No. 842,466. PATENTED JAN. 29, 1907.

J. W. KOHL.

INK FOUNTAIN FOR PRINTING PRESSES.

APPLICATION FILED NOV. 6, 1905.

3 SHEETS—SHEET 1.

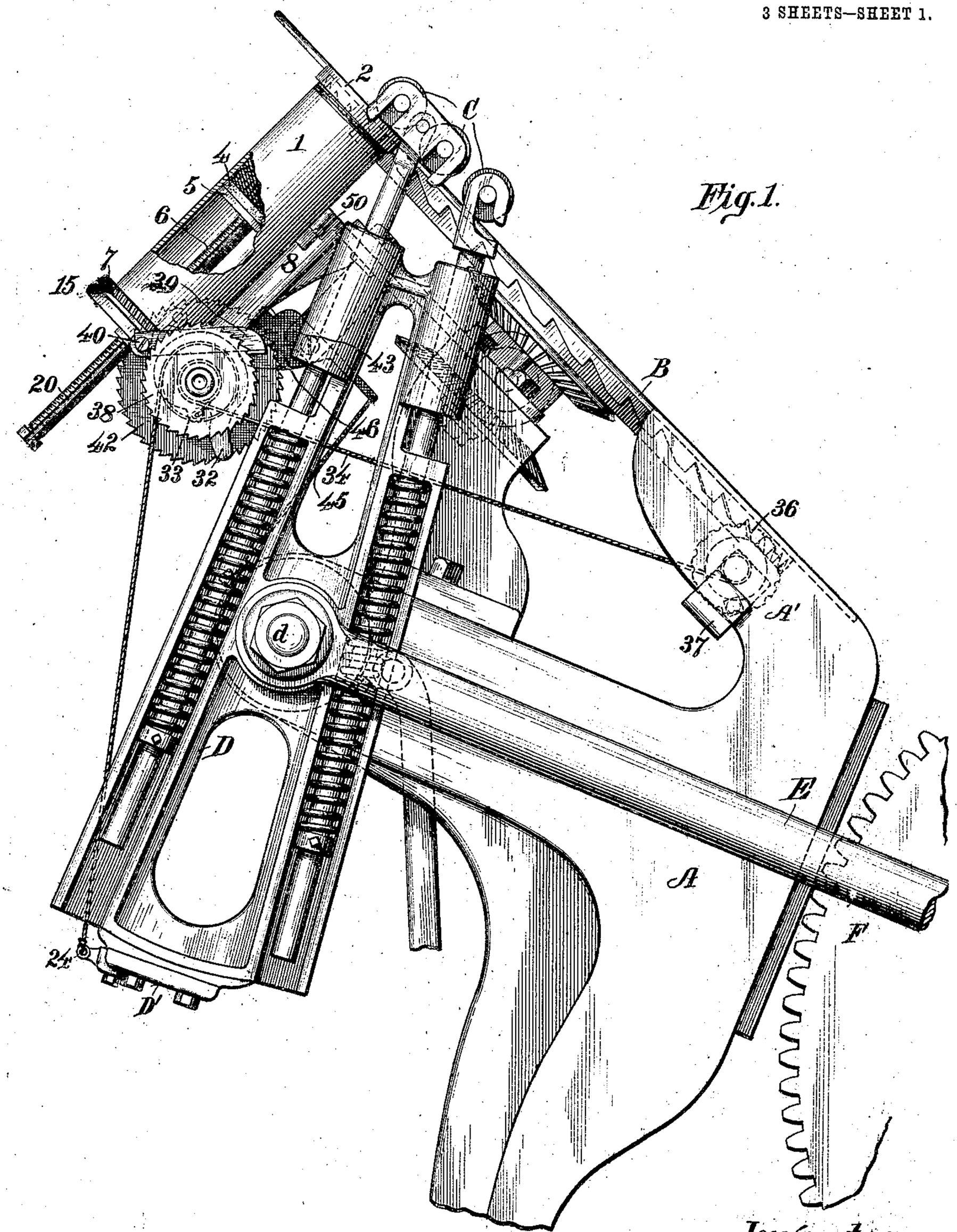

Fig. 1.

Witnesses:
H. S. Austin
M. Simon.

Inventor:
John W. Kohl,
by
his Att'y.

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3 SHEETS—SHEET 2.

