

A. HOLBROOK.  
CHRONOMETRIC LOCK.

No. 19,927.

Patented Apr. 13, 1858.

Fig. 1

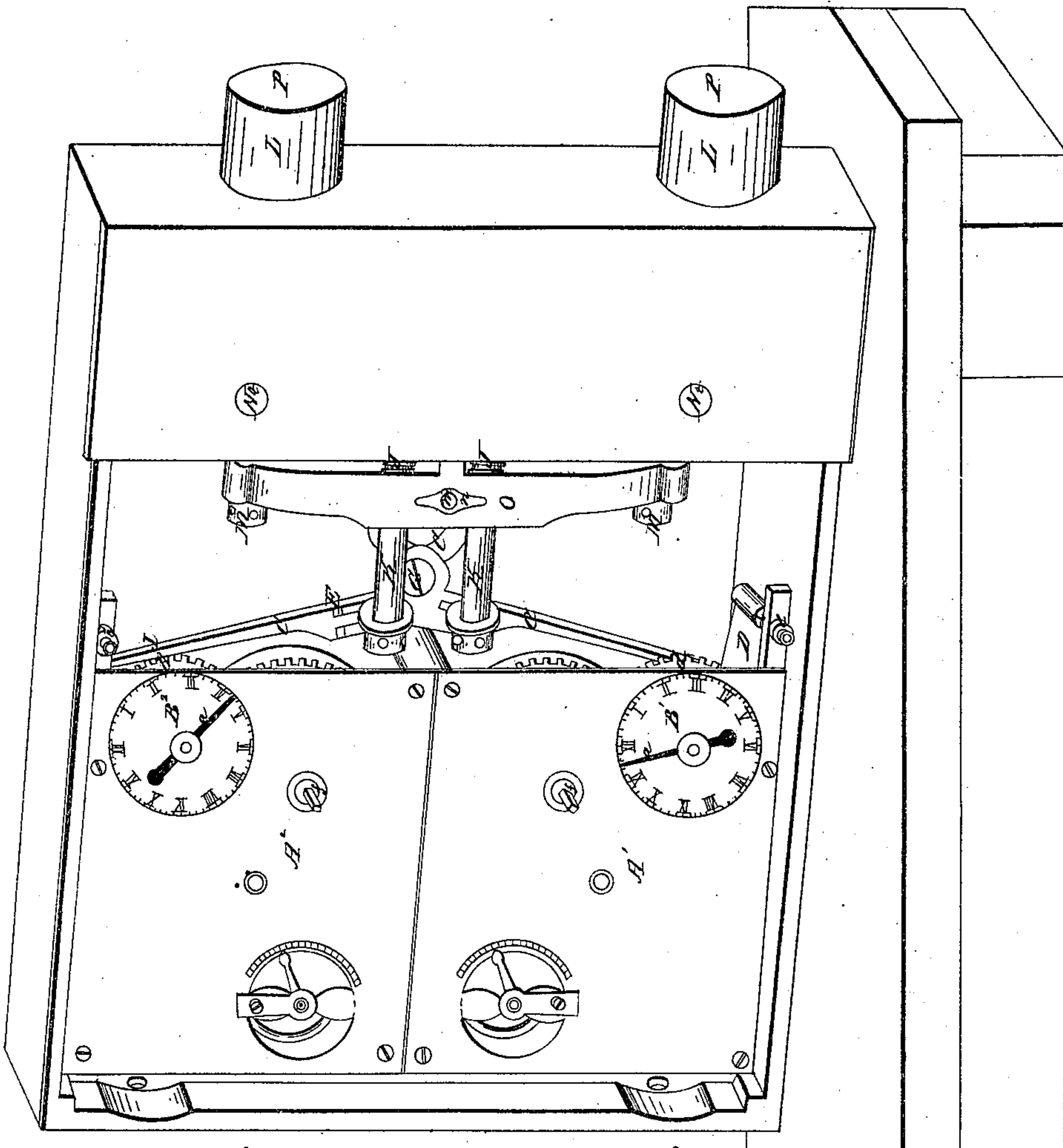
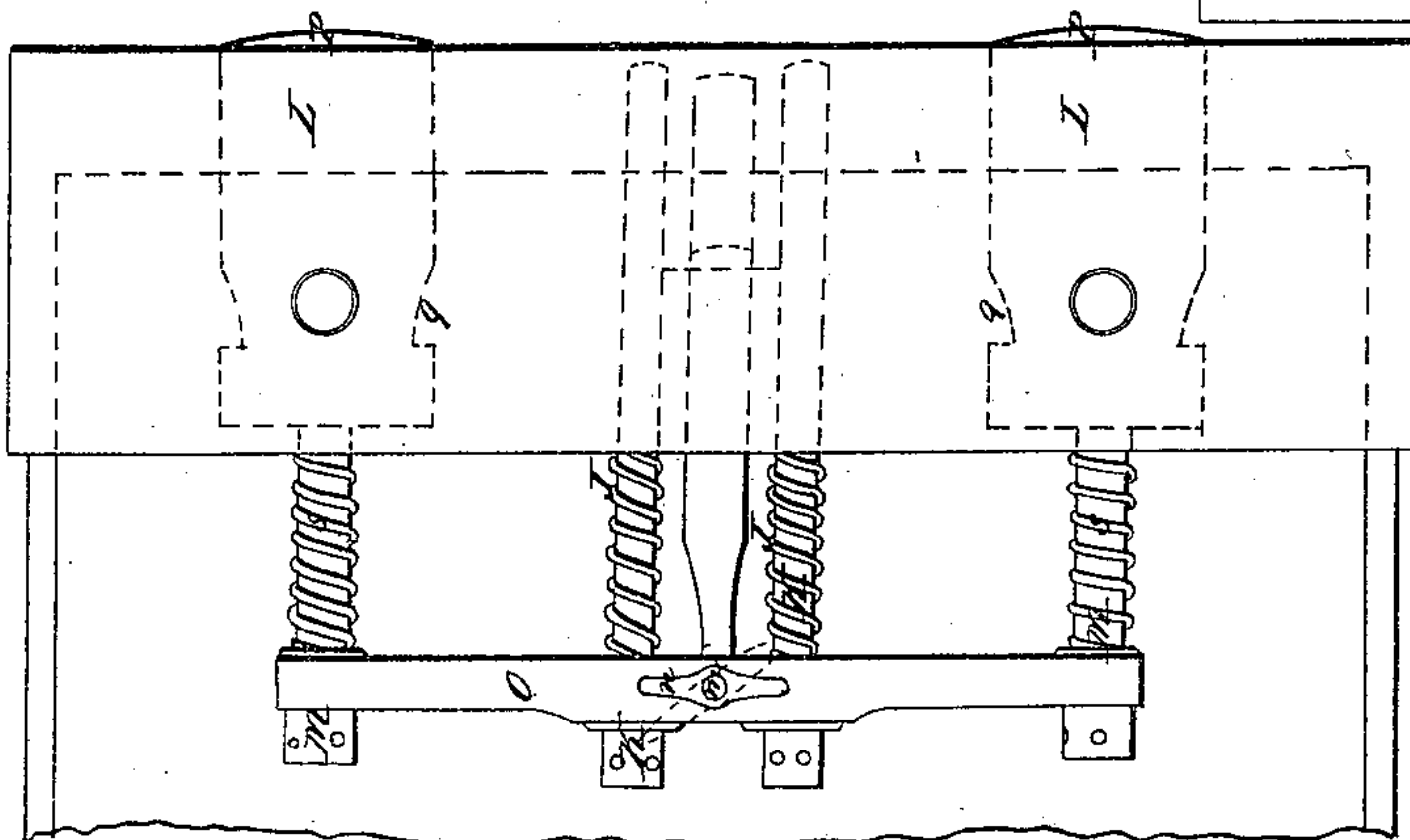


