

H. S. MILLS.  
 COIN OPERATED WEIGHING SCALE.  
 APPLICATION FILED MAR. 31, 1908.

900,409.

Patented Oct. 6, 1908.

7 SHEETS—SHEET 1.

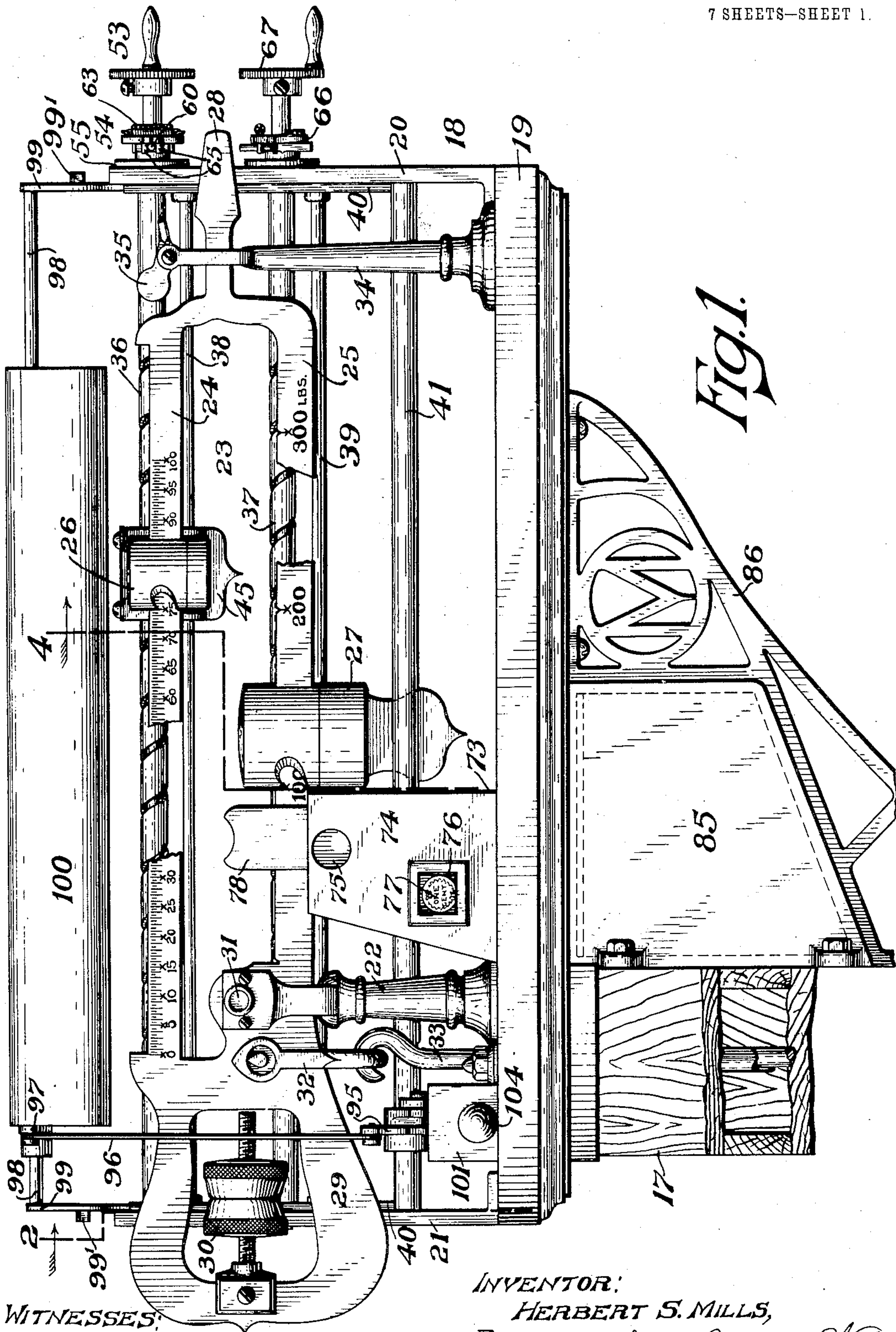


Fig. 1.

WITNESSES:  
 John F. Sandell.  
 Ralph A. Schaefer.

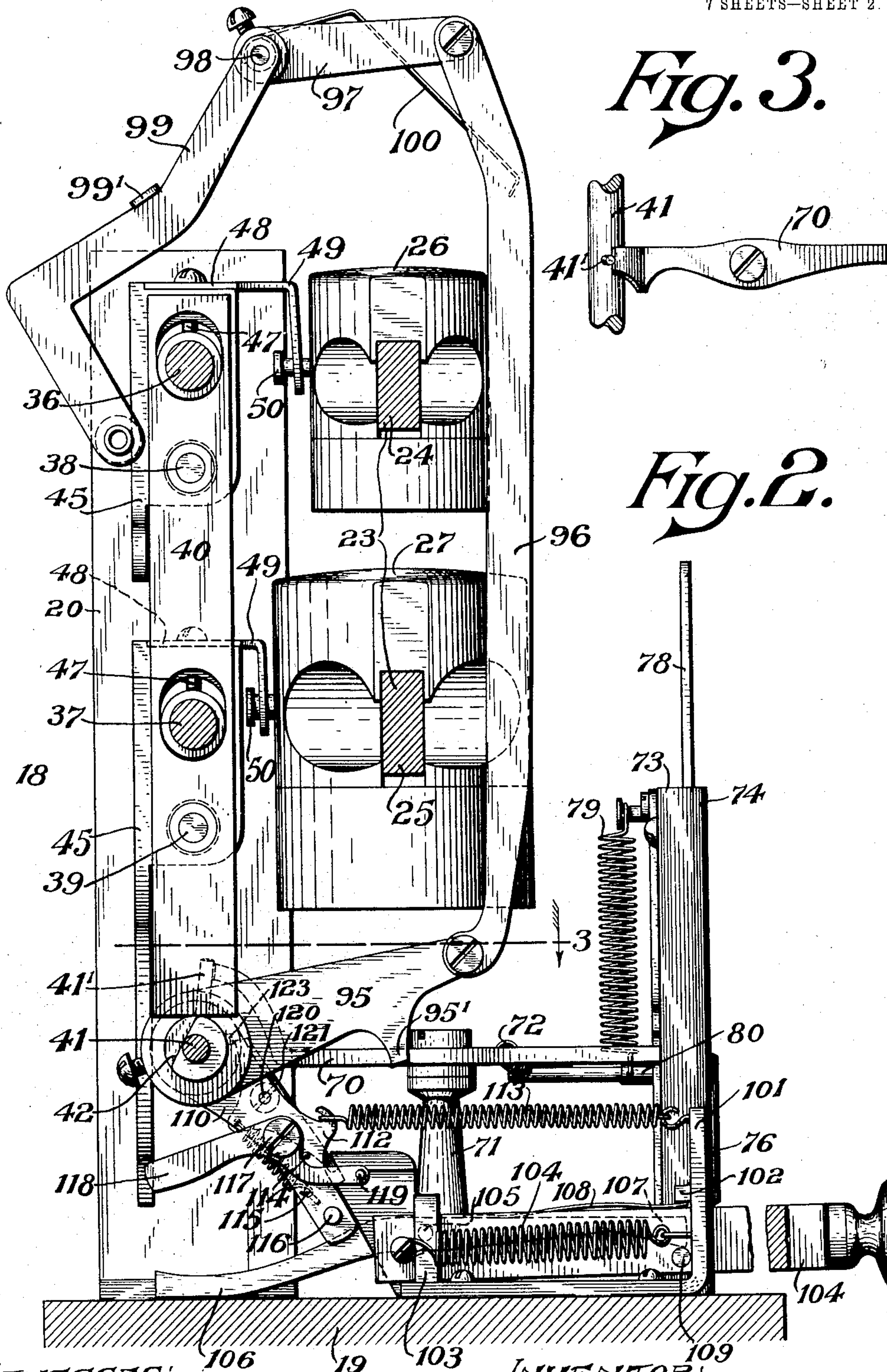
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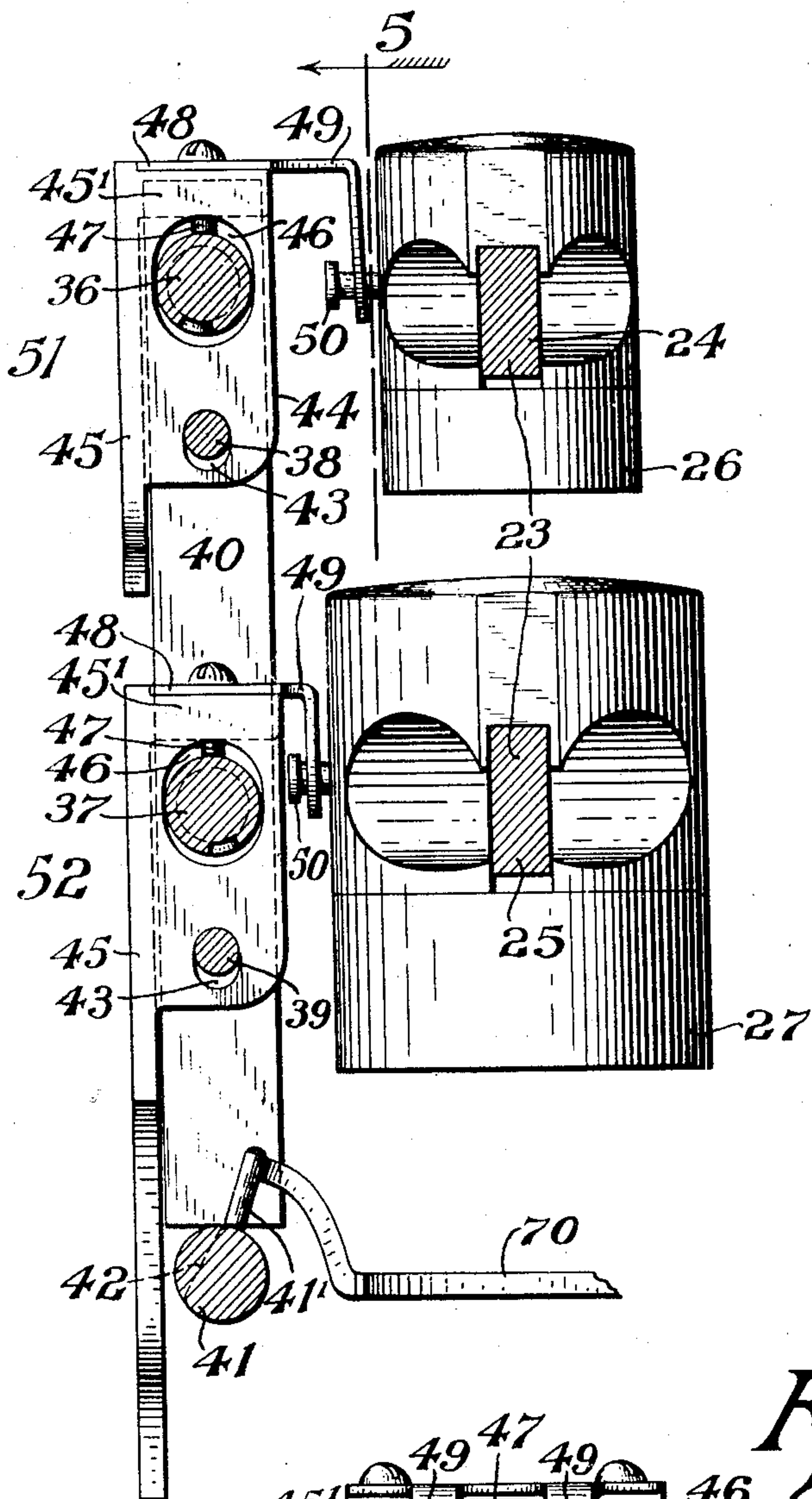


