

No. 771,170.

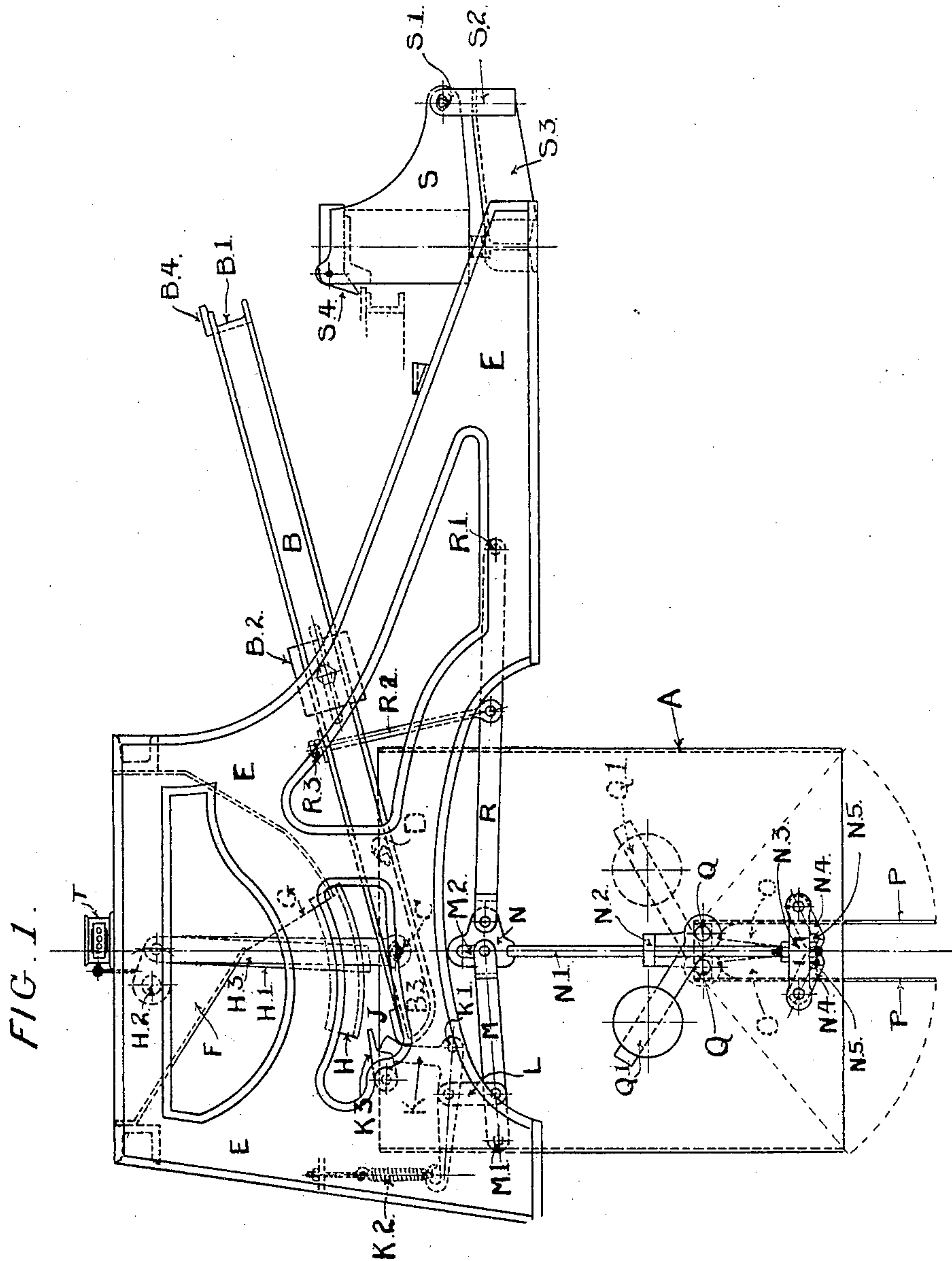
PATENTED SEPT. 27, 1904.

B. NORTON.
AUTOMATIC WEIGHING MACHINE.

APPLICATION FILED DEC. 29, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.
Stephen Kinaster
Fred W. Englebert

Inventor
Burtam Norton
by Wilkinson & Fisher
his Attorneys.

