

No. 750,006.

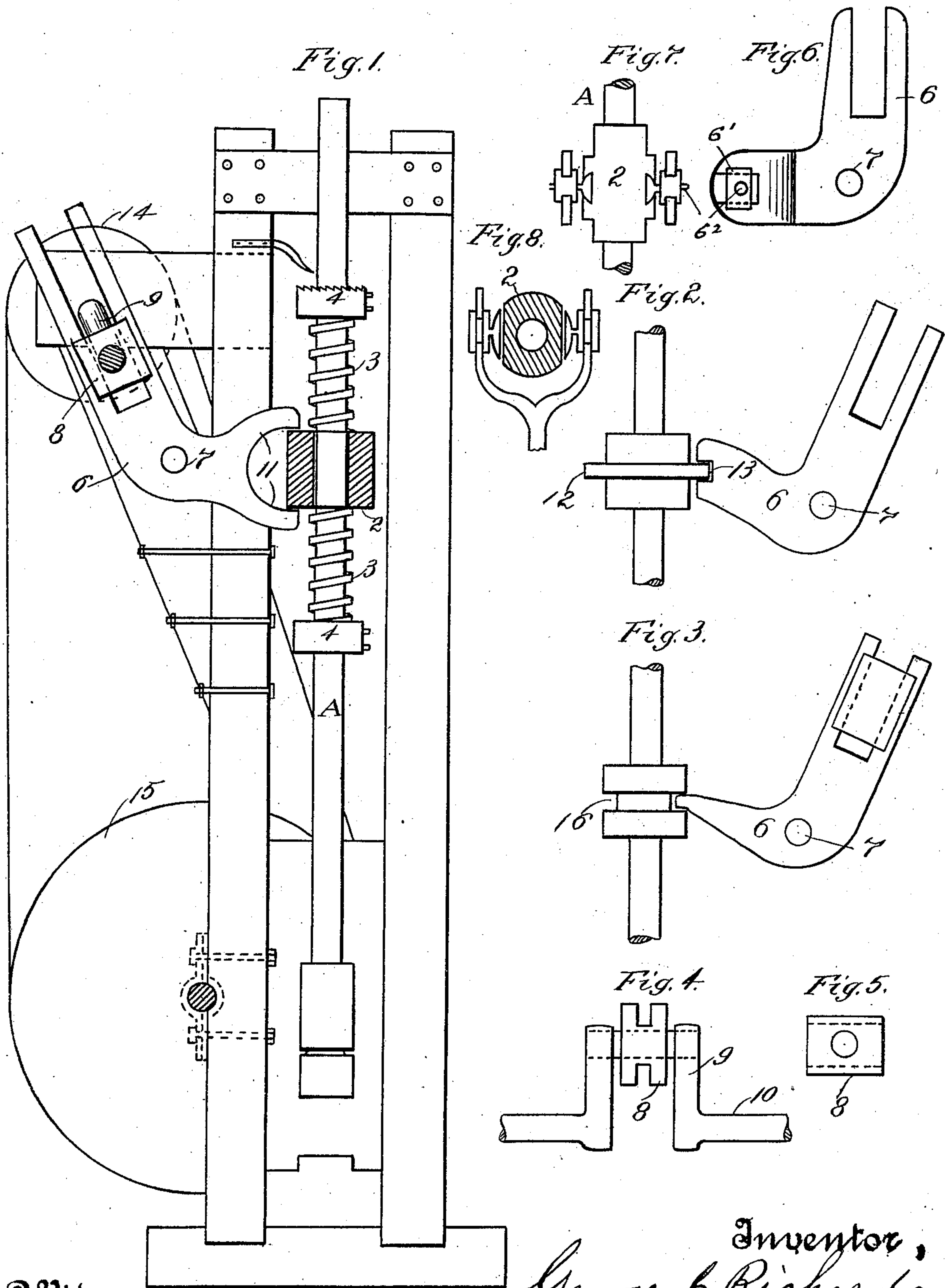
PATENTED JAN. 19, 1904.

