No. 690,855. Patented Jan. 7, 1902.

W. GREENE & S. CHISHOLM.

WEIGHING AND RECORDING APPARATUS.

(Application filed Mar. 13, 1901.)

(No Model.)

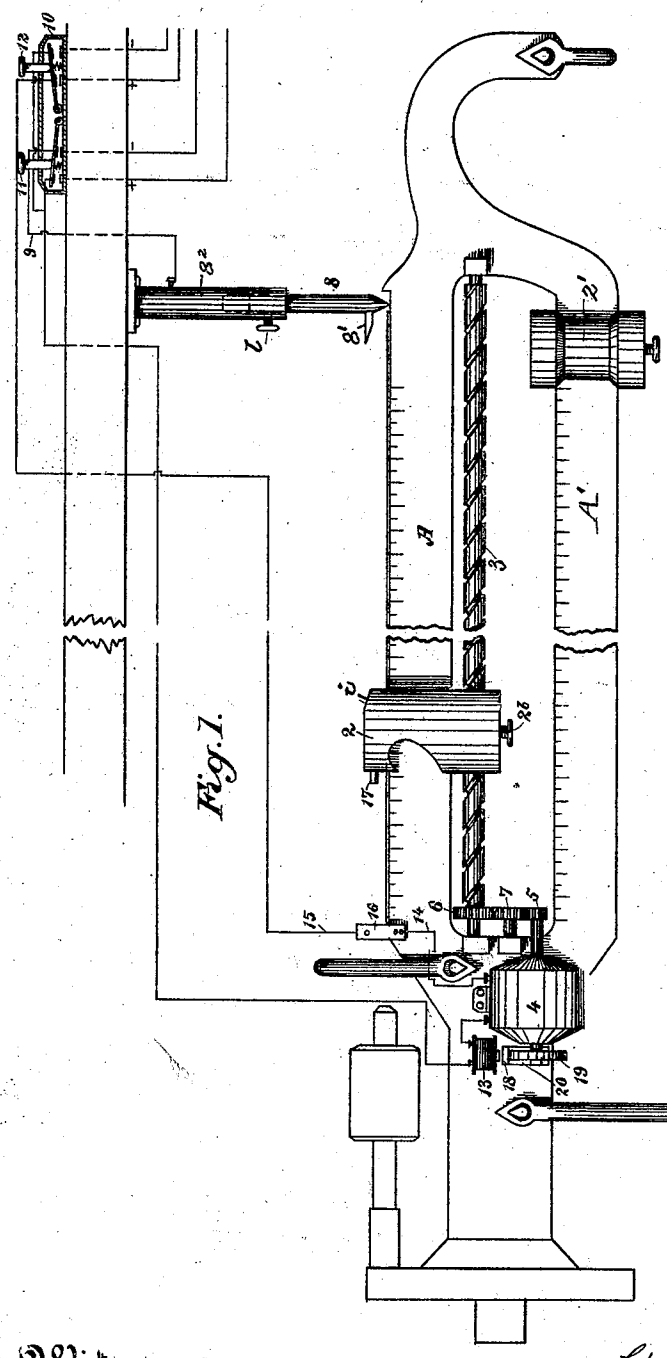


Fig. 1.

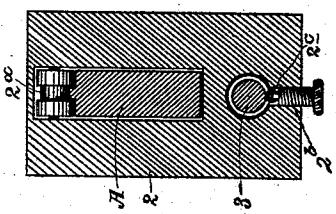


Fig. 4.

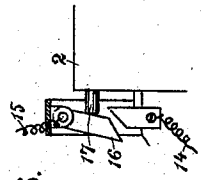


Fig. 3.

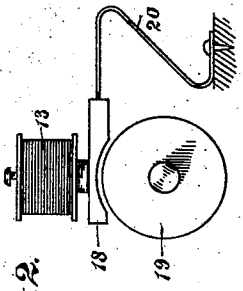


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM GREENE AND STEIN CHISHOLM, OF SAN FRANCISCO, CALIFORNIA.

