

(No Model.)

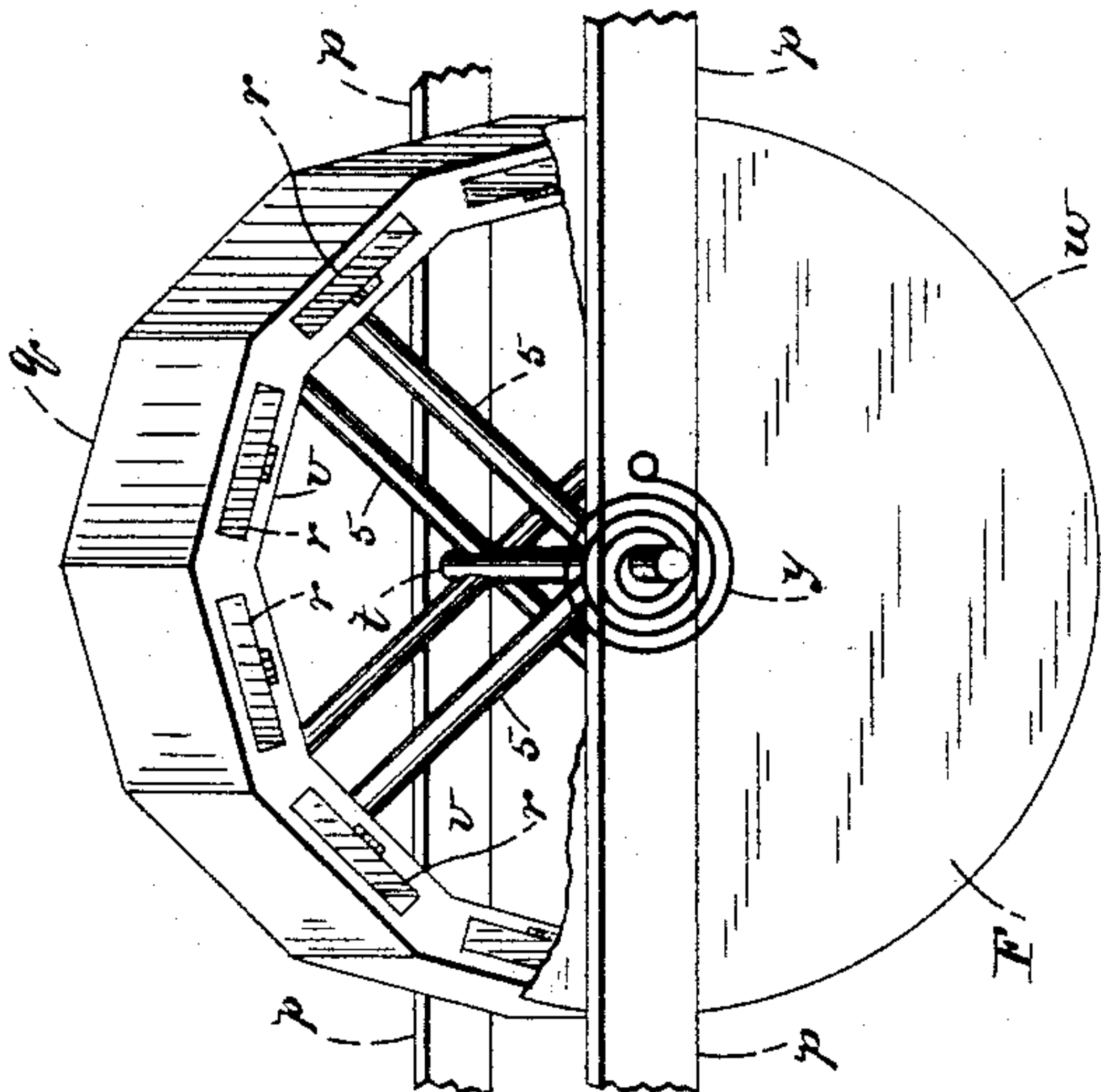
6 Sheets—Sheet 1.

P. V. W. WELSH.
COIN OPERATED PHOTOGRAPHING MACHINE.

No. 438,261.

Patented Oct. 14, 1890.

Fig. 13.



WITNESSES=

Gardner W. Spencer
N. F. Turner

Fig. 1.

INVENTOR=

Pine V. W. Welsh,
PER *C. A. Shawlee,*
ATTYS.

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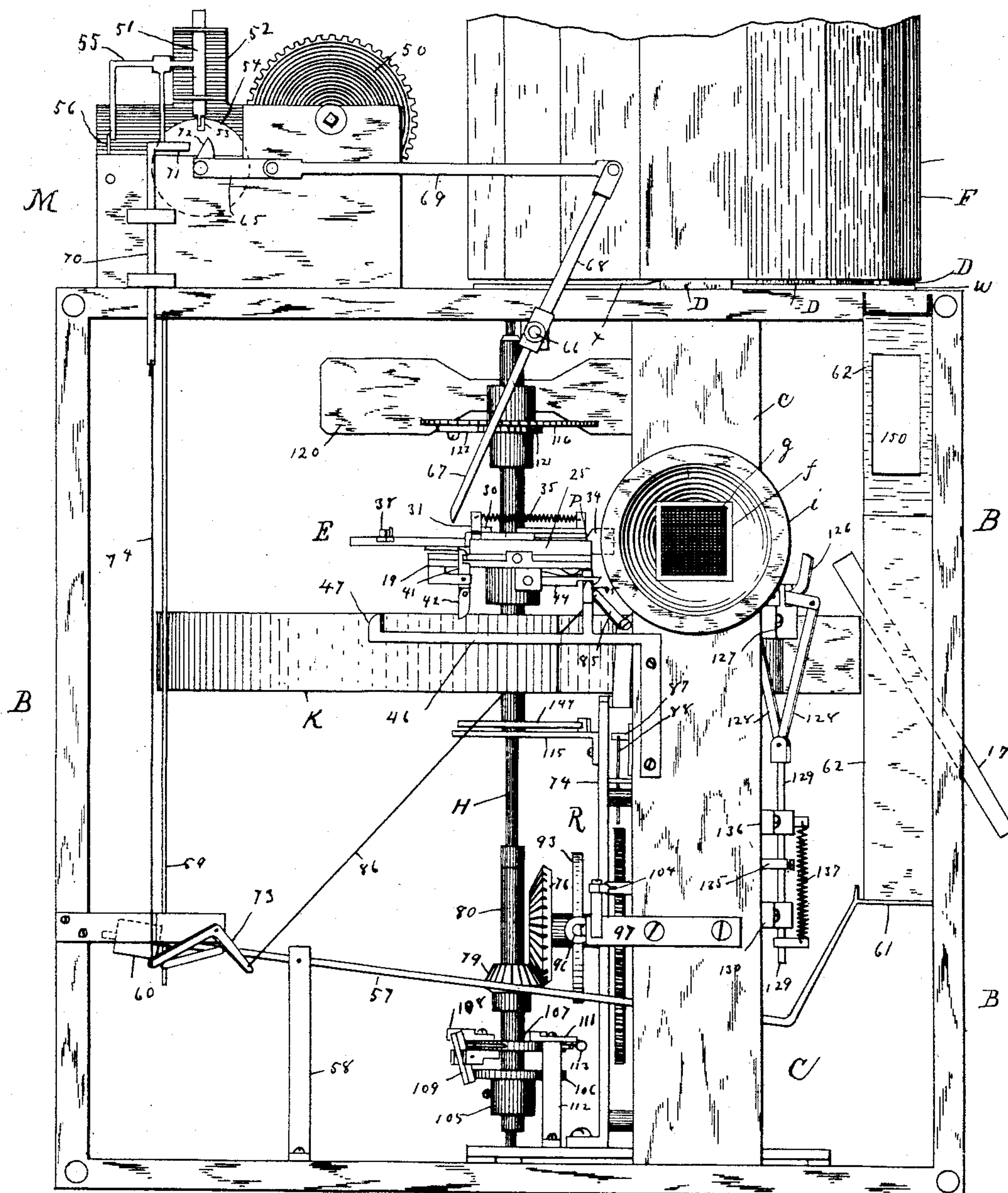


