J. WOODWARD.

FEED REGULATOR.

APPLICATION FILED MAR. 24, 1914.

1,155,459.

Patented Oct. 5, 1915.

2 SHEETS—SHEET 1.

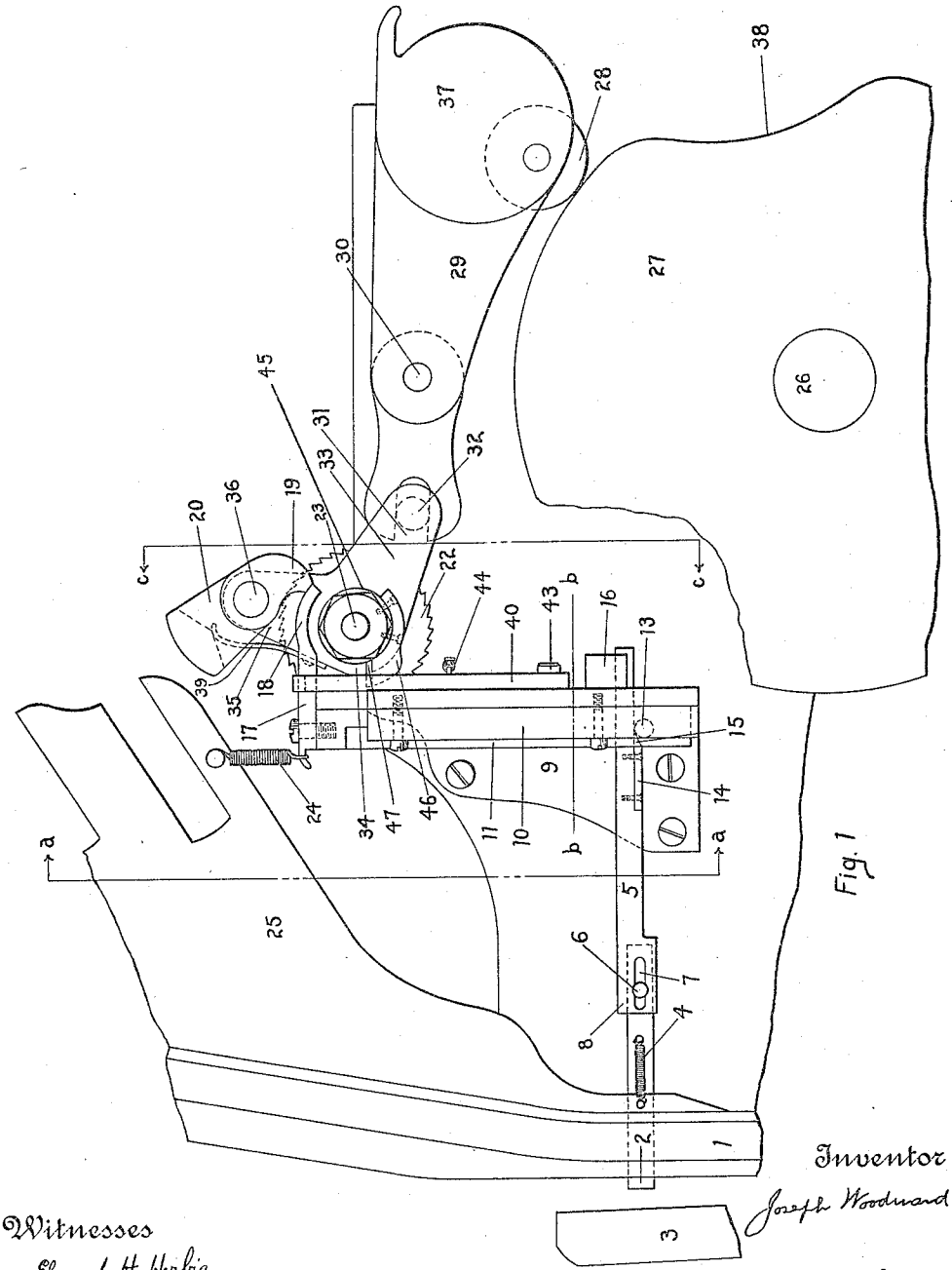


Fig. 1

Witnesses

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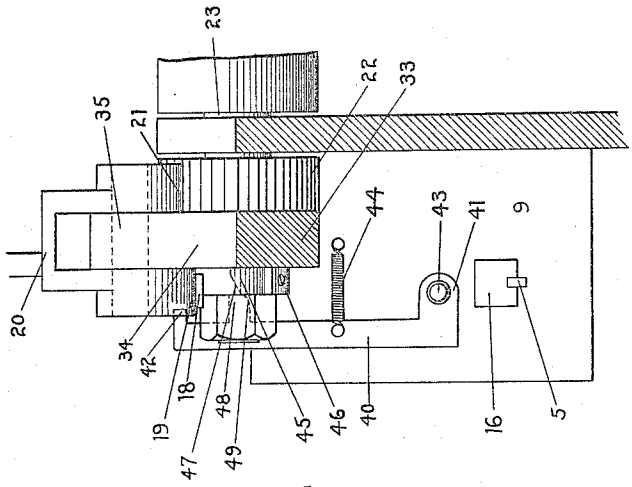


Fig. 4

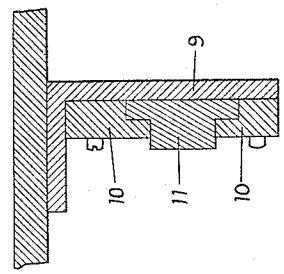


Fig. 3

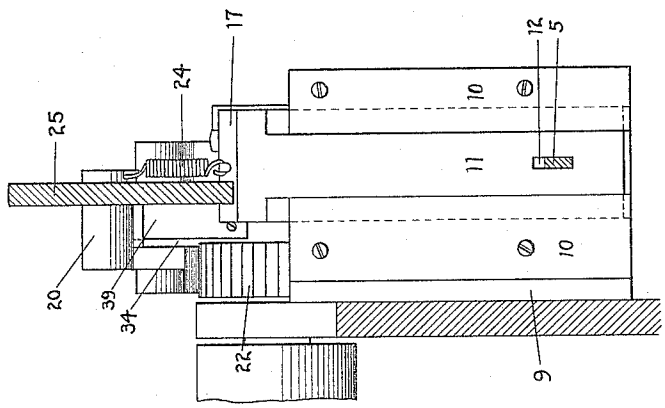


Fig. 2

Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH WOODWARD, OF DAYTON, OHIO.

FEED-REGULATOR.

1,155,459. Specification of Letters Patent. Patented Oct. 5, 1915.

Application filed March 24, 1914. Serial No. 826,962.

To all whom it may concern:

Be it known that I, JOSEPH WOODWARD, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented new and useful Improvements in Feed-Regulators, of which the following is a specification.

This invention relates to new and useful improvements in feed regulators.

The object of the invention is to provide a simple and efficient device to regulate the delivery of ink, paste, powder or like substances to impression and depositing machines.

It is particularly applicable to printing presses for the purpose of preventing the feed of ink from the fountain when the platen is not set for an impression.

Other important and incidental objects will be brought out in the following specification and particularly set forth in the subjoined claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved feed regulator applied to a printing press. Fig. 2 is a section on the line *a*—*a* of Fig. 1. Fig. 3 is a section taken on the line *b*—*b* of Fig. 1; and Fig. 4 is a section on the line *c*—*c* of Fig. 1, showing in detail the double pawl and retaining pawl.

Throughout the specification and drawings, similar reference characters denote corresponding parts.

In a detailed description of my invention, 1 designates the bed of a printing press through which extends a horizontal plunger 2 adapted to be engaged by a platen 3. By means of a coil spring 4 connecting it to the bed 1, the plunger 2 is returned to its normal position after being depressed by the platen 3.

The plunger 2 is connected to another horizontal plunger 5 by the following means. Carried by the inner end of the plunger 2 is an adjusting screw 6 which is received by an elongated slot 7 provided in the enlarged end 8 of the plunger 5. By loosening the screw 6 and moving it through the slot 7, the plungers 2 and 5 may be adjustably connected together, and when firmly joined, they act as one plunger for a purpose which will now be explained.

