

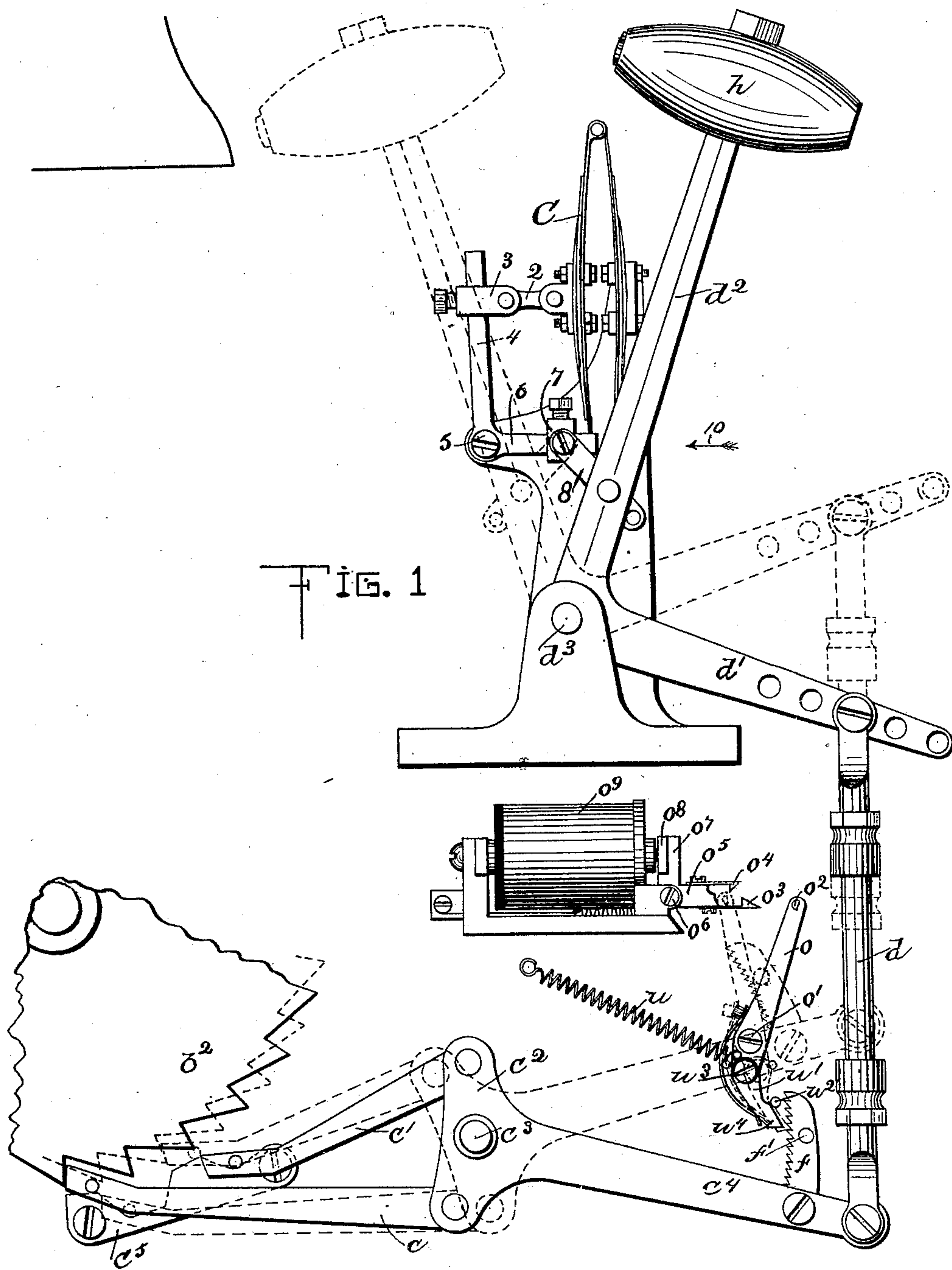
(No Model.)

2 Sheets—Sheet 1.

M. G. CRANE.
BELL STRIKER.

No. 452,166.

Patented May 12, 1891.



