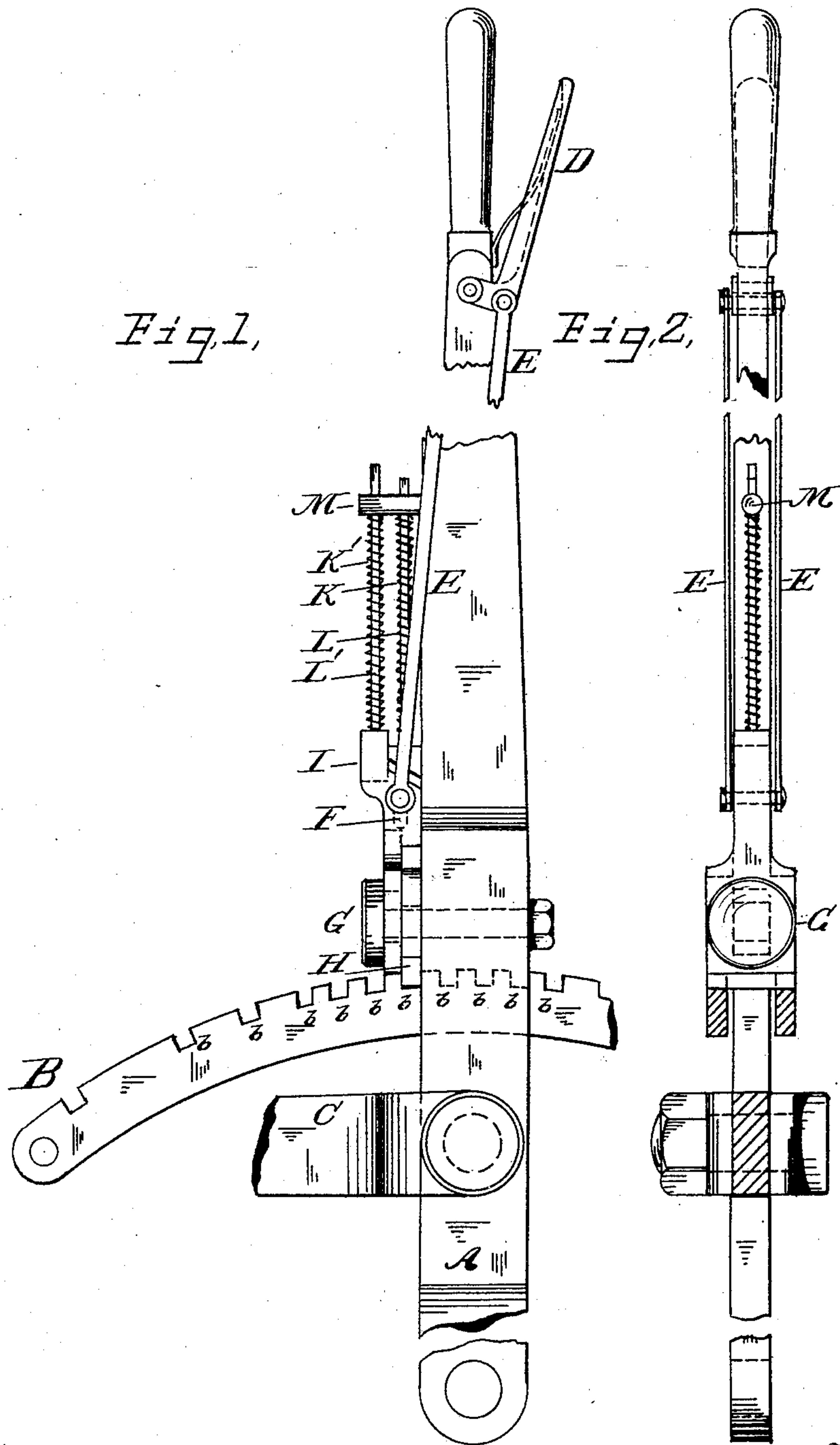


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LOCK FOR REVERSE AND THROTTLE LEVERS.