Secured to an angle bracket 9 supported by the bed 1 of the machine, are housings 10 10 in which a slide 11 is vertically movable. Provided in the lower end of the slide 11 is a vertically disposed slot 12 in which is pivoted a roller 13. The plunger 5 extends through the slot 12, and secured to the bottom side of said plunger is a metallic piece 14 having a beveled end 15 adapted to engage and override said roller. When the plunger 2 is forced inwardly by the platen 3, the plunger 5 will also be moved inwardly to carry the metallic member 14 over the roller 13, whereupon the latter will be forced downwardly, since the plunger 5 is held from an upward movement by a guide 16 through which it extends (see Figs. 1 and 4). When the roller 13 is forced downwardly, it will draw with it the slide 11 for a purpose now to be explained.

Secured to the top of the slide 11 is a laterally extending shoe or supporting member 17 having a curved end 18 upon which rests one nose portion 19 of a double pawl 20. The other nose portion 21 of said pawl is adapted to engage and rotate a ratchet wheel 22 secured to an ink fountain roller shaft 23 (see Figs. 1 and 4). Normally, the shoe 17 is held in an elevated position by a coil spring 24 attached to a supporting arm 25 extending outwardly from the bed 1. When the shoe 17 is in its raised position, the nose portion 19 of the pawl 20 will also be elevated by the curved end 18 of said shoe, to hold the other nose portion 21 of said pawl above the ratchet wheel 22, or, in other words, out of engagement with the latter.

In order that my improved feed regulator may be clearly understood, it is necessary that the means provided for rotating the ink roller shaft 23 be explained. Fast on a rotating shaft 26 is a cam 27, on the periphery of which rests a roller 28 pivotally secured to a follower 29 fulcrumed on a shaft 30. This follower 29 has provided in one end an elongated mouth portion 31 which receives a pin 32 carried by one arm 33 of a bell crank lever 34 loosely pivoted on the roller shaft 23. Secured to the other arm 35 of said bell crank lever is a shaft 36 which pivotally supports the double pawls 20 in such a manner that the nose portions 19 and 21 thereof will straddle the arm 35 of said bell crank lever 34. The roller end of the follower 29 carries a weight 37 whereby, when the said roller 28 enters a concave portion 38 of the periphery of the cam 27, the

weighted end of the follower 29 will descend to force the other end upwardly, whereupon the bell crank lever arm 35 will move the pawl 20 toward the arm 25 as the pin 32 carried by the arm 33 is moved upwardly by the mouth portion 31 of said follower. When the pawl 20 is thus moved, the nose portion 19 thereof will ride idly over the curved end 18 of the shoe 17, while the nose portion 21 of said pawl will move over the teeth of the ratchet wheel 22 without engaging them. But when the roller 28 is forced upwardly by the concave portion 38 of the periphery of said cam 27, the pawl 20 will be moved downwardly by the bell crank lever 34, whereupon the nose portion 21 of said pawl will engage a tooth of the ratchet wheel 22 to rotate the latter, and through it the ink roller shaft 23, until the roller 28 leaves the concave portion 38 of the periphery of said cam. By means of a spring 39, which is supported by the arm 35 and presses against the pawl 20, the nose portion 19 of said pawl is maintained in continuous engagement with the curved end 18 of the shoe 17, while the nose portion 21 is pressed into engagement with the teeth of the ratchet wheel 22 when said shoe is in its lowermost position.

It is eminently desirable that the ink roller shaft 23 be prevented from rotating when the platen 3 is not set for an impression. As is well known in the printing art, when an impression is not being made, the platen will not strike the impression means. Accordingly, the plunger 2 extends only a sufficient distance beyond the bed 1 so as not to be engaged by the platen 3 when the latter is prevented from receiving an impression.

