No. 864,549. PATENTED AUG. 27, 1907.

J. C. MOCK.

TIME LOCK MECHANISM.

APPLICATION FILED FEB. 19, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

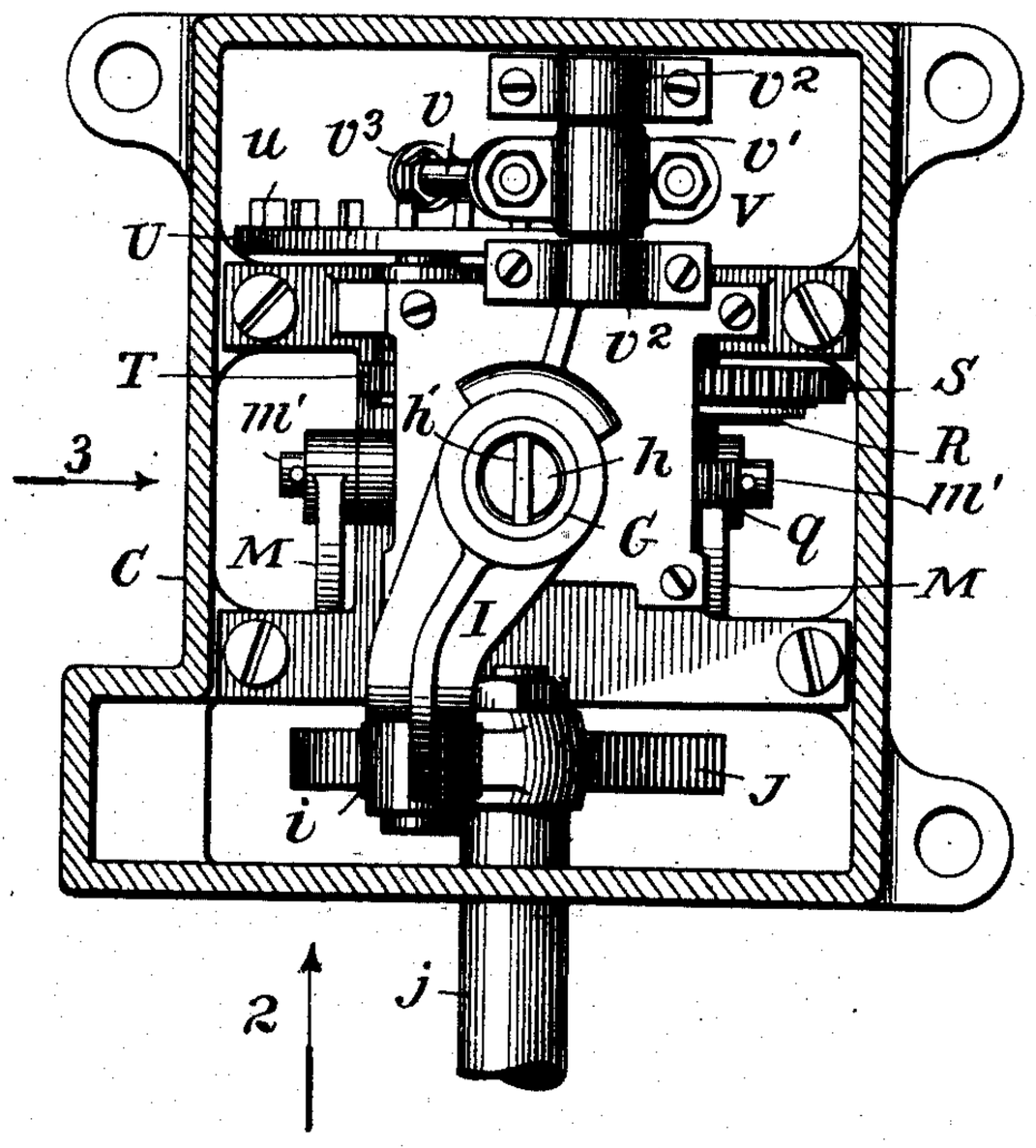
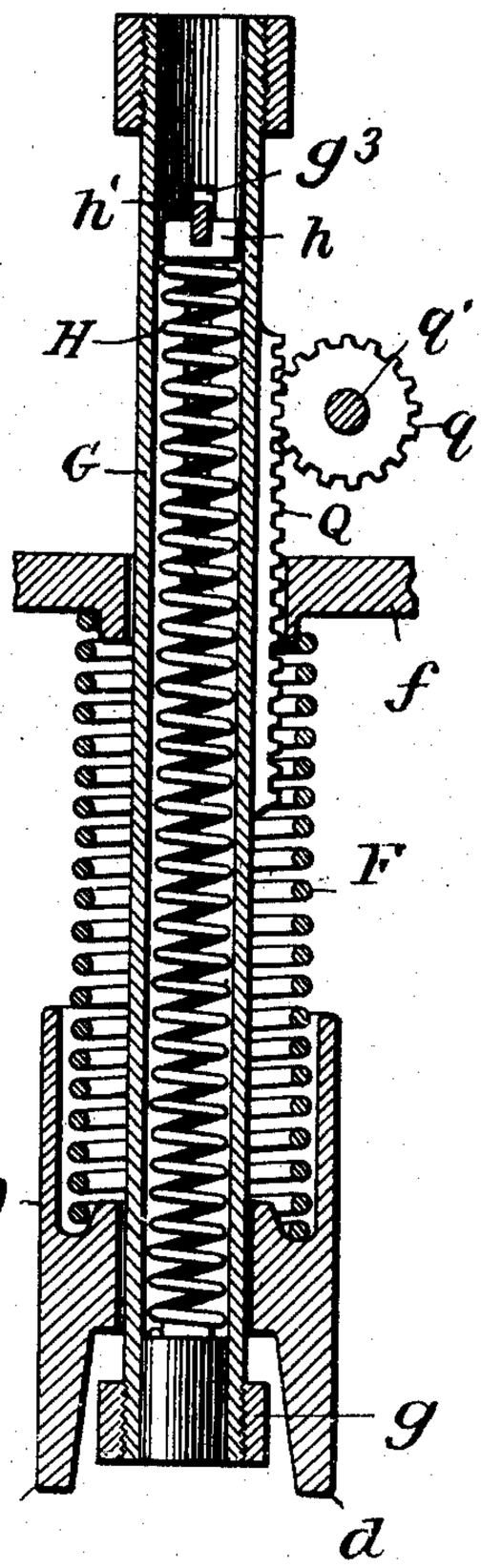


