(No Model.) 2 Sheets—Sheet 1.

J. W. SEARS.

AUTOMATIC DEVICE FOR FEEDING STOCK.

No. 346,505. Patented Aug. 3, 1886.

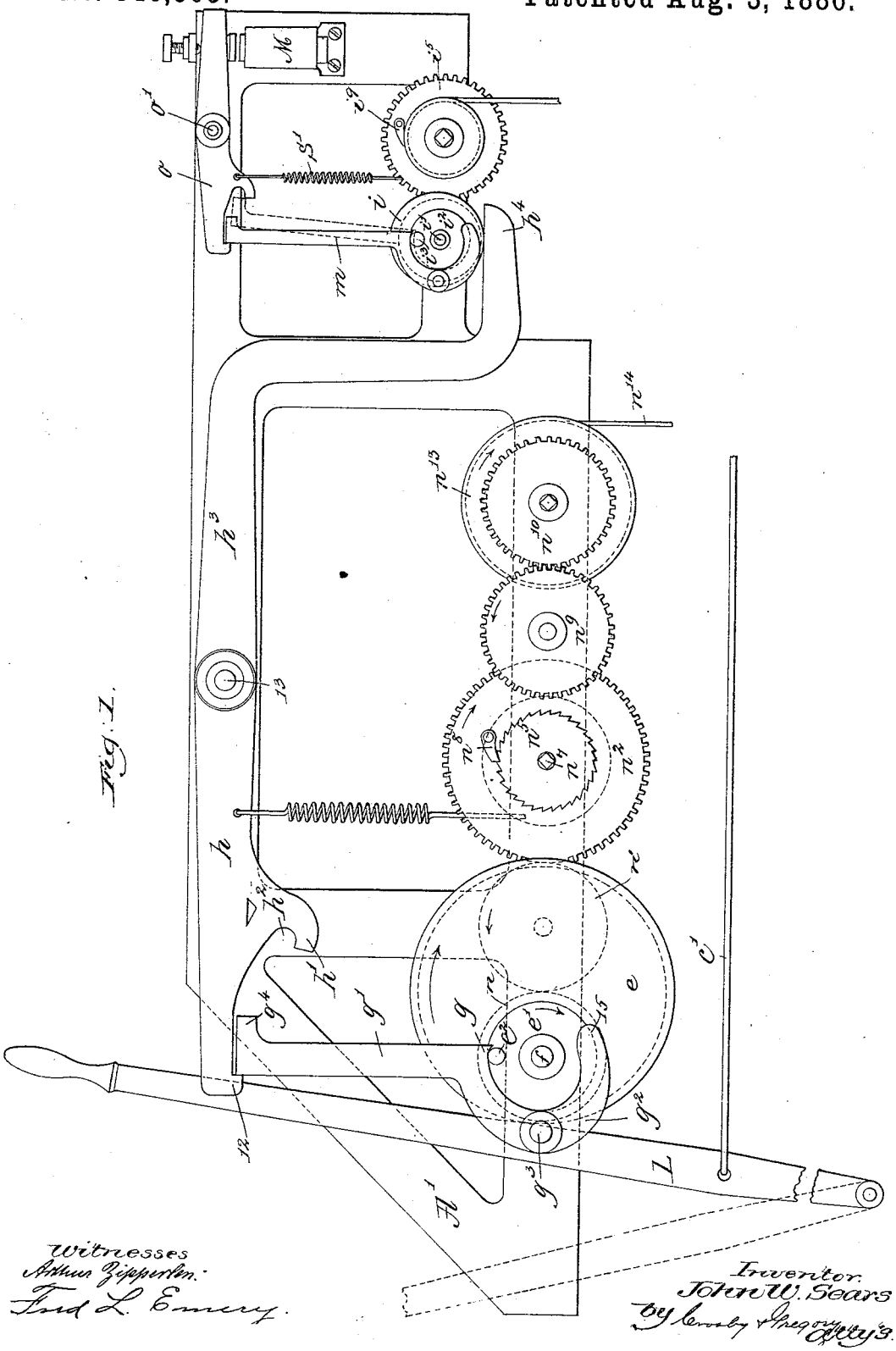

Fig. 1.

Witnesses
Arthur Zipperlen.
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Inventor.
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(No Model.) 2 Sheets—Sheet 2.

