

No. 657,114.

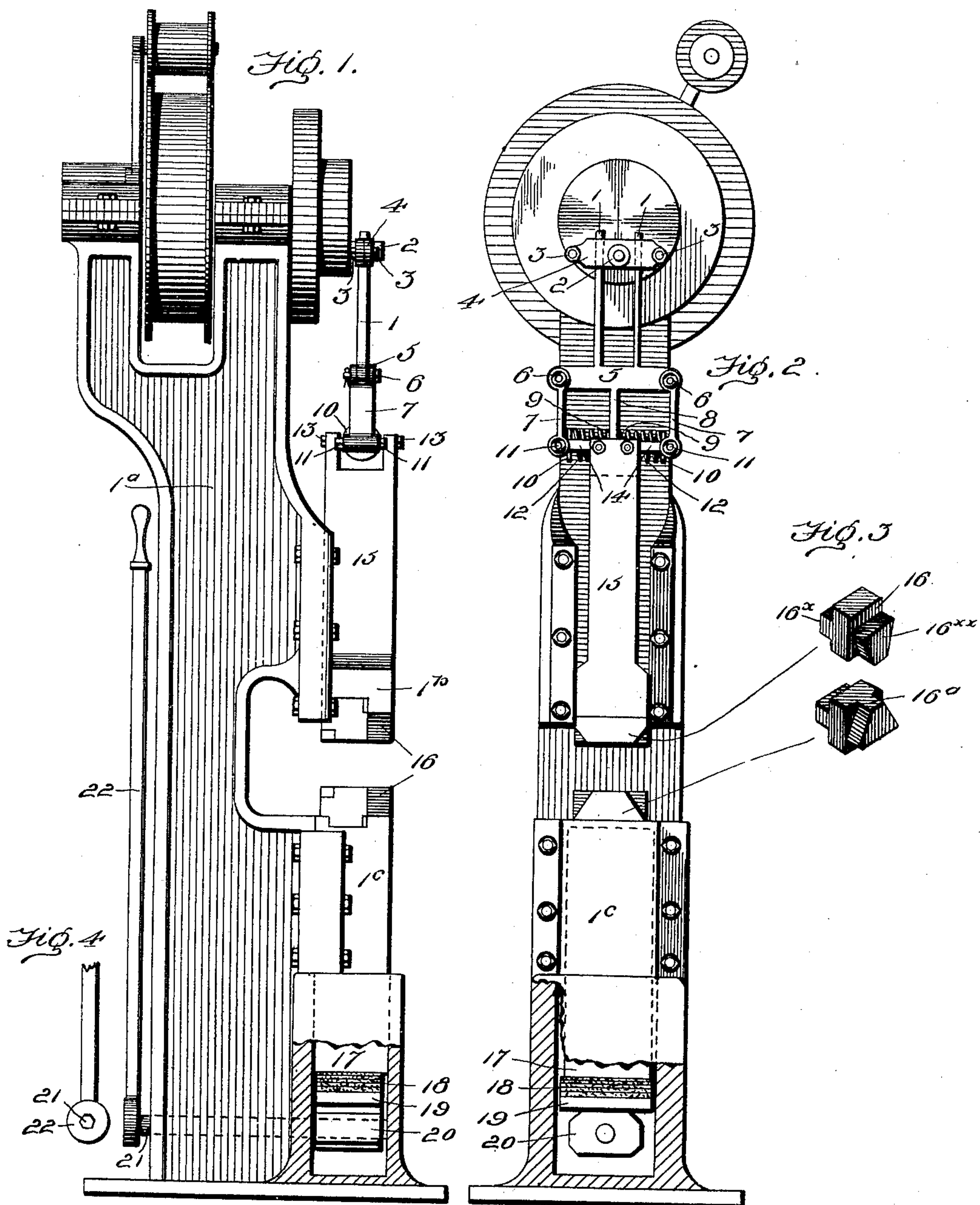
Patented Sept. 4, 1900.

