

J. McCLURE.
 INKING APPARATUS FOR PRINTING PRESSES.
 APPLICATION FILED NOV. 11, 1912.

1,190,779.

Patented July 11, 1916.
 3 SHEETS—SHEET 1.

FIG. 3.

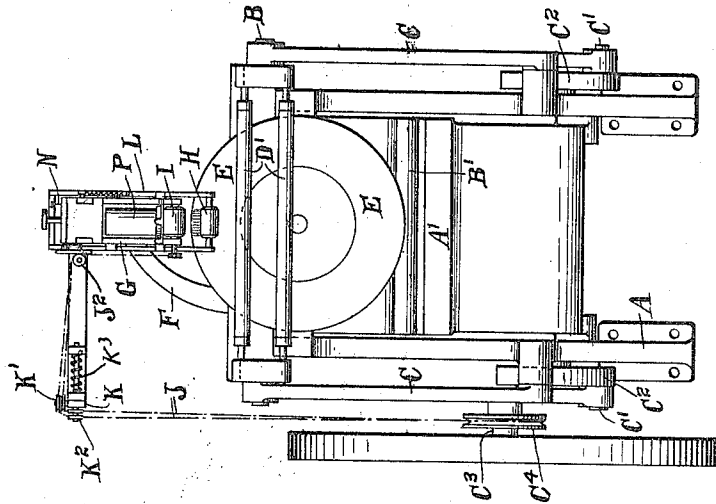
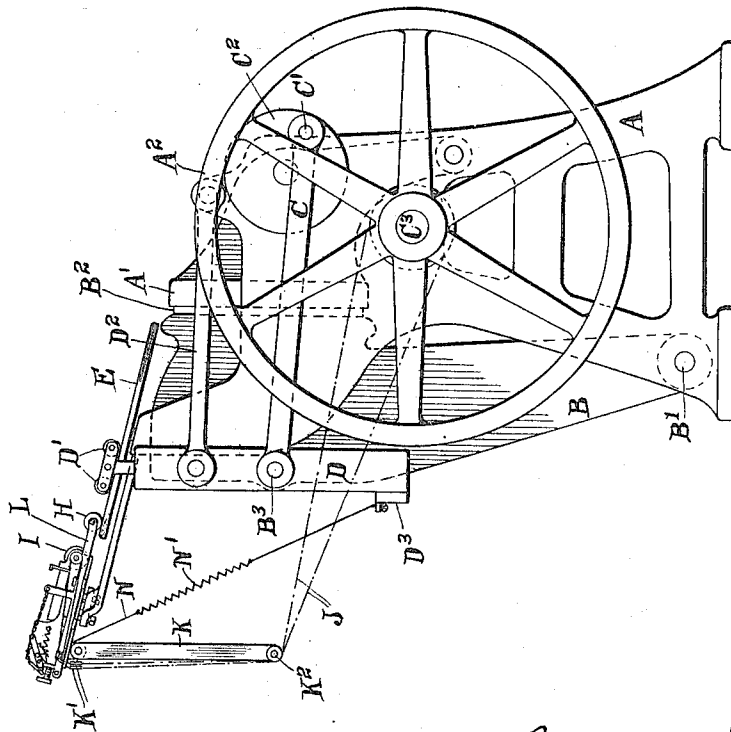


FIG. 1.