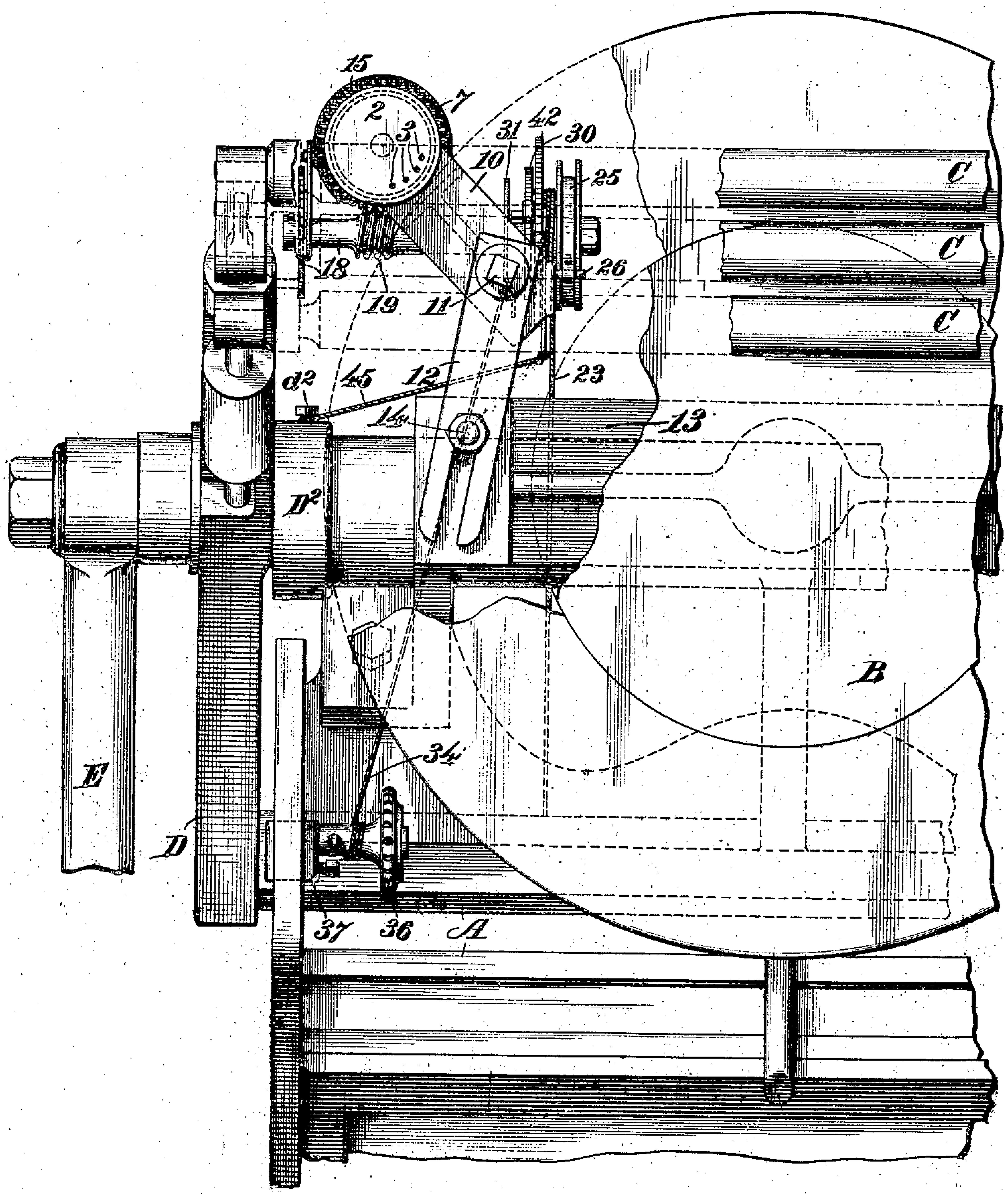

Fig. 2.

Witnesses:
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M. Simon.

Inventor:
John W. Kohl,
by Charles Wilbur Hawley
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3 SHEETS—SHEET 3.

Fig. 3.