Fig. 2.

Witnesses.

L. S. Barbary
H. Dwyer

Per

C. A. Shawles.

Inventor
P. V. W. Welsh,

Attorneys.

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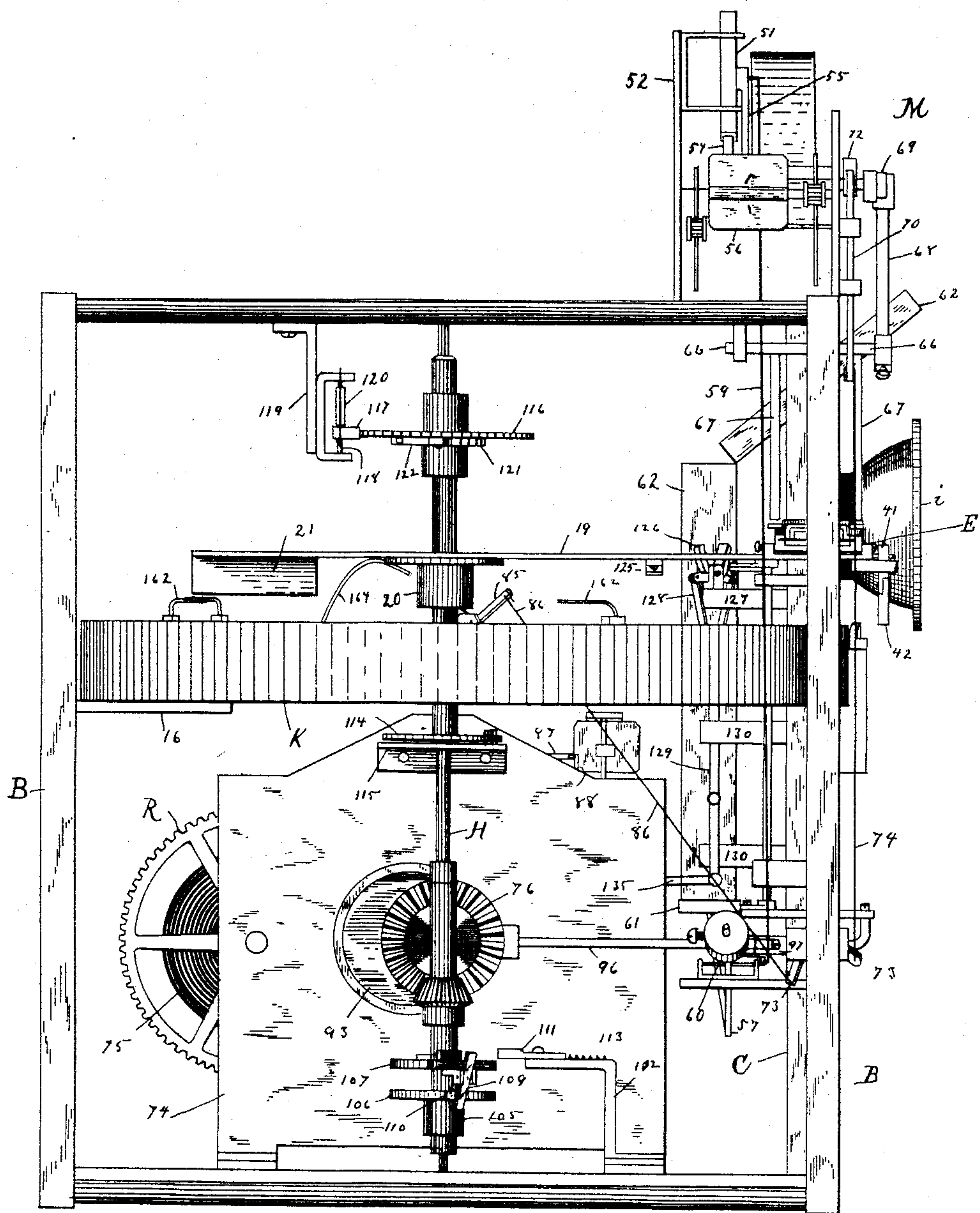


Fig. 3.

Witnesses
L. S. Burbank
H. Dwyer

Inventor
Pierre V. W. Welsh,
Per C. A. Shaw & Co.,
Attorneys.