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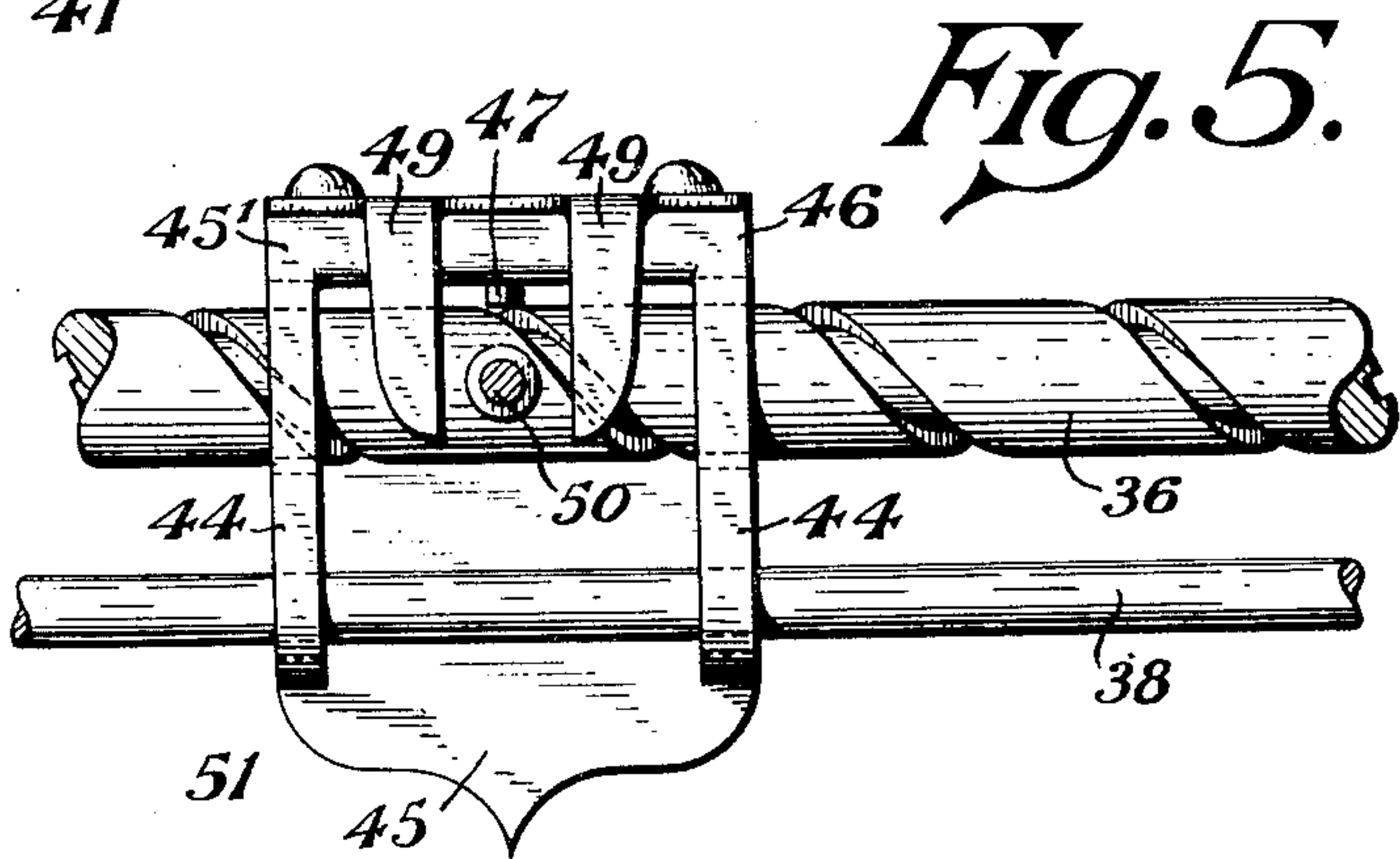
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7 SHEETS—SHEET 3