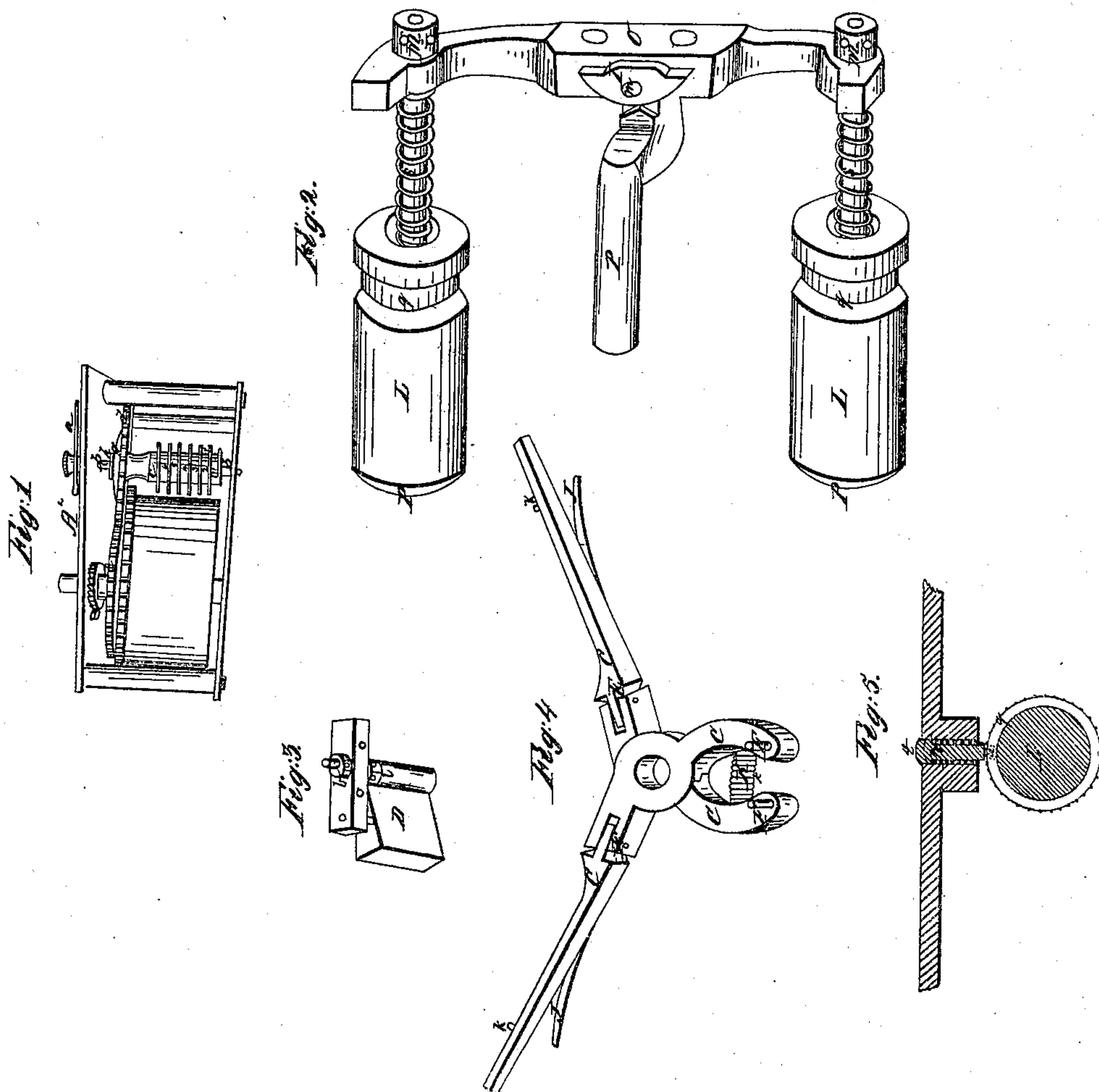
Fig. 2.



