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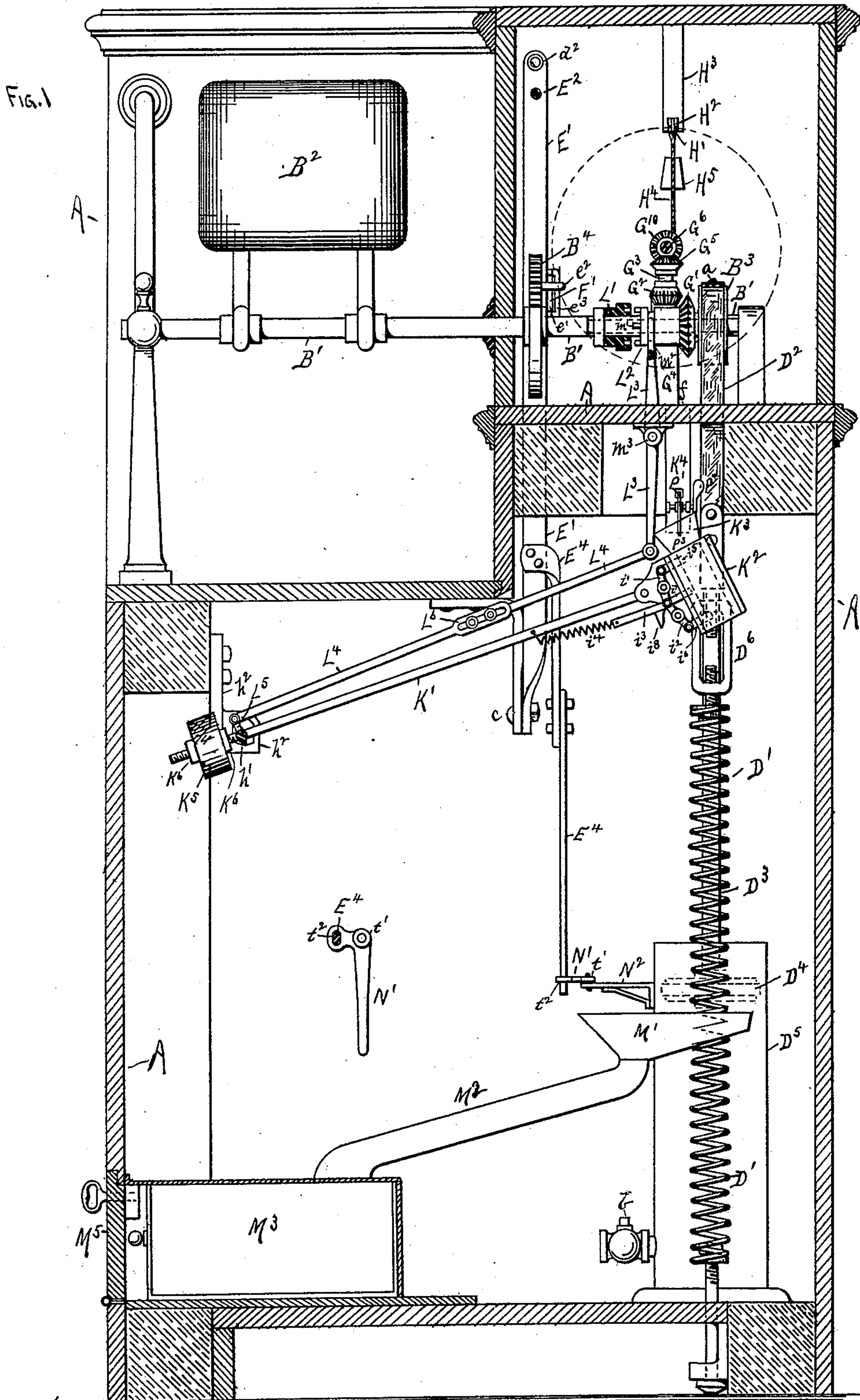
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E. C. PHILLIPS.

COIN CONTROLLED INDICATING STRIKING MACHINE.

No. 427,011.

Patented Apr. 29, 1890.



H. S. Webster { WITNESSES.
G. R. Huntington

E. C. Phillips INVENTOR, BY
Charles W. Woodward Atty.

(No Model.)