*Fig. 4.*



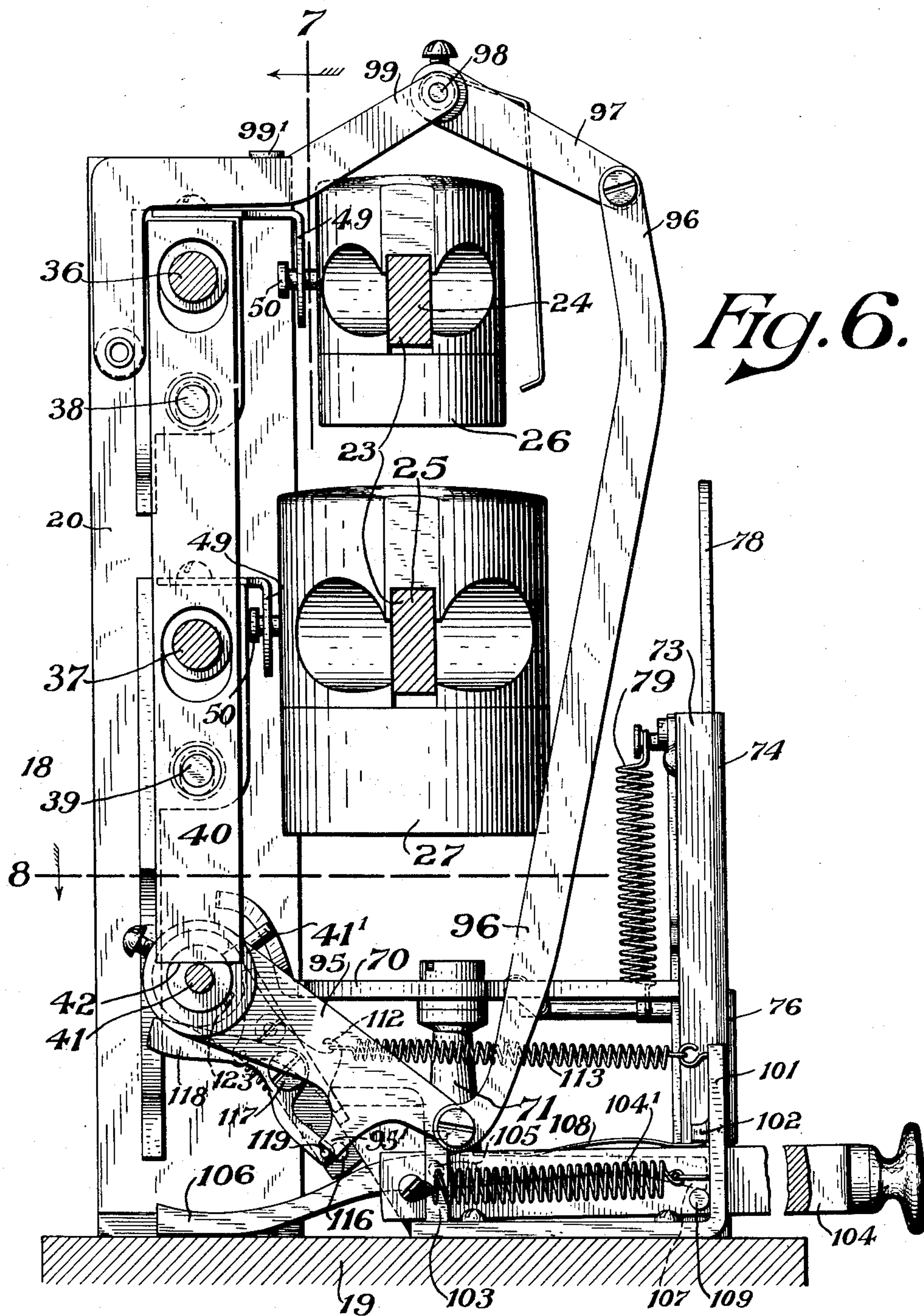
*Fig. 5.*

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7 SHEETS-SHEET 4



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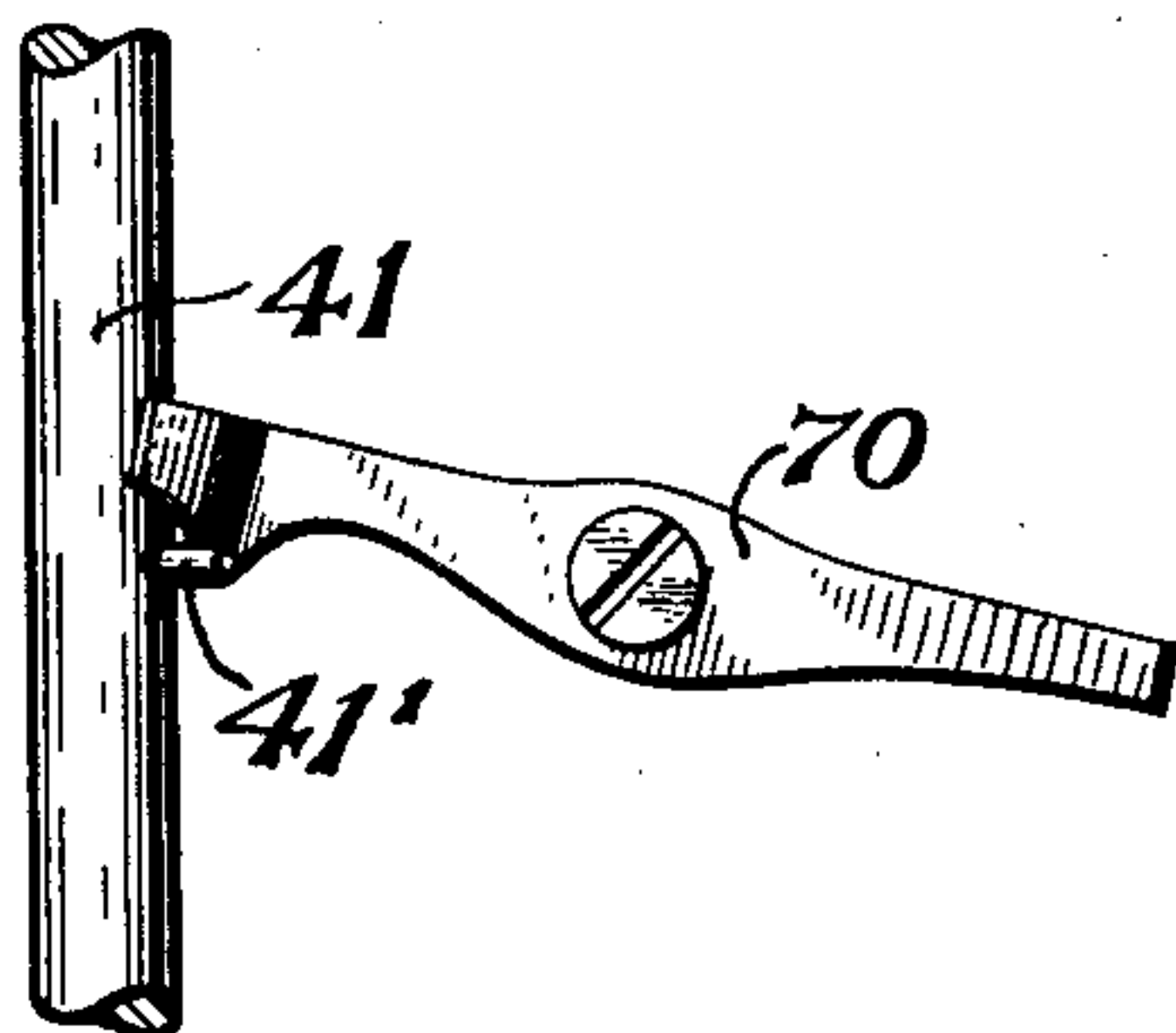
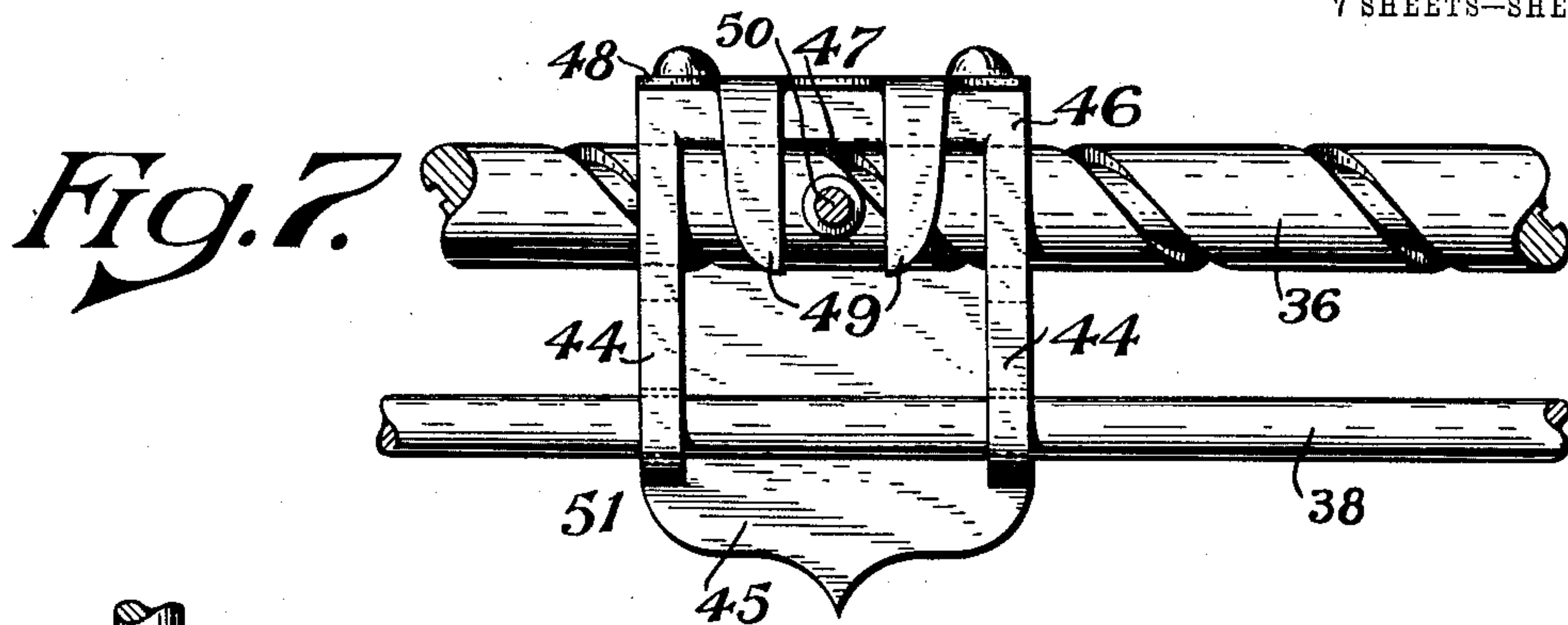


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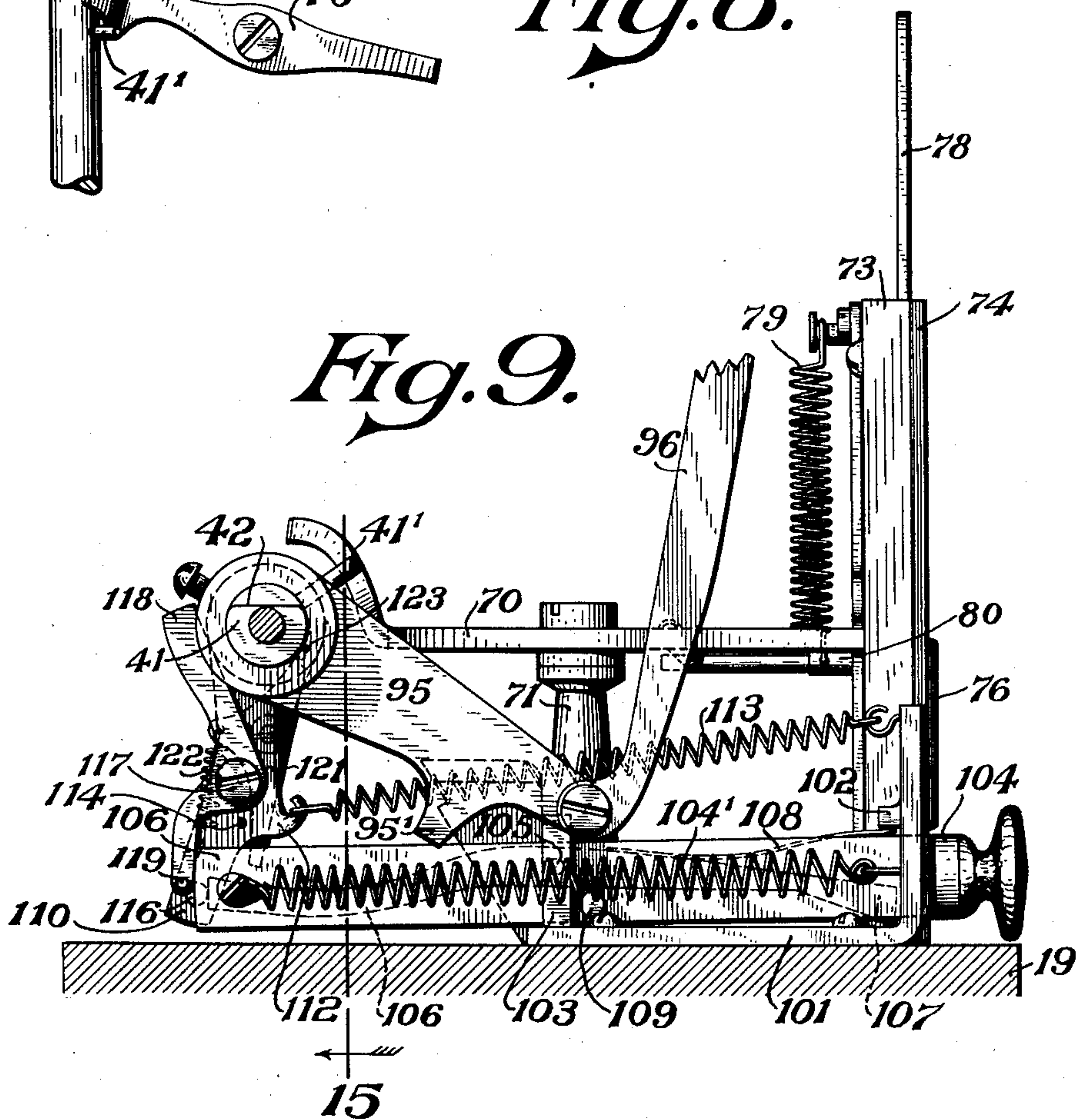
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7 SHEETS—SHEET 5.