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# UNITED STATES PATENT OFFICE.

A. HOLBROOK, OF MILFORD, MASSACHUSETTS.

## IMPROVED CHRONOMETRIC LOCK.

Specification forming part of Letters Patent No. 19,927, dated April 13, 1858.

*To all whom it may concern:*

Be it known that I, AMOS HOLBROOK, of Milford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Automatic Locks; and I do hereby declare that the following is a full, clear, and exact description of the principles or characters which distinguish them from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, of which—

Figure 1, Plate 1, represents a view of the lock in locked position, the lid being taken off to show the arrangement of the several parts in connection with two time-motions. Fig. 2, Plate 1, is a plan of a part of the lock, showing the position of the bolts, springs, and T-guide when unlocked.

Plate 2 represents the different parts of the inside work of the lock disconnected, the better to show their construction. On this plate Fig. 1 represents an end view of one of the time-movements, showing the construction of the spiral grooved releasing-cylinder, and its connection with the time-work. Fig. 2 represents the locking-bolts with their connecting-rods and locking-springs, also the T-guide and revolving crescent, all inverted from their true position in the lock. Fig. 3 represents one of the adjustable rests, with the adjusting screw and nuts. Fig. 4 represents two release-levers, with their adjusting-springs and retaining-studs. Fig. 5 represents a section taken through the center of the spiral-spring catch and a part of the lid of the lock and locking-bolt.