No. 348,681.

Patented Sept. 7, 1886.



Witnesses  
*George H. Pickbridge*  
*William Berens.*

Inventor  
*Charles May*  
By his Attorneys  
*Whittier & Wright,*

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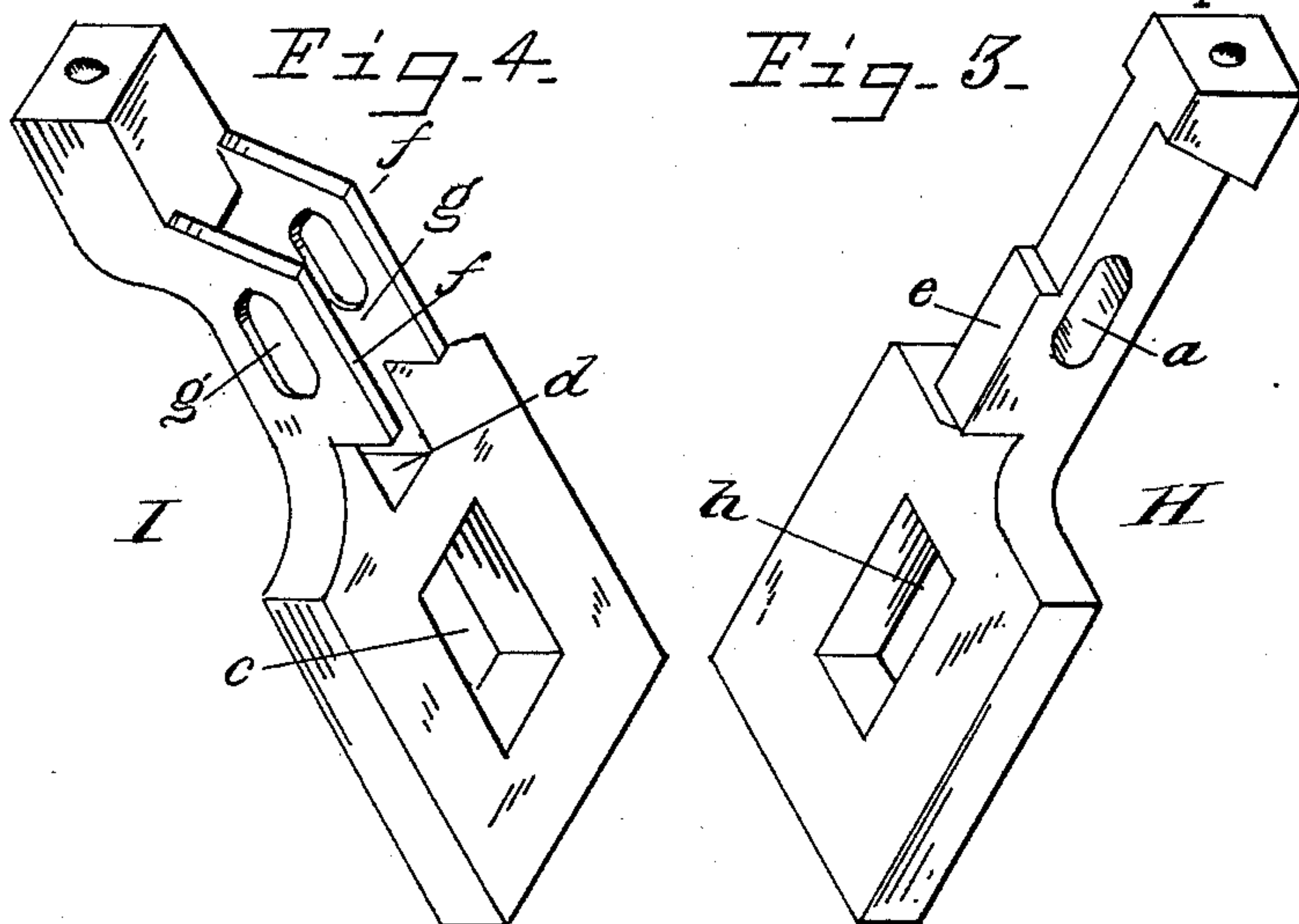
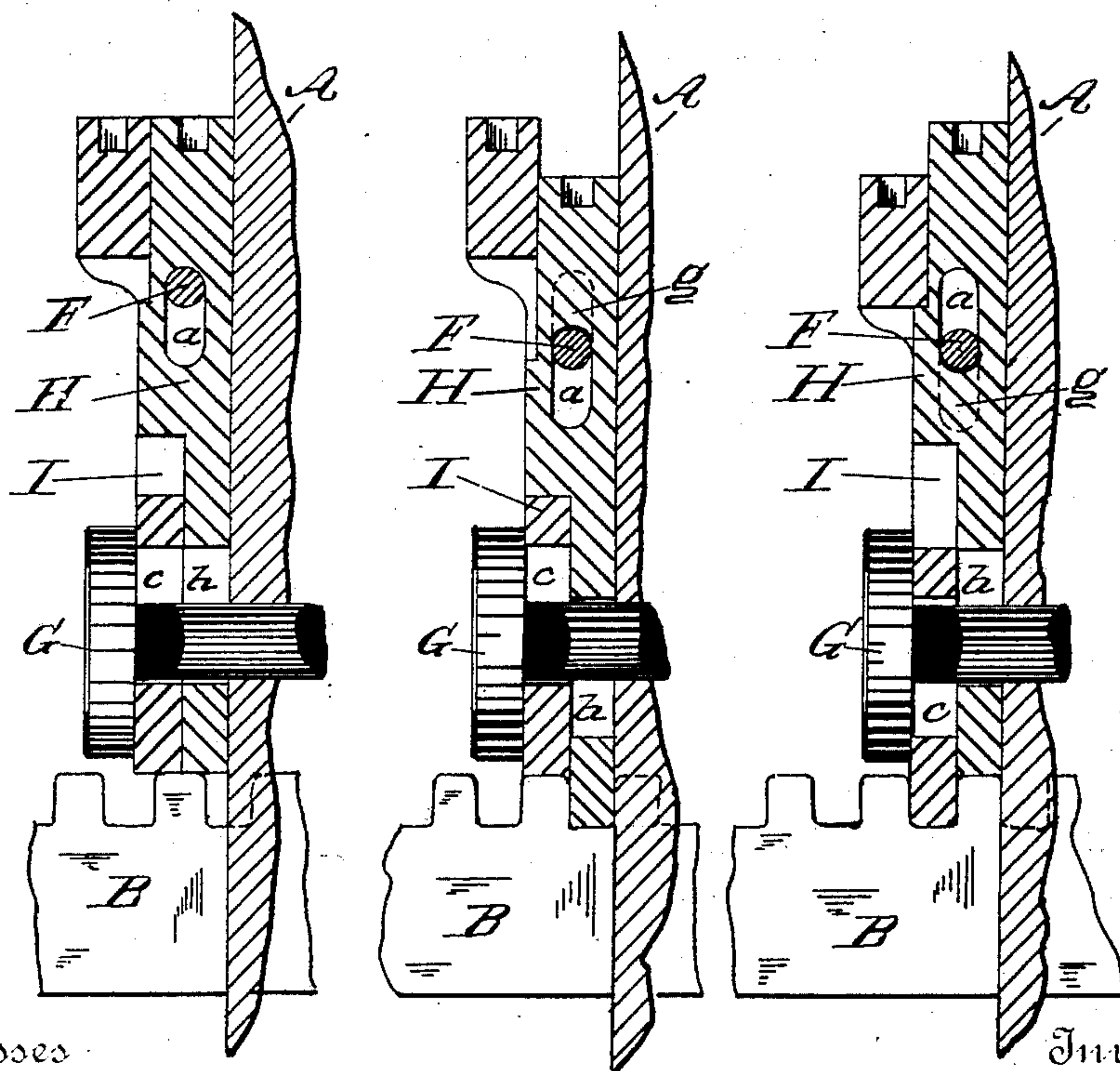


Fig. 5. Fig. 6. Fig. 7.