L. D. HOWARD.
POWER HAMMER.

(Application filed Feb. 24, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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Attorneys

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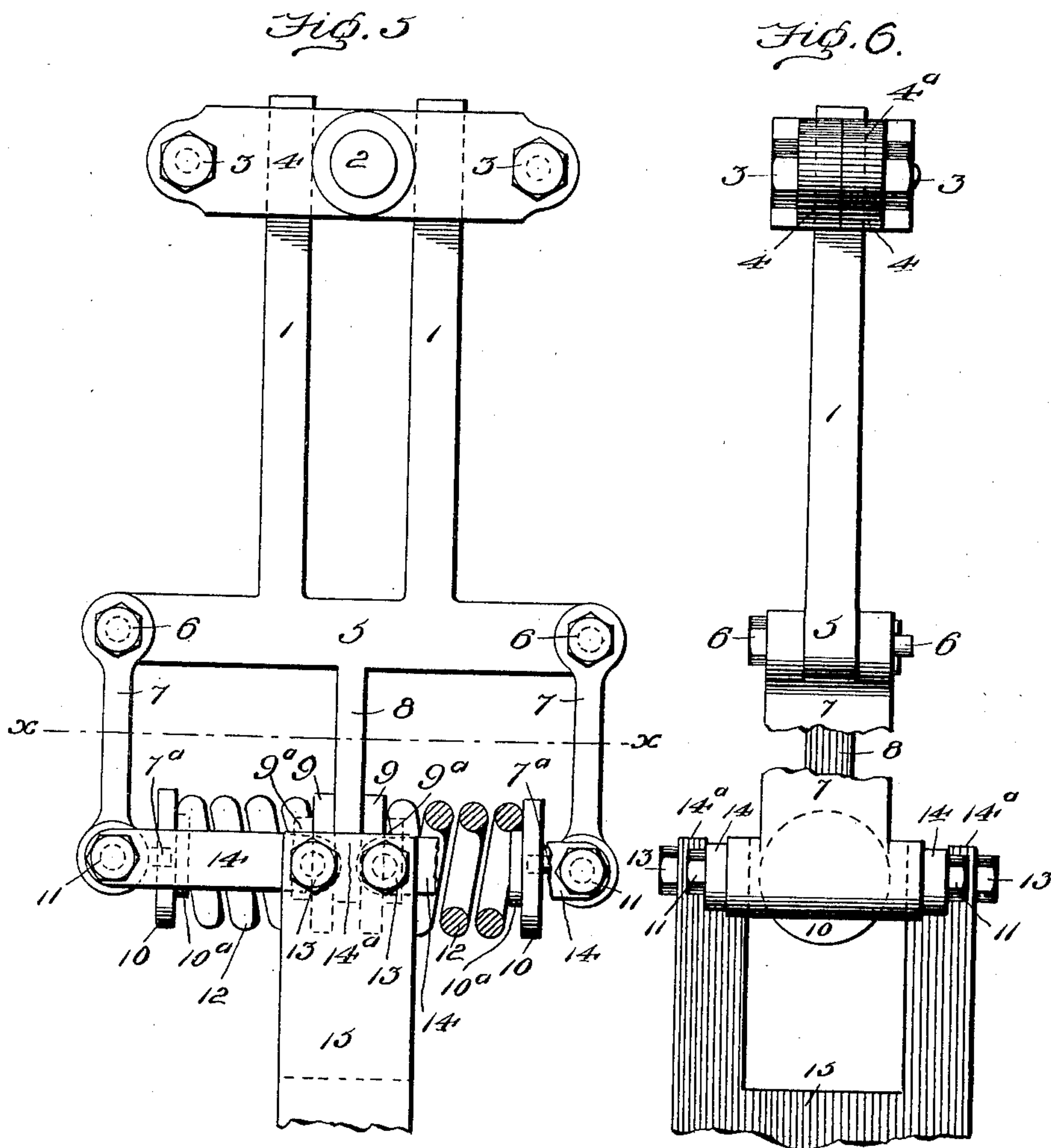