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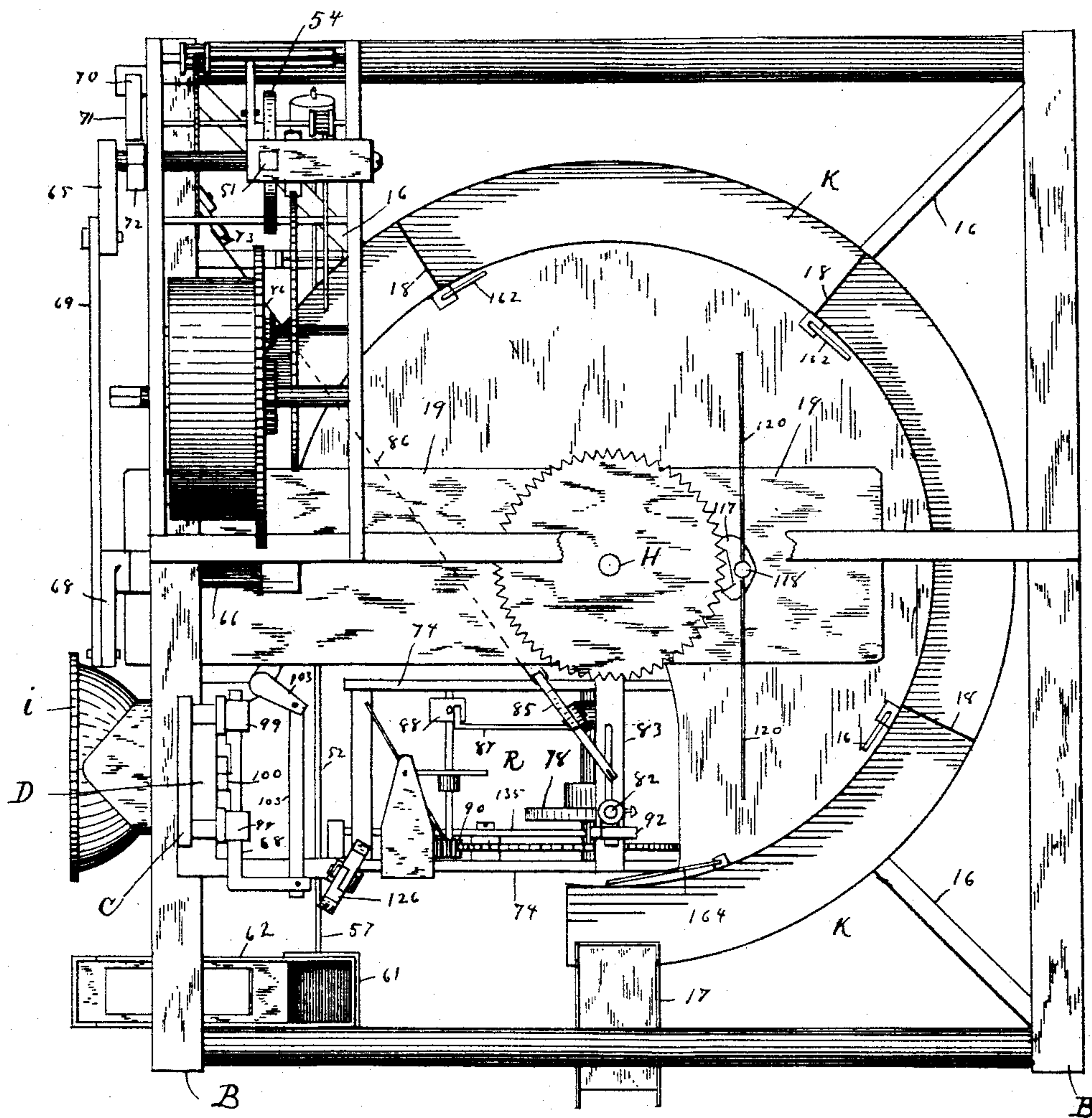


Fig. 4.

Witnesses.
L. P. Burbank
H. Dyer

Inventor
P. V. W. Welsh,
Per A. Shaw & Co.
Attorneys.

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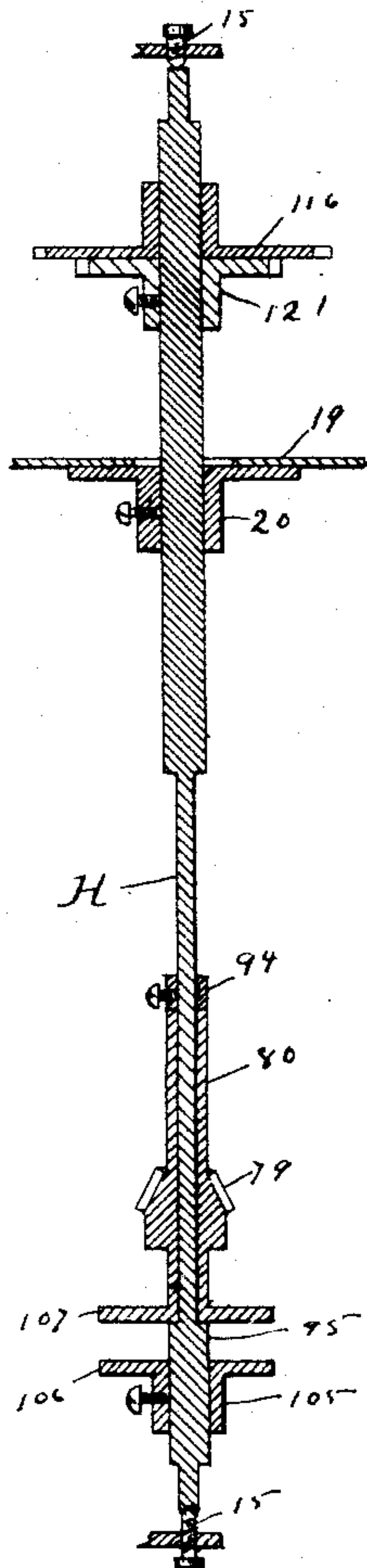


Fig. 6.