The objects of my improvements are, first, to reduce and compact the mechanical arrangement, so as to diminish the size of the lock and reduce the cost of manufacture; secondly, to secure certain and direct action by relieving the time-work from all pressure of the levers and springs for unlocking; thirdly, to enable me to use an independent revolving bolt; and, fourthly, to facilitate the labor of setting the lock.

I construct my locks with two or more independent bolts, in the form of a cylinder, bored hollow the greater part of their length, for the purpose of receiving the screw of the connect-

ing-rod and a part of the locking-spring. This form enables me to place the unlocking spring or springs (I prefer two) and the stem P of the T-guide between the bolts. Centrally in the T-guide I insert a small round shaft, working loose and standing perpendicular to the bottom or back of the lock, having a crescent firmly fastened to the lower end, and an index of elongated form parallel to the crescent firmly fastened to the other end. Upon each side of this shaft, and running at right angles with it, are two mortises, through which are passed the guide-rods of the unlocking-springs, having large heads, which form stop-motions for the T-guide and action of the springs, and are firmly screwed at the other end to the lock-box. At each end of the T-guide are like mortises for the reception and action of the connecting-rods of the bolts. When the T-guide is drawn forward, compressing the unlocking-springs, the crescent, being previously partly turned round, passes between the retaining-studs upon the short and bent end of the release-levers, and is brought again to a position parallel to the T-guide, as will be shown by the index, by striking on its rounded side against two studs placed upon the back of the lock-box, thereby placing the T guide and bolts in locked position. The release-levers are bent, and, crossing each other, operate by a shears-joint upon the same pivot; or separate pivot may be used. Each lever has a pin upon the side next to the time-work, and is jointed between the pin and the main pivot, which enables the long end of the lever to be moved perpendicular to the back of the lock, which pin takes into a spiral groove upon the cylinder on the shaft to which the index or hand of the time-work is attached. By turning this hand forward upon the dial the pin is taken up by the groove upon the cylinder, (the lever being pressed toward it by a spring placed between the short end of the levers, and upward by a spring under the lever acting against the back of the lock-box,) which raises the end of the lever against the adjustable rest, and is there retained until the hand has been carried or turned back to the point of starting, XII, when the lever will be again below the rest, and by the action of the unlocking-springs



the short end will be thrown backward and outward, releasing one end of the crescent and unlocking the lock.

To enable any one skilled in the art to make and use my invention, I will now proceed to describe the several parts in detail, reference being had to the accompanying drawings and the letters of reference on the same, in which—

A' A<sup>2</sup> represent two time motions or clocks, constructed upon the principle of the lever-watch to run six days, while the lock cannot be set for more than three days at one time. These occupy the entire portion of one-half of the lock, and are made right and left.

B' B<sup>2</sup> are the dials upon the outside of the clock-plates, to enable the operator to set and lock the lock for any number of hours or parts of hours up to the full time for which the lock is constructed to operate, which may be increased by constructing the lock with a longer spiral cylinder and rest. The index-hands *a* are mounted upon the shafts *b b*, which pass through and are firmly fastened to the spiral grooved cylinders *c*, Plate 2, and also pass loosely through the geared wheels *d d*, which take into and are driven by the clock-wheels *e* upon the spring-shafts *f f* of the clocks.

The wheels *d d* operate upon and turn the cylinders *c* by means of the friction-springs *g*, which are retained pressing upon the wheels by the pins *h* through the shafts, thus permitting the cylinders to be turned by the index-hands for the purpose of setting the lock without moving the time-work. Upon the cylinders are cut a right-hand spiral groove, 1 2 3 4 5, about eight to the inch, with a narrow thread or partition, *i*, for receiving the pins *k k* of the release-levers C C. When the index-hand is turned back to XII on the dial-plate the lower end of the thread is in the position shown in Fig. 1, Plate 2, at 1, the pin *k* being also at *o*, in position to be taken up in groove 1 when the index-hand is turned forward. There is a spring, J' J', placed under and attached to each of the release-levers C C, and acting upward upon them, pressing the pin slightly against the thread between 1 and 2. There is also a closely-coiled spiral spring, *k'*, placed between and attached to the short arms of the levers, which, by its action, holds the other arms against the cylinders, so that when the indexes are turned forward, as shown, on A<sup>2</sup> the pin *k* will be taken up in the grooves 1 of the cylinders and the levers raised against the adjustable rests D D. These rests are so constructed that they may be raised or lowered by means of the nuts *l l l l*, so that the levers shall be carried to the bottom or released when the index points to XII or any desired point on the dial.