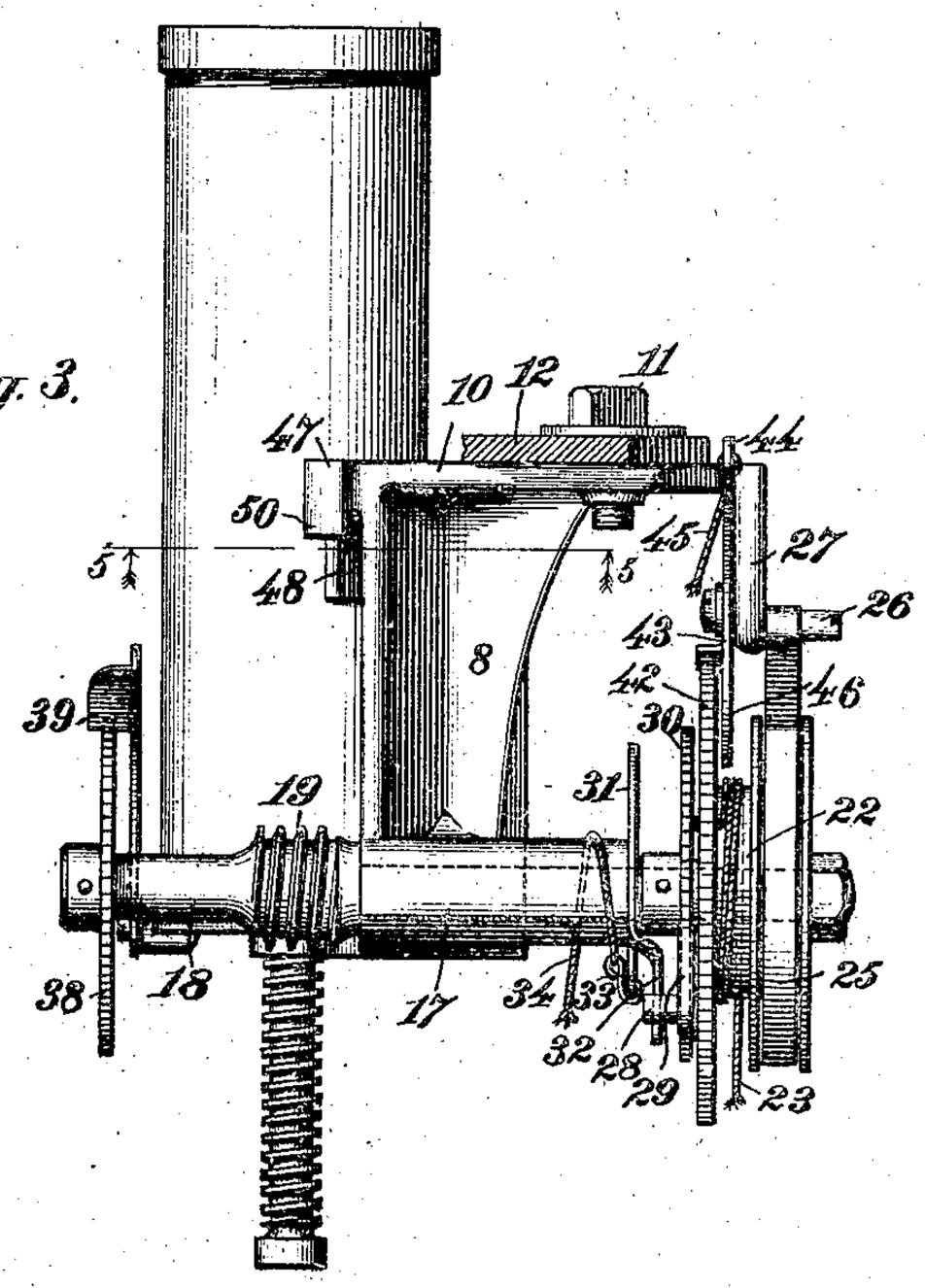


Fig. 5.

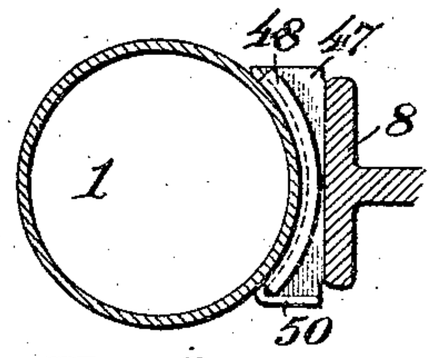


Fig. 6.

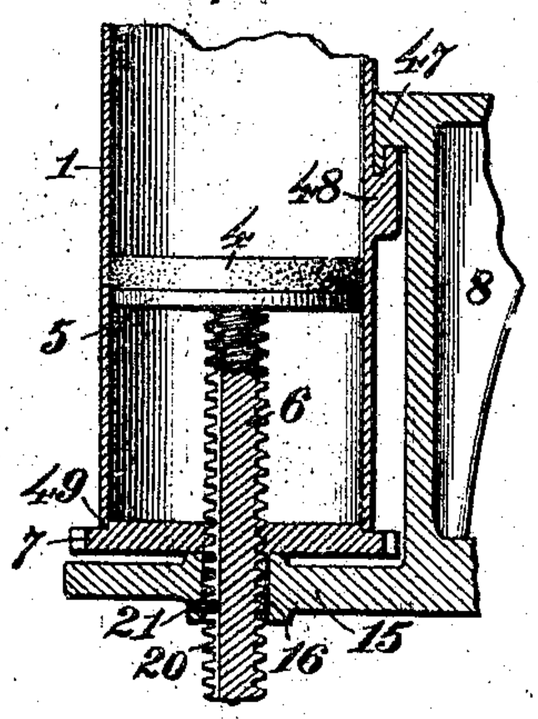
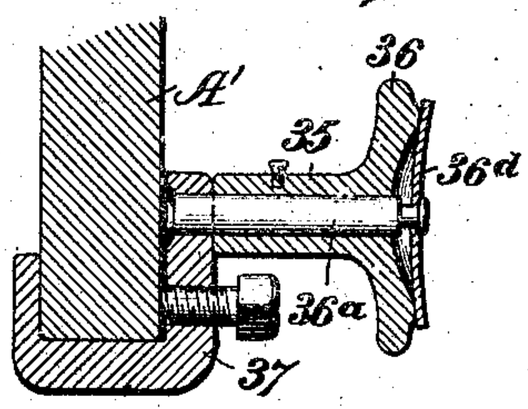


Fig. 4.



