No. 763,203. PATENTED JUNE 21, 1904.

H. POTTIN & L. M. DE LOGELIÈRE.

WEIGHT REGISTERING WEIGHING MACHINE.

APPLICATION FILED MAR. 15, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

FIG. 1.

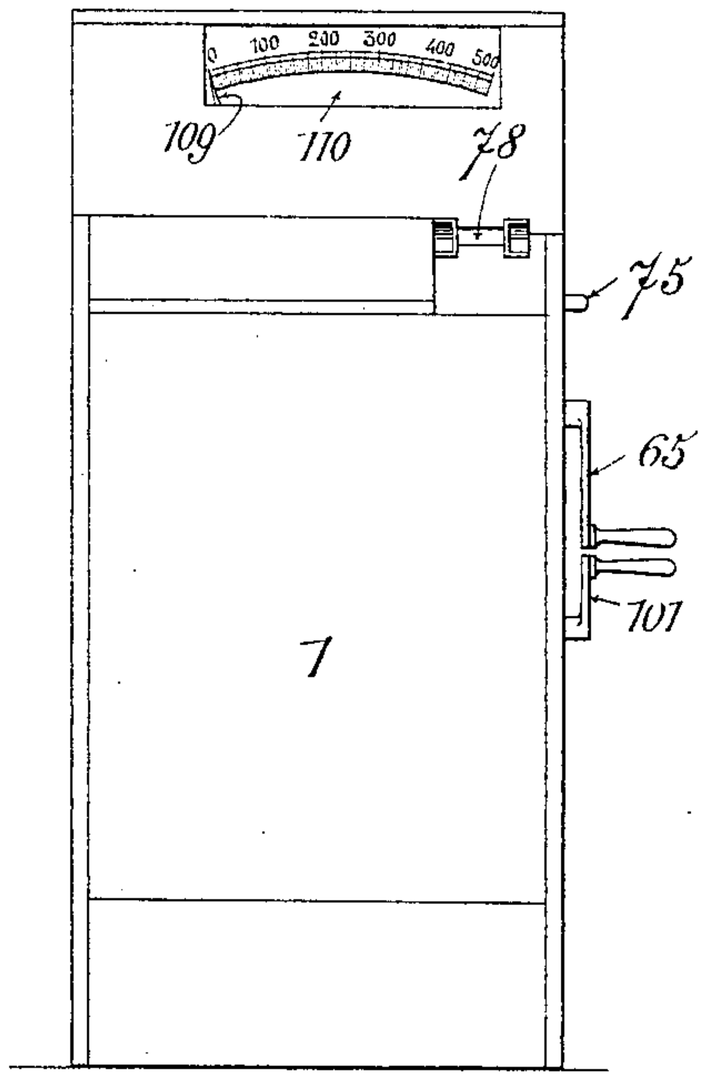
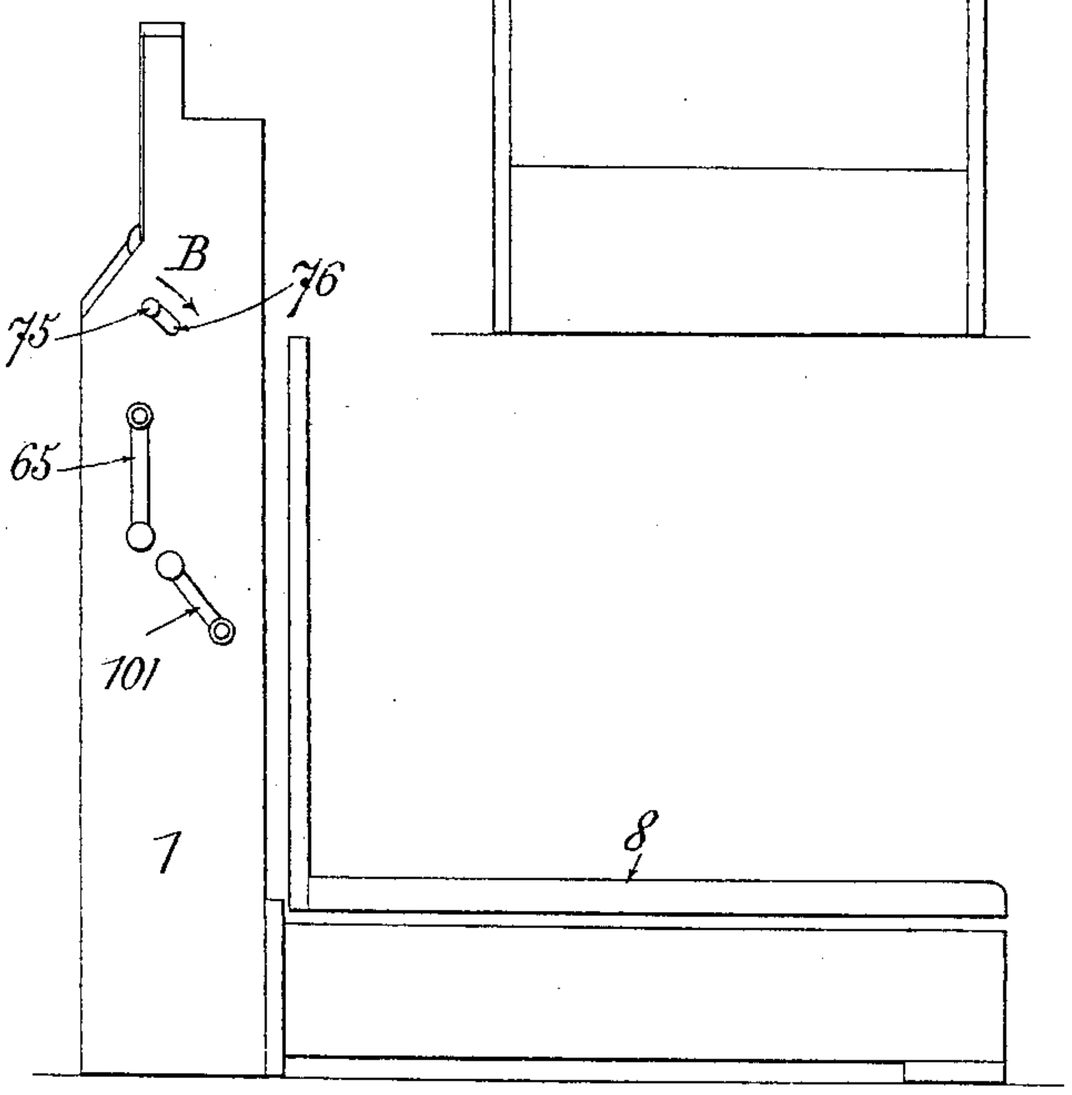