WITNESSES

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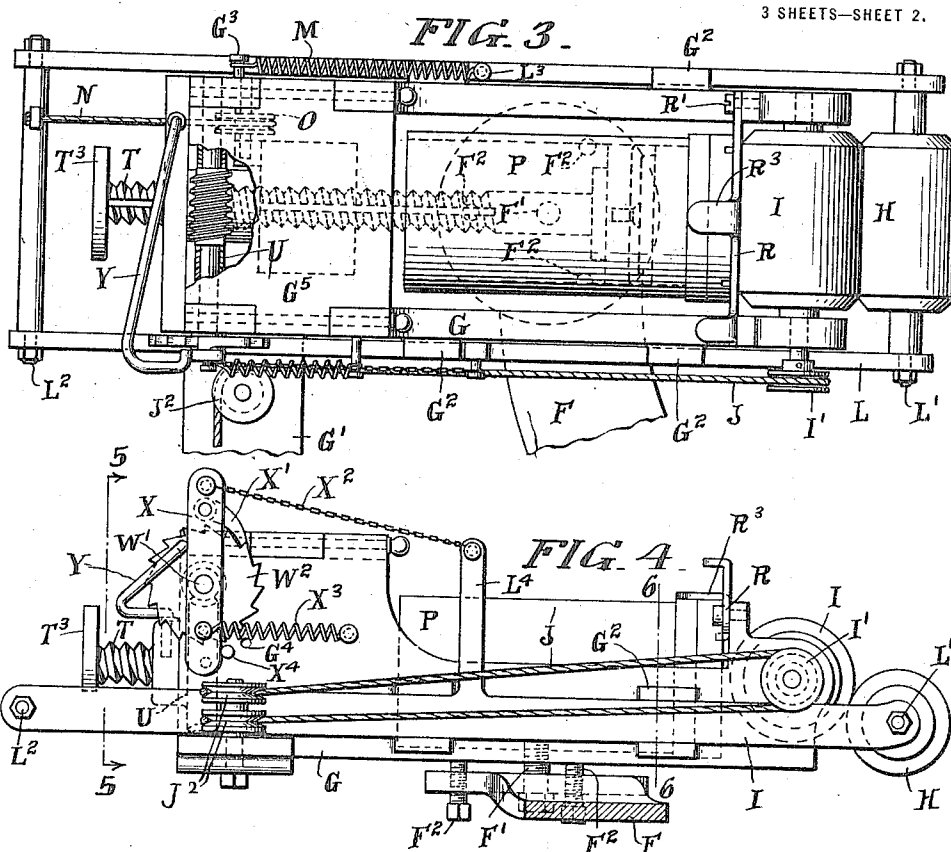
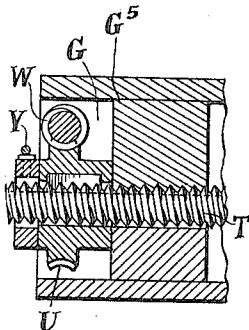
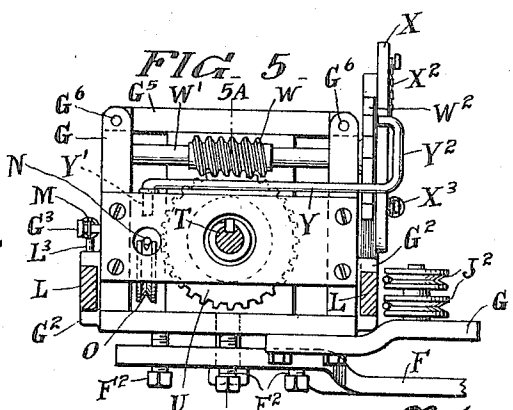