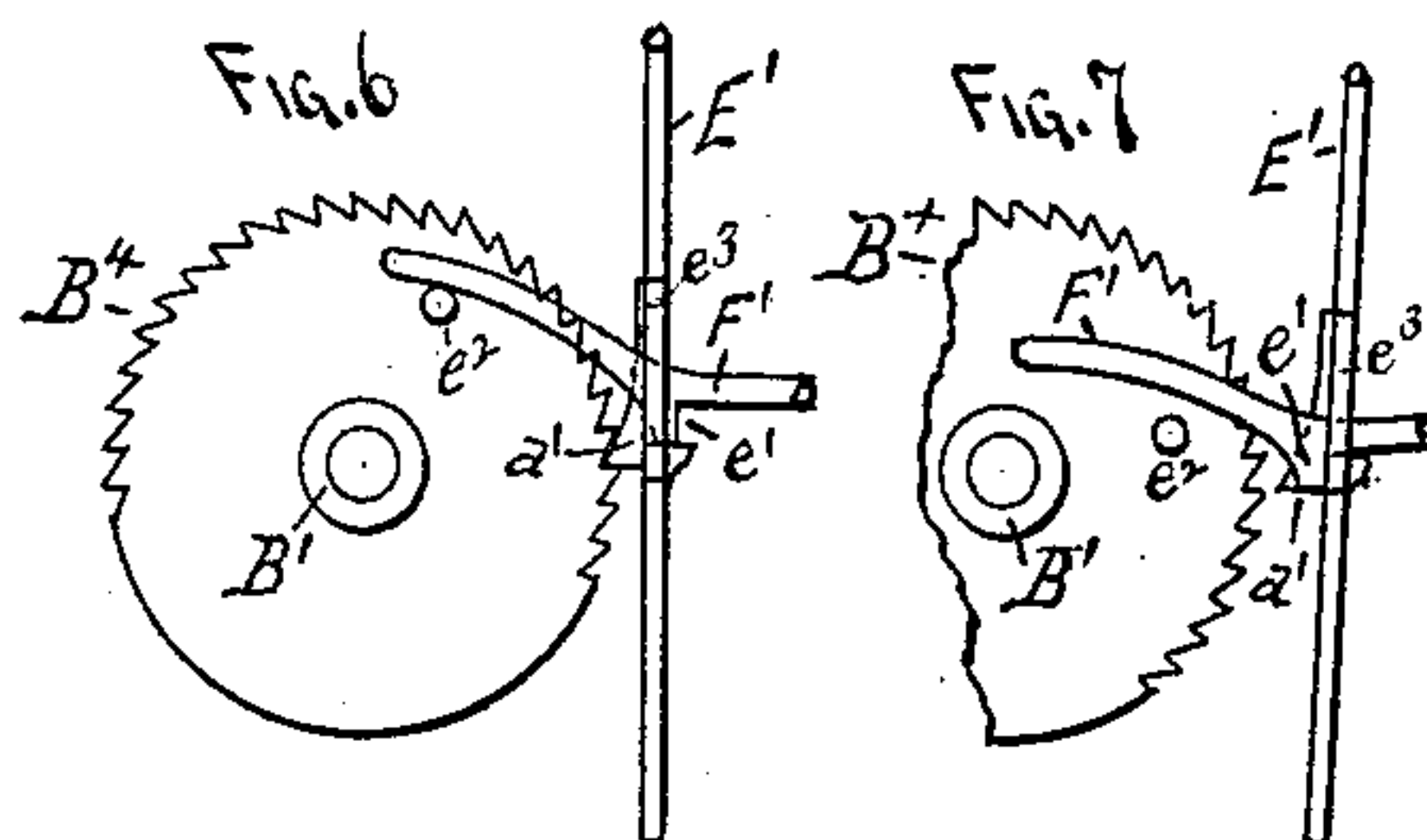
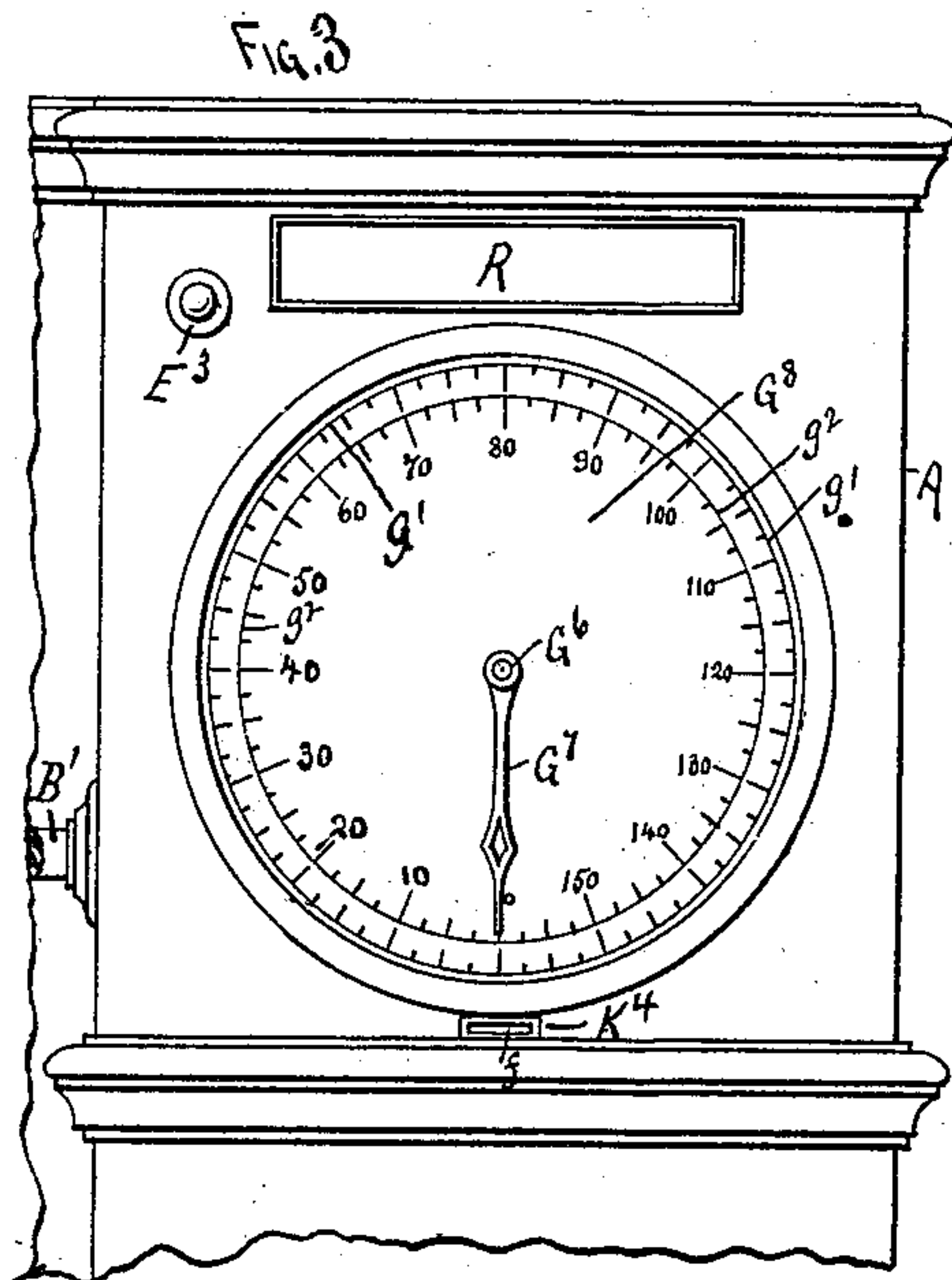