*Fig. 8.*



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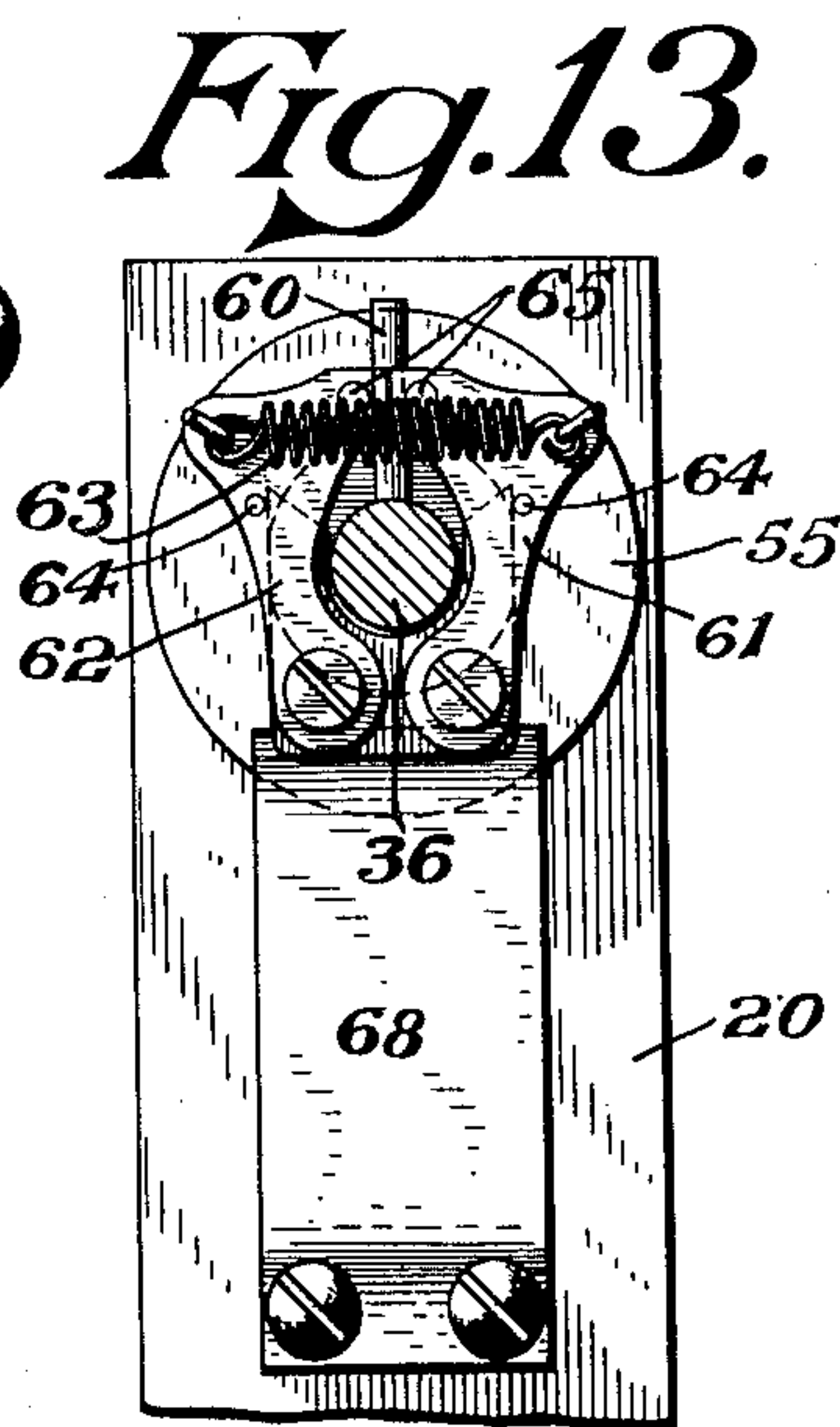
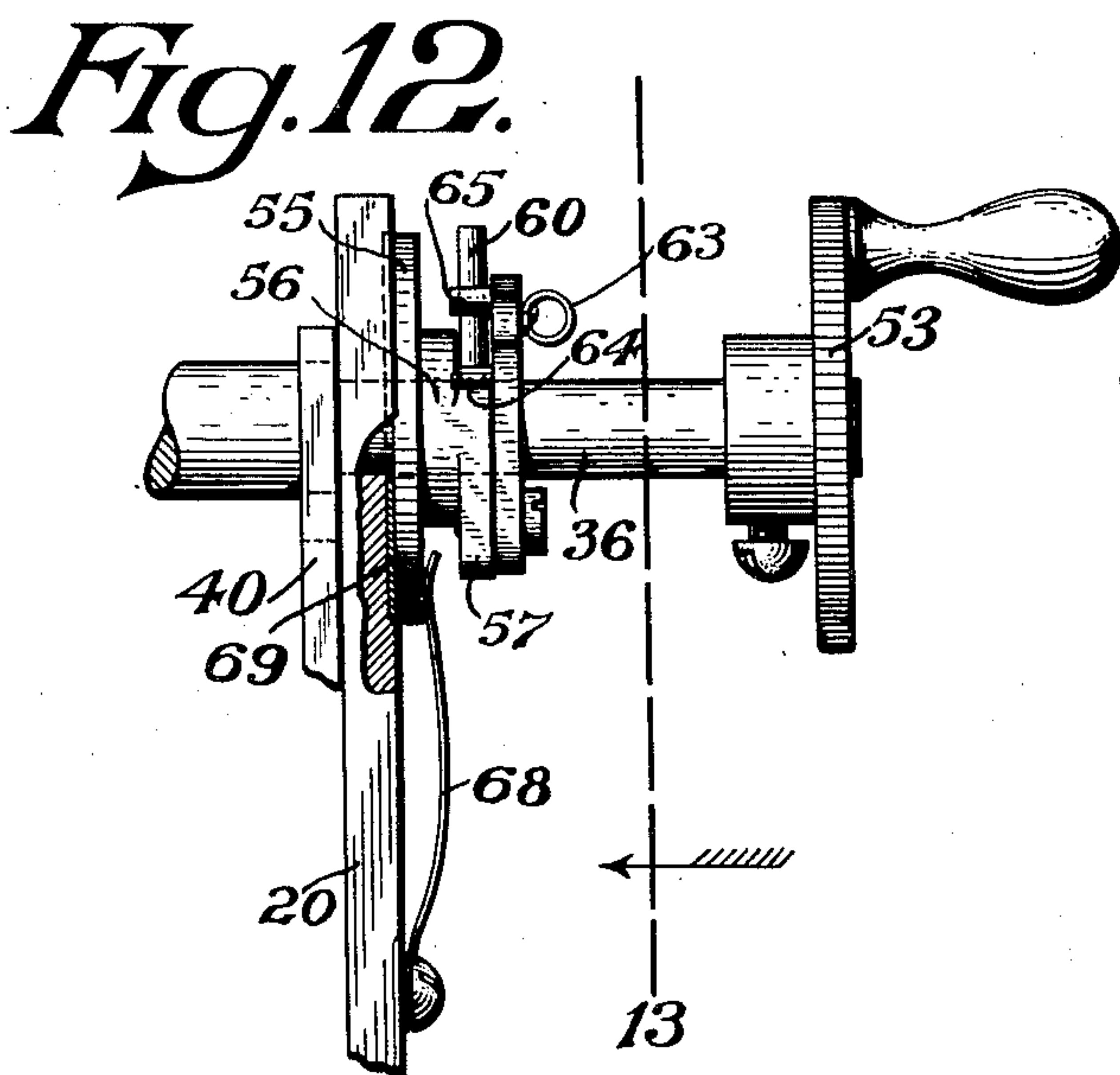
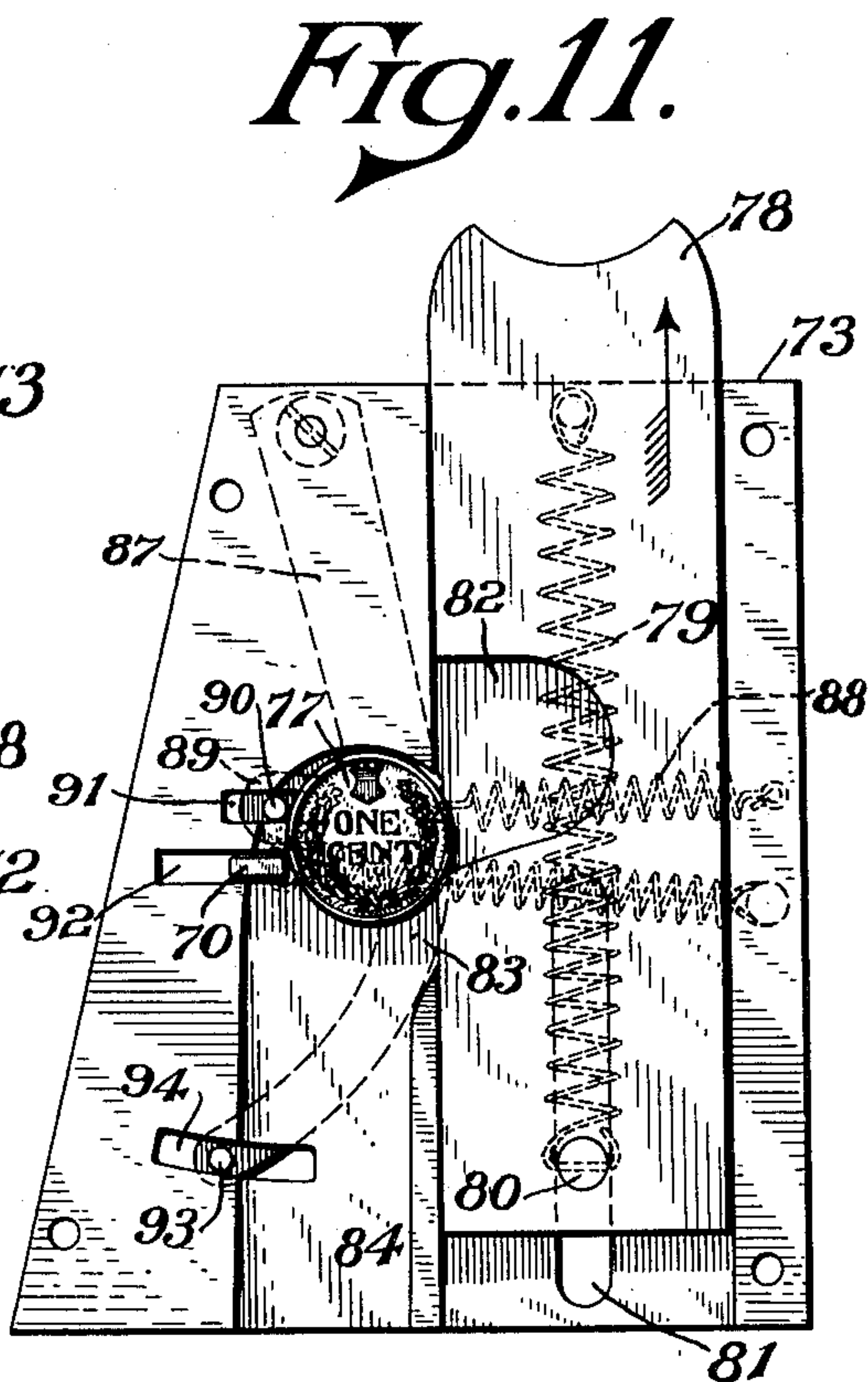
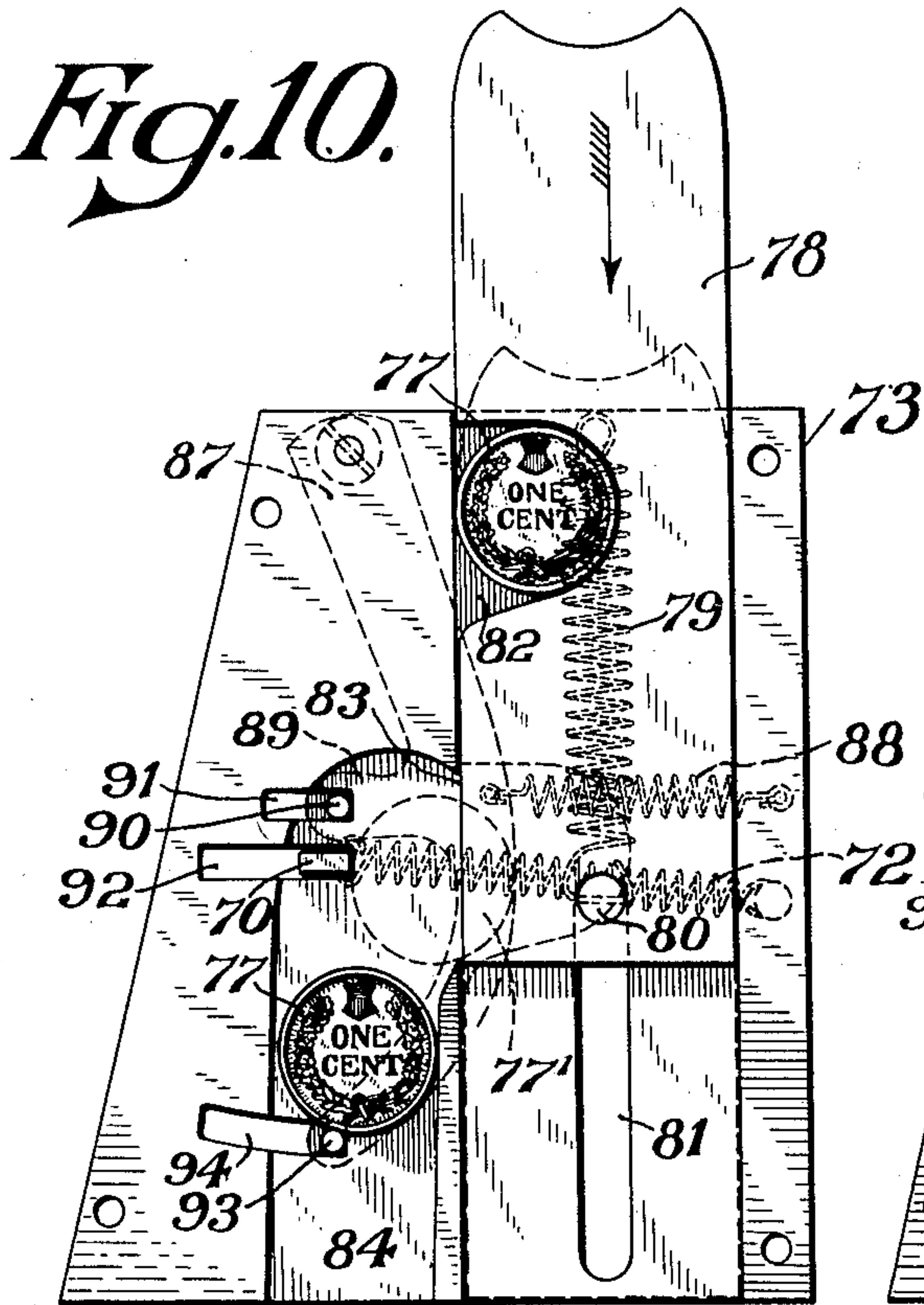