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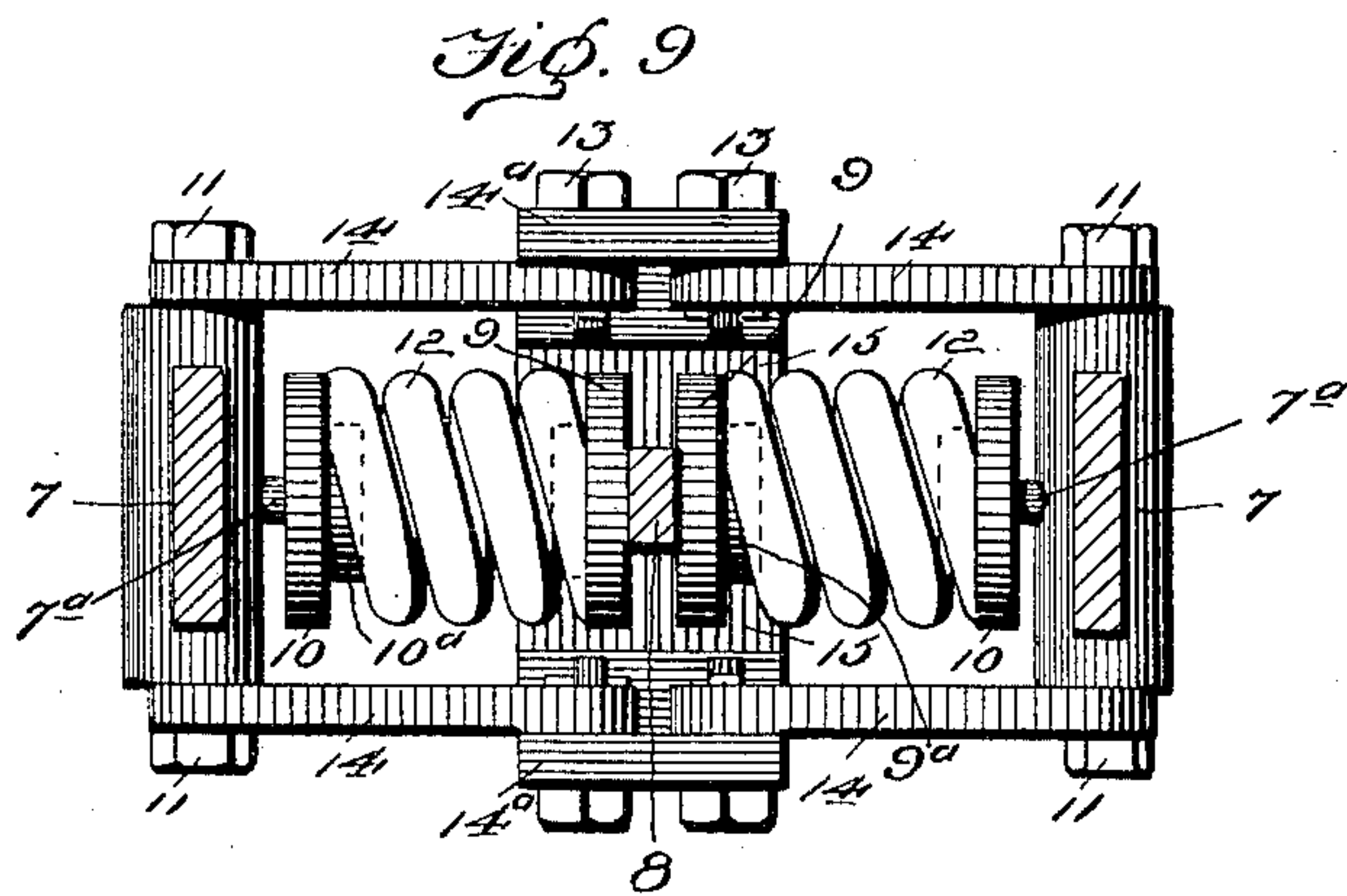
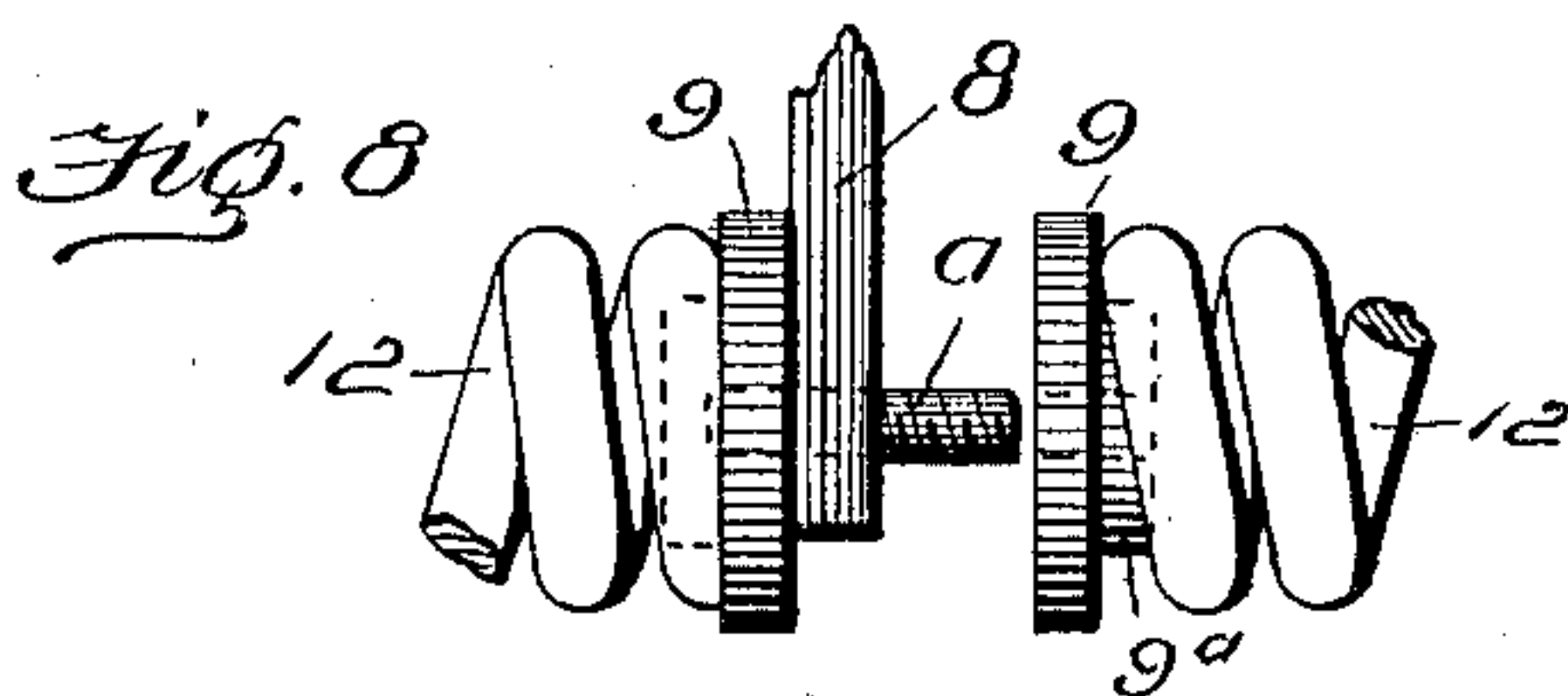