WEIGHING AND RECORDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 690,855, dated January 7, 1902.

Application filed March 13, 1901. Serial No. 50,946. (No model)

To all whom it may concern:

Be it known that we, WILLIAM GREENE and STEIN CHISHOLM, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Weighing and Recording Apparatus; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to an apparatus which is designed for weighing purposes; and it consists in the combination, with a fulcrumed scale-beam, of a weight, a motor, and means intermediate by which the weight is caused to move along the scale-beam until it arrives at a point where the weight is counterbalanced and the beam sinks, and electrical contacts through which the current passes to drive the motor, one of which contacts is broken by the sinking of the beam, so that the balance-weight stops at the point indicating the amount.

Referring to the accompanying drawings, Figure 1 is a front elevation of the apparatus. Fig. 2 is a detail of the brake mechanism. Fig. 3 shows the switch in the reversing-circuit. Fig. 4 is a lateral section through the counterbalance-weight.

We have here illustrated our invention as applied to an ordinary platform-scale having the marked scale-beam A and the counterbalance-weight 2 movable thereon. The upper edge of the scale-beam is preferably made with a smooth narrow track, and the weight 2 is provided with one or more rollers 2^a, which travel upon this rail to reduce the friction caused by the movement of the weight along the beam to the least degree. Below the beam is an elongated spiral 3, journaled at each end so as to be revoluble parallel with the beam. This spiral passes through an opening made in the lower part of the balance-weight 2, and the weight has a spur or projection 2^b, adapted to engage with the threads of the spiral. By thus having the spur or projection 2^b seated in the weight so that its point may enter the threads of the screw the weight serves and operates as a nut on the screw. If desired, the point of the screw may be provided with a smaller roller 2^c to reduce friction between the parts. These threads are preferably made with a sufficiently-rapid pitch, so that when the screw is turned in either direction it will advance the weight along the beam with considerable rapidity.

4 is an electrical motor of any suitable description journaled upon the side of the beam near its fulcrum, and the motor-shaft carries upon its outer end a pinion 5, engaging with a gear 6, fixed to and turnable with the screw 3. This connection may be either direct or through any desired number of intermediate gears. In the present drawings one intermediate gear is shown at 7.

Electric conducting-wires passing through suitable binding-posts and switches are so connected that when contact is made the motor is energized, and by its revolution the screw 3 is turned through the intervention of the gears previously described, and the counterbalance-weight 2 is caused to move outwardly along the scale-beam.

One of the contacts through which the electrical current passes to the motor is so disposed that while the beam is tilted upwardly this contact is complete; but as soon as the weight 2 reaches the point where it balances the article or substance being weighed the beam will tilt and will break this connection, thus stopping the motor. We have here illustrated this contact in the form of a point, as shown at 8, against which the outer end of the beam A strikes when the beam is up. With this point 8 connection is made through a wire 9 from a reverser 10. This reverser is of any usual or well-known form (not here necessary to describe) and serves to reverse the electrical current and the movement of the motor, so that after the weight has been recorded the motor may be reversed and the counterbalance-weight 2 returned to its original position. The reverser, as here shown, has two buttons 11 and 12, by the operation of which the reversal of the current takes place. One wire from the reverser leads to the contact-point 8, as before described, and the other leads to an electromagnet 13 and through this to the motor 4. The scale-beam forms a part of the circuit from the point 8, and thence a wire 14 leads to the motor. For the reversal of the current a wire 15 leads from the reverser to a switch at 16, and this

switch is actuated by a spur 17, carried by a counterweight 2, so that when the latter has returned to its initial point the spur striking the switch breaks the current and again stops the motor. The electromagnet 13 acts upon an armature 18, interposed between the electromagnet and a clutch wheel or disk 19, fixed upon the shaft of the motor. This armature is carried upon a spring-arm 20, suitably fixed to hold the armature between the electromagnet and the rim of the disk. When the magnet is deënergized, the spring acts to force the armature against the rim of the disk, thus forming a brake to instantly stop the motor whenever the current is cut off. As soon as the electrical current is caused to flow so as to energize the magnet 13, it acts to lift the armature 18 and release the clutch-disk 19 and the motor, thus allowing the latter to be immediately set in motion to move the weight 2 in either direction, according to whether the current is direct or the reverse.