FIG. 2.



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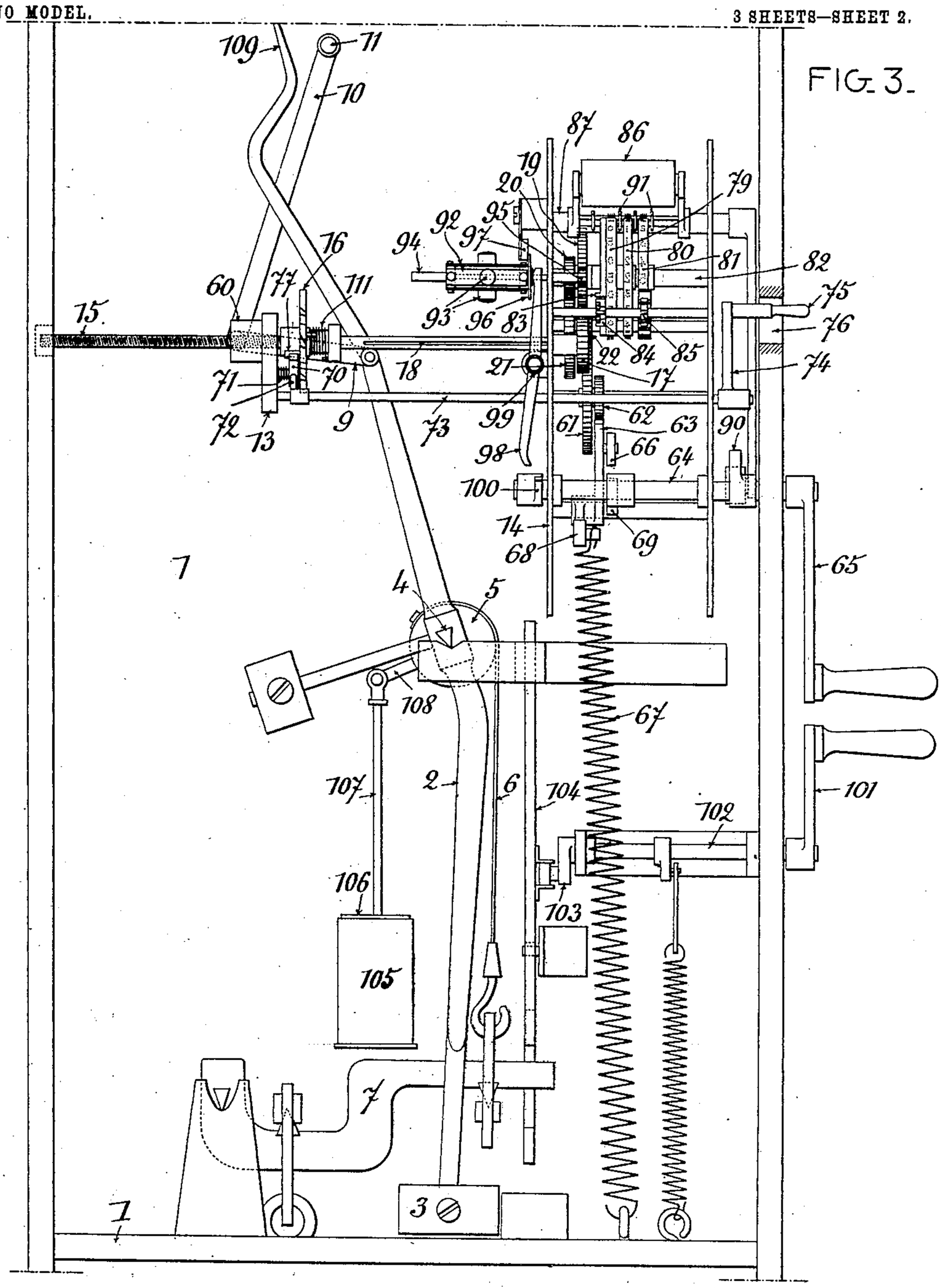
NO MODEL. 3 SHEETS—SHEET 2.

FIG. 3.



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NO. MODEL. 3 SHEETS—SHEET 3.