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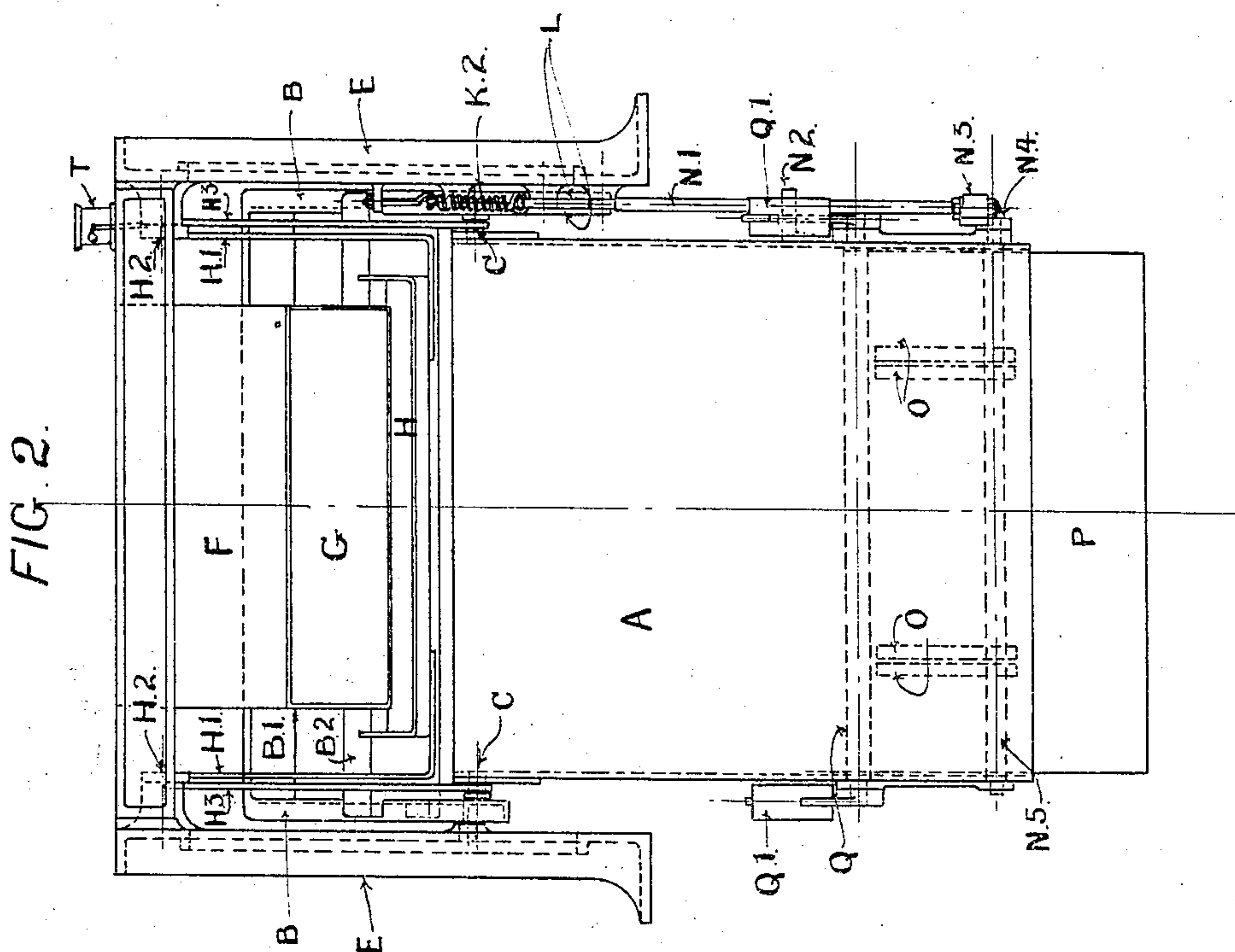
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3 SHEETS—SHEET 2.



Witnesses:-
Stephen Kinsten
Fred W. Engler.

In witness whereof
Bertram Norton
by Wilkinson & Fisher
his Attorneys

UNITED STATES PATENT OFFICE.

BERTRAM NORTON, OF TIPTON, ENGLAND.

AUTOMATIC WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 771,170, dated September 27, 1904.

Application filed December 29, 1903. Serial No. 186,981. (No model.)