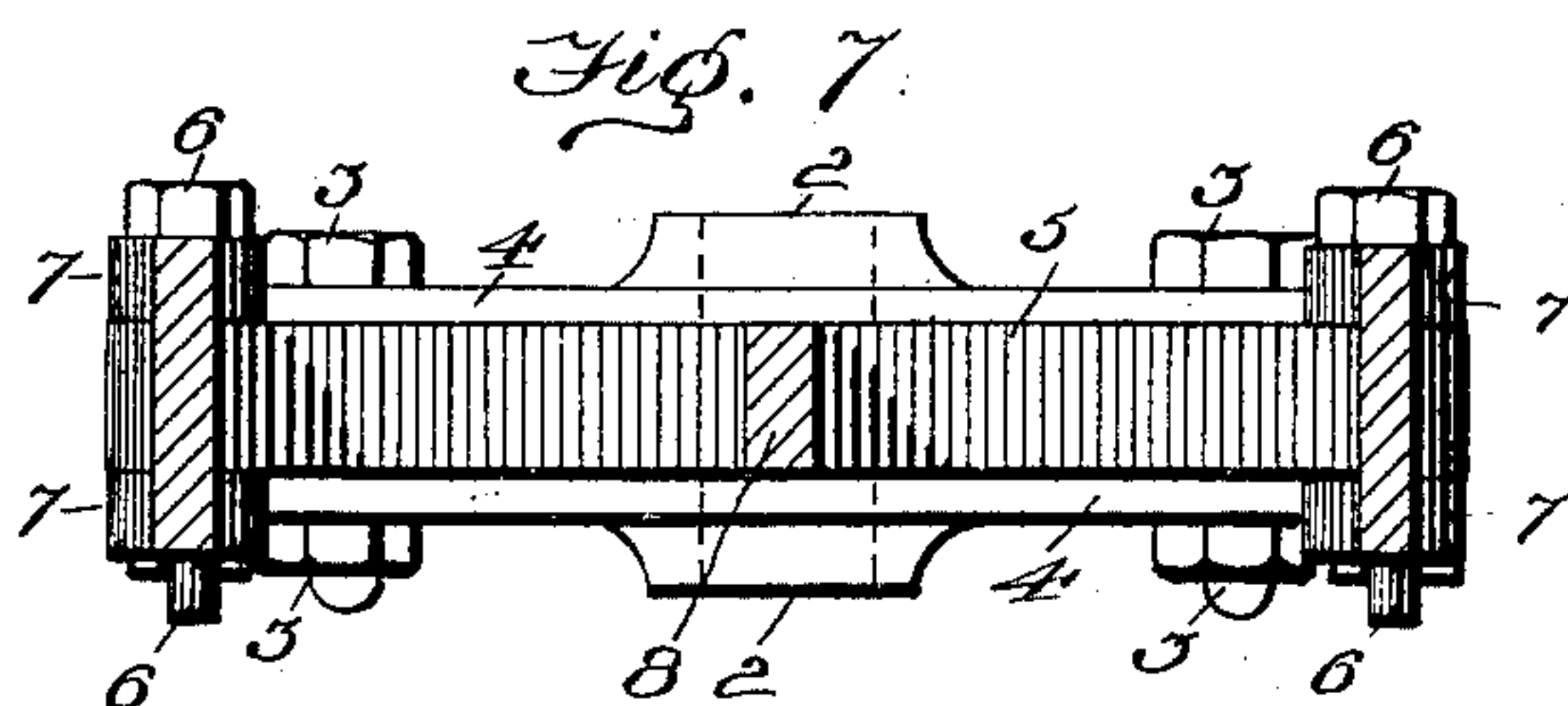
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UNITED STATES PATENT OFFICE.