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# UNITED STATES PATENT OFFICE.

CHARLES MAY, OF SUNBURY, PENNSYLVANIA.

## LOCK FOR REVERSE AND THROTTLE LEVERS.

SPECIFICATION forming part of Letters Patent No. 348,681, dated September 7, 1886.

Application filed June 23, 1886. Serial No. 205,935. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES MAY, a citizen of the United States, residing at Sunbury, in the county of Northumberland, State of Pennsylvania, have invented a new and useful Improvement in Locks for Reverse and Throttle Levers, of which the following is a full and clear description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the latch or locking device for retaining in any desired position the reversing-lever or throttle-lever of a steam-engine. It is applicable to any steam-engine, either stationary, marine, or locomotive, but is especially adapted to the latter, as shown in the accompanying drawings.

In engines with the link-motion the travel of the valve and point of cut-off is usually regulated by the reverse-lever, which, as commonly constructed, is movable backward and forward between two notched quadrants. A spring bolt or latch on the lever engages with any desired notch, and locks the lever in the position to give a certain cut-off. When the engineer wishes to admit steam into the cylinder during a longer portion of the stroke, he lifts the latch and moves the lever toward the end of the quadrant until the latch can be dropped into the next notch. In locomotives the quadrant is usually provided with eight notches for the forward, and as many more for the backward, eccentric. As a certain amount of material must be left between the notches for the sake of strength, it is found to be impracticable to get a very fine adjustment of the cut-off where it is most desirable. Various expedients have been proposed for overcoming this difficulty—such as worm-gears, screws, secondary levers, and the like—for the purpose of moving the reverse-lever a short distance forward or backward after it has been locked in the notch nearest to the point desired; but so far as I am aware all of these devices require two separate and independent operations by the engineer—that is to say, he must first bring the reverse-lever to one of the notches and lock it there, and then manipulate another device to accomplish the further adjustment of the cut-off.

The purpose of my invention is to enable a

comparatively fine adjustment to be obtained by a locking mechanism which requires only the ordinary manipulation of the reverse-lever to operate it.

To this end my invention consists in an auxiliary locking mechanism located adjacent or contiguous to the latch or other lock with which the reverse-lever is provided.

My invention further consists in certain combinations and arrangements of parts, which will be particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, and in which like letters indicate like parts in all the views, Figure 1 is a side elevation of a reversing-lever and its quadrant, showing my improved lock. Figure 2 is a front view of the same. Figs. 3 and 4 are perspective views of the main and auxiliary latches. Figs. 5, 6, and 7 are sectional views showing the operation of the latches.

The reverse lever A, the quadrant B, with its notches *b b*, the reach-rod C, latch-handle D, links E E, and pin F are of the usual construction. The main latch H, which is clearly shown in Fig. 3, has a slot, *a*, through which passes the pin F, and a slot, *h*, which receives the square shank of the bolt G, by which the latch is guided in its up-and-down movement. The latch H is normally forced downward by a spiral spring, K, encircling the rod L, the lower end of which rests in a socket in the upper end of the latch. The other end of the rod is supported and guided by an aperture in the lug M on lever A. The latch may be lifted in the ordinary way by the handle D and links E E. With a single latch the lever A must be moved the entire distance from one notch to the next whenever it is necessary to change its position; but as an intermediate position would often answer quite as well, and in many cases better, owing to the nicer adaptation of the cut-off to the work demanded of the engine, I provide an auxiliary locking device, which is operated by the same handle that controls the main latch or lock. This consists, preferably, of one or more auxiliary latches, I. The drawings show one such latch, which, as seen in Fig. 4, has a slot, *c*, to receive the shank of bolt G, a slot, *d*, to embrace the lug *e* on the main latch H, and two ears, *f f*, each provided with a slot, *g g*, for the pin