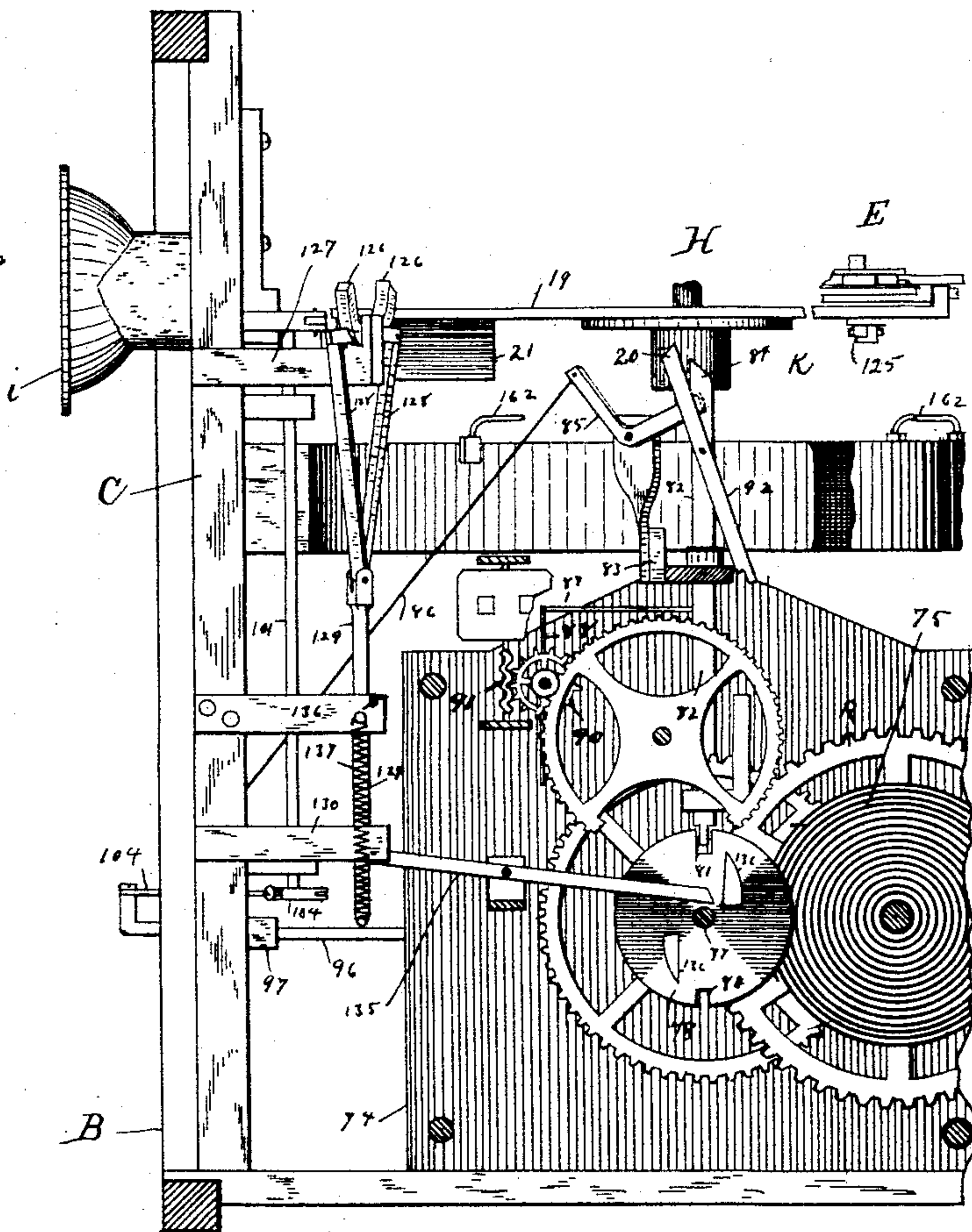


Fig. 5.