FIG. 5A



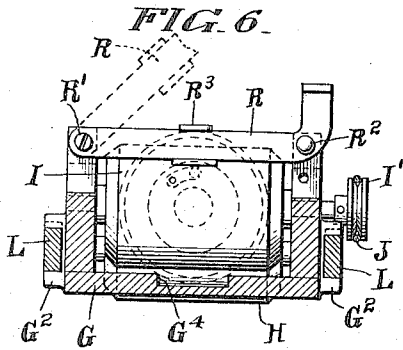
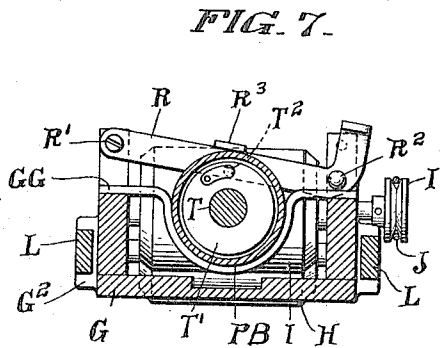
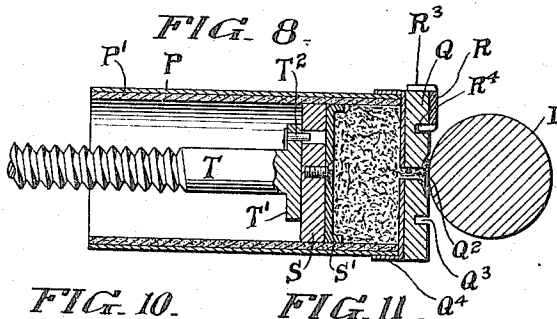
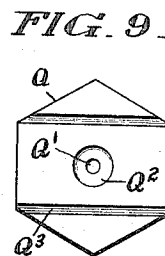
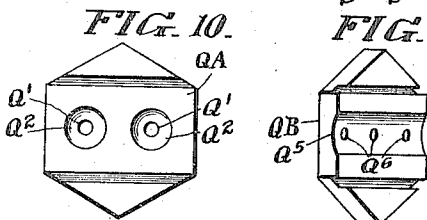
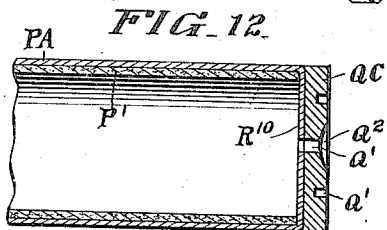
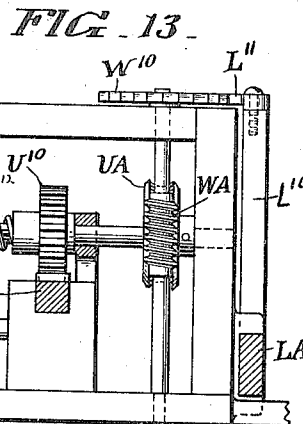
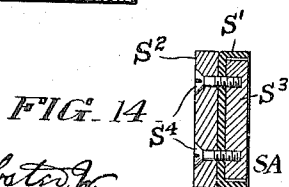
WITNESSES
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UNITED STATES PATENT OFFICE.

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INKING APPARATUS FOR PRINTING-PRESSES.

1,190,779.

Specification of Letters Patent.

Patented July 11, 1916.

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To all whom it may concern:

Be it known that I, JOHN McCURE, a citizen of the United States of America, residing in Glenside, in the county of Montgomery and State of Pennsylvania, have invented a certain new and useful Improvement in Inking Apparatus for Printing-Presses, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention has for its main object to provide simple and effective apparatus for supplying ink to printing presses, and is primarily devised and especially adapted for use with job printing presses which are operated intermittently or, at least, are not operated continuously with one kind of printing ink.

My invention consists in a novel form of apparatus adapted to have an ink receptacle removably inserted in it, and comprising means in the apparatus forming another part of my invention, and by which the ink is expelled from the receptacle and fed at a desired rate to the rotary disk or other inking bed of the printing press proper. After the printing operation requiring the use of ink contained in one receptacle is finished, the receptacle may be readily removed, and when the next printing operation is to take place the same receptacle or a similar receptacle containing the same or a different kind of ink may then be inserted in the apparatus. Each receptacle may thus be intermittently used until all of the ink initially inserted therein is finally consumed. The receptacles employed are adapted to keep the ink, wholly or partially filling them, clean and to protect it for long periods from exposure to the atmosphere which tends to dry out and oxidize the ink, and the receptacles may be used as the containers in which the ink is initially put up for sale and distribution.

Specific but practically important advantages of my invention are: small wastage of ink; a reduction to a practical minimum of the time, labor and expense involved in cleaning the inking apparatus, and in shifting from one kind of ink to another; and the ease with which the inking apparatus may be applied to existing job printing presses of common types.

The various features of novelty which characterize my invention are pointed out

with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described various forms of apparatus in which my invention may be embodied.

