

No. 787,007.

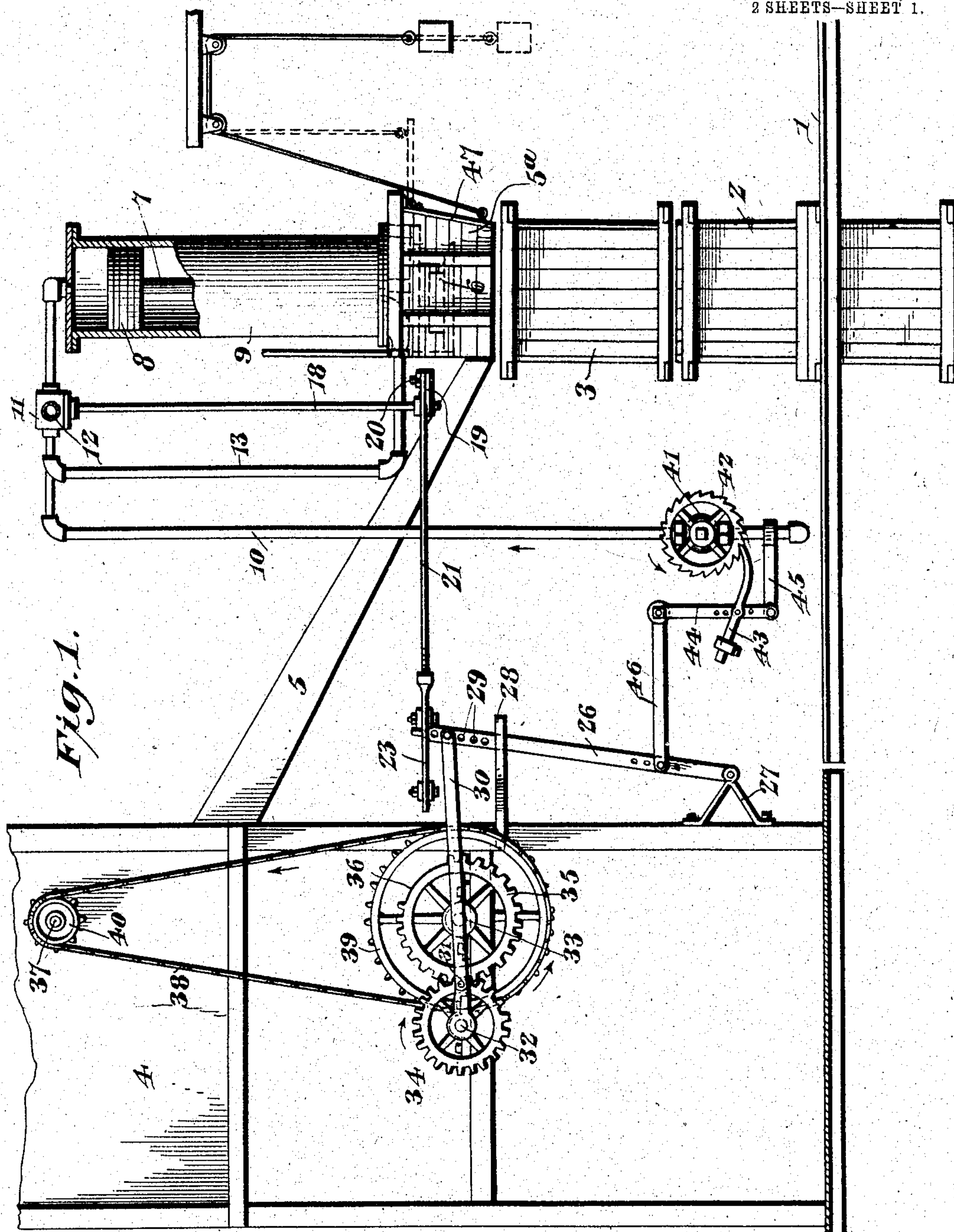
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J. M. STUART.

VALVE OPERATING MECHANISM FOR PRESSES.

APPLICATION FILED JULY 29, 1904.