F. The auxiliary latch slides upon the face of the main latch, and they are preferably formed with the intermatching lugs and slots, as above described, though these are not essential. The slots *a g* are preferably made equal in length to the depth of a notch in the quadrant plus the diameter of pin F. The auxiliary latch is provided with a spring, K', and rod L', similar to the main latch.

The operation of the auxiliary latch is clearly illustrated in Figs. 5, 6, and 7. Fig. 5 shows both latches raised, the slots *a* and *g* registering with each other, and the pin F at the top of the slots. Fig. 6 shows the main latch dropped into a notch, the auxiliary latch remaining in the position in which it is shown in Fig. 5, while the pin F has descended with latch H and rests at the bottom of slots *g g*. Fig. 7 shows the lever moved from the position shown in Fig. 6 a distance equal to the width of one notch, the main latch bearing on top of the quadrant, as in Fig. 5, the auxiliary latch engaging with the notch, and the pin F resting at the bottom of slot *a*. It thus appears that the handle D must be released in order that either latch may engage with a notch, while the slot in the idle latch allows the pin F to descend with the engaging latch.

It is evident that if one auxiliary latch is used it renders the lever capable of double the number of adjustments that it commonly has. Two auxiliary latches will give three positions of the lever for each notch in the quadrant, and so on.

The latches may be placed side by side; but I prefer to arrange them one in front of the other, as shown, in order that each may enter the notches in both quadrants.

The practical value of the improvement appears in the great saving of fuel which follows from the more careful adapting of the cut-off to the work to be done. Furthermore, the auxiliary latch or latches are actuated and controlled by the ordinary latch-handle, D, thus relieving the mind of the engineer from attending to an extra adjusting device, a very material advantage over those contrivances which require the adjustment to be made by means of a second lever, a screw, or the like.

It is also evident that this improvement is applicable not only to reversing-levers, but to throttle-levers, wagon-brake handles, and, in

fact, to any lever which is locked by a latch or lock engaging with a notched bar.

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

1. The combination, with a lever and its quadrant, of a main locking mechanism and an auxiliary locking mechanism operated by the same handle that controls the main locking mechanism, substantially as and for the purpose described.

2. The combination, with a lever and its notched quadrant, of a latch to lock the lever in a position corresponding to any one of said notches, and an auxiliary locking device to lock the lever in intermediate positions, said auxiliary locking device being operated by the same handle that controls the latch, substantially as and for the purpose set forth.

3. The combination, with a lever and its notched quadrant, of a main latch and one or more auxiliary latches, all operated by the same handle, substantially as and for the purpose described.

4. The combination, with a lever and its notched quadrant, of two or more latches, all operated by the same handle, the notches and latches being so arranged that only one latch is in engagement with the quadrant at the same time, substantially as and for the purpose set forth.

5. The combination, with lever A and quadrant B, having notches *b b*, of handle D, links E E, pin F, and latches H I, having slots *a g*, said slots being equal in length to the depth of a notch plus the diameter of pin F, substantially as and for the purpose set forth.

6. The combination of lever A, quadrant B, having notches *b b*, handle D, links E E, pin F, bolt G, main latch H, having slots *a h* and lug *e*, and auxiliary latch I, having lugs *f f* and slots *c, d, and g*, substantially as and for the purpose set forth.

7. The combination of lever A, having lug M, quadrant B, having notches *b b*, handle D, links E E, pin F, bolt G, latches H and I, rods K K', and springs L L', substantially as and for the purpose set forth.

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