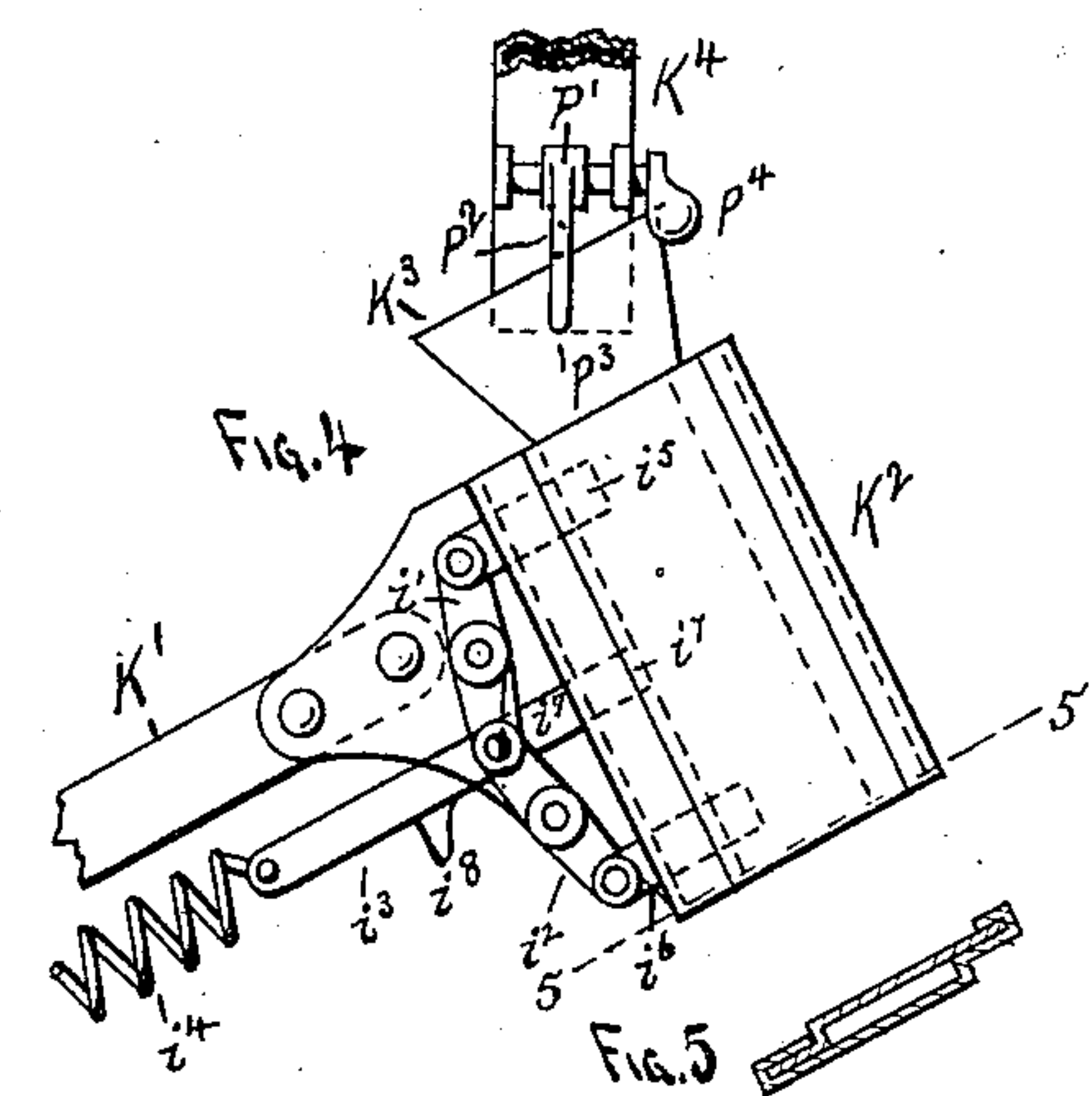
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E. C. PHILLIPS.