2 SHEETS—SHEET 1.



John M. Stuart, Inventor

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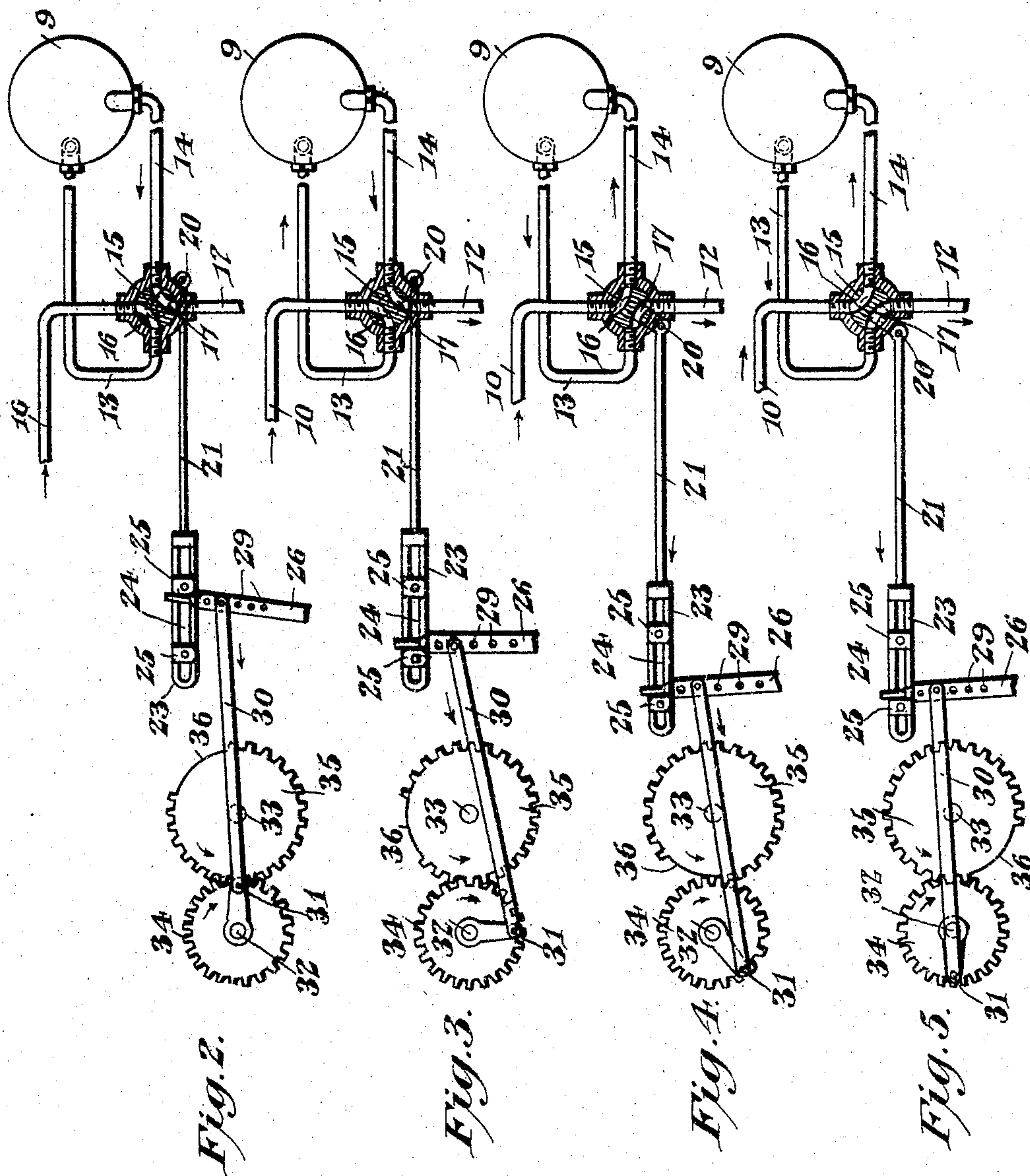
Witnesses

Jas E. McClathran

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN M. STUART, OF ELMO, TEXAS.

VALVE-OPERATING MECHANISM FOR PRESSES.

SPECIFICATION forming part of Letters Patent No. 787,007, dated April 11, 1905.

Application filed July 29, 1904. Serial No. 218,713.

To all whom it may concern:

Be it known that I, JOHN M. STUART, a citizen of the United States, residing at Elmo, in the county of Kaufman and State of Texas, have invented a new and useful Valve-Operating Mechanism for Presses, of which the following is a specification.

My present invention relates to further improvements in baling mechanism of that type exemplified in my Patent No. 748,231, wherein is shown a fluid-operated press controlled by valve mechanism which is operated automatically from a condenser constituting the feeder of the press.

