end with a pin or stud H and holding-nut, on which stud loosely revolves belt-tightening pulley I.

J is a balance-wheel on the main shaft, preferably placed on the side of the machine opposite to the driving-pulley.

On the main driving-shaft D is formed or rigidly secured thereto an eccentric K. L is an eccentric-strap surrounding said eccentric, with bearing-plates L'. This eccentric-strap is provided with a slotted projection L² and grooved, so as to receive a connecting-rod. At the lower portion of the groove is formed a square shoulder L³, Fig. 5, on which rests the lower end of a connecting-rod M, and held in position in the strap by a threaded bolt L⁴. The upper end of said connecting-rod is enlarged, so as to form bearings *a a*, which are held together by bolts and nuts *a' a'* in the ordinary manner. *b* is a pin passing through a hole in said bearing *a*, and on which the upper part of said connecting-rod can oscillate, as will be readily understood and fully shown in Fig. 9. This pin *b* is rigidly secured in bearings *c c*, Figs. 1 and 4, provided with set-screws *c' c'*.

On the top of the rear of the frame A is rigidly secured, by headed bolt *d* and nut *d'*, a metallic piece or upright *e*, having a tapering opening *e'*, in which is fitted a tapering sleeve or bushing *e²*, as shown in Fig. 7, having its inner hole straight, in which is firmly held a spindle or pin *f*, with its ends projecting beyond the piece *e* and threaded, so as to receive threaded nuts *f' f'*.

g is a forked helve, as shown more clearly in Fig. 4, the forked ends of the helve being pivoted to said spindle *f* on the outside of said piece *e* and held thereon by the nuts *f' f'*. The other end of said helve is formed into a flat semicircular spring *g'* and made integral therewith, as shown in Fig. 1. The outer end of said semicircular spring is formed with a slot *g²*, the ends of which are pro-

vided with holes to receive a pin g^3 in said helve, and near the base of the semicircular spring is formed a longitudinal slot g^4 , in which is arranged to slide a bolt i , provided
5 with a threaded nut i' to secure it in any desired position in the slot g^4 above described.

k is a strip of leather passing through a slot k' in the hammer-stock C, connected at one end with the pin g^3 on the outside end of
10 the spring g and at the other end with the bolt i on the helve.

The bottom of the anvil-support B is provided with a lug m , fitting in a corresponding recess m' in the frame, and the anvil-support is held firmly in position by a tapering
15 key m^2 in the usual manner. The top of said anvil-support is slotted, as seen at n , Fig. 2, in which rests the anvil o , which is rigidly held in proper position in the slot by the
20 keys n' n' .

p is a hammer resting in a groove p' in the bottom of the hammer-stock C and held securely therein by keys p^2 p^2 , Figs. 1 and 3.

r r are ways or guides, between which the
25 hammer-stock slides vertically. These ways have angular projections r' r' , fitting into corresponding recesses in the hammer-stock, and on which the hammer-stock slides, as shown in Fig. 3. r^2 r^2 are bolts for securing
30 said ways to the frame at their top and bottom, and s s are bolts passing horizontally through the frame and flanges s' s' on the ways, so as to maintain a suitable distance between said ways for the hammer-stock to slide in.
35 Between the lower flanges and the frame I insert pieces of rubber or elastic material, as shown in dotted lines at s^2 s^2 , Fig. 3, to relieve the jarring consequent from the concussion of the hammer. Between the top of the ways
40 and encircling the upper bolt s , I employ a stiff coiled spring, as shown at t , Fig. 6.

By the use of the sliding adjustable bearings on the rear of the helve which holds the connecting-rod, as shown, I am enabled to
45 change the position of the connecting-rod on the helve and thus increase or decrease the power of the hammer, as may be desired. Thus, if it is desired to decrease the power of the hammer, the bearings on the helve
50 are loosened, and, together with the connecting-rod, are moved forward or toward the semicircular spring. If it be desired to increase the power of the hammer, the connecting-rod is moved toward the rear of the
55 helve, a slight change in either direction causing a decided variation in the power of the hammer.

By the employment of the adjustable holder for the leather strip holding the hammer-stock the leather strip can easily be tightened
60 or loosened, thus increasing or decreasing the elasticity of the curved spring of the helve.