Witnesses
Edward F. Allen.
Frank L. Emery—

Inventor.
Moses G. Crane
by Lemby & Gregory attys

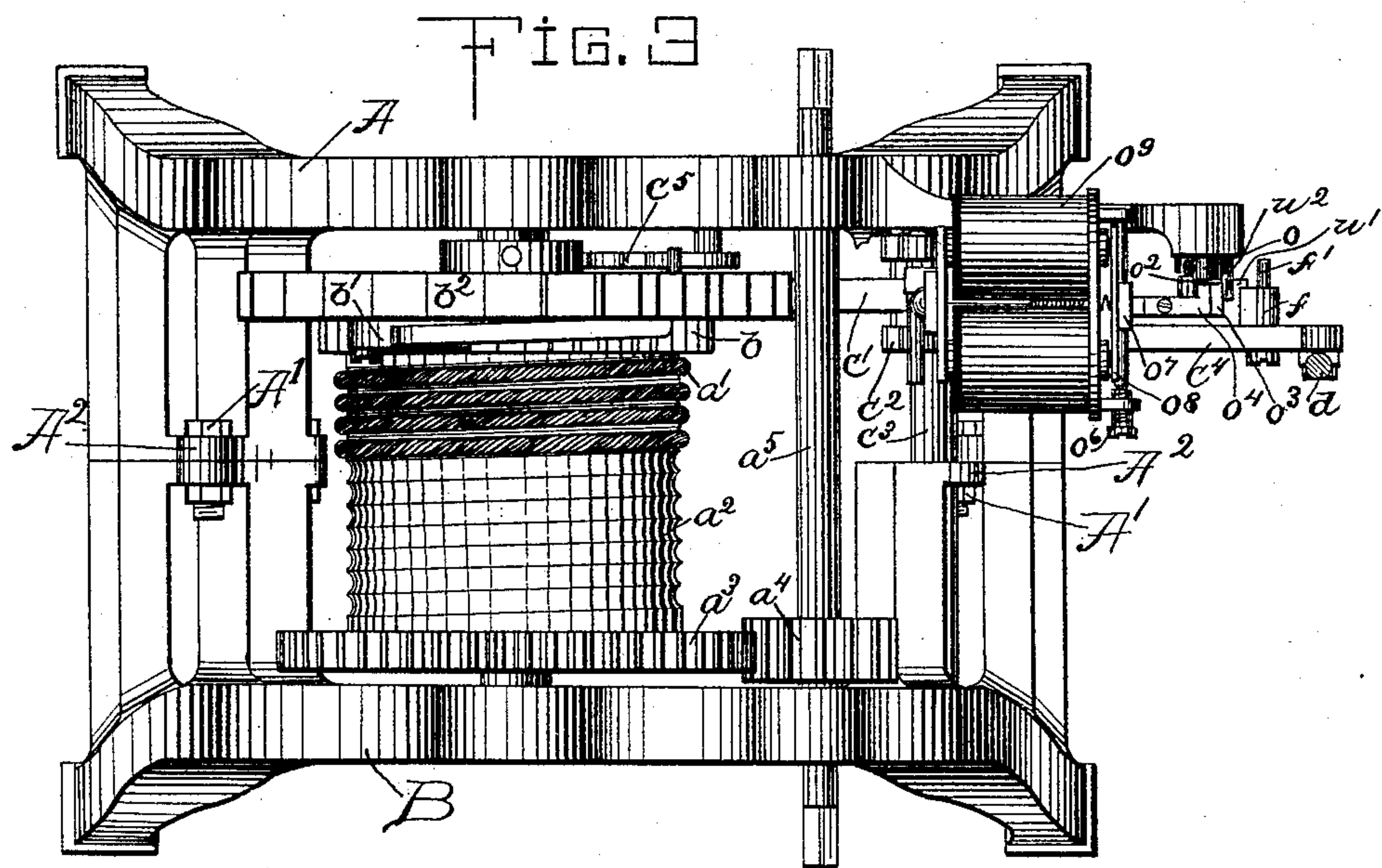
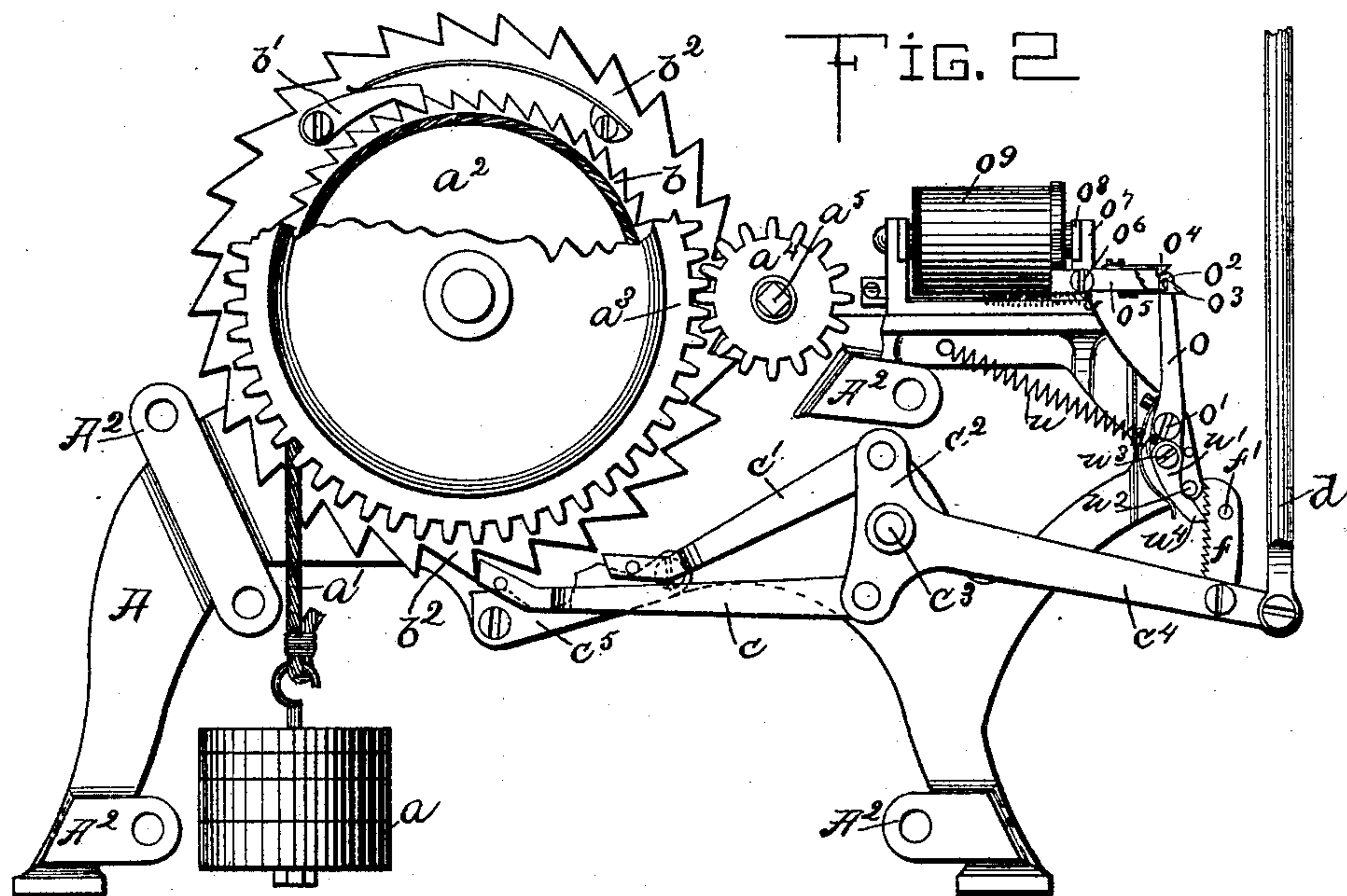
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UNITED STATES PATENT OFFICE.

