

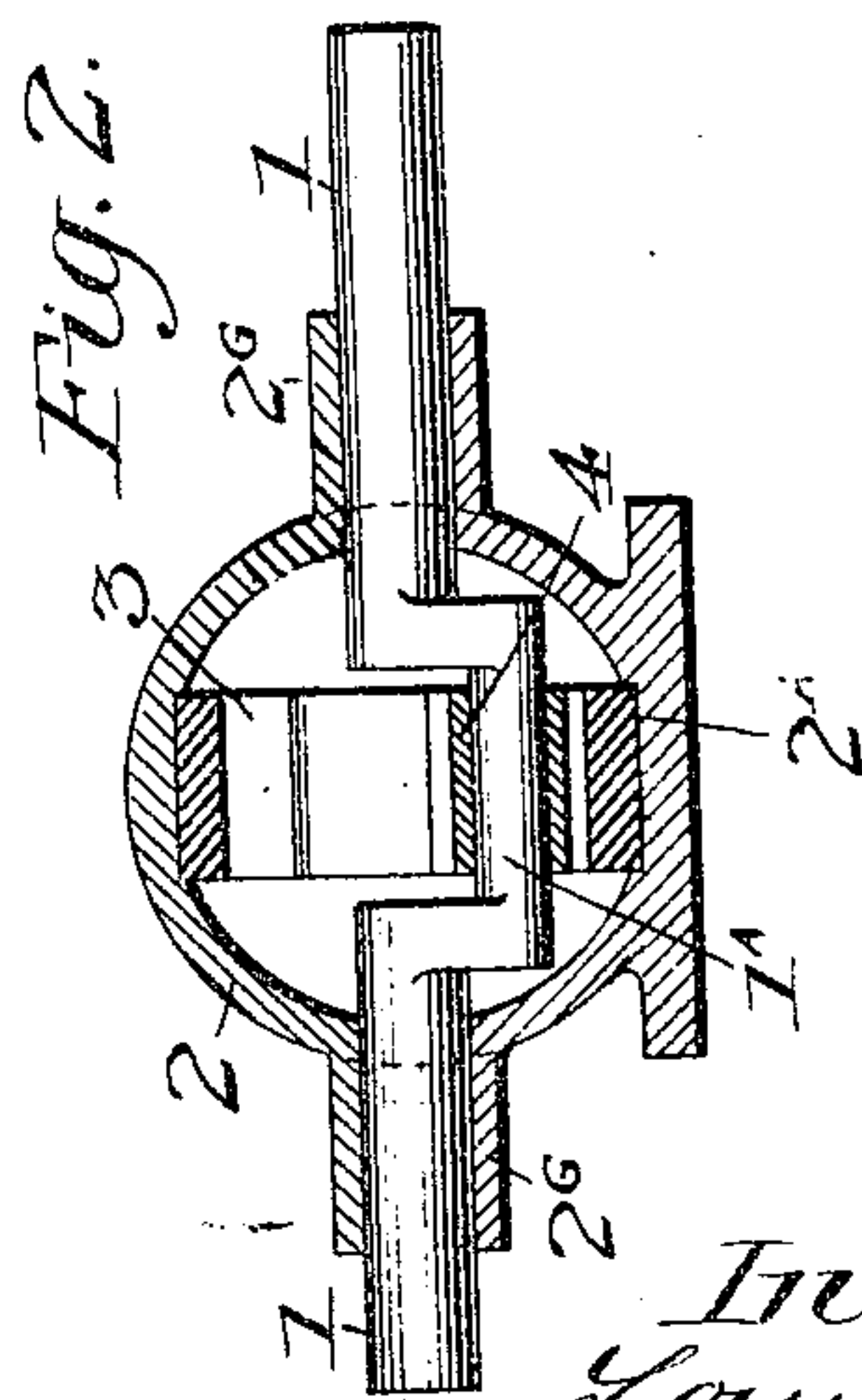