LEONARD D. HOWARD, OF ST. JOHNSBURY, VERMONT.

POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 657,114, dated September 4, 1900.

Application filed February 24, 1900. Serial No. 8,416. (No model.)

To all whom it may concern:

Be it known that I, LEONARD D. HOWARD, a citizen of the United States, residing at St. Johnsbury, in the county of Caledonia and State of Vermont, 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.

My invention relates to improvements in what are styled "power-hammers."

It has for its objects, among other things, to effectively deliver the blow or force to the metal or substance to be operated on, to effect the delivery of such blow or force immediately following the expenditure of the maximum movement of the hammer-actuating mechanism or pitman, to provide for a yielding independent movement of the hammer relatively to its actuating mechanism, to possess the hammer of a variable movement or stroke, to enable it to have a recoil movement after delivering its blow without interfering with the action of its actuating mechanism, and to simplify and promote the construction and arrangement of the parts generally.

It consists of sundry combinations of parts substantially as will be hereinafter more fully disclosed and specifically pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figures 1 and 2 are views in elevation, one at right angles to the other, parts also being broken away. Fig. 3 represents perspective views of the hammer and anvil dies. Fig. 4 is a broken side view of the anvil-adjusting lever. Figs. 5 and 6 are broken enlarged views, one at right angles to the other, showing more particularly the hammer-head and its guides. Fig. 7 is a transverse section taken on the line *xx* of Fig. 5 looking upward. Fig. 8 is a broken detailed view disclosing more especially the adjusting-screw connection between the springs and the hammer-head guide. Fig. 9 is a section also taken on line *xx* of Fig. 5 looking in just the opposite direction to that indicated in Fig. 7.

It will be understood that I do not limit my-

self to details, as they may be changed without departing from the spirit of my invention and the same yet remain intact and be protected.

In carrying out my invention I provide a suitable support or casting 1^a, upon which is mounted the cam-actuating shaft 2, with its driving-pulley and adjunctive parts, preferably as shown, and which support or casting is adapted to form guides for the hammer 1^b and anvil 1^c, also preferably as shown. The hammer 1^b is provided with a die 16, and the anvil 1^c is provided with a die 16^a, said dies being of peculiar construction, as disclosed especially in Fig. 3, and one being the counterpart of the other. Each die is rectangular in its general outline, having a central lateral rib or projection 16^x on one side and a tapered offset or extension 16^{xx} at its opposite side, with its face or reduced end terminating flush with the corresponding surface or face of the die. The opposite end of said offset or extension terminates a short distance inward from the corresponding end or base of the die and about in a line with the inner surface of the rib on the opposite side of the die, forming a rabbet at that point. The purpose of this construction is to provide for the presentation of either of two surfaces or faces toward the work, as described later on.

The anvil 1^c is adapted to be moved or adjusted vertically in the casting 1^a by means of a cam 20, secured to the axial arm or pivot 21 of a hand-lever 22. Said arm or pivot bears in the base of the casting 1^a, and said cam is arranged in a hollow part of the casting in alinement with the anvil, though not directly in contact therewith. Said lever and cam provide for the ready raising and lowering of the anvil to effect its adjustment at such height as may be required to accommodate the work. Between the lower end of the anvil and said cam are preferably arranged a strip of wood 19, placed next to the latter, and layers or strips of rubber 18, placed between said anvil and wood, thus cushioning the anvil in place.

The hammer-head 15 is bifurcated or recessed near its upper end, thus providing it at said point with arms, the purpose of which will be apparent hereinafter. The hammer-head is connected to its actuating cam and

shaft by a pitman. Said pitman comprises two sections, one consisting of a cross-head-like portion 5, having two parallel integral rods or bars 1, reaching upward, and received into opposed slots or recesses 4^a in two contacting bars or sections 4, constituting a yoke, through which passes the cam-wrist pin. The yoke-sections 4 are held together by nutted bolts 3. Therefore by loosening the latter the rods or bars 1 of the link or pitman connection between said cam-shaft and the hammer can be moved or adjusted longitudinally, providing for varying the length of said pitman or link, as may be required.