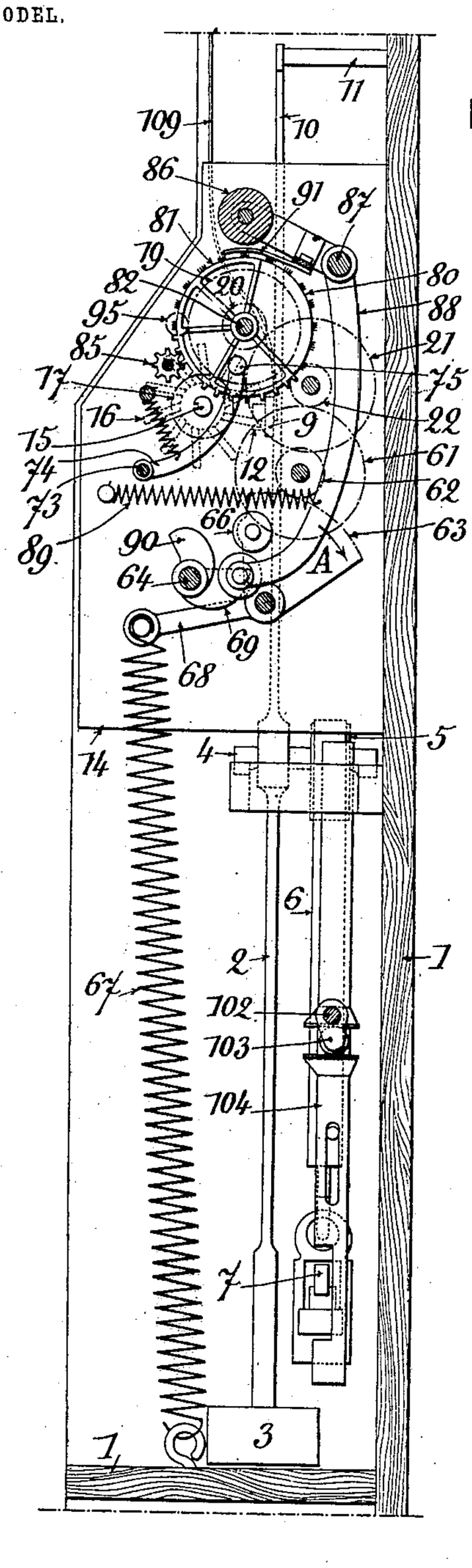


FIG. 4.

FIG. 5.

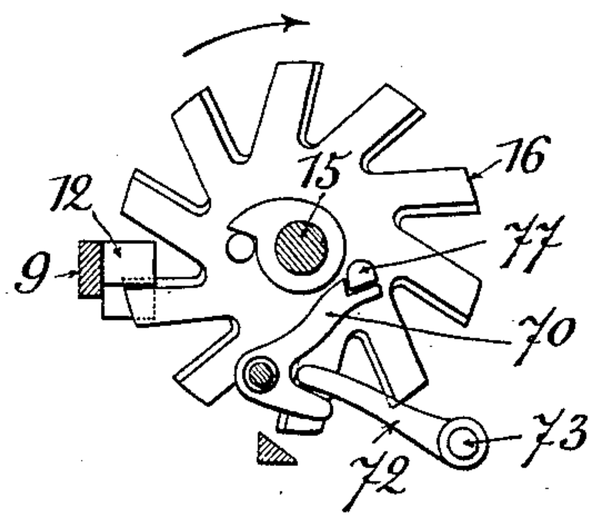
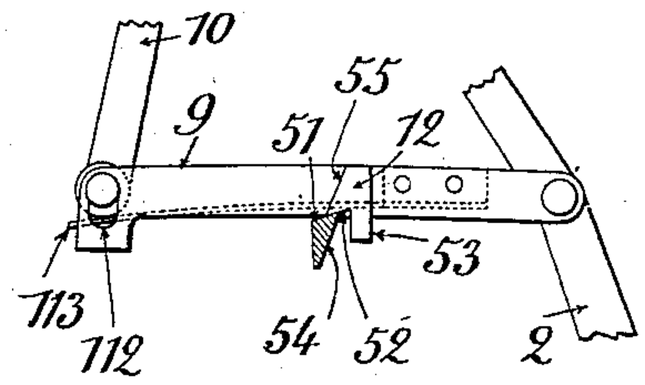


FIG. 6.



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UNITED STATES PATENT OFFICE.

HENRY POTTIN AND LÉONCE MERLET DE LOGELIÈRE, OF PARIS, FRANCE.

WEIGHT-REGISTERING WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 763,203, dated June 21, 1904.

Application filed March 15, 1904. Serial No. 198,215. (No model.)

To all whom it may concern:

Be it known that we, HENRY POTTIN, residing at 100 St. Lazare street, and LÉONCE MERLET DE LOGELIÈRE, residing at 25 Caumartin street, Paris, in the Republic of France, engineers, citizens of the Republic of France, have invented certain new and useful Improvements in Weight-Registering Weighing-Machines, of which the following is a specification.

This invention relates to a weight-registering weighing-machine so constructed as to supply a permanent control of the weighings effected.