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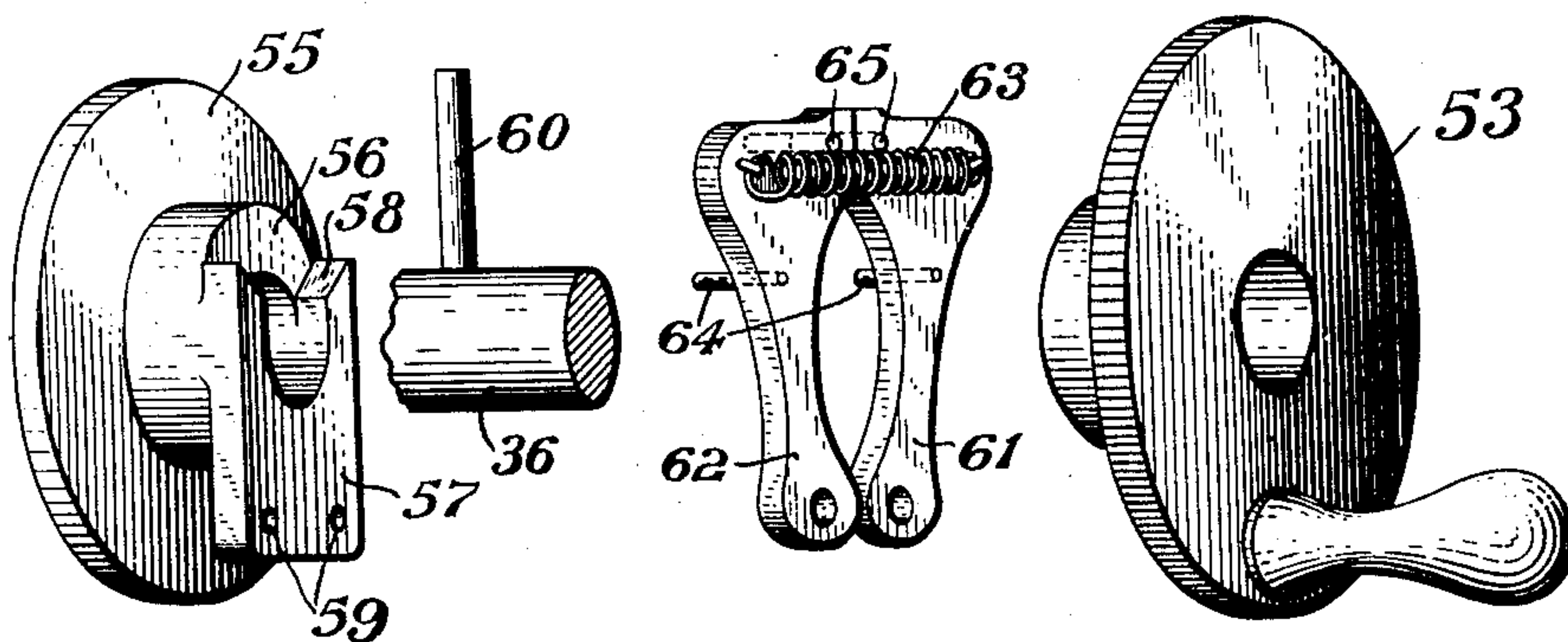
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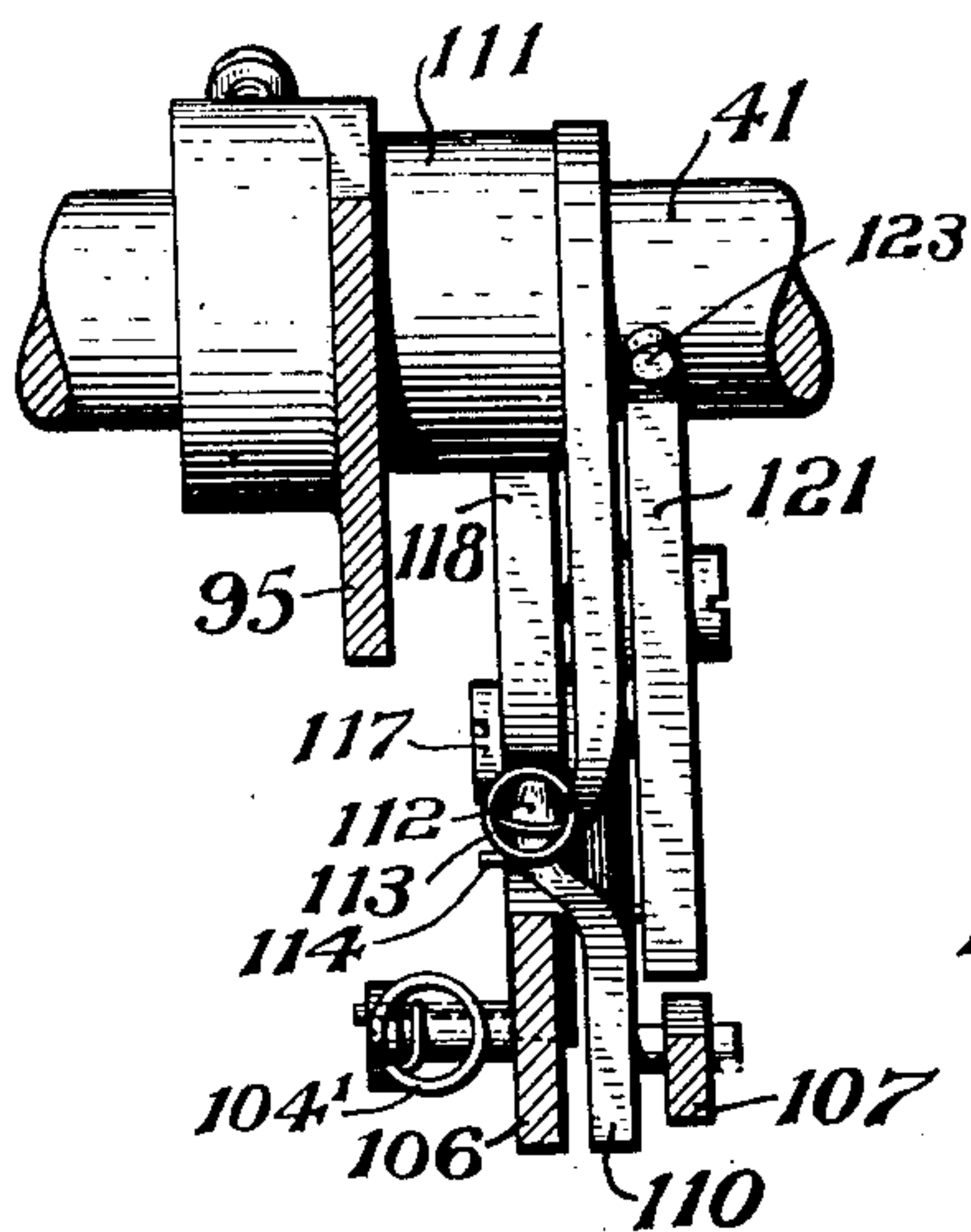
Patented Oct. 6, 1908.