The release-levers C C are jointed at E E, permitting the long arm to be raised and lowered without moving the retaining-studs F F or opposite ends of the levers. They (the levers) cross each other upon a pivot driven into the back of the lock, and moving upon the pivot as a shear-joint, and held by the

screw G, with a large head, and driven or screwed into the pivot. On the ends of the short arms of the levers are two retaining-studs, F F, standing perpendicular to the levers against which the crescent I is pressed by the action of the unlocking-springs J J, formed of spiral brass wires around the guide-rods K K, which rods and crescent, with the shaft *m* and index *n*, are heretofore described.

The locking-bolts L L are made of steel or hard composition in the form of a cylinder rounded at the end P P, with a groove cut around their circumference at *q q*, with the side farthest from the rounded end of the bolt perpendicular to the axis of the bolt and the other side beveled.

The bolt is bored nearly its whole length for the reception of the connecting-rod M M, and about two-thirds of its length large enough to admit the locking-springs *s s* to act freely, which springs are constructed similar to the unlocking-springs J J. Passing through the cover of the lock is placed a small spiral-spring bolt, N N, directly over each locking-bolt, and perpendicular to its axis, so that when the locking-bolt is pressed back from its locked position, compressing the locking-springs *s s*, the spring-bolt may be pressed into the groove *q q* by the finger placed at *t t* on the outside of the lock, and retained there until the pressure of locking-springs *s s* is counteracted by the rounded end *p* of the bolt striking against the jamb of the door on closing, when the spring-bolt N will be driven back from the dotted lines *u*, Fig. 5, to its original position, permitting the bolt to be locked into the staple by the spring *s*.

To set the lock for any desired time and lock the door, the clocks being wound up and running, the operator has only to turn the hands of the clocks backward (from large to small numbers on the dial) past XII, as shown on B'. Then, with the hand upon the T-guide O, compress the unlocking-springs fully, when the index *n* will stand parallel to the T-guide or across the lock. While in this position, turn the hands forward upon the dial any indefinite distance past XII, and the T-guide bolts, &c., will be retained in locked position, as shown on Plate 1, Fig. 1. Then turn the hands forward, (from small to larger numbers,) counting from XII, over any number of hour-spaces, according to the time which the lock is required to remain locked—that is to say, if it is set at 4 o'clock p. m., to remain locked till 8 o'clock the next a. m., or sixteen hours, the hands will be turned forward one entire revolution of the dial and past XII to IV; if for twenty-four hours, two entire revolutions, stopping at XII. Then place the hand upon the end of the bolts *p p*, compress the locking-springs *s s*, and press down the spring-bolts N N, and permit the bolts L L to press against them, when both the bolts L L will remain with springs compressed and the locking-bolts standing out of the lock sufficiently to strike against the jamb of the door, relieving the



spring-bolts, as before described, and locking the door when closed.

From the cylindrical construction of the bolt, it will be seen that when locked it would easily revolve in its bed, being an impediment to cutting, sawing, or boring the bolt.

What I claim as my invention, and wish to have secured to me by Letters Patent, is—

1. The use, in the construction of automatic and chronometric locks, of jointed release-levers, so arranged that their action when released shall be from the time-work, and so that the releasing of either lever from its rest or the time-work shall release one end of the crescent I or its equivalent.

2. The retaining of release-levers while the lock remains locked upon fixed or adjustable rests, which shall receive all pressure necessary to insure the action of the levers when released by the time-work.

3. The use of a crescent, I, or its equivalent, so arranged that the releasing of either end of it shall also release the unlocking spring or springs, unlocking the lock, as set forth.

4. The use of a spiral grooved cylinder operated by time-work, with the base or bottom of the spiral grooves full and entire, without notch or cavity, as set forth.

5. The use of a hollow-cylinder locking-bolt, revolving loosely in its bed when locked, as set forth.

6. The adjusting-springs J J  $\frac{1}{2}$ , or their equivalents, for the purposes set forth.

7. The arrangement of a T-guide, or its equivalent, with its guides and unlocking-springs between the unlocking-bolts, as set forth.

8. The spiral-spring bolt, operated from the outside of the lock-plate, for the purpose of retaining the locking-spring compressed till closing the door, as set forth.

In witness whereof I have hereunto set my hand and seal this 13th day of March, A. D. 1858.

AMOS HOLBROOK. [L. S.]

Witnesses:

G. W. BROWN,  
BENJAMIN C. KING.