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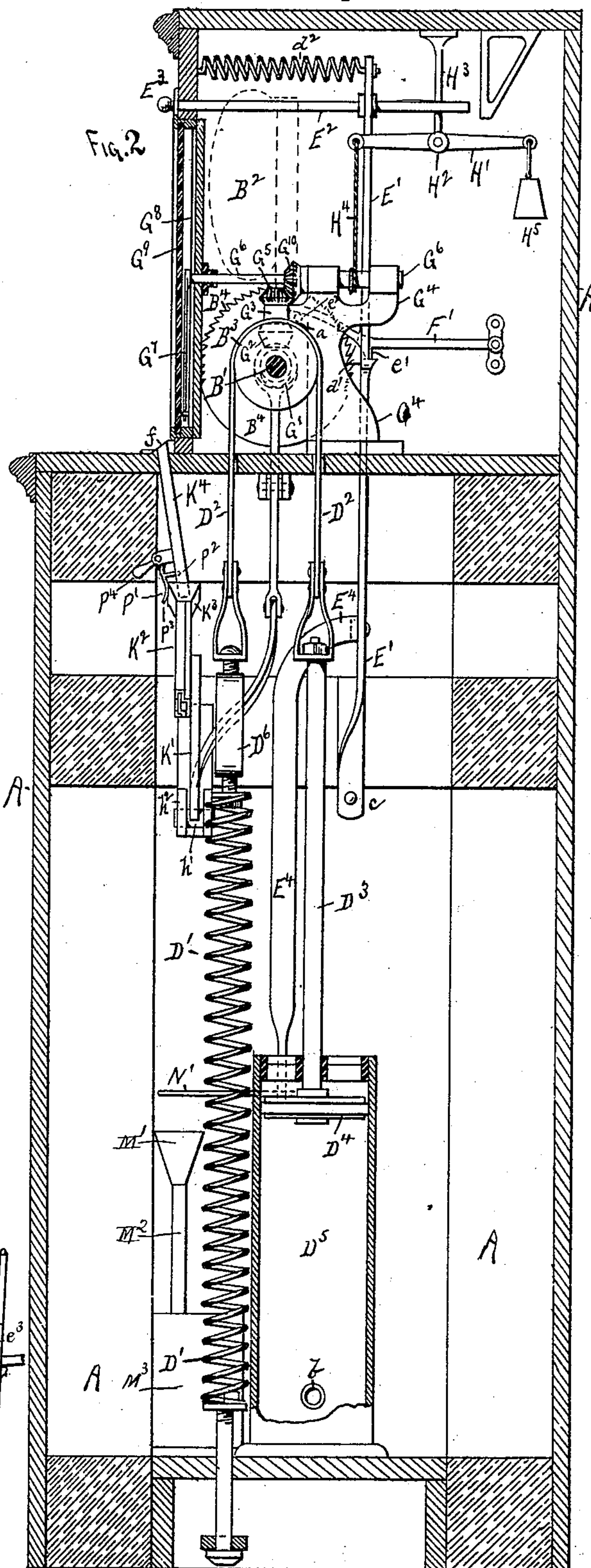
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UNITED STATES PATENT OFFICE.