As before stated, the spring 24 normally holds the shoe 17 in such an elevated position that the nose portion 21 of the double pawl 20 cannot engage the teeth of the ratchet wheel 22, but instead, the nose portion 19 of said pawl rides idly over the curved end 18 of said shoe when said pawl is rocked by the bell crank arm 34. It will now be observed that when the shoe 17 is thus elevated, the ink roller shaft 23 will not be rotated, since its rotation can only be effected through an engagement between the nose portion 21 of said pawl and the teeth of the ratchet wheel 22. When it is again desired to take an impression, the plunger 2 will be engaged by the platen 3, as the outer end of said plunger is in the path of the platen's movement when the latter is set for an impression. As the plunger 2 is forced inwardly by the platen 3, the plunger 5 will also be pushed inwardly, to cause the beveled end 15 of the metallic member 14 to ride over and force downwardly the roller 13, whereupon the slide 11 will be drawn downwardly against the tension of the spring 24 and carry with it the shoe 17 upon which the nose portion 19 of the pawl 20 rests. As the shoe 17 descends, the nose portions 19 and 21, under pressure of the spring 39, will also descend, to cause the nose portion 21 to engage a tooth of the ratchet wheel 22 and rotate the latter whenever the bell crank arm 35 is moved away from the supporting arm 25. On the reverse movement of said bell crank arm 35, the nose portion 21 of said pawl will be moved clear of the teeth of the ratchet wheel 22 to its starting position. It will now be observed that the shaft 23 will only be rotated by the ratchet wheel 22 when the shoe 17 is in its lowermost position, which is the position it occupies when the plunger 2 is fully engaged by the platen 3.

In order to lock or hold down the shoe 17 until the nose portion 21 of the pawl 20 has positively engaged a tooth of the ratchet wheel 22, a retaining pawl 40 is provided. The retaining pawl 40 comprises an elongated member having a right angled portion 41 and a shoulder portion 42 (see Fig. 4). The right angled portion 41 is loosely mounted on a pivot 43 secured to the angle bracket 9 at such a point that the shoulder portion 42 of said retaining pawl may be readily moved over the shoe 17 to lock the latter in its lowermost position. That the shoulder portion 42 of said retaining pawl 40 may be moved over and away from the shoe 17 at the proper times, the following means are provided. When the shoe 17 descends, the shoulder portion 42 of said retaining pawl will be drawn over it by a coil spring 44, one end of which being secured to said pawl and the other to the angle bracket 9. To release the shoulder portion 42 from engagement with the shoe 17, there is secured to the hub 45 of the bell crank lever 34 a cam segment 46 which has an outwardly tapering end portion 47. Provided on the retaining pawl 40 is a projection 48 having a curved end 49 which is adapted to be engaged and moved outwardly by the end portion 47 of the cam segment 46 whenever the bell crank arm 35 starts to move toward the supporting arm 25. The retaining pawl 40 is thus moved outwardly to disengage its shoulder portion 42 from the shoe 17, to permit the spring 24 to elevate the said shoe as hereinbefore described.

It is to be understood that my improved feed regulator will be operative without the retaining pawl 40, but in cases where the path of movement of the pawl 20 is short, such a device is desirable to lock down the shoe 17 until there is a positive engagement between the nose portion 21 of said pawl 20 and the teeth of the ratchet wheel 22.

The operation of my improved feed regulator is apparent from the foregoing description. As has been observed, it is posi-

tive in its movement, and permits the ink roller shaft 23 to be rotated only when the platen 3 strikes the plunger 2, or during an impression operation. At all other times the ink roller shaft 23 is prevented from rotation, due to the nose portion 21 of the pawl 20 being held out of engagement with the teeth of the ratchet wheel 22, by the means heretofore described.

While I have illustrated and described my improved feed regulator as applied to a printing press, it may be adapted to other impression and depositing machines if desired.

I do not wish to be limited to the details of construction and arrangement herein shown and described, and any changes of modifications may be made therein to suit different conditions of use.

Having described my invention, I claim:

1. In a feed regulator, a rotating member, a ratchet wheel secured to said member, a pawl adapted to engage said ratchet wheel, actuating mechanism to which said pawl is pivotally connected, said actuating mechanism adapted to intermittently rotate the ratchet wheel through said pawl, vertically movable means to lift and hold said pawl out of engagement with the ratchet wheel without disturbing the movement of said actuating mechanism, a platen, and a laterally movable device adapted to be engaged by said platen, to force downwardly the vertically movable means and thereby permit the pawl to descend and engage the ratchet wheel, substantially as described.