This invention has for its object to improve the operating connections between the condenser and the valve mechanism of the press, with special reference to the provision of means for economizing the steam or other motive fluid utilized to drive the packer.

A further object is to provide means for regulating the duration of the interval during which the packer remains at rest to permit the feeding of a new charge of cotton or other material to the charging-chambers.

Other objects subordinate to those enumerated will appear as the succeeding description of the preferred embodiment of the invention is developed.

In the accompanying drawings, Figure 1 is an elevation, partly in section, showing my apparatus complete, and Figs. 2, 3, 4, and 5 are diagrammatic views showing the controlling-valve and its operating mechanism in different progressive positions.

Like numerals indicate corresponding parts in the several views.

In order that this invention may be better understood, it may be explained, by way of premise, that the Munger baling-machine, illustrated in Patent No. 680,164 to R. S. Munger, and for the equipment of which my invention is primarily intended, includes a turn-table 1, carrying at opposite sides of its axis a pair of baling-chambers or press-boxes, one of which (indicated by the numeral 2) is shown in the drawings. By the intermittent rotation of the table 1 the boxes 2 are alternately presented below a charging-chamber 3 to receive the cotton fed to the charging-

chamber from a condenser 4 through the medium of a chute 5 and a hopper 5^a, as shown. The cotton fed to the chamber 3 is forced into the subjacent press-box by a fluid-operated tramper or packer 6, connected to the lower end of a piston-rod 7, operated by a piston 8, reciprocating in a cylinder 9, supported in any suitable manner above the charging-chamber.

The piston 8 is operated by a motive fluid received from the supply-pipe 10, led from a suitable source of supply to a controlling-valve casing 11 at a point diametrically opposite an exhaust-pipe 12. From other diametrically-opposed points of the casing 11 are led pipes 13 and 14, communicating with the opposite ends of the cylinder 9. Within the casing 11 is mounted a rotary controlling-valve 15, provided with a pair of arcuate ports 16 and 17, which serve, in a manner well understood in the art, to place the opposite ends of the cylinder in communication with the supply and exhaust pipes alternately. Thus by partially rotating the controlling-valve alternately in opposite directions the motive fluid will be alternately supplied to and exhausted from each end of the cylinder to effect the reciprocation of the piston 8 and the connected tramper 6.

To the well-known construction thus far described it has been my object to add efficient automatic mechanism for properly operating the controlling-valve and for also operating a regulating-valve designed to effect an automatic increase of the quantity of steam supplied to the cylinder 9 as the accumulation of cotton in the press-box increases. While the patented construction for attaining these ends is efficient, I have devised further improvements for increasing the efficiency, and I will now proceed to describe my present arrangement of valve-operating mechanism.

The stem 18 of the controlling-valve 15 is provided at its lower end with a crank-arm 19, whose wrist-pin 20 has connection with one end of a connecting-rod 21, having a separable slotted extension 23, within the slot 24 of which are located a pair of adjustable stops 25. Between the stops 25 is designed to play the upper end of a lever 26, fulcrumed at its

lower end upon a bracket 27 and movable in a suitable guide 28, the bracket and guide being preferably carried by the frame of the condenser 4, as shown.

5 The upper end portion of the lever 26 is equipped with a series of pin-holes 29, facilitating the adjustable attachment of one end of a pitman 30, connected at its opposite end to the wrist of a crank 31, fixed to a counter-
 10 shaft 32, mounted in suitable bearings on the condenser-frame. The shaft 32 is geared to the driving-shaft 33 of the condenser through the medium of a gear-wheel 34, mounted on the shaft 32, and a somewhat larger mutilated
 15 gear 35, mounted on the driving-shaft 33. The teeth of the wheels 34 and 35 correspond in number, so that a complete rotation will be imparted to the counter-shaft for each complete rotation of the driving-shaft. By rea-
 20 son, however, of the fact that the two gears are of different diameters a considerable interval or dwell 36 will occur between the adjacent ends of the toothed segment of the wheel 35. Consequently during a given period
 25 of movement of the driving-shaft 33, the counter-shaft 32 will remain stationary and to this fact is due the attainment of the primary objects of the present invention. The meaning of this statement will be clear from a consider-
 30 ation of the four diagrammatic views, Figs. 2 to 5, in connection with the following explanation:

The diagram in Fig. 2 corresponds to the position of the parts as they appear in Fig. 1—that is to say, the valve 15 is in position
 35 to supply steam to the lower end of the cylinder 9, the upper end of the cylinder is in communication with the exhaust, and the piston has reached the upward limit of its move-
 40 ment. The cotton will now be fed from the condenser to the charging-chamber 3, and in order to give time for the feed the upper end of the lever 26 will traverse the slot 24 in the connecting-rod 21 while the counter-shaft
 45 32 is making a quarter-turn. The parts will now be in the positions shown in Fig. 3, and as the lever 26 will now have reached the end of the slot 24 continued movement of the counter-shaft will cause the rod 21 to be
 50 moved endwise for the purpose of partially rotating the controlling-valve 15 sufficiently to partially open communication between the supply-pipe 10 and the upper end of the cylinder 9 by way of the port 16—that is to
 55 say, the movement of the valve will continue until it assumes the position shown in Fig. 4—and wherein it will be seen that communication between the lower end of the cylinder 9 and the supply-pipe has been cut off
 60 and that the port 16, while it has not been presented in direct coincidence to the pipes 10 and 14 has, nevertheless, advanced sufficiently to permit a restricted supply of steam to the upper end of the cylinder. The steam
 65 thus admitted is sufficient, however, to move

the piston down to present the tramper or packer 6 to the cotton in the charging-chamber. When the valve has reached the position shown in Fig. 4, the end of the toothed
 70 segment of the wheel 35 will pass beyond the point of engagement with the wheel 34, and as a consequence said wheel and the valve-operating mechanism connected thereto will remain stationary while the packer is moving
 75 down to the cotton and while the dwell 36 of the mutilated gear 35 is passing the wheel 34. By the time the packer or tramper 6 reaches the cotton in the charging-chamber the teeth of the mutilated gear will again
 80 mesh with the gear 34, the continued movement of which will complete the actuation of the valve 15, thus opening the port 16 to insure the continued movement of the piston 8 under a full head of steam. The parts will
 85 now have assumed the positions shown in Fig. 5, further rotation of the wheel 34 serving to move the lever 26 to the opposite end of the slot 24 and to thereafter effect the reversal of the valve 15 for the purpose of elevating the packer. It will thus be seen that
 90 the present invention involves means operated by the condenser or feeder to effect first a partial movement of the controlling-valve and to then complete the valve movement after an interval, so that the tramper will
 95 move down to the cotton under a partial head of steam and will then be driven under a full head of steam to compress the cotton in the press-box.

The driving-shaft 33 of the condenser is of
 100 course geared to the drum-shaft 37, this connection being preferably effected by means of a sprocket-chain 38, passed around sprockets 39 and 40 on the shafts 33 and 37, respectively.
 105

As successive charges of cotton are packed in the press-box the resistance opposed to the downward movement of the packer increases. At first comparatively slight pressure is sufficient to reciprocate the packer
 110 even after it has reached the cotton; but after a considerable quantity of cotton has been forced into the box greater pressure is applied to drive the packer down with sufficient force to effect the proper compression of the
 115 staple. I therefore utilize in my present construction, as in that described in the patent, a regulator including a throttle-valve 41, located in the supply-pipe 10 and having its stem equipped with a ratchet-wheel 42. This
 120 wheel is advanced step by step by a counterweighted pawl 43, mounted on a swinging arm 44, pivotally supported at its lower end by a bracket 45, outstanding from the pipe 10. The arm 44 is swung in unison with the
 125 lever 26 through the medium of an interposed link 46. The hopper 5^a is provided with a swinging counterweighted door 47, which is normally closed, but which may be opened for the purpose of enabling the operator to
 130

level the cotton in the box under certain conditions.