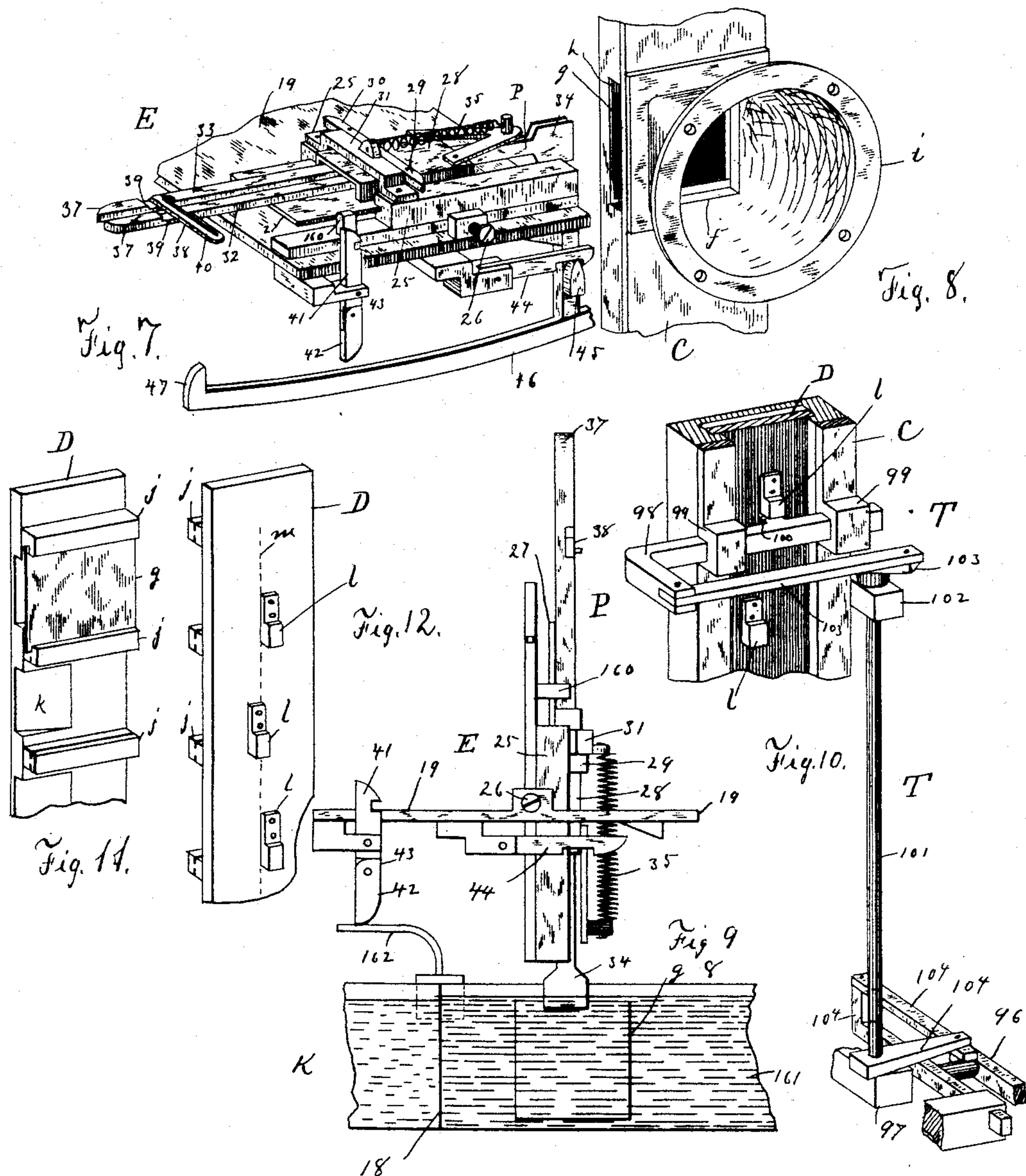
Witnesses
L. S. Burbank
H. Turpin

Inventor.
P. V. W. Welsh,
Per C. A. Shaw & Co.,
Attorneys

P. V. W. WELSH.
COIN OPERATED PHOTOGRAPHING MACHINE.

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Patented Oct. 14, 1890.



Witnesses.
L. S. Burbank
C. J. Sturges

Inventor
P. V. W. Welsh,
Per C. A. Shaw & Co.,
Attorneys

UNITED STATES PATENT OFFICE.

PIERRE V. W. WELSH, OF NEW YORK, N. Y.

COIN-OPERATED PHOTOGRAPHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 438,261, dated October 14, 1890.

Application filed April 8, 1890. Serial No. 347,050. (No model.)

To all whom it may concern:

Be it known that I, PIERRE V. W. WELSH, of New York, in the county and State of New York, have invented certain new and useful Improvements in Coin-Operated Photographing-Machines, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of my improved photographic machine, showing the lens-tubes and exposure mechanism; Fig. 2, a front elevation of the machine, the case being removed; Fig. 3, a side elevation looking from the left in Fig. 2; Fig. 4, a top plan view, the feed-box being removed; Fig. 5, a sectional side elevation, looking from the right in Fig. 2; Fig. 6, a vertical longitudinal section of the main shaft; Fig. 7, a perspective view of the developing-carriage; Fig. 8, a like view of the plate-box, the lens-tubes being removed; Fig. 9, an elevation showing the carriage upset and the plate in the bath; Fig. 10, a sectional elevation of the plate-escapement mechanism; Figs. 11 and 12 respectively front and rear elevations of portions of the plate-side, and Fig. 13 a plan view of the plate feed-box.

Like letters and numerals of reference indicate corresponding parts in the different figures of the drawings.

My invention relates especially to a photographing-machine actuated by a coin and adapted to automatically make the exposure, develop, and finish the picture; and it consists in certain novel features hereinafter fully set forth and claimed, the object being to produce a simpler, cheaper, and more effective device of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the case, which is provided with a coin-slot *b*, and through which the tubes *d*, containing the ordinary photographing-machines, protrude.

B is a rectangular metallic frame, which

supports the operating mechanism and is disposed in the case. A vertically-disposed plate C is secured to the front of the frame, and is provided on its inner face with a longitudinally-arranged dovetail groove, which forms ways in which the plate-carriers D slide. A rectangular opening *f* (see Fig. 2) is formed in the outer face of the plate C into the carrier track or ways, said opening being designed to expose the rectangular sensitive plate *g*. An opening *h* (see Fig. 8) is formed in the edge of the carrier-track to permit the plate *g* to be withdrawn from said carrier. A bell-shaped tube *i* projects outward from the track-plate C, around the opening *f*, and the lens-tubes *d* are secured thereto.

The carrier D (see Figs. 11 and 12) consists of a rectangular plate fitted to slide in the track C. The carrier is supported in its track by an escapement mechanism, (shown in Fig. 10,) the operation of which is hereinafter described. A series of laterally-arranged grooved bars *j* are secured to the inner face of the carrier, said bars forming ways in which the sensitive plates *g* are disposed. An edge of the carrier between the ways *j* is beveled at *k* to permit a clamp on the developing-carriage E, to be projected through the opening or slot *h* and grasp said plates *g*. Stud *l* are secured at suitable distances to the outer face of the carrier and engage the supporting-bar of the carrier-escapement, alternate studs being arranged at opposite sides of the center line *m* of said face, as shown in Fig. 12.

The carrier feed-box F (see Figs. 2 and 13) is mounted on the frame B above the carrier-track C, and is fitted to rotate in frame-bars *p*. The box comprises a rim *q*, in which twelve equidistant vertically-arranged chambers *r* are formed, adapted to register consecutively with the carrier-track groove and severally fitted to receive a carrier D, which is discharged by gravity therefrom into said track. The rim *q* is supported by radial rods or spokes *s* on a spindle *t*, rotating in the frame-bars *p*. A spiral spring *y* on one of said bars has an end secured to said spindle, whereby the feed-box may be rotated. The inner walls of the chambers *r* are slotted vertically at *v* to receive the studs *l* on the carriers. A carrier D, provided with twelve sensitive plates *g*, is disposed in each chamber

r, their lower ends resting on a plate *w* on the the frame, as shown in Fig. 2. The carrier in the chamber registering with the track C rests on the upper end of the carrier already
 5 in said track and follows it as it descends. A stop *x*, Fig. 2, checks the rotation of the box by the spring *y* after a carrier has been discharged therefrom into the track when the carrier in a succeeding chamber arrives over
 10 said track.

A vertically-arranged rotary shaft H (see Fig. 6) is journaled centrally in the frame on cone-bearings 15. Around said shaft a horizontally-arranged developing-tank K is secured, said tank being supported by brackets 16 on the frame B. The tank is segmental, and one end thereof terminates just below the plate-slot *h* in the track-plate C. The opposite end of said tank terminates at a plate-
 20 discharge chute 17, (see Fig. 4,) which projects through the side of the case adjacent to the lens. The tank is divided by partitions 18 into compartments adapted to contain the various liquors or washes employed in developing the picture on the sensitive plates. A horizontal plate 19 is mounted on a flanged sleeve 20 on the shaft H above the tank and carries the developing-carriage E on the outer end of its long arm and a counter-balance 21
 30 on its short arm.