Fig. 5.



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3 SHEETS—SHEET 2.

Fig. 2.

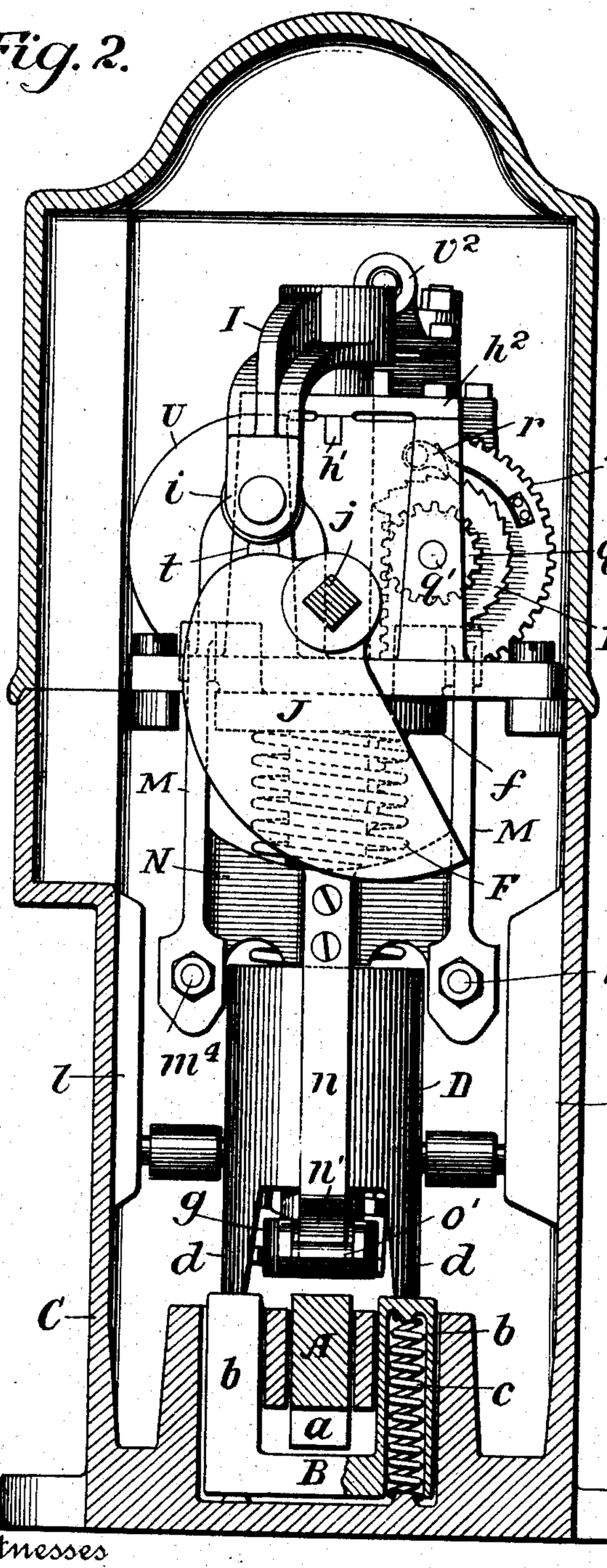
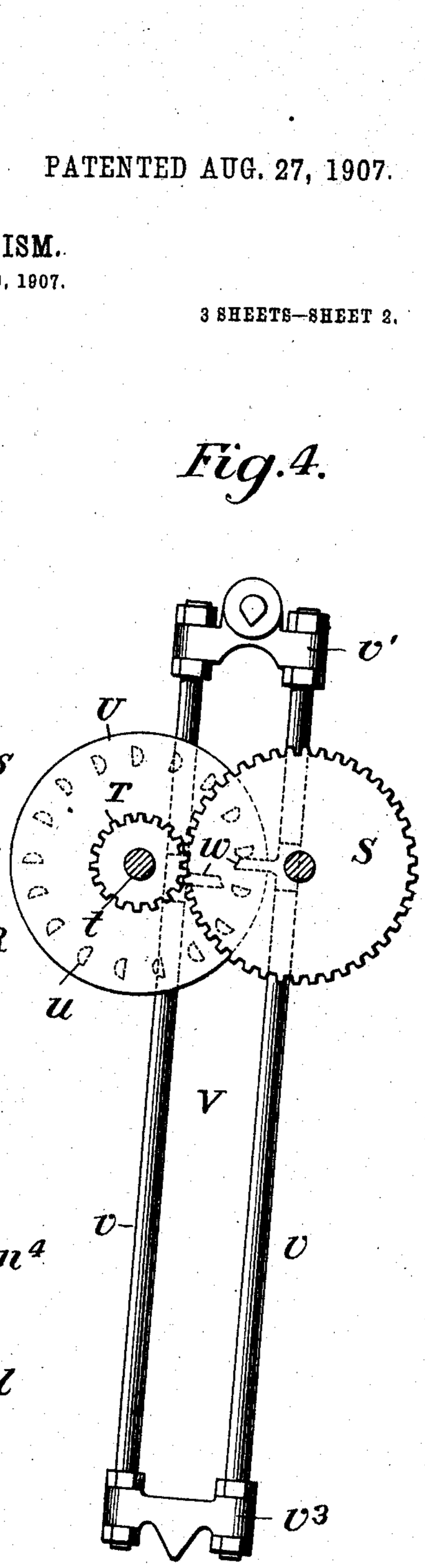


Fig. 4.