MOSES G. CRANE, OF NEWTON, MASSACHUSETTS.

BELL-STRIKER.

SPECIFICATION forming part of Letters Patent No. 452,166, dated May 12, 1891.

Application filed November 17, 1890. Serial No. 371,697. (No model.)

To all whom it may concern:

Be it known that I, MOSES G. CRANE, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Bell-Strikers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of tower or other bell-strikers.

In accordance with this invention the hammer is secured to a pivoted arm, and is normally held at the beginning of its advancing stroke toward the bell. An elliptical spring is preferably provided, which is held compressed when the hammer is in its normal position. This spring is designed to keep the hammer counterbalanced, and is adjustably connected so as to enable the hammer to be readily adapted to different belfries, and said spring is adapted to spend its force during the first half of the stroke of the hammer, which force is to be accumulated again during the last half of the stroke of the hammer when moving in each direction. Suitable actuating devices are provided for moving the hammer positively in each direction. Means are also provided for locking the hammer-actuating mechanism when the hammer is at the end of its retreating stroke, or limit of motion in a direction away from the bell, such locking mechanism serving to prevent vibration of the hammer, and thus allow quick action of the striker, said locking mechanism being controlled by an electro-magnet.

Figure 1 shows in side view the several parts of my invention, a portion only of the bell and motor mechanism for the hammer-actuating mechanism being shown; Fig. 2, a side view of the motor mechanism and hammer-actuating mechanism with a portion of the frame removed, and Fig. 3 a plan view of the parts shown in Fig. 2.