ERBINE C. PHILLIPS, OF APPLETON, WISCONSIN.

COIN-CONTROLLED INDICATING STRIKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,011, dated April 29, 1890.

Application filed May 25, 1889. Serial No. 312,045. (No model.)

To all whom it may concern:

Be it known that I, ERBINE C. PHILLIPS, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented certain new and useful Improvements in Coin-Controlled Indicating Striking-Machines, of which the following is a specification.

This invention relates to machines for registering the force of blows struck with the hand; and it consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a sectional front elevation. Fig. 2 is a sectional side elevation. Fig. 3 is a front elevation of a portion of the upper part of the casing, showing the manner of constructing the dial and index. Fig. 4 is an enlarged view of the coin-receptacle on the end of the operating-lever. Fig. 5 is a cross-sectional view on the line 5 5 of Fig. 4. Figs. 6 and 7 are detached views of the ratchet mechanism, illustrating the construction and mode of operation.

The mechanism by which the desired results are obtained is contained within a frame-work A, of any suitable construction, so that it is strong enough to resist the strains and force of the blows to which it will be subjected, and the whole must be heavy enough when placed upon the floor to require no other support, so that the machine is not only portable, but entirely independent of its surroundings.

Machines of this class as heretofore constructed have by the form of their construction necessarily been attached permanently to a wall or in some other fixed position; but my machine will be entirely "self-contained," and can therefore be easily transported from place to place, and can be used in any desired location.

The prime mover in my machine is a horizontal shaft B', journaled across the upper part of the portable frame-work A. The striking-pad B² is secured to this shaft B' near one end, and a pulley B³ is secured to it near the other end, while a ratchet-wheel B⁴ is secured to it in any suitable manner between the pad and pulley.

D' is a powerful spring attached by its lower end to the bottom of the frame-work A, while its upper end is attached to a strap D², passing over the pulley B³, and thence down to a piston-rod D³, carrying a piston D⁴ on its lower end, the latter working in a cylinder D⁵ on the bottom of the frame A, and the strap D² being firmly attached to the pulley B³ at a, as shown, Fig. 1. The cylinder D⁵ is provided with a check-valve b, opening outward, so that when the piston runs downward it will expel the air, and then when it is drawn upward the atmospheric pressure on the piston (the cylinder being open at the top) will greatly retard its upward movement and serve as a "cushion" to the return movement of the pad, as hereinafter described.

E' (see Figs. 1 and 2) is a rod or bar pivoted by its lower end at c to the frame of the machine and running upward in close proximity to the ratchet-disk B⁴, and is provided with a catch d', adapted to engage with the teeth of said ratchet and with a spring d', attached to its upper end, whereby it is held in contact with the ratchet-wheel, as shown.

E² is a rod connected by one end to the upper end of the bar E', and passing out through the front of the casing A, and provided with a push-knob E³. Pushing inward upon the knob releases the catch d' from the ratchet-disk B⁴, thus permitting the shaft B', after it has been rotated by striking upon the pad B², to be returned to its normal position.

The action is very simple, and is as follows: When the pad is struck by a blow of the fist, the shaft B' is rotated, carrying with it the pulley B³ and distending the spring D', and causing the teeth on the ratchet-disk B⁴ to rotate. The catch d', engaging the ratchet-teeth, holds the shaft B' from returning to its former position. The resistance of the spring is the basis from which the force of the blow is calculated, and the distance through which the pad travels, as determined by the position in which the pad is caught and held by the ratchet B⁴, shows the amount of the distention of the spring and the consequent force of the blow. The action of the shaft B' in rotating releases the piston D⁴, which moves downwardly both by its own weight and the downward pressure of the atmos-

phere upon its upper surface, there being a partial vacuum beneath it.

F' is a latch pivoted by its inner end to the casing A and passing through a strap e^3 , fixed to one side of the bar E', and with a projection e' , adapted to catch upon the lower portion of the strap e^3 when the bar E' is in its backward position, as shown in Fig. 7, and to rest upon the bottom of the strap on the bar and lie quiescent therein when the bar E' and its catch d' are in connection with the ratchet-disk B⁴, as shown in Fig. 6. The free end of the latch F' is curved, as shown, and projects forward alongside of and above a pin e^2 in the side of the ratchet-disk B⁴, the curve of the latch being of a longer radius than the radius of the pin e^2 with relation to the shaft B', so that when the ratchet-disk B⁴ is rotated by the movement of the pad B² the pin e^2 will lift the latch F' and release the bar E', (if it is held back by the catch e'), and permit the catch d' to engage with the teeth of the ratchet and hold the shaft B' and pad B² in whatever position the force of the blow leaves them. By this means the force of the blow can be ascertained by observing the position in which the pad remains after being struck.

By pushing inward on the knob E³ the catch d' will be disengaged from the ratchet-teeth on the disk B⁴ and permit the pad to return to its former position, the retarding force of the piston D⁴ preventing the spring D' from acting with rapidity upon the shaft B', but permitting the pad to return slowly to its normal position. Upon the shaft B' is a small bevel-gear G', engaging with a corresponding sliding bevel-pinion G³ on an upright shaft G³, the latter supported by a standard G⁴, and said shaft provided with another bevel-gear G⁵ on its upper end, as shown.