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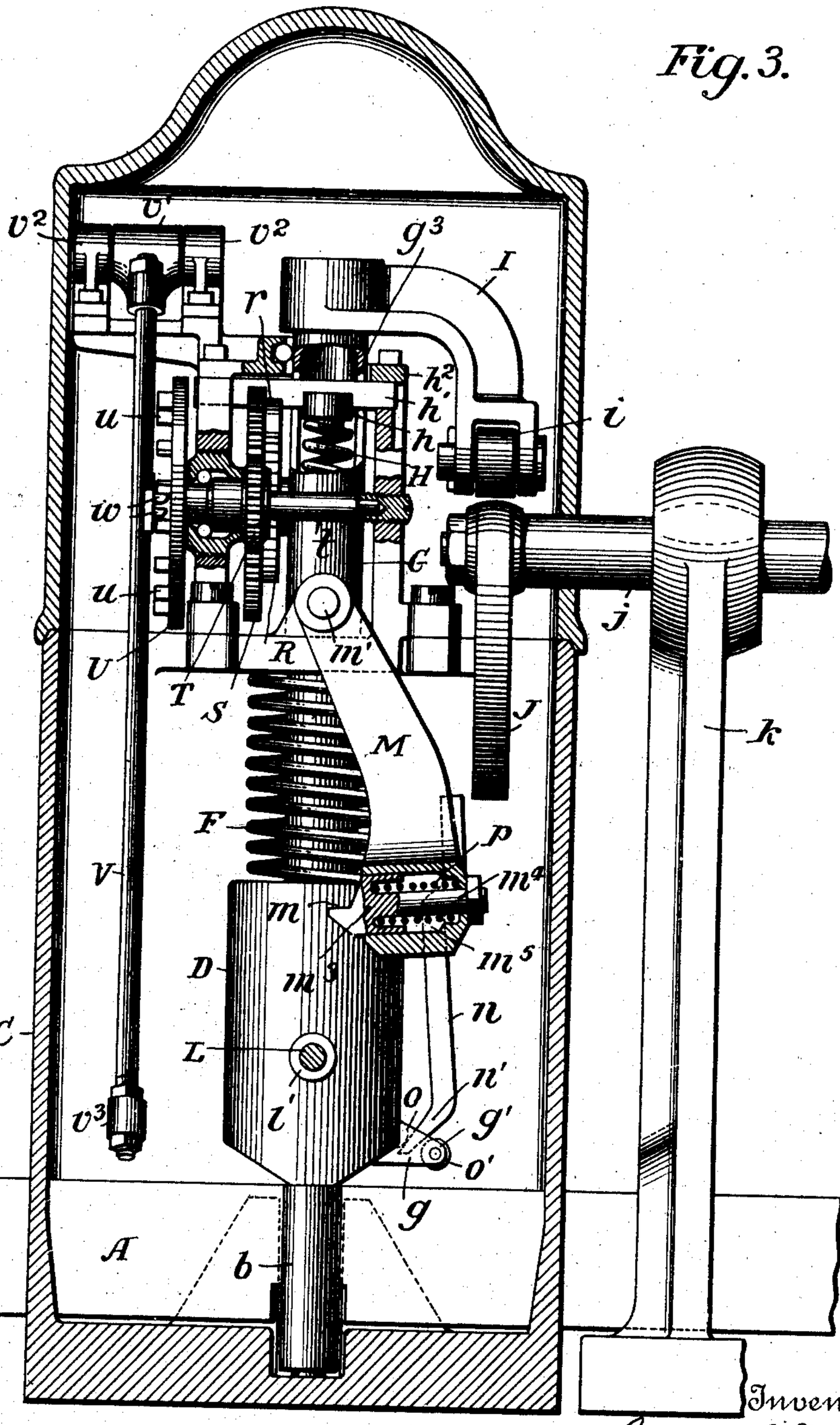
3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES C. MOCK, OF DETROIT, MICHIGAN.

TIME-LOCK MECHANISM.

No. 864,549. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed February 19, 1907. Serial No. 358,284.

To all whom it may concern:

Be it known that I, JAMES C. MOCK, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Time-Lock Mechanism, of which the following is a specification.

This invention relates to time locks particularly adapted for use with outlying or non-interlocked switches.

The object of the invention is to lock such a switch in normal position for a definite time after any signal, either mechanical or electric, which may be connected with it has been set to "stop".

I will describe a time lock mechanism embodying my invention, and then point out the novel features in claims.

In the accompanying drawings:—Figure 1 is a top plan view of the mechanism; Fig. 2 is an elevation, partly in section, looking in the direction of arrow 2 on Fig. 1; Fig. 3 is an elevation, partly in section, looking in the direction of arrow 3 on Fig. 1. Fig. 4 is an elevation of an escapement mechanism, detached; Fig. 5 is a sectional view of the hammer and its lifting devices.

In outlying or non-interlocked switches the switch points tend to spring away from the main track rails when the switch lever is unfastened and ready to move and this causes considerable friction between the switch locking bar and the locking dog and requires force in the nature of a blow for releasing the locking dog.

In my present invention I employ a spring actuated hammer for releasing the locking dog although it is obvious a hammer of sufficient weight might be used without a spring. In the operation of my invention the hammer is supposed to be lifted and held in elevated position when a main line signal is moved to indicate safety and to be released to strike a blow at a predetermined time, say one minute, after the signal has been moved to indicate danger.

I will now proceed to describe in detail a preferred embodiment of my invention.