On the lower beam A′ is a counterpoise-weight 2′, which determines the weight of the load approximately, while with the weight 2 on the upper beam the exact weight is shown. The contact-piece 8 is also shown as provided with a horn 8′, the purpose of which is to ride upon the incline *i* on the weight 2 when the latter has been brought up to the horn, and by contacting with the weight the point of the piece 8 is lifted off the beam, and consequently the electric current is broken. The piece 8 slides in a socket in the hanger 8^2, as shown by dotted lines in Fig. 1, and is held at the proper height by means of a set-screw 1.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination in a weighing apparatus of a fulcrumed tilting scale-beam, a weight movable thereon, a screw-threaded spindle turnable about an axis parallel to the line of travel of the weight, means for engaging it with the weight, an electric motor with intermediate connections whereby the screw is revolved and the weight advanced along the beam, and a brake mechanism engaging the motor when the current to the motor is shut off and releasing said motor when the latter is energized.

2. The combination in a weighing apparatus of a fulcrumed tilting scale-beam, a weight movable upon said beam, a screw-threaded spindle journaled and turnable about an axis parallel to the line of travel of the weight, means engaging said screw with the weight, an electric motor, mechanism between it and the spindle whereby the latter is revolved to advance the weight, contacts through which the electrical circuit is completed, said contact being broken by the sinking of the scale-beam when the weight has been moved to the point where it counterbalances the article being weighed, and a brake positively operating on the motor to stop its revolution when the motor is deënergized, said brake releasing the motor when the latter is energized.

3. The combination in a weighing apparatus of a fulcrumed tilting scale-beam, a weight slidable thereon, a screw revoluble about an axis parallel to the line of travel of the weight, and means engaging the weight with the screw, an electric motor and intermediate gearing by which the screw is revolved, wires forming with the scale-beam, an electric circuit through the motor, a contact-point through which the current passes to the beam when the latter is elevated, said contact being broken and the current cut off when the beam sinks by the counterbalancing of the weight, and a brake mechanism controlling the motor and actuated by the energizing and deënergizing of the latter.

4. The combination in a weighing apparatus of a fulcrumed tilting scale-beam, a weight slidable thereon, a screw journaled about an axis parallel to the line of travel of the weight, and a projection upon the weight engaging the screw-threads, a motor by which the screw is revolved, wires through which an electrical current is transmitted to the motor, a contact-point within the circuit through which the current passes, said contact being broken by the sinking of the scale-beam when the weight is completed, a brake-wheel mounted upon the motor-shaft, an electromagnet and an armature therefor between the magnet and the brake-disk, and a spring by which said armature is forced into contact with the brake-disk when the electrical current is cut off, said current energizing the magnet to raise the armature and release the brake-disk when the current is caused to energize the motor.

5. The combination in a weighing apparatus of a fulcrumed tiltable scale-beam, a weight slidable thereon, a screw-shaft journaled about an axis parallel to the line of travel of the weight, a projection on the weight engaging the screw, an electric motor and connections between it and the screw whereby the latter is revolved, a clutch-brake acting upon the motor-spindle, an electromagnet which is energized and deënergized in unison with the motor, whereby the brake is released when the magnet and motor are energized, and a spring by which the brake is applied to stop the motor when the parts are deënergized, contact-points within the electrical circuit, means for breaking said contacts and cutting off the current automatically when the scale-beam sinks, and a current-reverser within said circuit whereby the movement of the motor and the screw are changed to advance or retract the counterbalance-weight.

In witness whereof we have hereunto set our hands.

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Witnesses:
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