G⁶ is a horizontal shaft journaled in bearings in the casing A, and also in the standard G⁴, and with an index G⁷ on its outer end, rotating over a dial-face or indicator G⁸ in the casing A, the dial being covered by a glass G⁹. Upon the shaft G⁶ is a bevel-pinion G¹⁰, engaging with the bevel-pinion G⁵, the coaction of the bevel-pinions G' G² G⁵ G¹⁰ and shafts B' G³ G⁶ causing the index G⁷ to be moved around the dial-face G⁸ a distance corresponding to the movement of the pad B², so that the force of the blow upon the pad will be noted upon the dial-face.

The dial-face is provided with two separate graduations—an outer one g' and an inner one g^2 . The outer graduation is spaced with indications representing velocity, as feet per second, so as to indicate approximately the velocity of blows upon the pad, the scale being marked on the supposition that the speed of a blow is proportional to its force, and the inner graduation is spaced to indicate the force of the blow in pounds.

H' is a lever-arm pivoted at H² to a hanger H³ on the casing A, and having a weight H⁵ on one end, the other end being connected to

the shaft G⁶ by a cord or chain H⁴, the function of this weighted lever and its attachments being to return the index G⁷ to its normal position when released by pushing inward on the knob E³.

K' is a lever pivoted by a knife-edge jointed bar h' in a hanger or bracket h^2 on the casing A and on one side of the casing and projecting across the machine, and provided with a flattened tubular casing K² on its longer end, the latter having a funnel-shaped upper end K³, fitting over the lower end of a tube K⁴, secured in the casing A and opening outward therethrough at f , as shown in Figs. 2 and 3. This tube K⁴ and casing K² are just large enough to receive a "nickel" or other designated coin. The shorter end of the lever K' is provided with a counterpoise K⁵, adapted to be adjusted along the lever by nuts K⁶ to regulate its force, so that it will be of just sufficient weight to hold the casing K² K³ elevated, but will be overcome by a nickel or other designated coin dropped into the casing.

Upon the shaft B' is a fixed clutch-collar L', adapted to be engaged with and disengaged from a sliding clutch-collar L², the latter free to slide along the shaft, but held from turning thereon by a feather m' on the shaft B', fitting a corresponding groove in the sliding collar. The sliding bevel-gear G' is carried by and slides with the sliding collar L². The collar L² has a groove m^2 , in which the forked end of a lever L³ fits, the latter pivoted at or near its center m^3 to the casing A, and with its lower end connected by a rod L⁴ to an arm L⁵ on the knife-edge bar h' , so that any movement of the lever K' will likewise move the lever L³ and rod L⁴, and thus throw the clutch in or out of gear, as the case may be.

M' is a funnel-shaped receiver, from which a tube M² runs to a cash-receptacle M³ in the bottom of the casing A and accessible only through a locked door M⁵ in the casing A.

i' i^2 are two small levers pivoted centrally to the tubular casing K', and both united at their adjacent ends to a bar i^3 , extending along the lever K', and provided with a spring i^4 , by which the adjacent ends of the levers i' i^2 are kept outward. Attached to the other ends of the levers i' i^2 are two small bars i^5 i^6 , extending into the casing K' a sufficient distance to prevent the passage of the coins when the bars are in their inward positions, as in Figs. 1 and 4, but which, when withdrawn by moving the bar i^3 inward, will permit the coins to pass through the casing K². Another smaller bar i^7 projects from the point of juncture of the bars i' i^2 into the casing K' a short distance, the bar i^7 being withdrawn from the casing, or in its outward position, when the bars i^5 i^6 are in their inward position.

The lever K' will be so delicately poised, as before stated, and the length of the arm L⁵ will be so small in proportion to the lever K', that the light weight of a nickel or other predetermined coin dropped into the tube K⁴ and thence carried to the receptacle K² will

be sufficient to overcome its inertia and cause the receptacle to fall until stopped by the receiver M'. The lever K' descends until it rests on the edge of the receiver M', with the coin bucket or receptacle K² over the mouth of the receiver. This action causes the arm L⁵ and rod L⁴ to move the lever L³ and connect the clutch-collar L² with the clutch L', and thus likewise connect the bevel-gear G' with the bevel-gear G², and thus connect the shaft G⁶ and the index mechanism, the object being to so arrange the mechanism that the index will operate only when a coin is dropped into the slot.