In this machine the movable scale or plate which receives the matter to be weighed is so connected, by a suitable system of levers, with a cursor moving in a rectilinear direction and with an equipoise member, such as a balance-weight or a spring, that for each value of the matter or load to be weighed the cursor takes up a determined position. The apparatus also comprises a mechanism for registering the weighings intended to be operated after the weighing-machine has come into a position of stable equilibrium. This mechanism comprises in principle, first, a stopping device moving in a helix the axis of which is parallel to the direction in which the cursor moves so as to meet the latter; secondly, means independent of the load to be weighed for moving the said stopping device, and, thirdly, a reckoning and registering contrivance in which wheels having figures on their rims are so arranged as to revolve to a variable extent corresponding to the greater or less amount of rotation which the said stopping device is to effect from its invariable starting-point up to the point where it meets the cursor, the said rotation being consequently in relation with the load to be weighed. The said wheels are also so arranged as to produce, either on a continuous strip of paper or on a detached sheet or bulletin and either by perforation or printing, the reproduction of the figures on the said wheels, thus supplying an automatic and certain control of the weighings.

An important feature of this contrivance consists in that the "weighing-machine," properly so called, is independent of registering mechanism and takes up its position of equipoise without moving any of the parts save its own levers and its cursor, which may be so arranged as to move without any sliding friction, so that the weighing-machine may be of the very greatest sensibility. There is also the result that as the registering mechanism is actuated independently of the load to be weighed it may be of very compact construction and made to fulfil a plurality of functions without in any way impairing either the sensibility or the precision of the apparatus. It may, for instance, involve, in combination with the device for reckoning the revolutions and with the device for registering the separate weighings, a device for showing the total of the weighings, &c.

The accompanying drawings show one form in which this invention can be carried out.

Figures 1 and 2 represent a front elevation and a side elevation, respectively, of the weighing-machine. Fig. 3 is a front elevation of the registering mechanism. Fig. 4 is a side elevation of the same mechanism. Fig. 5 is an elevation of a ratchet-wheel and pawl. Fig. 6 is a detail view of a connecting-rod.

On the main frame 1 of the weighing-machine is supported a lever 2, having a balance-weight 3 and which is fixed on a spindle 4. The latter also carries a wheel 5, connected by a ribbon 6 with the lever 7 of the weighing-machine, on which acts the load placed on the scale or plate 8.

The upper part of the lever 2 is connected by a link 9 with the lower end of a lever 10, oscillating at 11 on the main frame 1, and the said link carries a finger or cursor 12, which is thus caused to travel in a substantially rectilinear and horizontal path when the levers 2 and 10 are oscillated.

Under the action of the balance-weight 3 these several parts occupy the position shown in Figs. 1 and 2 when there is no load on the scale or plate 8. When any load is placed on the plate, the lever 7 draws the ribbon 6 downward and causes the wheel 5 to turn with the lever 2 in moving the balance-weight 3 out of the vertical line passing through the spindle

4 until equilibrium is reached. The cursor 12 is thus moved to an extent which is all the greater as the load is all the heavier.

In order that the displacement of the cursor shall be proportional to the load, the operative part of the wheel 5 is in the shape of a cam, which is suitably determined in respect to the lengths and inclinations of the arms of the lever 2.

On the main frame 1 are also fixed two bearings 13 and 14, the former of which is provided with an internally-screw-threaded sleeve for the passage of an externally-screw-threaded rod 15, while the latter bearing has a plain hole through which the said rod passes freely. On the rod 15 is fixed a stop 16 in the form of a star having ten arms, the ends of which describe equidistant spiral lines when the screw 15 turns and moves forward in its fixed nut 60. The axis of these spiral lines—that is to say, of the screw—is parallel to the path in which travels the cursor 12, so that the latter shall be met by the arms of the star.