The motor mechanism consists of a weight a , (see Fig. 2,) attached to a cord a' , wound about a drum a^2 , having its bearings in a frame-work, herein represented as of a peculiar construction. A toothed wheel a^3 is formed integral with the drum a^2 , which is engaged by a pinion a^4 , secured to a winding-shaft a^5 . A ratchet-wheel b is also formed integral with

the drum a^2 , with which co-operates a pawl b' , secured to the ratchet-toothed wheel or other actuator b^2 . The frame-work supporting these parts comprises two halves or portions A B , divided vertically, and having ears A^2 , through which bolts A' pass to secure the halves or portions together. This form of frame-work is very important, as it can be cheaply made and more readily taken apart and set up in small places. Two pawls c c' are loosely connected one to each end of a rocking arm or cradle c^2 , pivoted at c^3 , and having an extended arm c^4 . The pawls c c' are held by a suitable support or guide, as c^5 , in position to be engaged by the ratchet-toothed wheel or actuator b^2 alternately, to thereby turn the arm c^2 on its pivot and to vibrate the arm c^4 . A rod d loosely connects the outer end of the arm c^4 with an arm d' , which is attached to or formed integral with an arm d^2 , which carries the hammer h , said arms d' d^2 being arranged at right angles with relation to each other, or substantially so, like unto a bell-crank lever and pivoted at d^3 . The hammer h normally occupies a position at the end of its retreating stroke, or limit of motion away from the bell, and means are provided, which will be hereinafter described, for holding it in this position.

A spring C —such, for instance, as an elliptical spring or wagon-spring—is placed adjacent the hammer-carrying arm d^2 , which is connected by a link 2 with a block 3, adjustably mounted on one arm, as 4, of the bell-crank lever pivoted at 5, the other arm 6 of said lever having on it adjustably arranged a block 7, which is connected by a link 8 with the arm d^2 . The lower end of the arm d^2 and link 8 constitute toggle-levers. When the hammer-carrying arm d^2 is in the position shown in full lines, Fig. 1, the spring C is compressed. When the arm d^2 advances in the direction of the arrow 10, the spring C expands or spends its force, moving the arm 4 on the pivot 5 and raising the arm 6, thereby assisting the movements of the arm d^2 during the first half of its stroke or until the arm d^2 has assumed its vertical position. As the arm d^2 continues moving in the direction of the arrow 10, completing the advancing stroke, the link 8 will be moved into the dotted-line position shown in Fig. 1, while the arm 6 will

be drawn by it into its former full-line position and the spring C compressed. As the arm d^2 retreats to its normal position the spring C acts in the same manner—viz., spending its accumulated force during the first half of the retreating stroke of the arm and accumulating it again during the last half of the retreating stroke of the said arm.

The locking mechanism consists of the lever o , pivoted at o' and having on it a detent o^2 , which is engaged by one or the other spring-actuated pawls o^3 o^4 , arranged on an arm o^5 , pivoted at o^6 and having secured to it or formed integral with it an arm o^7 , to which the armature o^8 of the electro-magnet o^9 is fixed. The pawls o^3 o^4 constitute the let-off.

The lever o has preferably attached to it a retractile spring u , although the parts would work correctly without such spring, and said lever has pivoted to it at u^3 a pawl u' , which is spring-pressed, and which has a guide-face which co-operates with a fixed pin u^2 . The arm c^4 has on it a ratchet-toothed bar or segment f , which is adapted to co-operate with the spring-pressed pawl u' , and said bar has on it a pin f' . When the lever o is held by the electro-magnet o^9 , as shown in dotted lines, Fig. 1, and full lines, Figs. 2 and 3, the spring-pressed pawl u' engages the ratchet-toothed bar f and holds the arm c^4 in fixed position with the hammer-carrying arm d^2 at the end of its retreating stroke, which is also at the beginning of its advancing stroke. The pivot u^3 of the pawl u' is at such time but a little to the left of a line between the point of engagement of said pawl with the ratchet-toothed bar f and the pivot o' of the lever o , and the pawl u' and the end of the lever o below its pivot o' form a toggle-jointed lever, which firmly holds the hammer, with but slight pressure on the let-off.