The carriage E is constructed of two parallel tracks or ways 25, arranged laterally on the plate 19 and pivoted at 26 to swing vertically, as shown in Fig. 9. A plate 27 is fitted to slide longitudinally in the ways 25 and bears a block 28, on the inner end of which are two laterally-projecting arms 29 and 30, which engage a fixed cross-piece 31, connecting said ways. A clamp P, consisting of two horizontally-arranged arms 32 and 33, passes through the block 28, the arm 33 being fixed and the arm 32 pivoted in said block. Each arm is provided with a clamping-head 34, adapted to enter the plate-slot
 40 *h* and grasp the plate *g*. A spring between said arms tends to hold said heads together. A coiled spring 35 connects the arch 31, and an arm on the block 28, said spring acting contractively to return the clamp after having been projected into the slot. The opposite ends of the clamping-arms are beveled at 37. (See Fig. 7.) A latch 38 is pivoted in a groove 39 on the arm 33 and slides in a corresponding groove in the companion arm.
 50 A flat spring 40 on the latch-pivot acts to force its free end into engagement with the edge of the groove 39 and lock said arms together, separating their heads 34 against the force of the spreading spring. The carriage is prevented from tilting by a vertical latch 41, pivoted to the plate 19 and taking on a pin on the ways 25. A bar 42 is pivoted to the lower end of the latch 41 and is fitted to swing freely in one direction, a shoulder 43 preventing it from moving toward the track C. A latch 44, pivoted to the plate 19, takes on a beveled stud 45 on an arm or bracket 46,

secured to the plate-track C, and locks the plate 19 in position near the slot *h*. The bracket 46 is elongated and has a projection
 70 47 on its outer end adapted to engage and trip the latch 41 as the carrier-plate 19 swings away from the track C. This releases the carriage E, which is hung so that it will tilt into the position shown in Fig. 9 and the
 75 clamp-heads 34 projected thereby into the tank K.

A fan-escapement mechanism M is mounted on the top of the frame B, and is actuated by a spring 50 in the usual manner. A vertically-sliding bar 51, mounted on a standard
 80 52, has its lower end reduced to enter a slot 53 in the scape-wheel 54. An arm 55 on the bar 51 projects downward into engagement with the fan 56. A horizontal lever 57 is
 85 pivoted in a standard 58 on the bottom of the frame, and has its short arm connected by a vertical rod 59 with the arm 51 of the escapement. A counterbalance-weight 60 is mounted on said short arm of the lever, and its long
 90 arm is provided with a table or pan 61, disposed in position to receive a coin from the coin-chute 62, which leads from the slot *b* in the case. The lever 57 is actuated by the weight of the coin to release the escapement
 95 M. A crank 65 is secured to the arbor of the scape-wheel 54. A stub-shaft 66 is journaled on the frame and bears a fork 67, adapted to engage the arms 29 and 30 on the carriage and force the clamp-heads 34 into the plate-slot
 100 *h*. A crank 68 is secured to the stub-shaft and connected with the crank 65 by a lever 69. A vertical rod 70 slides in eyes on the frame and has a head 71, adapted to be engaged by a cam 72 on the scape-wheel arbor, whereby the rod is elevated. A bell-
 105 crank lever 73 is pivoted on the frame near the counter-balance 60, and has one arm connected with the rod 70 by a lever 74.

A worm-escapement mechanism R (best shown in Fig. 5) is mounted in the frame below the tank K and at the rear of the plate-carrier track C. Said escapement R is mounted in vertical frame-plates 74, and is actuated when released by a coiled spring 75, in the
 110 usual manner driving the main shaft H by means of a beveled gear 76, mounted on the arbor 77 of the scape-wheel 78. This gear meshes with a corresponding gear 79 on a sleeve 80, loose on said shaft between a collar
 115 94 and shoulder 95, as shown in Fig. 6. The wheel 78 has two diametrically-opposite slots 81 in its periphery. A vertical rod 82 slides in a bracket 83 on the frame-plate 74, its upper end being beveled at 84 and its lower end
 120 reduced to enter the slots 81. A bell-crank lever 85 is pivoted to an arm on said bracket, and has one arm connected with an arm of the bell-crank 73 by a rod 86. The opposite arm of the lever 85 is connected with an angle-rod 87, secured to the sliding rod 83 and projecting into the path of a rotary arm or fan 88 on the arbor of the gear 90, which
 125 meshes with the fan-worm 91 of said escape-

ment. A latch 92 is pivoted to the sliding bar 82, said latch having a beveled upper end and a notched lower end adapted to engage the bracket 83 and lock said bar when elevated. An eccentric 93 (see Figs. 2 and 3) is mounted on the scape-wheel arbor 77 between the beveled gear 76 and frame-plate 74 and actuates a horizontal rod 96, sliding in a bracket 97 on the plate-track C. This rod actuates the escapement mechanism T (shown in Fig. 10) for the plate-carrier D.

The escapement consists of an angle-rod 98, which slides laterally in ears 99 on the inner face of the track C, (see Fig. 10,) and is provided with a boss or stud 100, which engages the studs on the carrier D and supports it. A vertical rocking shaft 101 is mounted in the bracket 97 and an arm 102 on the track C. Crank-levers 103 connect the upper end of the shaft with the angle-rod 98, whereby said rod may be intermittently moved to engage the alternate studs 1 on the carrier. Crank-rods 104 connect the lower end of the shaft with the eccentric-rod 96.

A flanged sleeve 105 is set-screwed onto the shaft H, its flange 106 being parallel with a companion flange 107 on the loose sleeve 80 on said shaft. A cam 108 is mounted on the flange 107, and a dog 109, pivoted to said flange, engages a stud 110 (see Fig. 3) on the flange 106, causing the shaft H to rotate when the gears 76 and 79 move the sleeve 80 in one direction or from left to right as viewed in Figs. 2 and 3. A lever 111 is pivoted on a standard 112 on the frame and projects into the path of the cam 108, and is adapted to engage the dog 109, freeing it from the stud 110, and release the sleeve 80 to permit the shaft H to be returned. A coiled spring 113 connects said lever with the standard and causes it to strike the dog after passing the cam with sufficient force to disengage said dog from the stud. A stiff coiled spring 114 has one end secured to an arm 115 on the frame-plate 74 and is coiled around the shaft H, to which it is secured, said spring serving to return the shaft when the sleeve 80 has been released, as described. A ratchet-wheel 116 is mounted loosely on the shaft H above the plate 19 and is engaged by a pallet 117 on a spindle 118, mounted in a bracket 119 on the frame, said spindle also bearing a fan 120. The ratchet 116 rests upon a ratchet-wheel 121, set-screwed to the shaft H. A spring-pawl 122 on the ratchet 116 engages the ratchet 121, and is arranged to slip thereon as the gears rotate the shaft H and to connect the ratchets to restrain the movement of the shaft when returned by the spring 114. The shaft when rotated by the escapement R carries the plate 19 and carriage E away from the track C. When said carriage arrives over the last tank-compartment, a pawl 125 (see Fig. 5) on the under side of the plate 19 near said carriage engages the upper end of the scape-rod 82 and locks said plate, preventing its return until said rod descends. The beveled ends 37 of