Of the drawings: Figure 1 is a somewhat diagrammatic elevation of a job printing press of well known type, to which one form of my inking apparatus is applied. Fig. 2 is a plan view of the apparatus shown in Fig. 1. Fig. 3 is a plan view on a larger scale of a portion of the apparatus shown in Figs. 1 and 2. Fig. 4 is a side elevation of the apparatus shown in Fig. 3. Fig. 5 is an end elevation of the apparatus shown in Figs. 3 and 4, partly in section on the line 5-5 of Fig. 4. Fig. 5^A is a partial sectional elevation taken on the line 5^A-5^A of Fig. 5. Fig. 6 is a sectional elevation on the line 6-6 of Fig. 4, with the ink receptacle shown in dotted lines. Fig. 7 is a view taken similarly to Fig. 6 illustrating the use of the apparatus, with an ink receptacle shown in section and of smaller size than that employed in Figs. 3 and 4. Fig. 8 is a sectional elevation through the ink receptacle of Figs. 3 and 4, and the roll on which the ink is discharged. Fig. 9 is an end elevation of the ink receptacle shown in Fig. 8. Fig. 10 is a view taken similarly to Fig. 9, illustrating a modified construction. Fig. 11 is a perspective view of still another form of ink receptacle. Fig. 12 is a sectional elevation of a fourth form of ink receptacle. Fig. 13 is an end elevation of a slightly modified form of inking apparatus; and Fig. 14 is a sectional elevation of a modified form of piston plug for the ink receptacle.

The well known form of printing press illustrated somewhat diagrammatically and conventionally in Figs. 1 and 2, comprises a stationary frame A, carrying a vertical platen A', and having pivotally connected to it at B' a swinging presser head B carrying a form B². The presser head B is oscillated on its fulcrum pivots B' by means of links C connecting the fulcrum pivots B³ to crank pins C' carried by crank disk C² which are mounted on a shaft connected by gearing (not shown) to the main driving shaft C³ of the press. An oscillating

frame D pivoted on the trunnion pivots B³, and caused to turn on the latter as the presser head B swings back and forth, by the link connections D² between the frame D and the pivot pins A² carried by the frame A. At its upper ends the frame D carries the usual form rolls D' by which the printing ink is transferred from the inking bed of the press which is in the form of the usual rotary inking disk E to the form B².

My improved inking apparatus, in the form shown in the drawings, is adapted to automatically supply ink at the proper rate and in an advantageous manner to the rotary inking disk E. As shown in these figures, my inking apparatus comprises a roll I, which I may call a fountain roll; mechanism for constantly rotating this roll; mechanism for expelling ink at the desired rate from the ink receptacle P against the roll I; a transfer or feeding roll H; and mechanism for moving the feeding roll H back and forth between one position in which it contacts with and receives ink from the fountain roll I, and another position in which it contacts with and applies ink to the ink disk E.

In the construction illustrated in Figs. 1 to 9, inclusive, the inking apparatus proper comprises a main trough like frame G secured at one end to an arm F, which is suitably affixed at its other end to the presser head B of the press. As shown, the frame G is secured to the bracket arm F in the desired adjustment with respect to the ink disk E by means of a central stud of bolt F' and a set of leveling screws F². The roll I, which may be a metal roll, is journaled in the frame G and its shaft carries at one end a pulley I'. The latter is connected by a belt J to a driving pulley C⁴ carried by the main shaft of the printing press. As shown, the belt J runs over idler or guide pulleys J² mounted on a bracket G' carried by the frame G, and over other idler or guide pulleys K' and K² carried at the opposite ends of an arm K pivoted at its upper end to the free end of the bracket G'. The arm K is employed to keep the belt J under the proper tension as the presser head B moves toward and away from the stationary platen A', a spring K³ acting on the swinging arm for this purpose. The distributing or feeding roll H which is preferably a composition roll, is journaled in a frame L. The frame L is longitudinally movable with respect to the frame G in the guideways formed by the notched lugs G² carried at the opposite sides of the frame G. As shown, the frame L comprises side bars connected at their opposite ends by bolts L' and L². The roll H is loosely journaled on the bolt L' and by removing the nuts on the ends of the

latter and loosening the nuts on the bolts L², the side bars of the frame L may be readily spread apart to permit the removal of the roll H to facilitate cleaning or for replacement. A spring M connected at one end to the stud G³ of the frame G, and at the other end to the stud L³ carried by the frame L, tends to hold the frame L in its retracted position in which the transfer roll H contacts with and is rotated by the fountain roll I. To advance the roll H from the position shown in Figs. 3 and 4 to that shown in Figs. 1 and 2, the frame L is suitably connected to some reciprocating part of the press. In the form shown, this is accomplished by securing one end of a flexible connection to the bolt L² and the other end to the oscillating form roller frame D. Advantageously the flexible connection N includes a tension regulating spring N', and runs over a guide pulley O mounted in the frame G.