When the armature of the electro-magnet is retracted, the let-off o^3 o^4 releases the lever o , and the latter, turning on its pivot o' , raises the pawl u' and by means of the fixed pin u^2 said pawl will be disengaged from the ratchet-toothed bar f , and the arm c^4 is then free to be moved by the actuating mechanism into the dotted-line position shown in Fig. 1, at which time the pin f' will strike the lever o and return it positively to its normal position into engagement with the let-off or spring-acting pawls controlled by the electro-magnet. The arm c^4 then returns to its normal position and the ratchet-toothed bar f engages with the pawl u' , which follows from tooth to tooth until the arm c^4 has reached its extreme limit of motion in this direction, at which time the hammer-carrying arm d^2 has arrived at the end of its stroke, and the end u^4 of the pawl u' then engages the ratchet-toothed bar f and prevents the arm c^4 vibrating or rebounding, and hence the arm b^2 will be securely held.

I do not desire to limit myself to the specific form of locking mechanism herein shown, nor to the specific connecting mechanism

herein shown connecting the spring C with the hammer-carrying arm, and also in lieu of the actuating mechanism herein shown any suitable construction may be employed.

If the parts are correctly adjusted, the bar f need have but one tooth, as the pawl u' will always engage the same tooth.

I claim—

1. In a bell-striker, a bell-hammer consisting of the arm d^2 , pivoted at its lower end and having the head h at its upper end, and means for moving said bell-hammer in each direction, combined with locking mechanism for locking said bell-hammer at the beginning of its advancing stroke, substantially as described.

2. In a bell-striker, a bell-hammer and two actuating-pawls therefor, combined with locking mechanism controlled by an electro-magnet for locking said bell-hammer at the beginning of its advancing stroke, substantially as described.

3. In a bell-striker, a bell-hammer and actuating mechanism therefor, combined with a toggle-jointed locking mechanism directly engaging and holding said bell-hammer, substantially as described.

4. In a bell-striker, a bell-hammer and actuating mechanism therefor, combined with a toggle-jointed locking mechanism directly engaging and holding said bell-hammer, one arm, as o , of said locking mechanism being extended and adapted to engage the let-off controlled by the electro-magnet, the other arm engaging the bell-hammer, substantially as described.

5. In a bell-striker, a bell-hammer and means for moving it in each direction, combined with locking mechanism consisting of a ratchet-toothed bar f , pawl u' , and means for moving said pawl controlled by an electro-magnet, substantially as described.

6. In a bell-striker, a bell-hammer and means for moving it in each direction, combined with locking mechanism consisting of the ratchet-toothed bar f , pawl u' , lever o , pivoted at o' and controlled by an electro-magnet, substantially as described.

7. In a bell-striker, a bell-hammer and means for moving it in each direction, combined with locking mechanism consisting of a ratchet-toothed bar f , pawl u' , lever o , controlled by an electro-magnet, and a pin on the bar f for restoring the arm o to its normal position, substantially as described.

8. In a bell-striker, a bell-hammer and actuating mechanism therefor, combined with locking mechanism for said bell-hammer, consisting of a ratchet-toothed bar f , pawl u' , lever o , carrying said pawl u' and pivoted at o' , and a let-off for the lever o , connected to the armature of the electro-magnet, substantially as described.

9. In a bell-striker, a bell-hammer and actuating mechanism therefor, combined with toggle-jointed locking mechanism comprising as a component part of it a spring-pressed pawl

u' , having a guide-face to engage a fixed pin u^2 , substantially as described.

10. In a bell-striker, a bell-hammer and means for moving it in each direction, combined with the spring C, bell-crank lever 4 6, adjustable blocks 3 7 thereon, one of which is connected with the spring and the other with the hammer-carrying arm, substantially as described.

11. In a bell-striker, a bell-hammer and means for moving it in each direction, combined with a spring C and toggle-jointed levers for operating it, substantially as described.

12. In a bell-striker, a hammer, and actuating mechanism therefor, and a toggle-jointed locking mechanism which directly engages with and locks the hammer at the beginning of its advancing stroke, with the pivotal points of the toggle near the line of dead-center through said points and the point of engagement with the bell-hammer, substantially as described.

13. In a bell-striker, a hammer, and actuating mechanism therefor, and a toggle-jointed locking mechanism which directly engages with and locks the hammer, with the pivotal points of the toggle near the line of dead-center through said points and the point of engagement with the bell-hammer, substantially as described.

14. In a bell-striker, a bell-hammer and means for moving it in each direction, combined with locking mechanism consisting of the ratchet-toothed bar f , pawl u' , lever o , pivoted at o' and controlled by an electromagnet, and the spring u , substantially as described.

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

MOSES G. CRANE.

Witnesses:

BERNICE J. NOYES,
EMMA J. BENNETT.