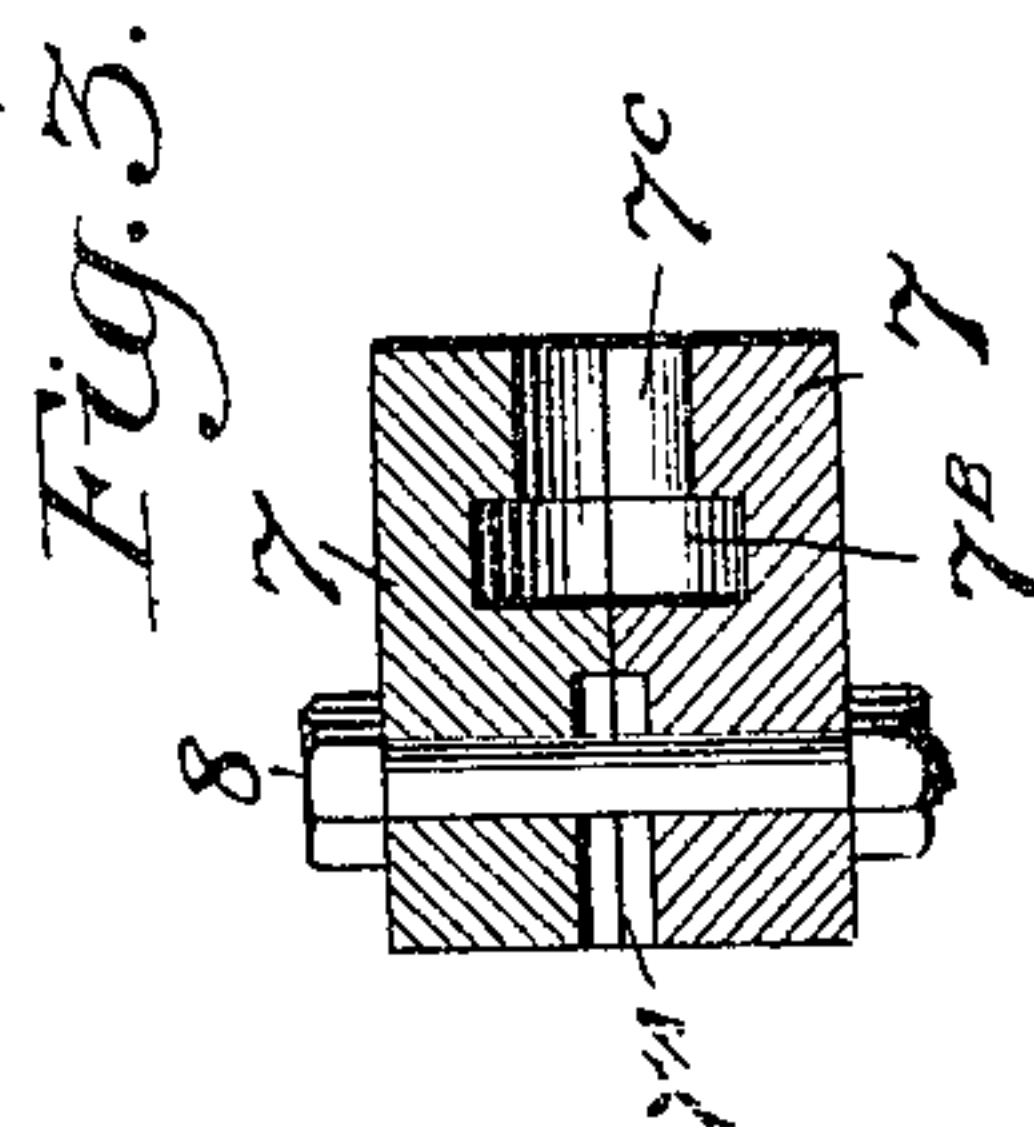
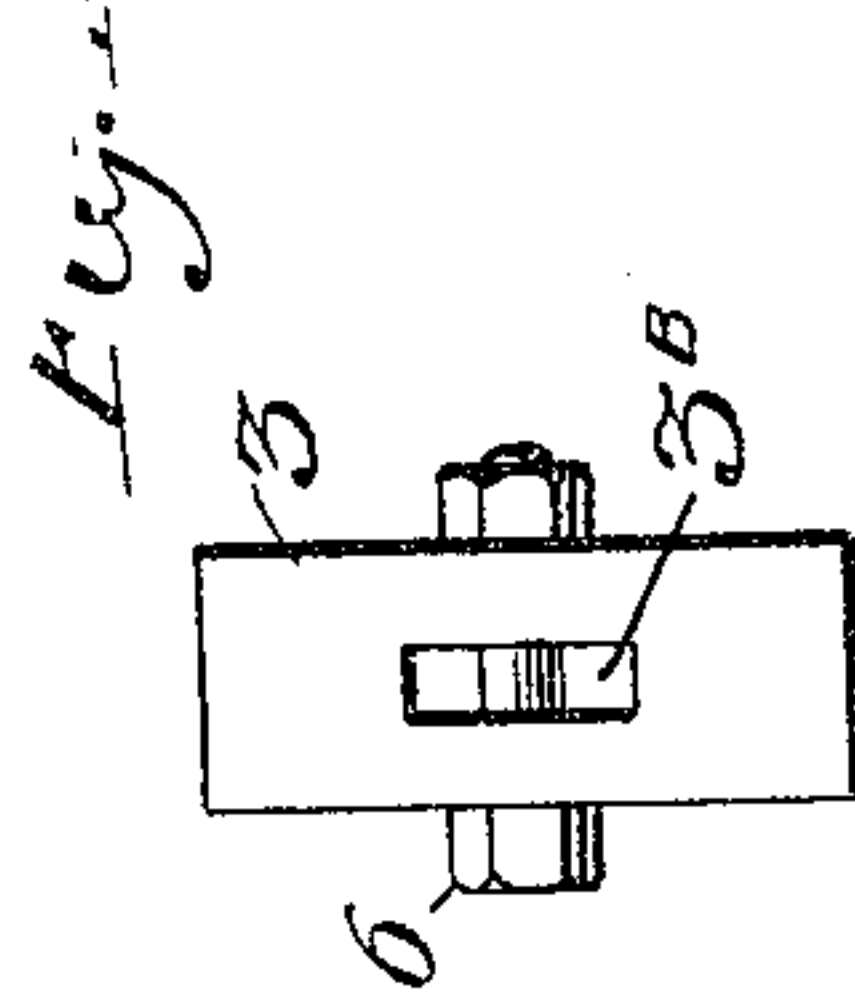