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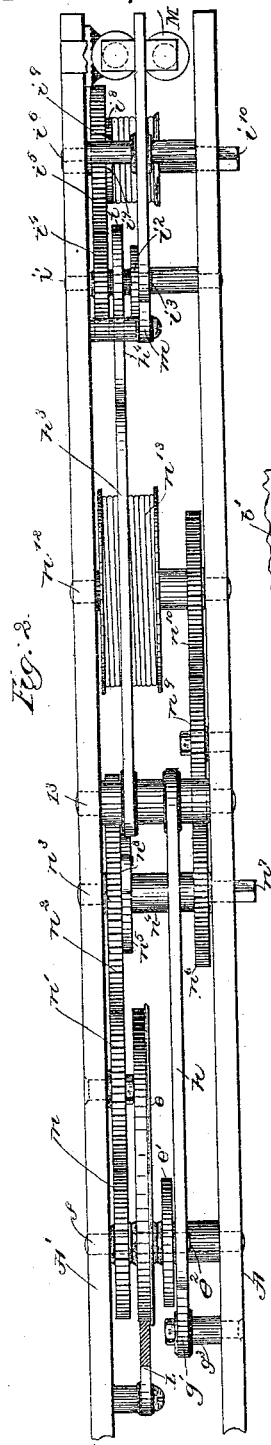

Fig. 2.

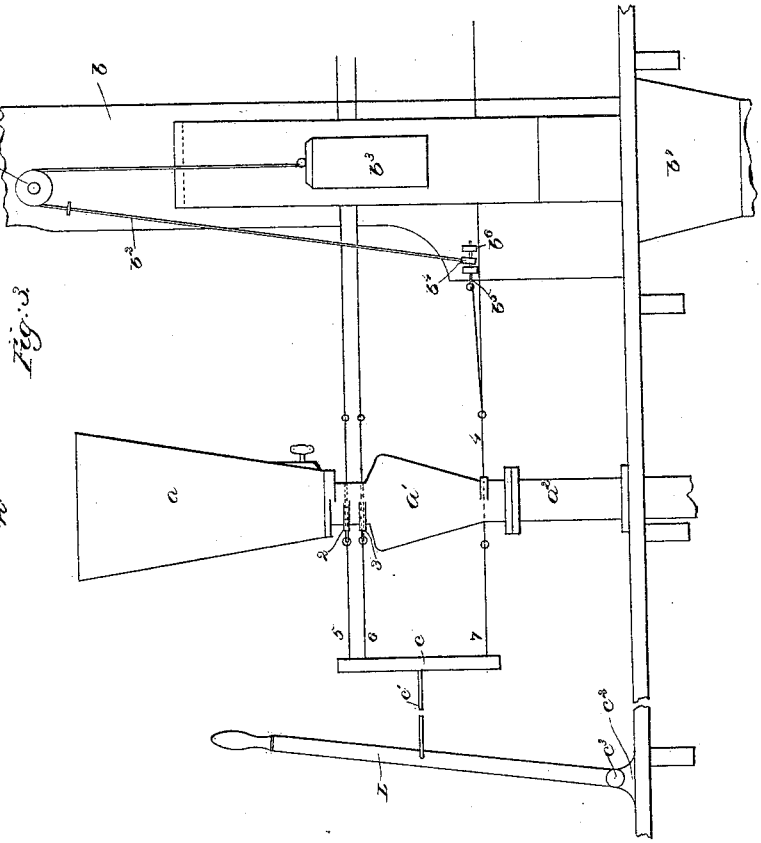

Fig. 3.

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Thomas Holdaway.
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UNITED STATES PATENT OFFICE.

JOHN W. SEARS, OF TAUNTON, MASSACHUSETTS.

AUTOMATIC DEVICE FOR FEEDING STOCK.

SPECIFICATION forming part of Letters Patent No. 346,505, dated August 3, 1886.

Application filed April 16, 1886. Serial No. 199,122. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. SEARS, of Taunton, county of Bristol, and State of Massachusetts, have invented an Improvement in Automatic Devices for Feeding Stock, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to construct an automatic device which, by a change in an electric current, may be set in operation to automatically open and close from a distant place the valves controlling the passage of feed through a feed-chute, to thereby feed stock at any desired time.