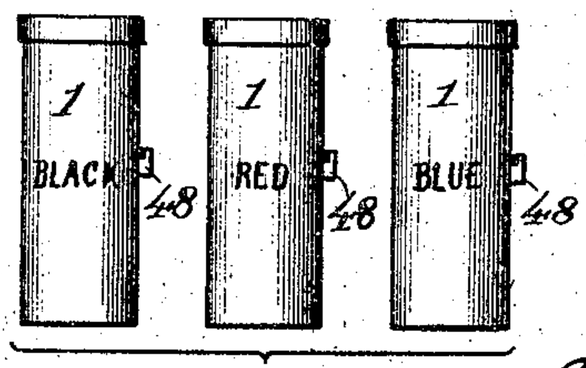


Fig. 7.

Witnesses:
H. S. Austin
M. Simon.

Inventor:
John W. Kohl
by Richardson Hawley
his Atty.

UNITED STATES PATENT OFFICE.

JOHN W. KOHL, OF MARSHFIELD, WISCONSIN, ASSIGNOR OF ONE-HALF TO GEORGE H. REYNOLDS.

INK-FOUNTAIN FOR PRINTING-PRESSES.

No. 842,466. Specification of Letters Patent. Patented Jan. 29, 1907.

Application filed November 6, 1905. Serial No. 286,097.

To all whom it may concern:

Be it known that I, JOHN W. KOHL, a citizen of the United States, residing at Marshfield, Wood county, Wisconsin, have invented a certain new, useful, and Improved Ink-Fountain for Printing-Presses.

My invention relates to printing-presses, and has special reference to ink distribution of that type thereof known as the "Gordon" presses.

My invention has further and particular reference to improvements in ink-fountains of that class especially applicable to the type of presses aforementioned.

The object of my invention is to provide means whereby ink in desirable quantities may be automatically fed to the inking mechanism of printing-presses, and particularly presses of the Gordon type.

Another object of my invention is to provide an ink-supplying mechanism or fountain which will automatically cease to feed when the impression is thrown off, thereby securing a perfect uniformity at all times in the quantity of ink fed to the form.

Another special object is to produce an ink-fountain so constructed and arranged upon the press that the quantity of ink fed therefrom may be regulated from a convenient point by the operator, and that while the press is in motion.

A still further object is to produce an ink-fountain in which various colors of ink may be quickly substituted for one another without necessitating a cleaning of the fountain at each change, with a consequent loss of time and waste of ink.

A further object of my invention is to provide a fountain which will successfully feed ink which has been previously mixed with quick-drying reducers and at the same time keep the ink in perfect condition for indefinite periods.

Further objects of my invention will appear and be fully set forth hereinafter.

In the type of presses under consideration the inking mechanism consists, primarily, of a distributing-disk which is partially rotated at each reciprocation of the bed-carrying portion of the presses and in a plurality of inking-rollers which travel alternately over the face of said distributing-disk and the form, taking ink from the former while the form is in contact with the platen and distributing it uniformly over said form intermediate of each stroke of the press. It further consists of an inking-fountain whereby the ink is fed in successive quantities to the primary inking mechanism just described. It is customary to place the inking-fountain above the back portion of the disks and so located there that the inking-rollers contact the said fountain upon each stroke of the press when the impression is on, taking ink therefrom and spreading the same over the distributing-disk as they travel toward the form. These rollers do not travel as far back when the impression is off as they do when the impression is on, and consequently do not contact the fountain and take ink therefrom at such times; but when the impression is again thrown on the first roller receives a fresh quantity of ink, which is unevenly distributed upon the rollers during the first few impressions. As a result the form is unevenly inked, causing the work to appear streaked. Especially is this the case when the impression of the press is heavy, as is usual on half-tone or other fine work. Frequent attempts have been made to overcome these imperfections in the operation of inking mechanisms; but so far as I am aware all devices provided to this end have been more or less unsatisfactory.