G. C. RICHARDS.
STAMP MILL.

APPLICATION FILED MAY 12, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses,
Max Wilke.
J. H. Jones

Inventor,
George C. Richards
Dewey Strong & Co. atty

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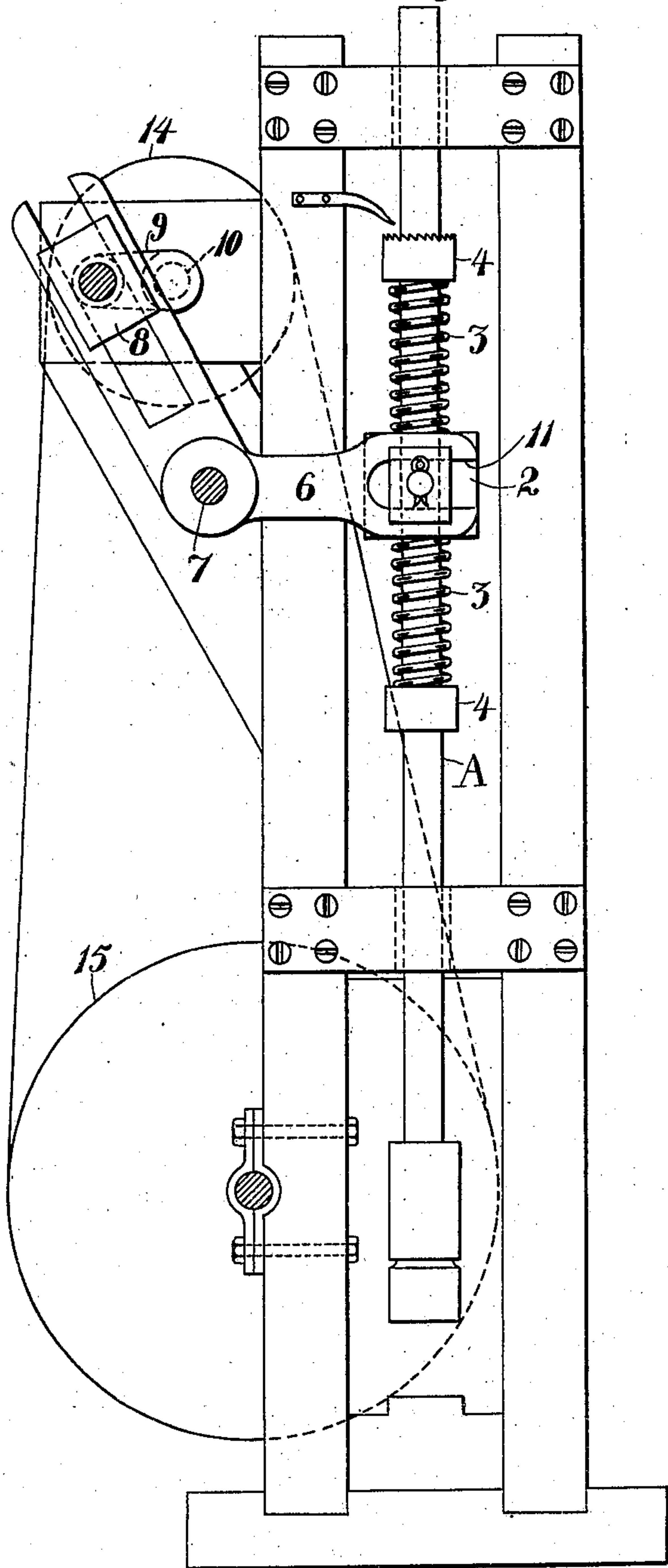
STAMP MILL.

APPLICATION FILED MAY 12, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 1.^a



Witnesses,

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UNITED STATES PATENT OFFICE.

GEORGE C. RICHARDS, OF BERKELEY, CALIFORNIA, ASSIGNOR OF ONE-HALF TO HERMAN MURPHY, OF SAN FRANCISCO, CALIFORNIA.

STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 750,006, dated January 19, 1904.

Application filed May 12, 1902. Serial No. 106,905. (No model.)

To all whom it may concern:

Be it known that I, GEORGE C. RICHARDS, a citizen of the United States, residing in Berkeley, county of Alameda, State of California, have invented an Improvement in Stamp-Mills; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in stamp-mills, such as are employed for crushing ore and the like; and the invention consists of the parts and the constructions and combinations of parts, which I will hereinafter describe and claim.

Figure 1 is an elevation with section of tappet. Fig. 1^a is a similar elevation showing a bell-crank lever of modified form. Figs. 2, 3, and 6 show different forms of engagement between the lever and tappet. Fig. 4 is a detail of crank and slide. Fig. 5 is a detail of slide. Fig. 7 is a front view of Fig. 6. Fig. 8 is a bottom view of same, the tappet being shown in section.