The switch locking bar is indicated by A and is provided with a slot *a* in its lower edge to receive the locking dog B. Connected to the dog B, one at each end thereof, are two cylinders *b*, which are closed at their upper ends, and within these cylinders coil springs *c* are contained which rest at their lower ends upon the base of the casing C, which incloses the mechanism, while their upper ends engage the closed ends of the cylinders *b*. These springs tend normally to elevate the cylinders and move the dog B into the slot *a* in the switch locking bar A.

D indicates a hammer having two toes *d* adapted respectively to engage the upper ends of the cylinders *b*. The upper portion of the hammer is bored out to receive the lower portion of the spring F, the upper end of which is seated against a head or plate *f* which is rigidly secured to the inclosing casing, and the tendency of spring F is to force the hammer D into contact with the cylinders *b* and thereby move the dog B out of the slot *a* in the switch locking rod.

The lower portion of the hammer D is centrally bored and a tube G extends through it and through an opening in the fixed plate *f*. To the lower end of the tube G is secured a bar *g* which fits loosely in a transverse slot in the lower end of the hammer and projects beyond it at one side as indicated by *g'*. A coil spring H is contained within the tube G and bears at its lower end upon the bar *g* and at its upper end against a head *h* held in position by a crossbar *h'*, and this spring tends normally to force the tube G downwardly. The upper portion of the tube G is slotted at opposite sides as indicated at g^3 and the bar *h'* extends through the slots. The upper end of the tube G extends through a fixed plate h^2 and a bracket I is secured to the upper end of the tube. This bracket extends laterally from the tube and then downwardly and in the lower end thereof a roller *i* is journaled in position to be engaged by a cam J which is rigidly secured to a shaft *j* journaled in suitable bearings *k* outside the inclosing casing. The shaft *j* extends through the casing and the cam J is within the casing.

From opposite sides of the hammer D, studs L project into guideways *l* secured to the sides of the casing. Each stud carries a roller *l'* and these rollers are adapted to be engaged by hooks *m* on the swinging levers M, such levers being pivoted at their upper ends on fixed studs *m'* within the casing. When the shaft *j* is turned in one direction the cam J will, by its engagement with the roller *i*, elevate the tube G and with it the hammer D until the rollers *l'* are engaged by the hooks *m* and the hammer will be held in such elevated position by the hooks *m* even after the cam J has been moved in the opposite direction and disengaged from the roller *i*. The levers M are connected together near their lower ends by a plate N and from this plate a bar *n* extends downwardly and is provided at its lower end with a bent portion *n'* adapted to be engaged by rollers *o*—*o'* journaled in the extension *g'* of the bar *g*. When the hammer is in its lowest position, the roller *o* will be in engagement with the bent portion *n'* and the bar *n* and the levers M will be held in their outer position in which case the rollers *l'* will be released from the hooks *m*. When, however, the hammer D is lifted the roller *o'* will engage the bent portion *n'* and force the bar *n* and the levers M to their inner position, in which case the hooks *m* will be enabled to engage and hold the rollers *l'*. The hooks *m* will be at their inner position before the rollers *l'* reach them on the upward movement of the hammer D and it is therefore necessary to provide means for the hooks *m* to yield in order that

the rollers l' can pass above them. As shown in the drawings, the lower end of each lever M is provided with a transverse recess m^5 in which a block m^3, of which the hook m forms a part, is supported to slide freely. A stem m^4 attached to the block extends through the end wall of the recess and is provided with a nut at its outer end which engages the outer surface of the lever M. A spring p surrounds the said stem and bears against the block m^3 at one end and against the end wall of the recess at its other end, and tends normally to hold the hook m is operative position. The lower face of the hook m is beveled as indicated at m'.

To one side of the tube G a rack bar Q is attached and meshes with a gear q which is loosely mounted on a shaft q'. Attached to the gear q is a ratchet wheel R with which a spring pressed pawl r engages. The pawl r is pivoted on a large gear S fast on the shaft q'. The gear S meshes with a smaller gear T which is fast on a shaft t journaled in suitable bearings in the frame. The shaft t also carries an escapement wheel U provided with a series of teeth u projecting from one of its faces, said teeth being uniformly spaced apart and arranged concentrically on the wheel adjacent to its periphery. V indicates a pendulum comprising two rods v connected to a head v', which is pivoted on a knife edge in fixed bearings v^2. The lower ends of the two bars v—v are connected together by a cross bar v^3 and the bars v are thus maintained in parallel relation to each other at all times. From each bar v a pin w projects inwardly in position to alternately be in engagement with one of the teeth u on the escapement wheel. One of the pins w is in a higher plane than the other and as the pendulum oscillates, the upper pin will release one tooth, which will be caught by the lower pin and when the pendulum swings in the opposite direction, the upper pin will catch the succeeding tooth.