The ink receptacle P, shown best in Figs. 8 and 9, comprises a tubular metal body P which, as shown, is lined with paper P'. To the front end of the receptacle P an end member Q is removably secured. The member Q comprises a hexagonal body formed with a central orifice Q' terminating at its outer end in a shallow depression Q² and formed also at each side of the depression Q² with a groove Q³. To the rear side of the body of the end member is secured a cap shaped member Q⁴ which fits snugly over the end of the tubular container P and is formed with a central aperture registering with the aperture Q'. The member Q⁴ may well be a sheet metal stamping, and the body of the end member may well be formed of cast metal to which the part Q⁴ is brazed or soldered. The hexagonal form of the body Q facilitates the removal of the end member when this necessary. When the ink receptacle shown in Figs. 8 and 9 is inserted in the feeding apparatus, whichever of the two grooves Q³ is uppermost is entered by a lug R⁴ carried by a lever R which is pivotally connected at R' to one side of the frame G and is normally secured to the opposite side of the frame G as by a pin R² passing through the lever and entering a socket formed in the frame G. Advantageously the lever is also formed with a lug R³ which engages the uppermost edge of the end member Q. The lever R may be swung into the dotted line position shown in Fig. 6 in the removal or insertion of an ink receptacle. Mounted in the container P and axially movable therein is a piston plug S which forms the rear wall of the ink space proper of the receptacle. As shown, this piston plug comprises a body to which is secured a flexible flanged washer S' secured to its front side.

In the inking operation the piston plug S is slowly fed forward by a plunger T which,

in the forms shown in Figs. 1 to 8, comprises a threaded rod formed at its front end with a head T' adapted to engage the piston S and carrying a spring pressed detent T² adapted to enter a socket formed in the piston plug S and thereby impart a rotary movement as well as an axial movement to the piston S when the plunger T is rotated. The threaded portion of the plunger T normally rests in an unthreaded groove or bearing formed in the frame G, and is normally in engagement with the threads of a half nut G⁵ which is connected to the frame G by the pins G⁶, each of which is adapted to serve as a hinge pintle on which the half nut G⁵ may turn to disengage the threads of the plunger T when the other pin G⁶ is withdrawn.

The plunger T is rotated at the desired rate by means of a worm wheel splined on the plunger T and meshing with a worm W. The shaft W' of the latter, which is journaled in the frame G, carries at one end a ratchet wheel W². Also journaled on the worm shaft W' is a ratchet lever to which an actuating pawl X' is pivoted. One end of the lever X is connected by a suitable flexible connection X² to an arm L⁴ carried by the frame L. A spring X³ connecting the opposite end of the lever to the frame G tends to hold the pawl lever X against a stop pin X⁴ which may be inserted in one or another of a series of holes G⁴ formed in the frame G. The particular hole in which the stop pin X⁴ is inserted determines the amount of rotary movement imparted to the ratchet wheel W² and therefore to the threaded plunger T on each forward movement of the frame L. A similar adjustment in the rate at which the piston is advanced may be obtained by varying the length of the flexible connection X².

To prevent the plunger T from being moved forward far enough to jam the piston plug S against the end member Q, the plunger is provided at its rear end with a head T³ adapted to engage a member Y on a predetermined forward movement of the plunger. The member Y, as shown, is in the form of a bent wire, having one vertical end Y' journaled in a socket formed in a portion of the frame G and having its other end bent to engage the lever X and hold it in a forward and inoperative position when the member Y is suitably engaged by the head D³.