The feed of inking-fountains on printing-presses must be regulated to a nicety, for if more or less ink is fed at each stroke than should be consumed upon the work the work turned out by the press will lack uniformity. The careful and nice adjustment of the fountains now in use is attended by difficulties and annoyances, such as to cause rather than to minimize neglect on the part of the pressman. For example, to make any change in the amount of feed thereof it is necessary to stop the press and for the pressman to leave his place at the feed-table. It follows also that as the adjustment must be made while the press is not running he must guess at the amount of change necessary to secure the proper feed, and then after adjusting it to the amount he thinks proper start his press and by trial ascertain if it is properly set. Even when the fountain has been adjusted so as to give a fairly uniform feed the pressman will frequently notice that a little more or a little less ink than is being fed to the inking mechanism is necessary in order to secure

the best impressions. As heretofore stated, these delicate adjustments are impracticable with the fountains now in use. In the fountains heretofore provided for these presses, so far as I am aware, the ink is constantly exposed to the atmosphere, and it is therefore practically impossible to use quick-drying ink in said fountains, for the reason that the rapid evaporation of the drier soon renders the ink thick, gummy, and unmanageable.

My invention consists, primarily, in a closed receptacle for the ink provided with a perforated top in a plane with the inking-disks and over which the rollers travel with each reciprocation of the press and in means for forcing the ink from said reservoir through the perforations in said cap in desired quantities.

It further consists in means whereby the feed of said fountain is automatically stopped whenever the impression is thrown off.

It further consists in such novel construction and arrangement of parts as will enable the pressman to regulate the quantity of feed therefrom from a convenient point, and that while the press is in operation.

It further consists in a plurality of readily-interchangeble reservoirs adapted to contain different-colored inks.

It further consists in various novel constructions and arrangements of parts, as will be hereinafter fully described and explained.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a fragmentary side elevation of a printing-press with a fountain constructed in accordance with my novel idea attached thereto. Fig. 2 is a plan view of the subject-matter of Fig. 1. Fig. 3 is an elevation of my fountain removed from the press. Fig. 4 is a detail section of a portion of the feed adjustment. Fig. 5 is a section of a line 5 5 of Fig. 3, showing the manner of detachably securing a reservoir to the frame. Fig. 6 is a vertical section through the lower portion of the reservoir and adjacent parts. Fig. 7 illustrates on a smaller scale a plurality of reservoirs removed from the frame.

In the drawings, A indicates a reciprocating bed-carrying portion of a press surmounted by the usual distributing-disk B and inking-rollers C. D is the ordinary roller-carriage, E the impression-arm, and F the main gear. These parts are common to all presses of the kind under consideration, and therefore need no detailed description.

Located to the side of the distributing-disk and somewhat behind the central axis thereof is a cylinder 1, closed at the top by means of a screw-cap 2. The face of said cap is in a plane with the surface of the disk B, and is provided with perforations 3, through which the ink is forced when the press is in operation. Located as described, it is in the path of the rollers C, the end of the first or upper one of which passes over it at each reciprocation of the press, taking ink therefrom and depositing the same upon the distributing-disk B. Within the cylinder 1 I provide a piston 4, made of leather or other suitable material, which is pressed inwardly at the proper time by a plunger 5, attached to the upper end of a piston-rod 6. The reservoir 1 is filled with ink between the top 2 and the piston 4. Consequently any inward movement of said piston will force the ink through the perforations 3 and upon the top 2, where it is taken up by the first of the rollers C. The rod 6 is screw-threaded through a worm-gear 7. The gear 7, when turned upon the rod 6 moves the said rod and piston in the cylinder 1.

The cylinder 1 is detachably secured to a frame 8 of the fountain, said frame also affording means whereby the fountain is secured to the press. Upon the upper part of the frame 8 is a substantially horizontally disposed arm 10, to which is secured, as by a bolt 11, an extension-arm 12, which is in turn fastened to the disk-support 13. That end of the extension-arm 12 which is secured to the disk-support is bifurcated to receive a bolt 14, which construction, taken in conjunction with the pivotal connection provided between the arm 10 and the extension-arm 12 by the bolt 11, affords means for properly adjusting the fountain to the press. At the lower end of the bracket 8 I provide a shelf 15, which supports the ink-reservoir 1 and worm-gear 7. Centrally disposed therein is a non-threaded hole 16 for the accommodation of the rod 6. As the rod 6 is operated by the rotation of the worm-gear 7, it is necessary to provide means to prevent the said rod 6 from turning therewith. Accordingly I provide a keyway 20 in the rod 6, engaged by a key 21, extending from the inner surface of the hole or sleeve 16. Also upon the lower part of the bracket 8 I provide a horizontally-disposed sleeve 17 for the accommodation of a shaft 18, carrying a worm 19. The worm 19 is in engagement with the worm-gear 7, and it is therefore obvious that whenever the shaft 18 is rotated the worm 7 will be rotated upon the rod 6, thereby moving the piston in the cylinder 1. As it is necessary that this movement of the piston shall be in one direction only, and that upwardly, in order to feed the ink to the inking mechanism, it is obvious that the shaft 18 with the worm 19 shall be rotated in a positive direction only, and that in direct proportion to the operation of the press. To this end I provide means for securing a partial but positive rotation of the shaft 18 upon each reciprocation of the bed-carrying portion of the press when the impression is on and, further, provide means for