the carriage-clamp arms 33 and 34 are now disposed between the arms (see Fig. 5) of a scissors-lever 126, pivoted in a bracket 127 on the track C. Rods 128 are respectively pivoted to the lower ends of the lever-arms and have their lower ends pivoted to a rod 129, fitted to slide vertically in brackets 130 on the track C. A lever 135 is pivoted to the frame-plate 74, one arm thereof projecting into the path of two cams 136 on the scape-wheel 78, which alternately engage and lift said arm. The outer arm of the lever is pivoted to the rod 129, which is drawn downward as said lever is moved by the cams, closing the scissors-lever onto the ends of the clamp-arms and separating the clamp-heads 34. A coiled spring 137 connects the rod 129 with a bracket 130 and acts contractively to return said rod and open the levers 126 after the lever 135 is released from the cams 136.

A shutter 151 (see Fig. 1) is fitted to slide across the lens-tube opening 152, and is mounted on an arm of a lever 153, pivoted on the tubes. A contractile spring 154 connects said arm and tube. A small lever 155 is pivoted on the inner end of the lever 153, and a coiled spring 156 connects one arm thereof with said lever. Arms 157 on the fork 67 above the carriage E engage an arm of the lever 155 and move the shutter 151 to expose the sensitive plate as said fork moves to advance the clamp into the plate-slot *h*. The end of the lever 155 is beveled to permit the arm 157 to slip by after making the exposure and the spring 154 to close the shutter before the clamp grasps the sensitive plate.

In the use of my improvement a coin is inserted in the slot *b* of the case and passes down through the chute 62 onto the table or pan 61. A slot 150 (see Fig. 2) is formed in the bottom of the chute to prevent coins of smaller denomination than those for which the chute is designed from falling onto the pan. The long arm of the lever 57 being depressed by the weight of the coin, the bar 51 is forced upward thereby and the escapement M released. The scape-wheel 54, rotating, actuates the fork 67 and opens the shutter 151 to make the exposure, as above described. The fork then engaging the arm 30 of the carriage-clamp, projecting the clamping-heads into the plate-slot at each side of the plate, at which point the latch 38 strikes a stud 160 on the carriage, freeing the clamp-arms 32 and 33, which are at once separated by their spring, and the heads 34 caused to grasp the plate *g*. The cam 72 on the arbor of the escape-wheel 54 now elevates the rod 70, actuating the bell-crank lever 73. Said lever, being connected with the bell-crank lever 85, moves it to elevate the rod 82 and release the escapement mechanism R. Said mechanism being at once set in motion by its spring 75, the shaft H is thereby rotated and the carriage E begins to travel away from the plate-track C, carrying the sensitive plate *g*, which has been withdrawn from the carrier

by the contractile spring 35, said spring causing the clamp to follow the fork as it is returned by its crank. The different compartments of the circular tank K are filled with the various solutions employed to develop the plate *g*. As the carriage advances, the latch 41 engages the stud 47, and is released therefrom, when it immediately tilts by its own weight into the vertical position shown in Fig. 9. The plate *g* is thus immersed in the first liquor 161, as shown in said figure. At each partition 18 a cam 162 on the rim of the tank engages the bottom of the carriage and elevates it sufficiently to enable the plate *g* to pass over said partition, when it drops into the bath in the succeeding compartment. When the scape-bar 82 is elevated, as described, the latch 92 (see Fig. 5) engages the bracket 83 and prevents said bar from dropping back into the slot 81 in the scape-wheel 78. The weight end 21 of the carriage-plate 19 engages said latch as it passes and frees the bar 82 therefrom, so that it drops onto the periphery of the scape-wheel 78 in position to fall into the succeeding slot 81 and stop the mechanism. An elongated cam 164, (see Figs. 3 and 4,) disposed on the tank near the end of the tank, tilts the carriage into a horizontal position, in which it is locked by its latch 41. As soon as the carriage E reaches the bar 82 its pawl 125 passes over the beveled end 84 of said bar and locks the carriage-plate. The ends of the carriage-clamp are now disposed between the arms of the scissors-lever 126, and a cam 136 on the scape-wheel 78 engages the lever 135 and actuates the bar 129 to close said levers against the clamp-arms until their latch 35 locks them together, as shown in Fig. 7. This opens the clamp-heads 34, which are disposed opposite the plate-chute 17, when the carriage is locked on the bar 82 and permits the finished picture to fall into said chute, through which it is discharged from the case. Meanwhile, at about three-quarters of the complete revolution of the shaft H, or approximately at the time when the lever 135 is engaged by the cam 136 on the scape-wheel 78, the lever 111, striking the pawl 109 on the flange 107 on said shaft, disengages it from the stud on the flange 106 and unlocks the sleeve 80, so that the shaft may be returned by the spring 114, said shaft being now held from so returning by the scape-bar 82. At the completed semi-revolution of the shaft 77 said bar falls into the opposite slot 81 in the scape-wheel. The eccentric 93 on the shaft 77 has meanwhile moved the rocking shaft 101 and drawn the angle-bar 98 from right to left, as viewed in Fig. 10, disengaging its stud 100 from the carrier-stud 1 and placing it in position to engage the succeeding stud 1. The carrier falls when thus released until stopped by said bar, when another sensitive plate *g* is adjusted in the opening *f* of the carrier-track. The shaft H being freed, as described, the spring acts at once to return said shaft, and with it the

carriage, to its original position, as shown in Fig. 3, where it is locked by the latch 44 on the stud 45. The carriers D following each other from the feed-box F into the track C a constant supply of plates *g* is afforded, said plates being adjusted consecutively in the opening *f*, opposite the slot *h*, by the carrier-escapement. The coin remains on the pan 61 until said pan is inclined sufficiently to permit it to slide therefrom into a suitable receptacle. The weight of the coin is thus utilized sufficiently long to render the releasing of the escapement M certain. As soon as the cam 72 on the scape-wheel arbor of said escapement has actuated the angle-bar 70 and released the main escapement R the bar 51 re-enters the slot in said wheel and stops said escapement until again released by a coin. By releasing the main shaft H prior to the completion of a revolution, as described, the entire power of the escapement R during the remainder of the semi-revolution of its shaft 77 is applied to operating the scissors-levers 126, considerable force being necessary to overcome the spring-tension of the clamping-arms and release the picture.