In operation the frame L is moved back and forth in timed relation to the movements of the press proper between one position shown in Figs. 3 and 4 in which the feed roll H contacts with and receives ink from the transfer roll I, and a second position, shown in Figs. 1 and 2, in which the feed roll H contacts with the disk E. As the roll H moves back and forth over the

portion of the disk E engaged by it, a portion of the ink carried on its periphery is transferred to the disk. The reciprocatory movements of the frame L impart corresponding intermittent rotary and axial movements to the plunger T, and the forward movement thereby given to the piston plug S expels the ink from the receptacle through the more or less restricted orifice Q' against the periphery of the rotating roll I. At the conclusion of any one printing operation the container P may be quickly removed after the plunger T is retracted. The retraction of the plunger T may be quickly brought about by first removing one of the locking pins G⁶, and thereby releasing the hinged half nut G⁵, and then lifting the latter clear of the plunger T sufficiently to separate the threads of the plunger from the threads of the half nut G⁶ in which it normally works. After the ink receptacle is removed the apparatus may be quickly and easily cleaned, since the readily accessible and easily cleaned rolls H and I and the front end of the end member Q of the container are the only parts which need to be cleaned. The apparatus is then ready for the reinsertion of the receptacle which has been removed, or for the insertion of another receptacle containing a different kind of ink when the press is to be operated again. After a receptacle is put in place in the feeding apparatus, the plunger T may be quickly advanced into engagement with the piston plug of the receptacle by an operation which is the reverse of that described for its retraction. A turn, or a fraction of a turn, of the plunger T is all that is required to enter the detent T² in the socket formed to receive it in the piston plug S.

It will be apparent that with the receptacle described, the ink with the exception of the outer end of the ink plug filling the restricted discharge orifice or orifices is at no time exposed to the atmosphere. The use of my improved receptacle thus avoids the serious waste now commonly experienced in job printing plants from the formation of films or skins on the ink contained in the receptacles which have been opened and partially emptied. Furthermore, it is apparent that there is no chance for dirt to get into the ink contained in a receptacle in any stage of operation; and only such ink is expelled from the receptacle as is necessary to properly coat the rolls H and I and the inking apparatus pertaining to the press proper.

Preferably, as shown, the rolls H and I are of different diameters, as this facilitates the distribution of the ink. The roll I is preferably beveled slightly at its ends as this facilitates cleaning, tends to prevent the ink from running over the ends of the roll, and reduces the liability of the composition roll

H being cut by the roll I which will ordinarily be mounted so that it is free to have a small endwise movement.

One advantage of my invention is the obvious ease with which it may be applied to existing printing presses and the fact that when so applied it does not disturb the pre-existing inking apparatus of the press proper. It is to be noted that where space conditions permit the parts are preferably arranged as shown so that the form rolls do not contact with, and hence are not liable to be injured, by the transfer roll H. Preferably the bracket G' is detachable and adapted to be secured to either side of the frame G and to be replaced by a bracket of different length, thus facilitating the application of the inking appliance to presses of different styles and sizes.

While I ordinarily consider it desirable to employ only one centrally located discharge orifice for the ink, I may obviously employ a plurality of such orifices when this seems desirable, and in Fig. 10 I have shown an arrangement in which two orifices Q', each terminating in a corresponding shallow depression Q², are formed in the head QA, otherwise like the head Q of Figs. 8 and 9. In Fig. 11 the head QB is formed with a shallow diametrical groove Q⁵ conforming generally to the curvature of the roll H, and three discharge orifices Q⁶ open into this groove. It will, of course, be understood that the head may be formed with a groove Q⁵ regardless of whether one or more discharge orifices are employed. Another modification of the ink receptacle, shown in Fig. 12, in which the body of the receptacle PA is formed with an integral perforated end R¹⁰ to which may be soldered or otherwise affixed a grooved and perforated body QC shown as similar to the body Q.

It is apparent of course that the ink receptacles employed may be refilled from time to time. Inasmuch as these receptacles are comparatively inexpensive to manufacture, however, they may also be employed as the receptacles in which the ink is initially packed for sale and distribution, being discarded in such case when their original contents are used up. When used in this manner, each receptacle may have its ends closed initially by removable stoppers replaced by the proper piston plug and perforated end head when the ink is to be used, or each container may be initially provided with a perforated head and piston plug to be discarded with the container when the latter is emptied.