The cross-head-like portion 5 has an integral pendent central extension or portion 8, and to its ends are connected, preferably, by suitable pivot pins or bolts 6, links 7, having inward-projecting horizontal lugs 7^a, upon which are slipped and held disks or plates 10. Similar plates or disks 9 are held or connected to the pendant or extension 8 of part 5 by a screw *a* passing through said extension and projecting through opposite sides thereof and engaging screw-threaded holes in said disks or plates. This connection provides for compensating loss of tension in the springs by effecting the required adjustment or turning of the screw, as will be readily understood. Sandwiched between said disks or plates 9 and 10 are springs 12 with their ends receiving bosses or projections 10^a and 9^a, formed upon said disks or plates, respectively. These springs permit of a yielding movement of the links 7 with relation to the central pendant or extension 8 of the pitman aforesaid, the function of which will be more fully apparent hereinafter. Also connected to the links 7 outside of the lugs 7^a are lateral bars or ties 14, constituting the other section of said pitman or hammer-actuating mechanism, arranged also alongside of the springs 12, with their ends adapted to be bolted or pivoted to the lower ends of said links and the hammer-head 15, as at 11 and 13, respectively. This arrangement, while it aids to retain the springs 12 in position between the disks or plates 9 and 10, primarily effects the suspending of the hammer-head in position. The bolts 11, effecting the connection between the links 7 and the bars or ties 14, pass through tubular end extensions or eyes of said links and, of course, openings in said bars or ties at their outer ends. The inner ends of the tie-bars 14 are arranged in slots 14^x in the arms 14^a of the hammer-head, with screw bolts or pivots 13 passing through said arms and ends.

It will be understood from the foregoing that as the hammer receives the maximum movement or action of the actuating-cam the yielding connection, formed by the interposed springs and links in the pitman, will cause the hammer to deliver its effective blow immediately following such cam action. Thus the otherwise-rigid connection between the

source or point of application of power and the hammer is obviated, reducing concussion and liability of breakage or impairment of the power-transmitting mechanism. Also the stroke of the hammer is rendered variable automatically in delivering the blow, and accordingly the force of the blow, according to the thickness of the metals or work operated upon. Further, momentum is provided for, the hammer-head being permitted to return or move beyond the point of connection between it and the cam-actuated member or section of the pitman after the hammer has delivered its blow and upon the return stroke thereof.

It will be observed, as above intimated, that the hammer and anvil dies, each having two faces, permit of the work being operated upon when presented either sidewise or edgewise for treatment without changing the position of said dies. The work when placed sidewise is acted upon by the face proper of the moving die; but when it is to be acted upon along its edge or in the plane of its greater area it is placed in the rabbeted portion or edge of the anvil-die and accordingly arranged in alinement with and receives the blow of the moving or hammer die at its corresponding rabbeted portion or edge.

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

1. In a power-hammer, the combination of a hammer, actuating mechanism and a sectional pitman connecting said hammer and actuating mechanism, one section comprising a cross-head-like portion, with parallel upward-extending arms and a central pendent arm, links connected to the ends of said cross-head-like portion, springs arranged between said links and said central pendent arm, and tie-bars connected to said links and to the hammer-head, respectively, and arranged laterally of said springs, substantially as set forth.

2. In a power-hammer, the combination of a hammer, actuating mechanism, and a sectional pitman connecting said actuating mechanism and hammer, one section comprising a cross-head-like portion having a central pendent arm, links connected to the ends of said cross-head-like portion, springs arranged between said links and arm, a screw carried by said arm and adapted to compensate tension of said springs, and the other section of said pitman comprising tie-bars connected to said links and to the hammer-head, and arranged laterally of said springs, substantially as described.

3. In a power-hammer, the combination of a hammer, actuating mechanism and a sectional pitman comprising links, and springs adapted to bear upon said links, and tie-bars connected to said links and arranged laterally of said springs, and the hammer-head having its arms provided with reduced or stepped upper end portions, said tie-bars

having lateral studs connected to said reduced or stepped portions of the hammer-head, substantially as set forth.

4. In a power-hammer, the combination of
5 a hammer, actuating mechanism, and a sectional pitman, adapted to connect said hammer and actuating mechanism, one section comprising a cross-head-like portion having upward-extending parallel arms, parallel con-
10 tacting slotted plates adapted to receive between them said parallel arms and carried by

said actuating mechanism, links connected to said cross-head-like portion, and springs adapted to bear upon said links, and tie-bars connecting links to the hammer-head, sub- 15
stantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LEONARD D. HOWARD.

Witnesses:

A. F. NICHOLS,
ROLFE COBLEIGH.