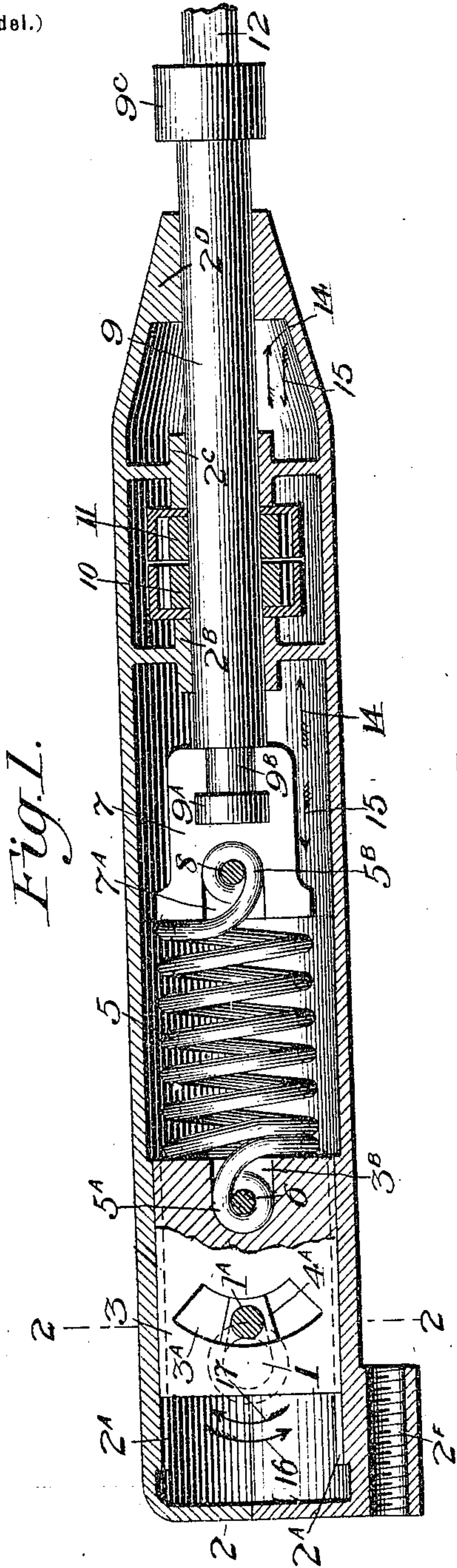
No. 672,082.