To all whom it may concern:

Be it known that I, BERTRAM NORTON, a subject of the King of Great Britain, residing at Tipton, in the county of Staffordshire, England, have invented new and useful Improvements in Automatic Weighing-Machines for Coal and Like Substances; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

A weighing-machine according to this invention is primarily intended to apply to coal, but may be employed for other like substances.

The object of the invention is to enable a determined weight of coal to be automatically weighed and automatically delivered as frequently as may be desired. To enable this to be done, the coal is fed into the weighing-machine from a supply-hopper in communication with a bunker or other supply, and when the determined weight has been received into the machine the weight so acts upon the machine that the hopper-supply is immediately cut off and the coal that has been received from the hopper automatically delivered, after which the machine remains stationary. When a further supply of coal is required, the attendant resets the machine by simply releasing a trigger arrangement, which by being acted upon by a moving part of the machine automatically closes the outlet for the coal in the bottom of the scale-box and opens at the same time the hopper-supply, from whence the coal again drops into the scale-box, and when the requisite weight has been again received further supply to the scale-box is instantly cut off by a downward movement of the box actuating parts which close the hopper-supply, and at the same time the said movement causes the outlet for the weighed coal in the bottom of the scale-box to be opened and the coal to drop out, or the machine can utilize the weight of the coal received and the movement of the scale-box to cause the machine to continue to work automatically as long as sufficient weight of coal will continue to fall into

the scale-box. By this means a large bunker-supply continuing to feed the hopper could be drawn off and weighed.

An important feature in the successful working of this invention is the arrangement of means to cause the coal itself to instantly close the coal-outlet from the feed-hopper, which assures and maintains the correctness of the weighing.

Having now briefly set out the general objects and principles of my invention, I will now proceed to fully describe the same with aid of the accompanying drawings, in which—

Figure 1 is a side elevation of the entire machine at the movement when the scale-box is at the end of its fall and the weighed coal discharged; Fig. 2, an end view thereof; Fig. 3, a plan.

The machine consists of a scale-box A, hung in a lever-frame B by knife-edge bearings C. The frame B is connected at the back end by a cross-piece B' and near the middle by a cross weight-stay B² of sufficient weight to overbalance the box A and parts connected thereto. This lever-frame B is carried by scale-beam bearings D in the main frame E. F is the supply-hopper, which is kept fed with coal from a main bunker-supply. (Not shown.) This hopper F is specially formed with slanting sides, in one of which an opening G is formed, through which the coal feeds to the box A. This opening has no closing-door; but the exit of coal is controlled by a curved sliding part H, (hereinafter called "door,") carried on a bent lever H' with elbow ends by which it is pivoted to main frame at H² at both sides. To the elbows of this lever H' are pivoted link levers H³, the lower ends of which are pivoted to the lever-frame B at or near the bearings C.

The box A end of the frame at one side is formed with a rounded part B³ and a top bearing-piece J, which engages a trigger arrangement K, pivoted in main frame E at K' and held in working position by spring K². To the trigger is pivoted a short link L, the other end of which is pivoted to another lever, M, pivoted in main frame at M'. The other end of lever M is connected by a pin to the slot

M² in a flat head N. This flat head has a pendent rod N' passing through a guide-eye N² on side of box A and is secured to a cross-head N³. To this cross-head are pivoted short levers N⁴. The other ends of these levers are keyed to axles N⁵, passing through the box A and carried in suitable bearings on the outside of box. Upon these axles within the box are keyed cam-arms O. The bottom of the box A is closed by doors P in a slanting position. These doors are keyed upon cross-axles Q, extending through box A on both sides, and are fitted with counterbalance-weights Q'.

R is a lever, one end being pivoted in main frame at R', the other end being pivoted to the flat head N. To this lever is pivoted a rod R², the free end of which passes loosely through an eye in lever-frame B, the end being fitted with nut-heads R³. On falling of the frame the end of rod R² stands out from frame.

S is a scale-weight carried by scale-bearings S' in standards S², formed on a bracket S³, secured to end of main frame E. This weight is fitted with a weighted finger S⁴, the point of which normally projects beyond the weight. The weight S is of such weight as will make up the necessary weight of box A and its connections and the weight of coal desired to be weighed.

T is a register of usual construction to work by reciprocating action, the operating part being connected to one of the elbows of lever-rod H'.