automatically stopping said rotation of the shaft when the impression is off. Accordingly a drum 22 is loosely mounted upon the shaft 18. Secured to the drum 22 is a cord 23, said cord being wound several times about said drum in a positive direction and carried down and secured, as at 24, to the cross-bar D′ of the roller-carriage D. A spring 25 is also secured to the drum 22 and wound about the same in a reverse direction from the windings of the cord 23. The outer end of the spring 25 is attached to a stud 26 on a depending lug 27, provided on the arm 10. As the roller-carriage D swings upon its pivot *d*, carrying the rollers upwardly toward the fountain, the lower end thereof swings away from its proximity to the drum 22, unwinding the cord from said drum and rotating it against the tension of the spring 25. As the roller-carriage reverses its swing it releases its pull on the cord 23. The spring 25 then returns the drum to its former position, rewinding the cord thereon preparatory to a repetition of the operation.

In order to communicate the positive movement of the drum 22 to the shaft 18, the said drum and shaft are connected by means of a ratchet mechanism. To this end the drum is provided with a stud 28, carrying a pawl 29, which pawl engages a ratchet-wheel 30, secured to the shaft 18. Thus when the drum rotates in a positive direction it rotates the shaft 18 to that extent also, but has no tendency whatever to rotate it in the reverse direction. The stud 28 extends outwardly some distance from the drum and pawl for a purpose hereinafter explained.

It is obvious that by regulating the amount of positive rotation of the drum 22 the amount of feed of the fountain is also regulated. The amount of positive rotation of the said drum is equal to the amount of reverse rotation imparted thereto by the spring 25. Therefore to regulate the feed of the fountain it is but necessary to provide means for regulating the amount of said reverse rotation of the drum. Accordingly a disk 31 is loosely mounted upon the shaft 18 and is provided with a substantially radial arm 32, which projects into the path of the stud 28 upon the drum 22. The position of the arm 32 determines the reverse rotation of the drum, and consequently the feed of the fountain. Therefore in order that the pressman may regulate at will the amount of feed of the fountain it is but necessary to provide means whereby he can readily adjust the position of the arm 32, carried by the disk 31. To this end the disk 31 is provided with an ear or lug 33. Attached thereto and passing around the sleeve 17 in the direction of the positive rotation of the drum is a cord or chain 34. After passing around the sleeve 17, as stated, the cord is carried forward on the reciprocating portion of the press and is there wound around and attached to a sleeve 35 of a thumb-wheel 36. The wheel 35 is mounted upon a stud-shaft 36^a, extending from a bracket 37, attached to a roller-bearer A′ or other convenient point where it is within easy reach of the pressman. It is obvious from this construction and arrangement of parts that the pressman by turning the thumb-wheel 36 in either direction will vary the feed of the fountain, for by unwinding the cord from the sleeve 36 a greater amount of reverse rotation of the drum is permitted, and a consequently greater positive rotation, resulting in a greater feed of the fountain. Likewise winding the cord upon the sleeve 35 admits of less reverse rotation of the drum and a correspondingly lessened positive rotation, consequently producing a diminished feed of the fountain. A leaf-spring 36^d is secured to the outer end of the stud-shaft 36^a and presses upon the face of the wheel 36 to such an extent as to prevent any tension of the spring 25 upon the cord 34 from rotating said wheel. To prevent any reverse rotation of the shaft 18 while the press is in operation, a ratchet-wheel 38 is secured thereto, said ratchet-wheel being engaged by a pawl 39, attached to the frame of the fountain, as at 40.

In order that the feed of the fountain shall be stopped while the impression is off, it is necessary to provide means whereby the shaft 18 shall be prevented from rotating at such times. To this end a ratchet connection is provided between the drum 22 and frame 8, which is automatically operated when the impression is thrown off or on. Accordingly the drum 22 has connected thereto a ratchet-wheel 42, adapted to be engaged by a pawl 43, pivoted upon the depending lug 27 of the bracket-arm 10. The pawl 43 has an arm 44, attached to the outer end of which is a cord 45. This cord 45 is carried down and attached to a bolt d^2 upon the roller-carriage shaft D^2. While the impression is on the cord 45 holds the pawl away from engagement with the ratchet-wheel 42; but as soon as the impression is thrown off, which is done by partial rotating the roller-carriage shaft D^2, the tension on the cord 45 is released, and the pawl 43, being weighted, as at 46, drops into engagement with the ratchet-wheel 42, thereby stopping the feed.