N' is a bell-crank lever pivoted at its "elbow" t' to a standard N², fixed to some part of the frame-work or other fixture, or to the cylinder D⁵, as shown, and having a slot t² in its shorter arm, into which the lower end of a bar E⁴ fits loosely, while its upper end is attached rigidly to the bar E', as shown. The bell-crank lever N' swings in a horizontal plane immediately above the mouth of the coin-receiver M', and when the coin bucket or receptacle K² descends on the insertion of a coin therein it is brought into the plane of the path of the long arm of the lever N'. The sliding rod i³ of the coin-receptacle K² is provided with a downwardly-projecting lug or stop i⁸, which, when the coin-receptacle is lowered, is directly in the path of the long arm of the bell-crank lever N'. The spring i⁴ holds the bars i⁵ i⁶ in their inward position, as in Figs. 1 and 4, so that the coin is prevented from passing through the casing K², and the latter remains in its downward position. When, however, the knob E³ is forced inward to release the bar E' from the ratchet-disk B⁴, the same movement causes the bar E⁴ to act upon the shorter arm of the bell-crank lever N' and throw the longer arm against the stop i⁸, and thus force the rod i³ inward and draw the bars i⁵ i⁶ outward, and thus release the coin. In the meantime the shorter bar i⁷ has been forced inward by the same action and catches the coin and prevents it from passing entirely through the casing, but supports it midway therein. The release of the bar E' from the ratchet B⁴ permits the pad to return to its upright position, and also (the clutch being still held in gear by the downward position of the casing K²) causing the index G⁷ to return to the "zero-mark" on the dial G⁸ by the action of the weighted lever H'. The return movement of the pad causes the pin e² on the ratchet-disk to release the latch F', (which, as before stated, catches the bar E' and holds its catch d' back away from the ratchet when the bar E' is forced backward by the knob E³), and thus permits the catch d' to again rest against the ratchet, this action also actuating the bar E⁴, and causing it to likewise release the rod i³ and bar i⁷ and permit the spring i⁴ to withdraw the bar i⁷ and again move the bars i⁵ i⁶ inward, as in Figs. 1 and 4, the bar i⁶ coming beneath the falling coin and still holding it

in the casing, thereby providing for two blows being struck upon the pad every time one coin is dropped into the slot. After the second blow upon the pad the pushing in upon the knob E³ to release the ratchet-disk will likewise withdraw the bar i⁶ by the action of the bar E⁴ upon the bell-crank N' and permit the coin to fall into the receiver M', and thence pass to the receptacle M³, the release of the coin also permitting the counterpoise to return the casing K² to its upper position and at the same time disengage the clutch L' L², so that if a blow be struck upon the pad it will not be indicated by the index. By this means the force of the blow or the speed of the movement of the pad will be indicated only when the receptacle K² is in its downward position, and this will occur only when the designated coin is dropped into the slot.

The spring D' and strap D² are adjustable by a screw-coupling D⁶, so as to adapt the several parts to each other and keep them in perfect adjustment.

P' represents a small arm or catch pivoted by its upper end to the tube K⁴, and provided with a pin P², projecting into the tube K⁴, as shown, the lower end P³ of the catch being curved and adapted to be held outward by the upper edge of the casing K³ when the latter is elevated, so as to hold the pin P² out of the interior of the tube K⁴.

The catch P' is provided with a weight P⁴, which causes the pin P² to be forced into the tube K⁴ when the casing K² K³ is lowered by the coin, to obstruct the tube K⁴ and prevent any coin passing through it when the casing K² K³ is downward. Thus if a second coin be dropped into the slot inadvertently before the first one is released from the casing by the action of the crank-arm N' it will be held suspended in the tube until the empty casing K² K³ returns to its upward position.

The casing A is shown with the part containing the ratchet and dial mechanism elevated above the main body of the machine, so that the part containing the pad is open and free from obstruction, and with no part of the casing or supports to the shaft B' very close to the pad. By this means no danger exists of the hand or arm of the person using the machine striking any of the fixed portions of the device and sustaining injury thereby.

The two circles g' g² of graduations on the dials are or may be of different colors, so as to readily distinguish them.

Above the dial is a tablet R, in which the directions for using the machine are placed.

One important feature of this machine is in the construction whereby the whole machine is self-contained, and is not required to be connected to a wall or to the floor in any particular location, but may be readily moved from place to place. Another important feature of the construction is found in the manner of supporting and arranging the shaft and pad, whereby they are free to ro-

tate a complete rotation, thereby enabling me to employ a much lighter spring D' to produce the same effect and with less shock to the mechanism or the hand of the person using the machine. The spring, however, must be stiff enough to withstand the heaviest blow to which it could possibly be subjected. Generally the spring should be "stiff" enough so that the heaviest practicable blow would not cause the pad to rotate the shaft B' more than three-fourths of one revolution.

The receptacle K² is shown formed of two parts, (see Fig. 5,) one part being a sliding front, so that the interior is easily accessible for repairs or for any other purpose.

The rod L¹ is shown with a coupling L⁶, by which its length may be adjusted to correspond with the relative positions of the parts, so that the different parts may be kept in perfect adjustment.

Having thus described my invention, what I claim as new is—

1. In a coin-controlled striking-machine, an axially-rotating shaft which in its normal position is free to rotate, a spring connected therewith, a striking-pad attached to said shaft and extending radially therefrom, a ratchet-disk on said shaft, a pivoted lever, a catch on said lever, a spring which brings said catch into operative relation with said disk to hold said shaft in any position to which it may be turned, and a push-rod acting upon said lever in opposition to said spring for disengaging said catch from said ratchet-disk, in combination with an indicating mechanism actuated by said shaft, but normally out of co-operative relation therewith, and means controlled by the deposit of a coin for bringing said indicating mechanism into co-operative relation with said shaft, substantially as set forth.