Patented Apr. 16, 1901.

L. T. SICKA.
ROCK DRILL.

(Application filed June 28, 1900.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

LOUIS T. SICKA, OF DENVER, COLORADO.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 672,082, dated April 16, 1901.

Application filed June 28, 1900. Serial No. 21,921. (No model.)

To all whom it may concern:

Be it known that I, LOUIS T. SICKA, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Rock-Drills; 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 rock-drills, which though especially designed for use in connection with a power system may be operated manually.

The object of the invention is to produce a device of this class which shall be simple in construction, economical in cost, and efficient and reliable in use; and to these ends my invention consists in the construction herein-after described and claimed, the features of which will be understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my drill.

Fig. 2 is a transverse section on line 2 2 of Fig. 1. Fig. 3 is a horizontal section through the yoke. Fig. 4 is a detail of the cross-head.

Referring to Fig. 1, 2 is a shell or casing, generally cylindrical in form and containing the reciprocating mechanism of the drill.

Projecting laterally from the side of the casing, at one end and preferably integral therewith, is a nut 2^F, which is adapted to receive the adjusting-screw of the guide-frame, (not shown,) which may be of any preferred form.

Journalled in bearings 2^G at diametrically opposite points of the casing 2 is a shaft 1, having a preferably integral crank-pin 1^A, adapted to rotate within the casing. Sliding freely in guides 2^A, formed in the casing, is a cross-head 3, preferably rectangular in section and provided with a segmental slot 3^A, in which slides a bushing 4^A, embracing the crank-pin 1^A. The outer end of the cross-head 3 is recessed at 3^B to receive the loop end 5^A of a stout spiral spring 5, which is secured in the recess by a transverse bolt 6. The opposite end of spiral spring 5 terminates in a loop 5^B, which is secured between the contiguous faces of a two-part yoke 7 in a recess 7^A, provided for that purpose, by means of a transverse bolt 8, which also secures the two sections of the yoke 7 together. Yoke 7 is

provided with a circular recess 7^B, into which is fitted a collar 9^A of the plunger-rod 9, which is secured in the yoke by an interior flange 7^C, which is clamped around the reduced neck 9^B of the plunger-rod. The rod 9 is supported in bearings 2^B 2^C 2^D, formed interiorly of the casing 2 and serving to guide the rod in its reciprocations. The outer end of rod 9 is fitted with a chuck 9^C, of preferred form, to receive the drill-bit 12.

Mounted upon rod 9 between the bearings 2^B and 2^C are ratchet mechanisms 10 11, of any well-known form, to impart a rotary movement to the plunger-rod 9 and the bit 12 as the latter are reciprocated, such rotary movement of the rod 9 being readily permitted by the swiveled connection between the rod and yoke 7.

A rotary motion imparted to crank-shaft 1 by a power-motor of any preferred type or, if desired, by hand-operated means, causes the cross-head 3 to reciprocate in the guides 2^A through the medium of crank-pin 1^A, carrying bushing 4^A, which slides in the segmental slot 3^A in the cross-head. The reciprocation of the cross-head is transmitted to the plunger-rod 9 and bit 12 through the elastic coils of the spring 5, and rotary motion is imparted to the plunger and bit by the ratchet mechanisms 10 and 11. The first movement in the forward stroke of the cross-head 3 in the direction of the arrow 14 compresses the elastic coils of spring 5 and transmits a relatively slow movement to yoke 7 and plunger 9, and as the cross-head approaches the end of its travel, which is governed by the crank-shaft 1, the energy stored in spring 5 imparts an accelerated movement to the plunger and bit 12, thereby delivering a hard sharp blow at the end of the stroke of the bit, which is effective and desirable in such machines. Upon the reverse movement of the cross-head in the direction of arrow 15 the coils of spring 5 are expanded and a gradually-increasing pull is exerted upon rod 9 to withdraw the bit. By this means any sudden or severe initial strains upon the operating parts are avoided and the energy of the blow is concentrated at the end of the stroke of the bit, when it is most effective. Furthermore, should the bit become wedged fast in the drill-hole the elastic connection between the

cross-head and the plunger-rod would permit the head to reciprocate without injury to any part of the machine.

Having thus described my invention, what I claim is—

In a rock-drill, the combination of an inclosing case, a shaft journaled in one end thereof, a cross-head mounted to slide but not to rotate in the case and connected to a crank on the shaft so as to be reciprocated thereby, a plunger-rod mounted in guides in the case

so as to slide and be rotated therein, a yoke swiveled to the plunger-rod, and a coiled spring operatively connected at one end to the cross-head and at the other to the yoke. 15

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

LOUIS T. SICKA.

Witnesses:

JOHN McDONOUGH,
ARTHUR J. CLARK.