One of the advantages of my invention is that inks of various colors may be used on the press without necessitating a cleaning out of the fountain, with the consequent loss of time and waste of ink. To this end I provide my fountain with a number of reservoirs, which are detachably secured to the frame thereof by means of interlocking lugs 47 48 upon the reservoir 1 and frame 8, respectively. Each reservoir may contain an ink of a different color. When it is desirable to

make a change, all that is necessary is to clean the inking-rolls and disks and substitute a reservoir containing the colored ink desired for the one on the press. With the novel construction of my fountain this change is accomplished in but a few seconds. To make the change, the reservoir on the press is turned until the lugs 47 and 48 are disengaged, and it is then lifted off of the gear 7, which is shouldered, as at 49, to accommodate the lower edge thereof. Before substituting another and fuller reservoir it is necessary to retract the plunger. To do this, the plunger 5, rod 6, and worm-gear 7 are removed from the fountain. This is easily done after the reservoir is removed by simply lifting them off of the extension 15 of the frame 8, the rod 6 readily passing through the hole or sleeve 16. The worm-gear 7 is then turned until it reaches the end of the rod 6 close up the plunger 5, after which they are replaced upon the fountain. The reservoir containing the desired ink is then placed thereon and locked in place by turning until the lugs 47 48 interlock. A flange 50 is provided upon the lug 47 to prevent further rotation of the reservoir after it is securely locked.

Insomuch as my reservoirs for the ink are closed receptacles, it is obvious that the ink may be mixed with quick-drying reducers before being put therein and that the ink so mixed and placed therein will be kept in perfect condition for indefinite periods.

The ink-reservoirs are easily cleaned. To do so, the cap 2 is unscrewed therefrom and the piston 4 removed, leaving but a plain cylinder, which is readily cleaned. To fill the reservoir, the piston 4 is first inserted in the bottom or at such other point therein as to give the reservoir the proper capacity for the desired quantity of ink. The ink is then put in and the cap 2 screwed on. The reservoir is then ready to be placed on the fountain.

The operation of the fountain is as follows: As the reciprocating part of the press swings forwardly upon the impression-stroke the inking-rolls C travel upwardly on the disk B to the fountain, where they take up what ink is above the surface of the upper face of the cap 2 ready to spread it upon the distributing-disks upon the return swing. At the same time that the rolls C are traveling upwardly the lower portion of the roller-carriage D is swinging away from its proximity to the fountain. In doing so it unwinds the cord 24 from the drum 22, thereby causing a positive rotation of said drum. As the drum thus rotates the pawl 29 by engagement with the ratchet 30 communicates a like positive rotation to the shaft 18 and worm 19. Thus motion is communicated to the rod 6 and plunger 5 through the medium of the worm-gear 7, thereby pressing the piston upwardly, forcing a measurable quantity of ink through the perforations 3 in top 2 in time to be taken up by the roller C, as before mentioned. As the roller-carriage D reverses its swing the tension of the spring 25 reverses the rotation of the drum 22, rewinding the cord thereon until the stud 28 comes in contact with the arm 32 of the disk 31. Upon such reverse rotation of the drum 22 the ratchet-wheel 38 and pawl 39 prevent the shaft from turning therewith. After the stud 28 engages said arm 32 any further swing of the roller-carriage D will produce slack in the cord 24, which slack is taken up upon the first part of the succeeding stroke of the press. Should the operator wish to increase the feed of the fountain, he merely turns the thumb-wheel 36, unwinding the cord or chain 34 from the sleeve of said thumb-wheel. This permits the stud 28 to shove the arm 32 farther back on the reverse rotation of the drum 22, thereby allowing a greater positive rotation on the next reciprocation of the bed, giving a greater feed of the fountain. If he desires to lessen the feed, he merely turns the thumb-wheel in the opposite direction, winding more cord or chain upon the sleeve thereof and in so doing rotates the disk 31 and its accompanying arm 32 in the direction of the positive rotation of the drum, thereby restricting the reverse rotation of the drum and its consequent positive rotation, and thus lessening the feed of the fountain.

I wish it to be understood that my invention is not confind to the special construction or features, as hereinbefore described, but may be embodied in any structure whereby the ink is contained in a closed receptacle and from which it is automatically fed in desirable quantities and that subject to regulation while the press is in operation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a mechanism of the class described, a printing-press and its disk, in combination with an ink-containing cylinder adjacent to the edge of said disk and perpendicular to the plane of said disk, a top for said cylinder containing a plurality of perforations, means whereby said cylinder is removably secured on the frame of the press, an ink-expelling piston, automatically actuated by the press and permanently arranged thereon, means upon the front of the press adapted to regulate the operation of said piston and means for automatically stopping the movement of said piston when the impression of the press is thrown off, substantially as described.