7 SHEETS—SHEET 7.

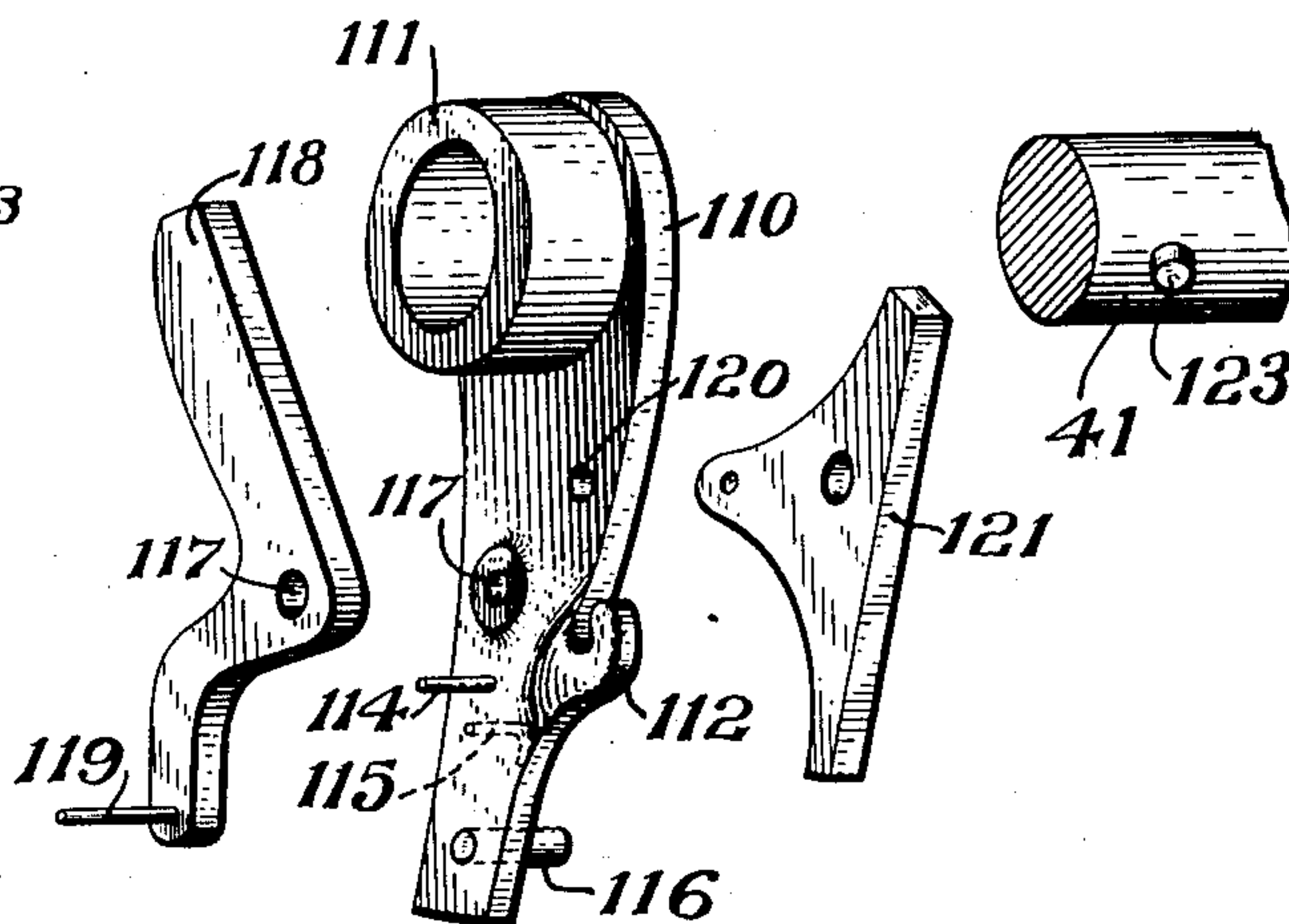
*Fig. 14.*



*Fig. 15.*



*Fig. 16.*



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# UNITED STATES PATENT OFFICE.

HERBERT S. MILLS, OF CHICAGO, ILLINOIS.

## COIN-OPERATED WEIGHING-SCALE.

No. 900,409.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed March 31, 1908. Serial No. 424,390.

*To all whom it may concern:*

Be it known that I, HERBERT S. MILLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Coin-Operated Weighing-Scales, of which the following is a specification.

The object of my invention is to provide a novel construction of weighing-scale whereby it shall be normally in locked condition against movement of the sliding weight and shall require the insertion of a coin to unlock the mechanism and adapt the weight to be moved for operating the scale.

In the accompanying drawings—Figure 1 is a broken view showing the head-portion of an ordinary type of weighing-scale provided with my improvements; Fig. 2, an enlarged section on line 2, Fig. 1; Fig. 3, a broken plan view showing the coin-tripped locking-lever in engagement with its locking-stud on a rock-shaft, the view being regarded in the direction of the arrow on line 3, Fig. 2; Fig. 4, an enlarged section on the irregular line 4, Fig. 1, showing the weights and their moving mechanism; Fig. 5, a broken section on line 5, Fig. 4; Fig. 6, a view like that presented in Fig. 2, but showing certain parts in a different position; Fig. 7, a broken section on line 7, Fig. 6; Fig. 8, a view like that presented in Fig. 3, but showing the coin-tripped lever in its unlocked position, the view being regarded on line 8, Fig. 6; Fig. 9, a view in sectional elevation of the plunger-restored mechanism shown in the lower parts of Figs. 2 and 6, but represented in the condition to which they are reduced by forcing the plunger inward to its full extent; Fig. 10, a view in elevation of the coin-chute device with its covering-plate removed and showing the parts in normal position, with the vertical push-bar represented by dotted lines in its completely depressed position; Fig. 11, a view like that presented in Fig. 10, but with the push-bar returning to normal position and the mechanism it actuates in the position to which it is brought by such return; Fig. 12, an enlarged broken view in front elevation showing the clutch-mechanism provided on each weight-propelling screw-shaft; Fig. 13, a section on line 13, Fig. 12; Fig. 14, a partly broken view showing in

perspective the different parts of the clutch mechanism in unassembled relation; Fig. 15, a section on line 15, Fig. 9, and Fig. 16, a view like that presented in Fig. 14, showing in unassembled relation the several parts of the mechanism for restoring the locking rock-shaft for the coin-tripped lever to normal position.

The general construction of the weighing-scale illustrated for showing the embodiment of my improvement is that of an ordinary type of platform-scale, so that it is unnecessary to encumber the drawings with the platform and its contained mechanism, especially since the features of the improvement are all applied to the beam-portion of the scale.