The rotation of the screw 15 is obtained by means of a pinion 17, keyed to and slidably mounted on a part of the screw 15, which is provided with a groove 18; of a toothed wheel 19, meshing with the pinion 17 and integral with a pinion 20; of another toothed wheel, 21, meshing with the pinion 20 and integral with a pinion 22; of a third idle wheel 61, provided with a pinion 62, and of a toothed segment 63, meshing with the pinion 62. A cam 69, fixed on a shaft 64, which can be turned from the outside by means of crank-handle 65, allows of causing the toothed segment 63 to oscillate in the direction shown by the arrow A in Fig. 4, thus acting on a roller 66, mounted on the said toothed segment. On the other hand, a spring 67, attached to the main frame, pulls on a lever 68 on the toothed segment 63 and tends to turn the same in contrary direction to that of the arrow A. On account of this arrangement when the camshaft 69 is turned to the left, so as to cause the toothed segment to oscillate in the direction shown by the arrow, the spring 67 is expanded, and at the same time the screw 15 is caused to move forward toward the left, Fig. 3, until it reaches its position of rest. The mechanism is then set or locked in this position of rest by means of a contrivance comprising the support 13, on which is mounted a retaining-pawl 70, which can be moved downward against the action of a spring 71 by means of a lever 72, fixed to a shaft 73, the latter being provided with a crank 74, the handle 75 of which projects through an opening 76 in the main frame or casing. The star-wheel 16 carries a pin 77, which at the end of its spiral movement toward the left meets the pawl 70 and moves the same downward against the action of the spring 71 and then moves past the free end of the said pawl in thus preventing the star-wheel from moving toward the right. The result is that the toothed segment 63 after having been pushed by the cam 69 so as to bring the star-wheel 16 to the left and to expand the spring 67 can be released by the said cam without allowing the star-wheel to turn backward and to return to the right. The registering mechanism is thus set and ready to operate for the purpose of registering a weighing. Then one has only to push the handle 75 in the direction shown by the arrow, Fig. 2, to move the lever 72 downward and to move the pawl 70 away from the pin 77, so that the released star-wheel 16 turns and moves toward the right under the action of the spring 67 and through the medium of the hereinbefore-described gearing. This rotation continues until one of the arms of the star-wheel meets the cursor 12, which has been previously brought into a position of equilibrium by the action of a load on the weighing-machine. The rotation of the screw, limited in this manner, corresponds to the movement of the cursor, and consequently to the weight of the load or matter to be weighed.

In the machine shown in the drawings the figures indicating the weighings are reproduced by perforation in paper bulletins, which are inserted through a slit 78. (Shown in Fig. 1.) For that purpose three wheels 79 80 81 are mounted on the shaft 82 of the wheel 19 and carry on their periphery figures formed by points arranged in rows. The wheels 79 and 80 are rigidly fixed to the shaft 82 and turn together. The former carries ten "naughts" and ten "fives," arranged alternatively, and the latter carries two "naughts," two "ones," two "twos," and so on up to two "nines," these twenty figures being placed, respectively, opposite the twenty figures of the wheel 79, so as to form all the numerals from five to five between zero and ninety-five. The wheel 81 is loose on the shaft 82 and carries all the figures—"naught," "one," "two," and so on up to five or over, according to the weighing power of the machine.

The wheel 81 is so actuated by the wheel 79 as to turn to the extent of a division at each revolution of the said wheel. For that purpose the wheel 79 carries a double tooth 83, which at each revolution meshes with a cross of Malta or a star-wheel 84 and causes the same to turn to the extent of ninety degrees, and the wheel 81 is provided with teeth meshing with a pinion 85, fixed on the same shaft as the wheel 84, so that at each quarter of a revolution of the latter the pinion 85 causes the wheel 81 to turn forward to the extent of a division. On account of these arrangements the figures of the wheels 79 and 80 indicate the units and the tens, while the figures of the wheel 81 indicate the hundreds. Above the said wheels 79 80 81 lies a roller 86, made of rubber and carried by a rock-shaft 87. A lever 88, fixed to the said shaft, is capable of

being moved against the action of a spring 89 by a cam 90, fixed on the shaft 64, so as to press the rubber roller 86 onto the figure-carrying wheels. After the cam has passed the roller 86 is again moved away from the wheels by the action of the spring 89.