In operation, the shaft j will be connected with the signal operating mechanism, and consequently every time the signal is moved from one position to another, the shaft j will be turned and the cam J will move with it. When turned in one direction, the cam J will act upon the roller i and lift the tube G and with it the hammer D until the hooks m are engaged with the rollers l' and the hammer will thus be held suspended against the force of the spring F. This will release the cylinders b and they will rise and lift the dog B into the slot a and lock the switch. As long as the cam J remains in engagement with the roller i, the tube G will also be held in its elevated position. The upward movement of the tube G will cause the gear q and the ratchet wheel R to rotate, but the pawl r will simply click over the teeth of the ratchet wheel and the gear S will not be moved. As soon, however, as the cam J is moved out of contact with the roller i by another operation of the signal, the tube G will begin to descend under the influence of the spring H and in the downward movement of the gear q and the ratchet wheel R will rotate in the opposite direction and through the pawl r will turn the large gear S and thereby impart movement to the gear T and the escapement wheel U. This will cause the pendulum V to oscillate, and the speed of the return movement of the tube G will thus be regulated by the escapement wheel, and a definite, predetermined time will therefore elapse after the last operation of the signal before the tube G will return to its lowest position so that the roller o may act upon the bent portion n' of the bar n to force the levers M outwardly and disengage the hooks m from the rollers l' and thereby permit the hammer D to be driven downwardly by the action of its spring F and move the cylinders b downwardly and thereby move the dog B out of the slot in the switch lock bar and so permit the switch to be moved.

Having described my invention, I claim:—

1. In a time lock for switches, the combination with the locking dog, of a hammer for striking the dog, means for lifting the hammer above the dog, means for holding the hammer suspended, and time controlled mechanism for releasing said hammer.

2. In a time lock for switches, the combination with the locking dog, of a spring actuated hammer, for striking the dog, means for lifting the hammer against the force of its spring, means for holding said hammer suspended, and an escapement mechanism for controlling the release of the hammer.

3. In a time lock for switches, the combination with the locking dog, of a hammer for striking the dog, means for lifting the hammer above the dog, means for holding the hammer suspended, and an escapement mechanism for controlling the release of the hammer.

4. In a time lock for switches, the combination with the locking bar and a spring actuated dog normally engaging said bar, of a hammer for striking the dog, means for lifting the hammer above the dog, means for holding said hammer suspended, and an escapement mechanism for controlling the release of the hammer.

5. In a time lock for switches, the combination with the locking dog, of a hammer for striking said dog, a bar for lifting said hammer, means for holding the hammer suspended, means actuated by the downward movement of the bar for releasing the hammer, and an escapement mechanism for controlling the downward movement of the bar.

6. In a time lock for switches, the combination with the locking dog, of a hammer for striking said dog, a bar for lifting the hammer, a rack on the bar, means for holding the hammer suspended, means actuated by the downward movement of the bar for releasing the hammer, a train of gears movable by said rack in its downward movement, and an escapement for controlling the movement of the gears.

7. In a time lock for switches, the combination with the locking dog, of a hammer for striking said dog, lateral projections on said hammer, means for lifting the hammer above the dog, pivoted hooks for engaging the lateral projections to hold the hammer suspended, means for disengaging said hooks from the projections, and an escapement mechanism for controlling the movement of the disengaging means.

8. In a time lock for switches, the combination with the locking dog, of a hammer for striking the dog, lateral projections on the hammer, pivoted hooks for engaging the lateral projections to hold the hammer suspended, a bar for lifting the hammer to a position for said hooks to engage the said projections, a rack on the bar, a train of gearing actuated by the downward movement of the rack on said bar, an escapement for controlling the movement of the gearing, and means actuated by said bar on its downward movement for disengaging said hooks from said lateral projections.

In testimony whereof I have signed my name to this specification in the presence of two subscribed witnesses.

JAMES C. MOCK.

Witnesses:
SIDNEY G. JOHNSON,
GEO. E. CRUSE.