Having thus explained my invention, what I claim is—

1. In a coin-operated photographing-machine, a developing-tank, a tilting plate-carriage provided with a spring-tensioned sliding plate-clamp and mounted on a rotary shaft, an escapement mechanism adapted to be released by the coin and actuate said sliding clamp, a main-escapement mechanism for rotating said shaft released by the coin-escapement, mechanism, substantially as described, for disconnecting the shaft from said main escapement, and a spring for returning the shaft and carriage.

2. In a coin-operated photographing-machine, a sliding plate-carrier, an escapement therefor, a developing-tank, a tilting carriage mounted on a rotary shaft and provided with a sliding plate-clamp, a coin-released escapement adapted to project the clamp into said carrier, a main escapement released by the coin-escapement for actuating said shaft and the carrier-escapement, mechanism for disconnecting the shaft and escapement, a stop for locking the carriage when the shaft is disconnected, mechanism actuated by the main escapement for opening said clamp, and a spring for returning the shaft and carriage.

3. In a coin-operated photographing-machine, the rotary feed-box F, provided with the chambers *r*, adapted to receive the carriers D, substantially as described.

4. In a coin-operated photographing-machine, a frame provided with a plate-carrier track, in combination with a rotary feed-box having peripheral chambers adapted to receive said carriers and register with said track, a stop for said box, and a spring for rotating it as the carriers are discharged.

5. In a coin-operated photographing-machine, a vertical plate-carrier track provided

with an opening for exposing the plate in the lens-tube, in combination with a carrier fitted to slide therein and provided with a series of ways for receiving sensitive plates and an escapement mechanism for intermittently releasing said carrier.

6. In a coin-operated photographing-machine, a rotary plate-carriage shaft, a loose sleeve thereon geared to the shaft-actuating mechanism, mechanism detachably locking the sleeve to the shaft, whereby it may be rotated in one direction, a cam for releasing said shaft before the termination of a rotation, and a spring for returning it when released.

7. In a coin-operated photographing-machine, a rotary carriage-shaft, a sleeve thereon geared to a coin-released driving mechanism, a pawl locking the sleeve and shaft when rotated in one direction, means for tripping the pawl before the termination of a revolution of the shaft, and a spring for returning said shaft when released.

8. In a coin-operated photographing-machine, the plate-carriage E, comprising the pivoted ways 25, the sliding plate 27, the spring-tensioned clamping-arms 32 and 33, the latch 38 for locking said arms, and the spring 35, connecting said sliding plate and ways, all being arranged to operate substantially as described.

9. In a coin-operated photographing-machine, a shaft and actuating mechanism, combined with a plate thereon, a plate-developing carriage pivoted on said shaft-plate, a spring-tensioned plate-clamp fitted to slide on said carriage, a latch for locking said clamp when open, and a trip on the carriage for unlocking the clamp, substantially as and for the purpose set forth.

10. The tank, shaft, and actuating mechanism, combined with a tilting carriage mounted on an arm on said shaft, latches for locking said arm and carriage, the plate-carrier and track therefor, and studs for tripping said latches as the shaft rotates.

11. The tank, shaft, and actuating mechanism, in combination with the tilting plate-carriage provided with a sliding plate-clamp, levers operated by the actuating mechanism for opening said clamp, means, substantially as described, for disconnecting the shaft from said mechanism, and a spring for returning the shaft and carriage.

12. The shaft and carriage provided with the spring plate-clamp, in combination with the coin-actuated driving mechanism, the locking scape-bar, and the scissors-levers operated by said mechanism to open the clamp, substantially as described.

13. The combination of a rotary shaft bear-

ing a developing-carriage provided with a sliding-spring plate-clamp, an escapement mechanism for actuating said shaft, a sensitive-plate carrier, and a coin-released escapement mechanism for consecutively projecting said clamp into the carrier and releasing the shaft-escapement, substantially as described.

14. The shaft H, provided with the stud 110, in combination with the sleeve 80, having the latch 109 and geared to a driving mechanism, a trip on the machine for releasing the sleeve before the termination of a shaft revolution, and a spring for returning said shaft, substantially as described.

15. The combination of a sliding sensitive-plate carrier, a track therefor, provided with an exposure-opening, lens-tubes, an exposure plate or cap thereon, and a coin-released escapement mechanism actuating said plate or cap, substantially as described.

16. In a coin-operated photographing-machine, the plate-carrier D, provided with ways *j* and studs *l*, in combination with the track C, provided with an opening for exposing the plate, and the escapement T, actuated by the driving mechanism of the machine and adapted to intermittently release said carrier.

17. The spring-actuated feed-box F and a stop therefor, in combination with the track C, carriers D, and an escapement mechanism therefor, substantially as described.

18. The combination of a sliding plate-carrier, a track therefor opening into the lens-tube, a circular developing-tank, a rotary shaft, a tilting plate-carriage thereon, provided with a sliding plate-clamp, an escapement mechanism for actuating said shaft, means, substantially as described, for disconnecting the shaft therefrom, a spring for returning it, a coin-released escapement mechanism adapted to consecutively project said clamp into the plate-carrier and release the shaft escapement, a carrier-escapement actuated by the shaft-escapement, and mechanism actuated by the shaft-escapement for opening the plate-clamp and releasing the plate at the termination of the forward movement of the carriage, substantially as set forth.

19. The combination of the shaft and coin-released actuating mechanism therefor with the carriage provided with the sliding plate-clamp, the scissors-levers 126, actuated by said mechanism for opening the clamp, and the spring-catch 38, for locking it when open, substantially as described.

PIERRE V. W. WELSH.

Witnesses:

THEO. A. WELSH,
SUMNER W. GRIFFIN.