91 designates fingers arranged between the figure-carrying wheels and serving to support the sheet of paper inserted through the slit 78 between the figure-carrying wheels and the roller 86. The said fingers, fixed to the shaft 87, are moved down with the sheet by the roller, and they then move upward in disengaging the said sheet from the perforating-points so that the sheet may be withdrawn.

The weighing-machine shown in the drawings also comprises a safety device comprising yielding plates 92, loaded with weighty matter 93 and fixed to a shaft 94, which carries a pinion 95 in gear with the wheel 19. The movable ends of the plates are attached to a disk 96, slidable on the shaft. When the wheel 19 is put in rotation, the wheel 94 rotates rapidly and the centrifugal force causes the plates or bands to move away from each other, so that the disk 96 moves and comes and rubs against a spring friction-pad 97, serving to moderate the speed of rotation. At the same time the movement of the disk 96 allows a lever 98 to oscillate under the action of a spring 99, so that one of its ends comes into the path of an arm 100, fixed to the shaft 64. The result is that the shaft 64 can no longer be turned, and consequently that the reproduction of the figures of the weight is prevented so long as the centrifugal force holds the disk 96 and the lever 98 displaced. The said reproduction cannot take place before the train of gear-wheels and figure-carrying wheels is brought to a stop.

101 designates a crank-handle serving both to stop and to permit the movement of the scale or plate of the weighing-machine through the medium of a shaft 102 of a crank 103 and of a connecting-rod 104, of which the lower end, in the shape of a hook, is engaged under the lever 7 of the beam of the weighing-machine.

105 is an air-cylinder, in which freely moves a piston 106, the rod 107 of which is pivoted to a lever 108, fixed on the spindle 4. The resistance of the air which passes between the piston and the wall of the cylinder weakens the oscillations of the balance when the beam 7 is released by moving the crank-handle 101 upward, so that the lever quickly reaches the position in which it is in equipoise. The upper end 109 of the lever 2 is in the shape of an index and moves in front of a graduated index-plate.

The operation of the weight-registering weighing-machine is as follows: The crank-handle 101 being moved down, the star-wheel 16 and the cursor 12 being in their initial positions toward the left, the substances to be weighed are placed on the scale or plate of the weighing-machine and the crank-handle 101 is moved up to render the scale or plate free to move. Under the action of the said substances or load the beam 7 causes the lever 2 to oscillate into a determined position of equipoise and the index 109 indicates directly the weight of the substances on the index-plate 110. At the same time the cursor 12 has been moved to the right to an extent which is proportional to the load. Then the crank-handle 75 is pushed to disengage the retaining-pawl 70 and to render the star-wheel 16 free to move. By the action of the spring 67, transmitted by the gear-wheels 63 62 61 22 21 20 19 17, the star-wheel 16 is immediately put in rotation and moves forward toward the right until one of its arms comes against the cursor 12. The figure-carrying wheels 79 80 have then turned to an extent which is proportional to the movement of the cursor—that is, to the weight of the substances—and this weight of the substances is expressed by the figures brought under the roller 86. A bulletin is then inserted through the slit 78 and the crank-handle 65 is turned, which becomes possible as soon as the gear-wheels have come to a stop and the clutch-lever 98 is again in its position of rest. During the first half of a revolution of the crank-handle 65 the cam 90 acts on the lever 88 and causes the roller 86 to move down onto the bulletin and the figure-carrying wheels, so that the figures indicating the weight of the load are reproduced by perforation on the bulletin. Then the cam 90 releases the lever 88 and the roller 86 moves up under the action of the spring 89, and at the same time the bulletin is disengaged from the points by the fingers 91. The bulletin may then be withdrawn. During the second half of the revolution of the crank-handle 65 the cam 69 acts on the toothed segment 63 and causes the same to oscillate against the action of the spring 67, thus causing the gear-wheels and the star-wheel 16 to turn in the opposite direction to that in which they moved previously until they reach their initial position, in which position they are set or locked by the engagement of the pin 77 on the pawl 70. The cam 69 then moves away from the roller 66 of the toothed segment 63, as shown in Fig. 4, so that the weighing-machine is again ready to operate when the crank-handle 101 has been moved down and the substances or load has been taken off the scale or plate.