On the hollow standard 17 which rises from the scale-platform (not shown) is stably supported the head 18, consisting of a base 19 with vertical bearing-plates 20 and 21 extending from its ends. On the base is the fulcrum-post 22 for the scale-beam 23 formed with the upper and lower bars 24 and 25 for the shiftable weights 26 and 27, respectively, being joined at their forward ends, from which extends a pointer 28, and at their rear ends by a yoke 29 containing the usual poise-adjusting weight 30. Between the yoke and the fulcrum-point 31 the beam is connected, as usual, by a link 32 with a hook on the upper end of a rod 33 through the medium of which the connection is made with the scale-platform. The pointer 28 is represented as passing through the upper bifurcated end of a post 34 rising from the base and carrying a locking-dog 35 for the usual purpose of confining the scale-beam against movement when the scale is not being used.

The novel features involve the following-described construction: Journaled in the end-plates of the head 18 is the spirally-grooved shaft 36, or screw-shaft, adjacent to the bar 24, and a similar screw-shaft 37 is journaled in the end-plates to extend adjacent to the bar 25, each of these shafts projecting beyond the plate 20 and carrying a similar clutch-device, for the purpose hereinafter explained, the details of which are illustrated in Fig. 14. Guide-rods 38 and 39 extend, respectively, underneath the shaft 36 and the shaft 37, between, and they connect, two similar vertically movable plates 40, 40, which bear against the inner surfaces of the



plates 20 and 21 and rest at their lower extremities on the end-portions of a rock-shaft 41 journaled in the said head-plates, which end-portions are reduced by correspondingly flattened sections like that represented at 42, in Figs. 2, 4 and 9. The rod 38 extends through elongated slots 43 in the lower ends of two similar parallel ears 44 extending at right-angles from a shield-shaped back-plate 45 formed with a cross-head 45<sup>1</sup> joining the ears, preferably as an integral casting, these ears also containing alining upper elongated slots 46 through which the screw-shaft 36 extends to be engaged at its spiral-groove by a stud 47 depending from the head 45<sup>1</sup>; and on the top-of the head is secured a plate 48 carrying dependingly from its forward edge parallel fingers 49 to straddle a stud 50 projecting into their path from the rear side of the sliding weight 26. The elements carried by the back 45 constitute a device 51 for rendering the shaft 36 normally inoperative as and for the purpose hereinafter explained; and a device 52, similar thereto in every detail and normally carried by the guide-rod 39 in the same way as the device 51 is carried by the rod 38, is provided for rendering in like manner the shaft 37 normally inoperative. On the projecting end of the shaft 36, which carries a crank-disk 53 forming the operating handle, is provided a clutch-device 54 shown in Figs. 12 and 13 and more in detail in Fig. 14, and involving the following-described construction: A disk 55 loosely surrounding the shaft is provided with a concentric hub 56 extending from its outer face and terminating in a depending flat-faced flange 57 having a recess 58 of substantial V-shape formed in one end with pivot-holes 59 in its opposite end. Where the shaft 36 passes centrally through this hub and disk it carries rigidly an abutment-pin 60 to engage the inclined shoulders of the recess 58. Two similar jaws 61 and 62 are pivotally supported at corresponding ends on the flange 57 at the points 59 and are resiliently held in abutting engagement at their free ends by a spring 63. These jaws carry, to extend from corresponding faces, similar studs 64, 64 to embrace between them the side-edges of the flange 57; and from the same faces of the jaws, near their abutting ends, extend the studs 65, 65 to straddle the abutment-pin 60. A similar clutch-device 66 is provided on the projecting end of the shaft 37, which carries an operating-handle 67 like the crank-disk 53.

The purpose of the clutch-device in each instance is to prevent, while the scale is performing its weighing function, frictional contact of either finger 49 with the stud 50 on the respective sliding weight, thereby to avoid the impediment which such frictional contact would occasion to the free movement of the scale-beam and render it inaccurate in

the performance of its function; and the operation of the clutch-device to this end is as follows: With a device 51 or 52 in its lowermost position, to which it is brought as hereinafter described, the stud 47 projects into the groove in the respective screw-shaft, whereby rotation of the shaft through the medium of its operating handle causes such device to travel along it and by engaging a finger 49 with the stud 50 on the respective weight, slide the latter along its scale-bar. Thus turning the shaft in one direction or the other brings its pins 60 into engagement with a stud 65 to move the jaw carrying that stud against the resistance of the spring 63 away from its companion-jaw held by the abutment of the stud 64 thereon against the adjacent side of the flange 57, and the continued turning of the shaft brings the pin 60 against a shoulder of the recess 58 to turn the disk 55 against the resistance of its friction-hold 68, 69. When, therefore, turning of the screw-shaft has brought the sliding-weight to the desired point on its bar of the scale-beam, release of the operating-handle permits the spring 63 to act by its recoil to restore the distended jaw into the abutting relation with its companion-jaw, and in thus returning, the stud 65 carried by it encounters the pin 60 to reverse the screw-shaft and cause its coöperation with the respective stud 47 to move the device 51 or 52, as the case may be, accordingly to place the fingers 49 out of contact with and at approximately equal distances from the weight-stud 50. The disk 55, since the recoil-force of the spring 63 is insufficient to overcome the pressure of the spring 68, remains in the position to which it was thus turned until the scale is again operated, when it will be turned further in the same direction or in the contrary direction, depending on the direction of turning the screw-shaft to perform the weighing function.

The normal position of the rock-shaft 41 is with its flattened end-portions out of registration with the vertically-movable plates 40, whereby the latter bear against cylindrical parts of the shaft (see Fig. 2) to hold these plates in raised position for rendering the scale inoperative; and this position of the rock-shaft is maintained by engagement of a stop-pin 41<sup>1</sup> upon it with the extremity of the upwardly curved end of a lever 70 fulcrumed between its ends on a post 71, rising from the base 19, to turn horizontally against the resistance of a spring 72 Fig. 10, connected with its opposite end forming the coin-tripped part of a mechanism.

The coin-receiver 73 (Figs. 10 and 11) rises in accessible position from the base 19 in proximity to the lever 70 and comprises a case provided with a face-plate 74 (Fig. 1) containing a coin-insertion opening 75 near its upper end and a glass-covered opening



76 near its lower end through which to expose the inserted coin 77. In the casing is formed a vertical guide in which is reciprocatingly confined a push-bar 78 resiliently sustained in raised position by a spring 79 connected at one end with the casing and at its opposite end to a stud 80 on the bar, working in a slot 81 in the back of the casing for limiting the movements of the push-bar, which contains in one lateral edge a recess 82 having a downwardly inclined base and which registers with the coin-insertion opening 75 in the raised position of the bar. The vertical guide for the push-bar contains in one of its walls an opening 83 for the escape of the inserted coin into a chute 84 formed in the inner face of the back of the casing, and leading through the base 19 into a suitable coin-depository 85 represented in Fig. 1 as contained in a bracket 86 extending from the standard 17 to supplement the latter in supporting the head of the scale. On the back of the casing of the coin-receiver, near its top, is fulcrumed at one end a curved lever 87 retractable under the recoil-force of a spring 88 connecting it with the casing and provided between its ends with a finger 89 carrying a laterally extending stud 90, which projects into the chute 77 through a slot 91 formed in the rear casing-wall just above a longer slot 92 provided therein and through which the free end of the lever 70 projects into the coin-chute; and the lower end of the curved lever 87 carries a stud 93 which projects into the coin-chute near its lower end through a slot 94, shown slightly curved, provided in the rear wall of the casing. Thus when a coin is inserted at the opening 75 into the recess 82 in the push-bar, depression of the latter carries the coin to the opening 83, whence it rolls part way, but past its center of gravity, into the chute to the position indicated at 77<sup>1</sup> in Fig. 10, wherein it encounters the lower end of the opening and the end in its path of the lever 70. The rise of the push-bar under the force of its spring forces the coin against the lever 70 to turn it on its fulcrum 71 and move its bent end out of the path of the pin 41<sup>1</sup> on the rock-shaft 41. In thus turning the lever 70 the coin impinges against the stud 90 to turn the lever 87 in opposition to the spring 88 and thereby move the stud 93 out of the path of a previously inserted coin. This last-named stud affords an arresting coin-seat to expose the coin at the opening 76, and when the stud is thus moved out of the path of the coin, the latter drops into the depository 85. When, with the rise of the push-bar, the last-inserted coin has fully entered the chute, it frees the stud 90 to permit the lever 87 to be retracted by its spring 88 into normal position, thereby bringing the stud 93 into its seat-forming

position to arrest that coin at the point of its display.

By tripping the lever 70 in the manner described to turn it out of the path of the pin 41<sup>1</sup>, the rock-shaft is turned to present its flattened sections uppermost, thereby permitting the plates 40 to drop by gravity and bear against those sections to engage the studs 47 with the spiral grooves in the shafts 36 and 37 and thereby reduce the scale to a condition to be operated as described. When the lever 70 has been thus tripped, the rock-shaft is turned as stated by the gravity of mechanism connected with it, described as follows: On the shaft 41, near one end thereof, is secured to turn with it a crank-arm 95 having its free end connected by a link 96 with one end of an arm 97, the other end of which is secured to a rod 98 extending between and connecting the free-ends of bent levers 99, fulcrumed on the plates 40 at their inner sides (Figs. 1 and 2). The rod 98 carries a forwardly and downwardly extending shield 100, whereby, when the rock-shaft 41 turns under the weight of the crank-arm 95 and the described parts connected with it, the resultant movement of the crank-arm draws with it the levers 99 until they rest at 99<sup>1</sup> upon them against the upper ends of the frame-ends 20, 21, thereby moving the shield into the position shown in Fig. 6, wherein it covers the numbered face of the scale-bar 24 to hide it from view. By thus concealing this face during the operation of gaining the poise of the scale-beam under the weight of a person standing on the scale-platform, such weight is not ascertainable until the parts of the mechanism, including the shield, have been restored to normal position, the object of the concealment being to prevent repeated operation of the scale without first restoring the parts to normal position requiring the insertion of another coin to reduce the mechanism to operative condition. For so restoring the mechanism means are employed, (shown in detail in Figs. 2, 6, 9, 15 and 16) of which the following is a description: A rectangular bearing-plate 101 is securely fastened on the base 19 near the left-hand end of the scale-head and is provided on the inner face of its forward upright section with a lug 102, and on the inner end of its horizontal section with an upright wall 103. A plunger 104 works through alining openings in the aforesaid forward section and said wall and has a spring connection 104<sup>1</sup> from its inner end with the forward section. On the wall 103 is fulcrumed at 105, between its ends, a lever 106 curved toward its inner end and terminating at its opposite end in a cam-like head 107 against which, in its normally raised position, a leaf-spring 108 acts, being fastened at one end to the upper side of the lever and projecting at its free end, for con-



finement, underneath the lug 102. The plunger carries on its side along which the lever 106 extends, a stud 109 to ride against the under side of the lever in the movements of the plunger. An arm 110 loosely surrounds, at its hub 111 on one end, the rock-shaft 41 and is provided on one edge with a hook 112 from which it is connected by a spring 113 with the plate 101, and carries projecting from one side a stud 114 and from its opposite side the studs 115 and 116. To the outer face of the arm 110 is pivoted at 117 a gravity-pawl 118 carrying on its lower end a laterally-extending stud 119 to project into the path of a finger 95<sup>1</sup> on the crank-arm 95; and on the opposite side of the arm 110 is pivoted at 120 a pawl 121 connected by a spring 122 with the said arm at the stud 115 to project normally at its upper end into the path of a stud 123 on the rock-shaft 41.