By the use of the rubber pieces or washers between the flanges on the lower ends of the
65 ways or slides and the frame the jar and rattling noise ordinarily attending the use of

power-hammers are avoided, and a yielding cushion is provided against which the ways are bolted or secured. The spring surrounding the holding-bolt on the top of the ways
70 also serves as a cushion or yielding support for the upper part of the ways.

By constructing the bearing for the pivotal connection of the helve to the frame with a tapering hole and with a bushing tapered
75 on the outside in a direction contrary to that of the hole in the bearing, with its center straight, in which is secured the connecting-pin, I am enabled to readily take up the wear in the bearing by turning up one or both of
80 the nuts, so as to force the bushing farther into the tapering hole in the bearing when desired, as will be manifest.

The helve and the semicircular spring on the end in my improved hammer are made of
85 one integral piece, thus reducing its cost and at the same time increasing its strength and rendering it easier of adjustment.

I do not intend to limit myself to the particular form of construction of the sliding
90 bearings on the helve and the pin connecting them, on which the connecting-rod oscillates, as the bearings and the pin can all be made integral with one another, if desired.

Having thus described my invention, what I
95 claim as new, and desire to secure by Letters Patent, is—

1. In a power-hammer, the combination, with the driving mechanism, of a helve pivoted at one end to the frame and provided
100 at the other end with a semicircular spring made integral therewith, and a flexible strap adjustably secured between the ends of said spring by bolts, substantially as described.

2. In a power-hammer, the combination,
105 with the driving mechanism, of a vibrating helve pivoted at one end to the frame, the other end being provided with a semicircular spring made integral therewith, a flexible strap adjustably secured between the ends of
110 said spring, and adjustable bearings for receiving the end of a rod from the driving-shaft, substantially as shown and described.

3. In a power-hammer, the combination,
115 with the driving mechanism, of a vibrating forked helve pivoted at one end to the frame and adjustably connected to the driving-shaft by a suitable connecting-rod, as shown, and provided at its other end with a semicircular spring, and a flexible strap adjustably secured
120 between the ends of said spring, substantially as shown and described, for the purposes set forth.

4. In a power-hammer, the combination,
125 with the driving mechanism, of a vibrating forked helve pivotally connected at one end to the frame and adjustably connected with the driving-shaft by a suitable connecting-rod, as shown, the other end of said helve being provided with a semicircular spring and
130 a slot in said helve at the base of said spring, and a bolt for holding one end of a flexible

strap between the ends of said spring, substantially as described, and for the purposes set forth.

5 In a power-hammer, the combination, with the driving mechanism, of a pivoted connection and bearings for a helve, consisting of a spindle with a tapering bushing firmly fixed thereon and adapted to enter a tapering hole in the bearing, as described, and for the purposes set forth.

6 In a power-hammer, the combination, with the frame and driving mechanism of the machine, of a hammer-stock, a helve pivoted at one end to the frame, a semicircular spring on the other end of said helve and integral therewith, a flexible strap extending between the ends of said spring, whereby said helve is connected with said hammer-stock, and a slot in said helve adapted to receive a bolt for adjustably securing one end of the flexible strap, as shown, and for the purposes set forth.

7 In a power-hammer, the combination, with the hammer-stock, of ways between which the hammer-stock slides, and a helve pivoted at one end to the frame and also adjust-

ably and pivotally connected to the driving-shaft, as shown, and for the purposes set forth.

8 In a power-hammer, the combination, with the hammer-stock provided with a slot k' , of ways between which the hammer-stock slides, bolts s , rubber washers or cushions s^2 , a helve pivoted at one end to the frame, a semicircular spring upon the other end of said helve, a flexible strap extending between the ends of said spring and passing through slot k' in said hammer-stock, bolt i , adapted to slide in slot g^4 in said helve for adjustably securing one end of said flexible strap, adjustable bearings c on said helve, and rod M , pivotally connected at one end to said adjustable bearings c and at the other end to the driving-shaft, substantially as shown and described, and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of October, 1888.

CHARLES A. VAUGHN.

Witnesses:

OLIVER DRAKE,
E. L. SHERMAN.