It will be seen by Fig. 6 that the arms of the star-wheel 16 and also the cursor 12 have inclined contact-faces and ridges 51 52. The cursor is also provided with a heel 53. By these means the star-wheel comes to a dead stop against the cursor. The arms of the star-wheel and also the cursor are also provided with inclined lateral faces 54 55,

which allow the arms of the star-wheel to become disengaged from the cursor to the left and in a downward direction when the star-wheel is brought back toward its initial position.

For the purpose of deadening the impact of the star-wheel 16 against the cursor the said wheel is connected to its shaft 15 by a twist-spring 111. A certain amount of yield is also given to the connecting rod or link 9 in a vertical direction by means of a slideway 112 and a spring 113.

It will be understood that the number of the arms of the star-wheel may be greater or less, according to the pitch of the screw and the more or less approximative weighings it is desired to obtain. The said stopping device may, if required, comprise a single tooth.

We claim—

1. A weight-registering weighing-machine, comprising a cursor guided in a straight line, means for moving the said cursor to an extent proportional to the substances or load to be weighed, a stopping device, means for guiding the stopping device in a spiral line, means independent of and distinct from the load to be weighed for moving the said stopping device, and means for registering the extent of the movement of the aforesaid stopping device.

2. A weight-registering weighing-machine, comprising a scale or plate to receive the load to be weighed, an oscillating lever connected to the said scale or plate, a balance-weight acting on the said lever, another oscillating lever, a link connecting the two levers together, a cursor fixed to the link at a determined point to move in substantially a straight line, a rotary screw, a fixed nut engaging the said screw, a stopping device fixed to the screw and adapted to meet the cursor, means independent of and distinct from the load to be weighed to cause the screw to turn, and means for registering the rotation of the screw.

3. A weight-registering weighing-machine comprising a cursor guided in a straight line, means for moving the said cursor to an extent proportional to the loads to be weighed, a stopping device, means for guiding the stopping device in a spiral line, said stopping device having several stopping projections regularly spaced around the axis of the guiding means to meet the cursor at every point of its path, means independent of and distinct from the load to be weighed for moving the said stopping device, and means for registering the extent of the movement of the stopping device.

4. In a weight-registering weighing-machine, a stopping device, means for guiding the stopping device in a spiral line, a train of gear-wheels to cause the said stopping device to turn, a toothed segment, a spring acting on the said toothed segment, a shaft actuated by hand and having a cam to cause the said toothed segment to oscillate against the action of the spring, a pawl engaging the stopping device, and means for moving the said pawl away from the stopping device.

5. In a weight-registering weighing-machine, a fixed nut, a screw, a stopping device on the said screw, a train of gear-wheels to cause the said screw to turn, a toothed segment, a spring, a cam-shaft acting on the toothed segment against the action of the said spring, a centrifugal regulator, a friction device actuated by the regulator to slacken the rotation of the said gear-wheels, and a lever actuated by the said regulator to prevent the rotation of the cam-shaft.

6. In a weight-registering weighing-machine, a stopping device, means for guiding the stopping device in a spiral line, a train of gear-wheels to cause the said stopping device to turn, figure-carrying wheels connected with the said gear-wheels, a presser-roller to press a bulletin onto the figure-carrying wheels, a spring to move the train of gear-wheels in one direction, a spring to move the presser-roller in one direction, and a shaft having two cams one of which is adapted to actuate the presser-roller in the opposite direction to that imparted by its spring and the other of which is adapted to actuate the train of gear-wheels in an opposite direction to that imparted by their spring.

In testimony that we claim the foregoing as our invention we have signed our names in presence of two subscribing witnesses.

HENRY POTTIN.
LÉONCE MERLET DE LOGELIÈRE.

Witnesses:
EDMOND BLETRY,
MAURICE ROUX.