2. In a feed regulator, a rotating member, a ratchet wheel secured to said member, a pawl adapted to engage said ratchet wheel, actuating mechanism to which said pawl is pivotally connected, said actuating mechanism adapted to intermittently rotate the ratchet wheel by means of said pawl, a vertically movable member, resilient means for elevating said member, means carried by said member to lift the pawl out of engagement with the ratchet wheel when the vertically movable member is elevated, without disturbing the movement of said actuating mechanism, a platen, and a laterally movable device adapted to be engaged by said platen, to force the vertically movable member downwardly, against the tension of said resilient means, and thereby permit the pawl to descend and engage the ratchet wheel, substantially as described.

3. In a feed regulator, a shaft, a ratchet wheel secured to said shaft, a pawl, cam operated mechanism to which said pawl is pivotally secured, said pawl having two projecting portions, one projecting portion adapted to engage the ratchet wheel and rotate the latter when the pawl is moved by the cam operated mechanism, a vertically movable member, a shoe carried by the top portion of said member, the other projecting portion of said pawl resting on said shoe, resilient means for elevating said shoe and vertically movable member, to lift the pawl out of engagement with the ratchet wheel without disturbing the movement of the cam-operated mechanism, a curved device secured to the lower end of said vertically movable member, and a laterally movable plunger, said plunger being movable over the curved device to force the latter downwardly, whereby the vertically movable member and shoe may be drawn downwardly thereby, to permit the first named projecting portion of said pawl to descend into engagement with the ratchet wheel, substantially as described.

4. In a feed regulator, a shaft, a ratchet wheel secured to said shaft, a pawl, a cam-operated arm to which said pawl is pivotally secured, a vertical slide, a shoe carried by the top portion of said slide, said pawl having two nose portions, one nose portion thereof adapted to engage the ratchet wheel and rotate the latter when the pawl is moved forwardly by said arm, the other nose portion of said pawl resting upon said shoe, a spring for elevating said shoe to hold the first named nose portion of the pawl above the ratchet wheel, a roller carried by the lower end of said slide, and a laterally movable plunger, said plunger having a beveled portion movable over said roller, to force the latter downwardly, whereby the slide and shoe will be drawn downwardly against the tension of said spring, to permit the first named nose portion of said pawl to descend into engagement with the ratchet wheel, substantially as described.

5. In a feed regulator, a shaft, a ratchet wheel secured to said shaft, a pawl, a cam-operated arm to which said pawl is pivotally secured, a vertical slide, a shoe carried by the top portion of said slide, said pawl having two nose portions which straddle said cam-operated arm, one nose portion adapted to engage the ratchet wheel and rotate the latter when the pawl is moved forwardly by said arm, the other nose portion of said pawl being movable upon said shoe, a spring for elevating said shoe and slide, said shoe adapted, when elevated, to carry upwardly its respective nose portion of the pawl, whereupon the other nose portion of said pawl will be lifted above the ratchet wheel, a roller carried by the lower end of said slide, a laterally movable plunger, a beveled piece secured to said plunger, said plunger adapted to carry the beveled piece over said roller to force the latter downwardly, whereupon said slide and shoe will be drawn downwardly by said roller against the tension of said spring, and resilient means for forcing the first named nose portion of said

pawl into engagement with the ratchet wheel when the shoe descends, substantially as described.

6. In a feed regulator, a rotating member, a ratchet wheel secured to said member, a pawl adapted to engage said ratchet wheel, actuating mechanism to which said pawl is pivotally connected, said actuating mechanism adapted to intermittently rotate the ratchet wheel through said pawl, a vertical slide, resilient means for elevating said slide, a member carried by said slide to lift the pawl out of engagement with the ratchet wheel when said slide is elevated, a laterally movable plunger for forcing downwardly said slide, said slide adapted to draw downwardly with it the pawl lifting member, and a retaining pawl in operative connection with said actuating mechanism, to engage and hold the pawl lifting member in its lowermost position until the first named pawl has engaged the ratchet wheel, substantially as described.

In testimony whereof I have hereunto set my hand this 21st day of March, 1914.

JOSEPH WOODWARD.

Witnesses:
WALTER V. SNYDER,
HOWARD S. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."