In accordance with this invention both the feed-chute and hay-chute have valves and releasing devices, and in instances where several chutes are employed the devices to actuate the said valves are connected by cords, joined with a cross-bar attached to a pivoted operating-lever, substantially as in my application, Serial No. 166,893, filed May 27, 1885. As the operating-lever is moved back and forth on its pivot, the feed is automatically delivered to the stock. The device employed for automatically moving the operating-lever consists of a cam-disk mounted upon a shaft carrying a crank and crank-pin, a set of gears controlled by a motor being employed to rotate the said shaft when released. The pin of the said crank is normally engaged by the hooked end of a pivoted releasing-lever, the latter in turn being engaged by a pivoted controlling-lever, so that when the said pivoted controlling-lever is moved the pivoted releasing-lever is released to in turn release the crank, thereby permitting the cam-disk to rotate, and thereby move the operating-lever. The levers are so constructed that as the cam-disk completes its rotation the crank-pin cooperates with the pivoted releasing-lever and restores the parts to their normal position. The pivoted controlling-lever is in turn controlled by an auxiliary device, of similar construction to the device controlling the movement of the operating-lever, but on a somewhat smaller scale, it comprising a cam-disk mounted upon a rotating shaft, a crank and crank-pin also carried by said shaft, and a set of gears, a motor for rotating the shaft, a pivoted releasing-lever having a hooked end, and a controlling-lever, which latter forms the armature of an electro-magnet, so that when the electro-magnet is energized the entire apparatus is set in operation, moving the operating-lever back and forth to operate the valves, &c.

Figure 1 is a side elevation of an apparatus embodying my invention, the face-plate being removed; Fig. 2, a top view of Fig. 1, and Fig. 3 a side elevation of one feed-chute and hay-hopper, together with the cords and operating-lever for controlling the movement of the valves and releasing devices.

The frame-work A A′ is of proper shape to support the working parts. The grain-hopper a, grain-measure a', chute a^2, valves 2 3 4, controlling the passage of grain from the hopper a into and to allow a definite quantity of grain to enter the chute a^2, the hay-hopper consisting of the upright b, to which is attached a pulley, b', over which passes a cord, b^2, sustaining a weight, b^3, said cord b^2 having at one end a ring, b^4, through which passes a pin, b^5, bearing in standards b^6, to serve as a releasing device, to permit the weight b^3 to drop and enter the hay-hopper b^7, the cord c' connecting the releasing devices and valves, and the operating-lever L, pivoted to a standard, c^2, by a pin, c^3, are substantially the same as in the application above referred to.

In this my present invention the operating-lever L, to actuate the valves and releasing device of the grain and hay hoppers, is operated automatically by a cam-disk, e, secured to a rotating shaft, f. The shaft f has a crank or disk, e', provided with a crank-pin, e^2, normally held in engagement with the curved heel g of the releasing-lever g', pivoted on the stud g^3, and having a hooked end portion, g^2. The rotating shaft f has its bearings in the frame-work A A′. The pivoted releasing-lever g' is held in vertical position by the engaging end 12 of a lever, h, fast to the shaft 13, mounted loosely between the side plates, A A′. The toothed gear n is secured to the shaft f, and meshes with the intermediate n', (see dotted lines, Fig. 1, and full lines, Fig. 2,) the gear n' in turn meshing with the toothed gear n^2, loosely mounted upon a shaft, n^3, having its bearings in the frame A A′. The sleeve n^4, having an attached ratchet-wheel, n^5, and

toothed gear n^6, is secured to the shaft n^3, and the forward end of the shaft is squared, as at n^7, that it may be rotated by a suitable key. The toothed gear n^2 carries a pawl, n^8. The toothed gear n^6, through an intermediate, n^9, is driven from the toothed gear n^{10}, secured to the shaft n^{12}, the said shaft carrying a suitable drum, n^{13}, about which is wound the cord n^{14}, to which is attached a suitable weight. (Not shown.) Rotation of the shaft n^3 by a suitable key causes the cord n^{14} to be wound about the drum to accumulate a motive force, which will be expended to rotate the shaft f, carrying the cam-disk e, whenever the crank-pin e^2 is disengaged from the pivoted releasing-lever g'.