2. In a coin-controlled striking-machine, an axially-rotating shaft which in its normal position is free to rotate, a spring acting thereupon, a striking-pad attached to said shaft and extending radially therefrom, a sliding clutch member on said shaft, a gear carried by said sliding clutch, and a fixed clutch member on said shaft, in combination with an indicating mechanism, gearing actuating said indicating mechanism, said gearing being normally inoperative, but adapted to be actuated by said sliding gear, and mechanism controlled by the deposit of a coin for coupling said sliding and fixed clutch members, and thus rendering operative the indicating mechanism, substantially as set forth.

3. In a coin-controlled striking-machine, a rotating shaft actuated by a blow, and which in its normal position is free to rotate, a fixed clutch member thereon, a sliding clutch member on said shaft, and indicating mechanism operated upon through said sliding clutch member, in combination with a lever adapted to be tilted by the weight of a coin, a clutch-lever connected with said sliding clutch mem-

ber, and an intermediate rod connecting said clutch-lever with said coin-actuated lever substantially as set forth.

4. In a striking-machine, a tilting lever, and a coin-bucket carried thereby having a coin-receiving passage extending there-through, in combination with three sliding bars carried by said coin-bucket and adapted to be projected within and withdrawn from said coin-passages, the intermediate of said sliding bars projecting into said coin-passages when the other two are withdrawn therefrom, and vice versa, substantially as set forth.

5. In a striking-machine, a tilting lever and a coin-bucket carried thereby having a coin-receiving passage extending therefrom, in combination with three sliding bars carried by said coin-bucket and adapted to be projected into and withdrawn from said coin-passages, the intermediate of said sliding bars projecting into said coin-passages when the other two are withdrawn therefrom, and vice versa, an actuating-bar exterior to said coin-bucket, but carried by said tilting lever, said actuating-bar being directly connected with said intermediate sliding bar, levers connecting said actuating-bar and the two outer of said sliding bars, a spring acting upon said actuating-bar to hold said intermediate bar withdrawn from said coin-passages, a projecting lug on said actuating-lever, and a swinging lever, into the path of which said projecting lug is brought when said tilting lever is tilted on the deposit of a coin, substantially as set forth.

6. In a striking-machine, a supporting frame-work, a shaft mounted upon said frame-work and carrying a striking-pad, a pulley B³ upon said shaft, a spring D', a piston D⁴, a flexible connection D², passing over said pulley and uniting said spring and piston, and a cylinder in which said piston runs, combined and operated substantially as described, whereby the reactionary force of said spring is nullified and controlled.

7. In a striking-machine, a supporting frame-work, a shaft mounted thereon and carrying a striking-pad, a spring adapted to be actuated by the rotation of said shaft, a graduated dial G⁸ upon said frame-work, an index G⁷, adapted to indicate the graduations upon said dial, mechanism connecting said index with said pad-shaft, a clutch mechanism upon said pad-shaft adapted to connect and disconnect said index-operating mechanism therewith, a lever K', having a counterpoise K⁵ and a coin-receiver K², a coin-duct K⁴, connecting the outside of said frame-work with said coin-receiver, and lever L³ and rod L⁴, connecting said lever K' and said clutch mechanism, whereby the insertion of a coin into said receptacle will cause said clutch mechanism to be thrown into gear with said indicating mechanism, substantially as and for the purpose set forth.

8. In an indicating striking-machine, a supporting frame-work, a shaft mounted thereon

and carrying a striking-pad, a spring adapted to be actuated by the revolution of said shaft, a ratchet-wheel D⁴ upon said shaft, a lever E', having a catch engaging with said ratchet-wheel, whereby said striking-pad will be retained wherever left by the force of the blow to which it is subjected, a push-rod E², whereby said catch may be disconnected from said ratchet, a graduated dial G⁸ upon said frame-work, an index G⁷, adapted to indicate the graduations upon said dial, a clutch mechanism connecting said pad-shaft with the mechanism actuating said index, a counterpoise-lever K', carrying a coin-receiver K², lever L³ and rod L⁴, connecting said lever K' and said clutch mechanism, one or more stop-levers i'² and their actuating-rod i'³, connected to said

lever K' and receiver K² and adapted to obstruct the coin in its passage through said receiver, and bell-crank lever N', pivoted to said frame-work and adapted to be actuated by a bar E⁴, connected to said lever E', whereby said stop-levers upon said coin-receiver may be actuated to release the coin every time the lever E' is operated to release the pad, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ERBINE C. PHILLIPS.

Witnesses:

C. N. WOODWARD,
H. S. WEBSTER.