In the usual operation of stamp-mills it is customary to lift the stamps and their stems by means of cams mounted upon a horizontal shaft and acting upon tappets which are fixed upon the stamp-stems, so that the stems and stamps would be lifted by the revolution of the cams, and when the cams leave the tappets they are allowed to fall by gravitation. In some cases springs have been applied above the fixed tappets to increase the rapidity of the fall.

In my invention I employ a supplemental shaft with levers adapted to engage tappets which are loosely carried upon the stamp-stems and which are retained in place by sufficiently stiff springs, so that vertically-reciprocating movements of the stems and stamps would be effected by the action of the levers upon these tappets, while the springs would yield sufficiently to prevent sudden strain caused by the inertia of the heavy stamps and stems, the lower spring also acting to prevent breakages in case any hard substance that cannot be broken falls between the stamps and the dies.

As here shown, A represents a stamp-stem; 2, a tappet loosely fitting the stem and having sufficient length of bearing, so that it will move freely upon the stem.

3 3 are stout spiral springs, and 4 are collars securely fixed to the stem above and below, so that the outer ends of the springs press against these collars while the contiguous or adjacent ends contact with the upper and lower surface of the tappet, respectively. The collars may be set so as to compress the springs as much as may be found desirable, while allowing a sufficient yield to overcome shocks caused by rapid action of the mechanism by which the stamp is to be reciprocated.

The actuating mechanism consists of a lever for each stamp, such a lever being shown at 6. This lever may be in the form of a bell-crank or any suitable form. I have here shown it as a bell-crank lever having the angle fulcrumed, as at 7, and one arm slotted, and having slidably-guided boxes 8, movable in the slot. The cranks 9 of a counter-shaft 10 pass through these boxes, and it will be seen that when the crank-shaft is revolved the movement of the cranks will be communicated through the slidable boxes to the lever. The opposite ends of the levers will be either forked, as shown at 11, to engage the upper and lower edges of the tappet, respectively, or the tappet may have a rim formed on it, as shown at 12, to be engaged by a corresponding slot 13 in that end of the lever, the slot being of such length as to allow the movement of the lever in the necessary arc of a circle for the proper lifting and dropping of the cam. In Figs. 6 and 7 the inner end of the lever is forked, and boxes 6' are slidable in the forks and are connected to the tappet by means of pins 6². By another equivalent construction, as shown in Fig. 3, the tappet may have a deep groove or channel made around it, as shown at 16, and the arm of the lever may be adapted to enter this channel, and thus raise the tappet. Other devices of an equivalent nature may be employed, and, if found desirable, any suitable antifrictional device, such as rollers, can be interposed to reduce

the friction, the object being in any case to allow of the application of a positive means for raising and dropping the stamps.

The shaft 10 may have upon its end a pulley, as at 14, and power can be transmitted to it by a belt from a larger pulley, as at 15, so that any desired speed of the smaller pulley and shaft can be effected and the drops of the stamps made as frequent as is found desirable or efficacious.

It will be understood that the upper spring might be dispensed with, if found desirable, and only the lower safety-spring employed, in which case the tappet would abut directly against the upper collar or an equivalent stop, so that the positive lifting action of the stamp would be effected, and the downward movement of the stamp, while being also a positive movement, would by the action of the spring relieve the parts from shock and danger of breakage.

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

1. The combination with a vertically guided and movable stamp-stem, having a tappet slidable upon it, a lifting-stop above, and a compressible spring below and in contact with the tappet, of a rigid bell-crank lever having its angle fulcrumed at one side of the line of travel of the stem, connections between one arm of

the lever and the tappet, and slidable connections between the other arm and an operating-crank.

2. A vertically guided and movable stamp-stem, having a tappet slidable thereon, a lifting-spring device above the tappet, and a compressible spring below, a crank-shaft journaled at one side of the stem, an inflexible rigid bell-crank lever having its angle fulcrumed between the shaft and the tappet, and a slide movable in the outer arm of the lever and forming connection with the crank, said lever having its inner end connected with the tappet.

3. A vertically guided and movable stamp-stem having a tappet slidable thereon, compressible springs through which the tappet acts to impart motion to the stem, a bell-crank lever fulcrumed at one side of the stem, a slot and a slide movable thereon at the outer end of the lever, a crank engaging the slide and acting to rock the lever, slotted forks and boxes slidable thereon at the opposite end of the lever, and pins connecting the boxes with the tappet.

In witness whereof I have hereunto set my hand.

GEORGE C. RICHARDS.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.