After the scale has been caused to perform its balancing purpose in the manner described, by pushing inward the plunger 104 the mechanism is restored to normal condition as follows: In the drop of the crank-arm 95 its finger 95<sup>1</sup> was brought to bear against the stud 119 on the pawl 118, as represented in Fig. 6, to depress the end of the pawl into the path of the plunger. The inward movement of the plunger rides its stud 109 from underneath the cam-head 107 of the lever 106, thereby tilting that lever under the action of the spring 108 to raise its inner end into the path of the stud 116 on the arm 110. In the continued inward movement of the plunger its inner end encounters the pawl 118 and turns its upper end into bearing contact with the hub of the arm 110, whereby thenceforward further movement of the pawl moves with it the arm and the stud 116 is caused to ride upon the upper curved surface of the inner end-portion of the lever 106 to depress that end until the stud 116 clears the extremity thereof to abut against the same. In this turning movement of the arm it turns with it the spring-pawl 121 to snap it over and into engagement with the stud 123 on the rock-shaft. On releasing the plunger, in moving outward under the stress of its controlling-spring 104<sup>1</sup>, the stud 109, by its engagement with the cam-end of the lever 106, raises the same thereby depressing its opposite end out of engagement with the stud 116, this engagement having effected the locking of the arm 110 and parts carried by it in the position represented in Fig. 9. Thus freed, the spring 113 acts to turn the arm 110 suddenly back to its normal position, thereby engaging the pawl 121 with the stud 123 to turn the rock-shaft accordingly, and with it the crank-arm 95 to raise the shield 100 and disclose the weight indication on the scale-beam

and bring the stud 41<sup>1</sup> into position to be engaged by the inner end of the lever 70, the spring 72 of which turns it back to its position of such engagement. With the parts of the mechanism thus restored the machine is in position to be again operated in the manner described upon inserting a coin.

What I claim as new and desire to secure by Letters Patent is—

1. In a weighing scale, the combination with a scale-beam and a movable weight co-operating therewith, of a rotatable screw-shaft, a releasable connection between said shaft and weight for actuating the weight to adjust it relative to the beam, and means normally holding said connection out of operating engagement with said shaft, for the purpose set forth.

2. In a weighing-scale, the combination with a scale-beam and a movable weight co-operating therewith, of a rotatable screw-shaft, a releasable connection between said shaft and weight for actuating the weight to adjust it relative to the beam, and means, including a beam-covering shield, normally holding said connection out of operating engagement with said shaft and said shield out of its beam-covering position, for the purpose set forth.

3. In a weighing-scale, the combination with a scale-beam and a movable weight co-operating therewith, of a rotatable screw-shaft, a releasable connection between said shaft and weight for actuating the weight to adjust it relatively to the beam, an automatic clutch-device on said shaft operating to reverse its movement, and means normally holding said connection out of operating engagement with said shaft, for the purpose set forth.

4. In a weighing-scale, the combination with a scale-beam and a movable weight co-operating therewith, of a rotatable screw-shaft, a releasable connection between said shaft and weight for actuating the weight to adjust it relative to the beam, means normally holding said connection out of operating engagement with said shaft, and plunger-operated mechanism for restoring said means and connection to normal position after being released therefrom, for the purpose set forth.

5. In a weighing-scale, the combination with a scale-beam and a movable weight co-operating therewith, of a rotatable screw-shaft, a releasable connection between said shaft and weight for actuating the weight to adjust it relative to the beam, vertically movable connected plates carrying said connection, a rock-shaft having reduced end-portions on which said plates are supported, and means normally locking the rock-shaft to maintain said plates in raised position to support said connection out of operating



engagement with said screw-shaft, for the purpose set forth.

6. In a weighing-scale, the combination with a scale-beam and a movable weight co-  
 5 operating therewith, of a rotatable screw-shaft having a releasable actuating-connection with the weight for adjusting it relative to the beam, vertically movable connected plates carrying said connection, a  
 10 beam-covering shield pivotally supported on said plates, a rock-shaft with which said shield is connected and having reduced end-portions on which said plates are supported, and means normally locking the rock-shaft  
 15 to maintain said plates and shield in raised position, for the purpose set forth.

7. In a weighing-scale, the combination with a scale-beam and a movable weight co-  
 20 operating therewith, of a rotatable screw-shaft having a releasable actuating-connection with the weight for adjusting it relative to the beam, vertically movable connected plates carrying said connection, a  
 25 rock-shaft having reduced end-portions on which said plates are supported, means normally locking the rock-shaft to maintain said plates in raised position, and plunger-operated mechanism for restoring the rock-shaft to locked engagement with said means  
 30 after being released therefrom, for the purpose set forth.

8. In a weighing-scale, the combination with a scale-beam and a movable weight co-  
 35 operating therewith, of a rotatable screw-shaft, a releasable connection between said shaft and weight for actuating the weight to adjust it relative to the beam, means normally holding said connection out of operating engagement with said shaft, and a  
 40 clutch-device in said shaft comprising a disk carrying on one side a flange provided with a V-shaped recess, an abutment-pin on said shaft engaging the shoulders presented by said recess, and spring-connected jaws piv-  
 45 oted on and carrying studs embracing said flange, and studs on the free ends of the jaws between which said pin extends, for the purpose set forth.

9. In a weighing-scale, the combination with a scale-beam and a movable weight co-  
 50 operating therewith, of a rotatable screw-shaft, a rock-shaft having reduced end-portions, vertically movable plates connected by a rod and resting on the end-portions of the rock-shaft, connected ears containing upper  
 55 elongated slots through which the screw-shaft passes and carrying a stud to engage the spiral groove therein and containing lower elongated slots through which said  
 60 rod passes, fingers carried by said ears and a stud extending from the weight between said ears, and means normally locking the rock-shaft to maintain said plates in raised position, for the purpose set forth.

10. In a weighing-scale, the combination 65 with a scale-beam and a movable weight co-operating therewith, of a rotatable screw-shaft having a releasable actuating-connection with the weight for adjusting it relative to the beam, vertically movable con- 70 nected plates carrying said connection, a rock-shaft having reduced end-portions on which said plates are supported and carrying a stud, a spring-retracted lever normally engaging said stud to lock the rock-shaft, 75 and tripping-mechanism for disengaging said lever from said stud on the rock-shaft, for the purpose set forth.

11. In a weighing-scale, the combination with a scale-beam and a movable weight co- 80 operating therewith, of a rotatable screw-shaft having a releasable actuating-connection with the weight for adjusting it relative to the beam, vertically movable connected plates carrying said connection, a 85 rock-shaft having reduced end-portions on which said plates are supported and carrying studs, a spring-retracted lever normally engaging one of said studs to lock the rock-shaft, mechanism for tripping said lever to 90 disengage it from said stud to unlock the rock-shaft, and means for restoring the rock-shaft to locked condition when released therefrom, comprising a crank-arm secured to the rock-shaft, a spring-pressed arm having a 95 hub at which it is journaled on the rock-shaft, a pawl pivoted on one side of said arm to extend into the path of a stud thereon and carrying a stud extending in the path of said crank-arm, a spring-pressed pawl 100 pivoted on the opposite side of said arm to engage the other stud on the rock-shaft, a lever fulcrumed between its ends, one of which terminates in a cam-head the other end coöperating with said arm, and a spring- 105 retracted plunger carrying a stud to ride against said cam-headed lever, for the purpose set forth.

12. In a weighing-scale, the combination with a scale-beam and a movable weight co- 110 operating therewith, of a rotatable screw-shaft having a releasable actuating-connection with the weight for adjusting it relative to the beam, vertically movable connected plates carrying said connection, a 115 rock-shaft having reduced end-portions on which said plates are supported and carrying studs, a spring-retracted lever normally engaging one of said studs to lock the rock-shaft, mechanism for tripping said lever to 120 disengage it from said stud to unlock the rock-shaft, a shield pivotally supported to cover in its lowered position said scale-beam, and means for restoring the rock-shaft to locked condition when released therefrom, 125 comprising a crank-arm on the rock-shaft connected at its free end with the shield, a spring-pressed arm having a hub at which



it is journaled on the rock-shaft, a pawl pivoted on one side of said arm to extend into the path of a stud thereon and carrying a stud extending into the path of said crank-arm, a spring-pressed pawl pivoted on the opposite side of said arm to engage the other stud on the rock-shaft, a lever fulcrumed between its ends, one of which terminates in

a cam-head the other end coöperating with said arm, and a spring-retracted plunger 10 carrying a stud to ride against said cam-headed lever, for the purpose set forth.

HERBERT S. MILLS.

In presence of—

F. T. BUTTOMER,  
M. J. KELLY.