When the pivoted controlling-lever h is lifted, the releasing-lever g' is left free, and no longer holding the crank-pin e^2 the shaft f is permitted to rotate in the direction of the arrow marked on the disk or crank e', the said crank-pin in its rotation striking the hooked end 15 of the releasing-lever g', which, being somewhat curved, is turned on its pivot g^3 as the crank-pin passes, thereby throwing the lever g' from the dotted-line position forward, moving the said lever until its end g^4 strikes the curved ear h' of the controlling-lever h, it at such time being in elevated position. As the crank-pin e^2 continues its rotation toward its full-line position, the controlling-lever h is restored to its normal position by a spring, permitting the engaging end g^4 of the releasing-lever to enter the recessed portion h^2 of the controlling-lever, where it remains until about as the said crank-pin e^2 arrives at the curved heel portion g of lever g', when the said releasing-lever g' is again held in its normal position, as shown by full lines, Fig. 1. The cam-disk e and shaft f thus make, it will be understood, one complete rotation at each movement of the controlling-lever h, and the operating-lever L, normally lying against the cam e, by the action of a spring, (not shown,) but, as in my application referred to, is consequently moved upon its pivot back and forth at each revolution of the said cam-disk. The shaft 13 also has fixed to it a bent lever, h^3, having an engaging end, h^4, against which acts a cam, i, mounted upon a shaft, i', also having its bearings in the side plates, A A'. The shaft i' also carries a crank, i^2, and a crank-pin, i^3. The shaft i' also carries a toothed gear, i^4, which meshes with a toothed gear, i^5, mounted upon a shaft, i^6, having its bearings between the frame-work A A'. A drum, i^7, is also mounted upon the shaft i^6, about which a cord sustaining a suitable weight is wound, the said drum being fixed to the shaft i^6 to move simultaneously therewith, and a ratchet-wheel, i^8, engaged by a suitable pawl, i^9, attached to the toothed gear i^5, is also mounted upon the said shaft i^6, to control its backward movement. One end of the shaft i^6 is squared, as at i^{10}, that it may be rotated by a suitable key to wind the cord about the drum.

A controlling-lever, m, of similar construction to the lever g', is held in engagement by a releasing-lever, o, pivoted to the shaft o', the said lever being of similar construction to the lever h, and having similar engaging ends. This lever o serves as the armature of an electro-magnet, M.

It will thus be observed that the device just described is of substantially the same construction as that previously described for moving the operating-lever L, and its operation is the same, viz: First, the magnet M is charged and armature attracted. The lever m is released, permitting the shaft i' to rotate. The cam-disk i then moves the lever h^3 in the same manner as the cam-disk e moves the operating-lever L. Thus it will be seen that when the magnet M is energized from any given point first the lever o will be moved to free the lever m, which will release the crank-pin i^3, permitting the shaft i' to be rotated, so that the cam thereon, acting on the lever h^3, turns the rock-shaft 13, and effects the movement of the lever h to free the lever g', and setting the motor controlling the rotation of the cam-disk e in operation.

It is obvious that the levers h h^3 may, and preferably will be, a single arm. It is also obvious that any other motor may be employed to rotate the cam-disk e than that herein shown, the only necessity being that the motor shall be released and operated to rotate the cam-disk one revolution.

The device herein shown will preferably be located within the stable, but the circuit-changer (not shown) will be located within the house, so that when desired to feed the stock the condition of the electro-magnet M may be unchanged.

I claim—

1. In a device for automatically feeding stock, one or more grain hoppers, chutes, and valves controlling the passage of grain through said chutes, and an operating-lever controlling the movements of the valves, combined with motor mechanism, substantially as described, for effecting the movement of the operating-lever L, and an electro-magnet for releasing and stopping the said motor mechanism, as set forth.

2. In a device for feeding stock, one or more grain-hoppers, grain-chutes, and valves, and an operating-lever, L, controlling the movements of the said valves to govern the passage of grain from the grain-hoppers to the grain-chutes, combined with a cam-disk for moving the operating-lever L, and means, substantially as described, for locking and releasing said cam-disk, and mechanism, substantially as described, for effecting the rotation of the said cam-disk when released, as set forth.

3. In a device for feeding stock, the operating-lever L and cam-disk to move it, a motor for rotating the said cam-disk, combined with a crank and a crank-pin, and pivoted releasing-lever g', having a hooked end, substantially as described, and a controlling-lever to normally retain the releasing-lever in a fixed position, as set forth.

4. The operating-lever L and motor mech-

anism, substantially as described, for moving it, combined with the pivoted releasing-lever g', for starting and stopping the said motor mechanism, and the controlling-lever h therefor, and an auxiliary motor mechanism controlled from a distance for moving the controlling-lever h, to thereby permit the releasing-lever g' to release the main motor mechanism and then stop it, all as and for the purpose set forth.

5. The operating-lever L and motor mechanism, substantially as described, for moving it, the releasing-lever for permitting said motor mechanism to start, and a controlling-lever for arresting the releasing-lever and stopping the said motor mechanism, combined with an auxiliary motor mechanism constructed and arranged, substantially as described, for moving the said controlling-lever, a releasing-lever for permitting the said auxiliary motor mechanism to operate, and a controlling-lever for arresting the said releasing-lever, thereby stopping the said auxiliary motor mechanism, and an electro-magnet for moving the last-named controlling-lever, all substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN W. SEARS.

Witnesses:
BENJAMIN L. WOOD,
ELISHA T. JACKSON.