2. A printing-press and its disk, in combination with an ink-reservoir fastened on the frame of said press and provided with a perforated top adjacent to the edge of said disk in the plane thereof, a piston in said reservoir, a piston-rod attached to said piston, a worm-gear screw-threaded upon said rod, a

worm for actuating said gear, and a driving connection between a moving part of said press and said worm, substantially as described.

3. A printing-press and its disk, in combination with an ink-reservoir fastened on the frame of said press and provided with a perforated top adjacent to the edge of said disk in the plane thereof, a piston in said reservoir, a piston-rod attached to said piston, a worm-gear screw-threaded upon said rod, a worm for actuating said gear, a driving connection between a moving part of said press and said worm and a regulable driving connection, substantially as described.

4. A printing-press and its disk, in combination with an ink-reservoir fastened on the frame of said press and provided with a perforated top adjacent to the edge of said disk in the plane thereof, a piston in said reservoir, a piston-rod attached to said piston, a worm-gear screw-threaded upon said rod, a worm for actuating said gear, a driving connection between a moving part of said press and said worm, a regulable driving connection and automatic means for stopping the operation of said worm, substantially as described.

5. A printing-press and its disk, in combination with an ink-reservoir having a perforated top in the plane of said disk and held adjacent to the edge thereof, a piston in said reservoir, a threaded wheel fitting said rod and closing the bottom of said reservoir beneath the piston, means supporting said wheel and regulable means for actuating said wheel from a moving part of the press, substantially as described.

6. In an ink-fountain, an ink-reservoir, a piston in said reservoir, a piston-rod attached to said piston, a worm-gear screw-threaded upon said piston-rod, a shaft in a plane transverse to the axis of said worm-gear, a worm upon said shaft in juxtaposition to said worm-gear, an oscillatory drum loosely mounted upon said shaft and a ratchet connection between said shaft and said drum, substantially as and for the purpose described.

7. In an ink-fountain, an ink-reservoir, a piston in said reservoir, a piston-rod attached to said piston, a worm-gear screw-threaded upon said piston-rod, a shaft in a plane transverse to the axis of said worm-gear, a worm upon said shaft in juxtaposition to said worm-gear, an oscillatory drum loosely mounted upon said shaft, a ratchet connection between said drum and said shaft and regulatable means for limiting the degree of oscillation of said drum, substantially as and for the purpose described.

8. In an ink-fountain, an ink-reservoir, a piston in said reservoir, a piston-rod attached to said piston, a worm-gear screw-threaded upon said piston-rod, a shaft in a plane transverse to the axis of said worm-gear, a worm upon said shaft in juxtaposition to said worm-gear, an oscillatory drum mounted upon said shaft, a ratchet connection between said shaft and drum, means for actuating said drum and means for automatically interrupting the oscillation of said drum, substantially as and for the purpose described.

9. In a mechanism of the class described, a suitable bracket or support, in combination with a cylinder detachably secured thereto and having a perforated upper end, a piston in said cylinder, a piston-rod, a piston-rod driver arranged in the bracket and inclosing the lower end of said cylinder, a driver-shaft borne by the bracket and suitably connected with said driver and single-direction intermittent operating means on said shaft, substantially as described.

10. In a mechanism of the class described, a suitable bracket or support, in combination with an ink-reservoir arranged thereon and having a perforated end, a piston, a piston-rod, a piston-driver, the shaft thereof, an intermittent actuating-drum and a cord for connecting the same with a moving part of the printing-press, substantially as described.

11. A mechanism of the class described comprising an ink-reservoir having a perforated end, in combination with a piston, a piston-rod, a piston-rod driver, the shaft thereof, a single-direction-actuating mechanism arranged on said shaft and a cord connecting the same with a moving part of the printing-press, substantially as described.

12. A mechanism of the class described comprising an ink-reservoir having a perforated end, in combination with a piston, a piston-rod, a piston-rod driver, a ratchet for preventing backward movement of said driver, an intermittent spring-retracted actuating mechanism connected with said driver and a cord for connecting the same with a moving part of a press, substantially as described.

13. A mechanism of the class described comprising an ink-reservoir having a perforated end, in combination with a piston, a piston-rod, a piston-rod driver, a ratchet for preventing backward movement of said driver, an intermittent spring-retracted actuating mechanism connected with said driver, a cord for connecting the same with the moving part of a press and means adapted to be attached to a press for shortening and lengthening said cord to regulate the action of the mechanism, substantially as described.

In testimony whereof I have hereunto set my hand this 16th day of October, 1905, in the presence of two subscribing witnesses.

JOHN W. KOHL.

Witnesses:
C. S. VEDDER,
LULU WYMAN.