Briefly, the operation of the described apparatus is as follows: The condenser being in operation and the parts being positioned as shown in Fig. 1, an initial charge of cotton will be fed into the charging-chamber 3 while the valve-operating mechanism is moving from the position shown in Fig. 2 to that shown in Fig. 3. The controlling-valve 15 will then be partially operated to admit a limited supply of steam to the upper end of the cylinder, the valve-operating mechanism moving from the position shown in Fig. 3 to that shown in Fig. 4. The valve-operating mechanism will now remain stationary while the condenser continues to feed cotton to the charging-chamber and while the trumper moves down to the cotton. Finally, the valve-operating mechanism will be moved from the position shown in Fig. 4 to that shown in Fig. 5 for the purpose of fully opening the port 16 of the valve to admit a full head of steam behind the piston. The latter will now be driven down with considerable force to compress the cotton, and this pressure will continue while the lever 26 is retraversing the slot 21, after which the controlling-valve will be reversed to admit steam to the lower end of the cylinder for the purpose of raising the trumper. The parts will then be positioned as in Fig. 2 for a repetition of the described operation. As the repetition continues and the cotton accumulates in the press-box the throttle-valve 41 will be opened wider and wider, so that after the bale has assumed considerable proportions the baling mechanism will operate under maximum pressure.

It is believed that the foregoing description is ample for the purposes of this disclosure; but it may be stated in conclusion that while the illustrated embodiment of the invention is thought at this time to be preferable I reserve the right to effect such changes, modifications, and variations of the illustrated structure as may fall within the scope of the appended claims.

What I claim is—

1. In baling mechanism, the combination with a baling appliance, including a reciprocatory fluid-operated packer, of means for controlling the supply of motive fluid and operative to increase the supply at an intermediate point of the packer-stroke.

2. In a baling mechanism, the combination with a baling appliance including a reciprocatory fluid-operated packer, of a controlling-valve, and automatic means for operating the valve to supply motive fluid to the packer and to increase the fluid-supply at an intermediate point of the effective stroke of the packer.

3. The combination with a fluid-operated packer and controlling mechanism therefor, of means for feeding cotton to the packer to be tramped thereby, and an operative con-

nection between the cotton-feeding means and the controlling mechanism, whereby said controlling mechanism will be operated to supply motive fluid for moving the packer to the cotton and to increase the fluid-supply during that portion of the packer-stroke whereby the cotton is tramped.

4. The combination with a baling appliance including a press-box and a fluid-operated packer, of valve mechanism controlling the fluid-supply, a cotton-condenser arranged to deliver cotton to the packer, a driving-shaft for the condenser, and connections between the driving-shaft and the valve mechanism to effect an increase in the rate of fluid-supply after the packer has completed a portion of its tramping stroke.

5. The combination with a fluid-operated packer and valve mechanism controlling the fluid-supply, of valve-operating mechanism including a driving-shaft, a mutilated gear thereon, a counter-shaft having a gear opposed to the mutilated gear, and connections between the counter-shaft and the valve mechanism.

6. The combination with a reciprocatory fluid-operated packer, of controlling-valve mechanism controlling the supply of motive fluid to the packer, regulating-valve mechanism for regulating the quantity of motive fluid controlled by the controlling-valve mechanism, and valve-operating means for operating the regulating-valve mechanism to increase the motive-fluid supply after each reciprocation of the packer, and for operating the controlling-valve mechanism to supply motive fluid for the reciprocation of the packer and to increase the motive-fluid supply at an intermediate point of the packer-stroke.

7. The combination with a reciprocatory fluid-operated packer and a press-box, of a controlling-valve for the motive fluid, a condenser arranged to feed cotton to the press-box to be tramped by the packer, a driving-shaft for the condenser, a mutilated gear carried by said driving-shaft, a counter-shaft provided with a gear-wheel arranged to be driven by the mutilated gear, and operating connections between the counter-shaft and the controlling-valve.

8. The combination with a reciprocatory fluid-operated packer, of a controlling-valve for the motive fluid, and operating connections for the valve including a rod provided with a pair of adjustable stops, a lever interposed between the stops, and means for oscillating the lever.

9. The combination with a reciprocatory fluid-operated packer and a controlling-valve for the motive fluid, of valve-operating connections including a slotted rod, relatively adjustable stops mounted in the slot, a lever disposed to engage the stops, and means for guiding the lever in its movement.

10. The combination with a reciprocatory

fluid-operated packer and a press-box, of a
condenser disposed to feed cotton to the press-
box, a controlling-valve, a regulating-valve,
valve-operating means including an operat-
5 ing-lever common to said valves, a ratchet-
wheel fixed to the regulating-valve, a counter-
weighted pawl engaging the ratchet-wheel, a
swinging arm carrying the pawl and having
connection with the operating-lever, and

means including a mutilated gear for operat- 10
ing the lever from the condenser.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses.

JOHN M. STUART.

Witnesses:

W. C. McCORD,
C. C. BENNETT.