The machine works as follows: Assuming the parts to be in the positions shown fullest in Fig. 1, a weighed quantity of coal has been dropped out through the bottom of the box A, the doors P having been opened by the weight of coal within the box and are shown hanging down, the whole of the parts of the machine being locked by the trigger K, secured by the pawl K³. A further quantity of coal being required, the attendant lifts the pawl K³, when the weight B² of lever-frame B causes the frame to fall, when the end J pushes back trigger K, which movement acts upon lever M through link L, pushing down cross-head N³, which rocks right and left the cam-arms O, spreading apart and securing the doors P to close the bottom of the box A, the other end of lever-frame B being caught at B⁴ by the finger S⁴ of weight S. During this movement of the lever-frame B the curved door H is swung back by the connecting-lever H³ acting upon the elbow of the carrying-rod H', thereby allowing the coal in hopper F to continue to fall through the opening G into box A. When sufficient weight of coal has fallen into the box A to lift weight S, this moving in an arc from S' frees the end B⁴, allowing the frame to rise and the box A to drop the length of its short stroke, and during this movement of the frame B the le-

ver R is pulled up by the rod R², thereby lifting the cross-head N³, rocking back the cam-arms O, and so allowing the doors P to fall open when the coal drops out. At the same time the curved end B³ of lever-frame B pushes back the trigger K, which is then secured by the dropping of the pawl K³, the parts of the machine coming back, as shown in Fig. 1. To enable this motion of the trigger to take place without acting upon the cross-head N³ is the reason why the lever M is connected to the flat head N by the elongated eye M² to admit the necessary lost motion, the trigger being operated twice for each weighing, but only being required to act once for closing the doors. The falling of the box end of the frame B then causes the door H to swing forward, shutting off further outlet of coal from hopper. To enable the machine to work automatically and continuously by utilizing the weight of coal, it is only necessary to throw the pawl K³ over to keep it out of the way of the trigger. The machine will then go on working until the whole of the bunker-supply has passed through the machine in correspondingly weighed quantities and the amount registered. It will be observed that the rise and fall of the box A is very slight, being simply the movement between bearing C and bearing D of frame B.

Having now described my invention, what I desire to secure by Letters Patent of the United States is—

1. In an automatic weighing-machine, the combination of a main frame, a scale-box movably supported therein and adapted to fall when a predetermined amount of material has been delivered thereinto and to rise when empty, a hopper supported by said frame and having one of its walls so inclined as to give a movement to the material to be weighed away from the vertical, and provided with a discharge-opening near its lower part, a door adapted to be moved in one direction beyond the limit formed by the angle of repose of the material to be weighed when resting on said door after issuing through the opening in said hopper, and to be moved beneath said inclined wall to permit the delivery of the material into said scale-box, and means for moving said door to stop the delivery of the material into said scale-box when said scale-box falls, substantially as described.

2. In an automatic weighing-machine, the combination of the main frame, the weighted frame pivoted therein, a scale-box provided with doors pivoted to said weighted frame, means for locking said doors closed, a hopper provided with an opening, a curved door pivoted in said main frame and operated by said weighted frame to stop the delivery of the material at the proper time, a trigger device attached to the main frame and connections be-

tween said trigger device and said locking means, permitting the opening of the doors of the scale-box when the required weight has been delivered into said box, substantially as described.

3. In an automatic weighing-machine, the combination of a main frame, a weighted frame pivoted thereon, a weight pivotally attached to said main frame with which said weighted frame is adapted to engage, a scale-box provided with swinging discharge-doors, said box being pivoted on said weighted frame, supports for said doors, a trigger device pivoted on said main frame, and connections between said trigger device and said supports, whereby on the fall of said scale-box said doors are opened, substantially as described.

4. In an automatic weighing-machine, the

combination of a main frame, a weight pivoted thereon, a weighted frame pivoted on said main frame and adapted to engage said weight, a scale-box pivotally attached to said weighted frame and provided with downwardly-opening doors, supports for said doors, connections whereby said doors are kept closed while said weighted frame is in engagement with said weight and whereby the movement of said weighted frame caused by the downward movement of the scale-box caused by the weight of the material to be weighed will allow said doors to open, substantially as described.

BERTRAM NORTON.

Witnesses:

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