Figs. 3, 4 and 6, illustrate the use of the receptacle of largest diameter which can be employed in the frame G shown. Fig. 7 illustrates how a receptacle PB of smaller size may be employed. In this figure the body of the receptacle is supported in a

cradle GG, removably supported on the sides of the frame G. It will be apparent that the receptacle may be almost entirely emptied in the feeding apparatus. To reduce to a practical minimum the amount of ink remaining in the ink receptacle when the corresponding piston plug reaches the inner limit of its movement, I may employ the plug SA shown in Fig. 14. The plug SA is formed of two disks S² and S³ between which the body of the flanged washer S' is clamped, the parts being connected by screws S⁴. In this construction the front end of the flange of the washer S' may be substantially flush with the inner side of the inner disk S³. While I consider it advantageous in some cases to provide the ink receptacle with a paper lining, this may be omitted as shown in Fig. 7.

In Fig. 13 I have illustrated a modification of the plunger and plunger advancing mechanism in which the plunger comprises a body portion in the form of a rack bar TA which rests in a grooved guide carried by the frame GA, with the rack teeth normally in mesh with the teeth of a spur gear U¹⁰ splined on the shaft U¹¹. The gear U¹⁰ is normally held in mesh with the rack bar by a spring U¹² but may be moved axially on the shaft to permit the rack bar to be retracted or advanced when an ink receptacle is to be removed or inserted. As shown, the shaft U¹¹ carries a worm wheel UA in mesh with a worm WA. The shaft of the latter carries at its upper end a ratchet wheel W¹⁰ intermittently engaged and advanced by a pawl L¹¹. The latter is carried by an arm L¹⁰ of the reciprocating frame LA which otherwise may correspond to the frame L of Figs. 1-7. With the arrangement shown in Fig. 13, the piston plug in the ink receptacle is not rotated by the plunger as the latter is advanced, and it is not essential where the plunger is rotated as in the construction first described for the rotary movement of the plunger to be transmitted to the piston plug; for instance, with the construction shown in Fig. 8, the detent T² through which the piston plug is rotated may be omitted. This rotation of the piston plug may be of advantage in some cases, however, as it tends to insure the ink being scraped clean from the inner wall of the ink receptacle as the piston plug is advanced.

It will of course be understood that my inking appliance in the form shown is capable of being applied with little or no change to printing presses of different sizes and differing in type from the particular form of press conventionally illustrated in the drawings. The operating connections between the press and the inking appliance may vary of course with conditions. For instance, when the inking appliance is

mounted on a stationary part of the printing press the swinging arm K may well be dispensed with.

Certain novel features of construction, disclosed but not claimed herein, are disclosed and claimed in my copending application, Serial No. 754,539.

While in accordance with the provisions of the statutes I have illustrated and described the best forms of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed herein, without departing from the spirit of my invention, and that certain features of my invention may well be used in some cases without a corresponding use of other features.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. An inking appliance adapted to be attached to a printing press to supply ink to the ink bed thereof, comprising in combination, a frame adapted to be attached to a part of the printing press, a roll journaled in said frame, means for mounting an ink receptacle in said frame, a plunger working in said frame and adapted to engage said ink receptacle and thereby expel ink therefrom against said roll, a movable frame mounted on the said first mentioned frame, a distributing roll mounted in said movable frame and movable with the latter back and forth between one position, in which it contacts with the first mentioned roll and is out of contact with said ink bed, and a second position in which it contacts with said bed and is out of contact with the first mentioned roll, means adapted to connect said movable frame to a movable part of the printing press whereby said frame may be given its to and fro movement, means adapt-

ed to connect the first mentioned roll to a movable part of the printing press whereby said roll is given a rotary movement, and mechanism for advancing said plunger, including a pawl and ratchet connection through which the movements of said movable frame are caused to impart a feeding movement to said plunger.

2. An inking appliance adapted to be attached to a printing press of the kind comprising a stationary frame member and a reciprocating presser head member, said inking appliance comprising a frame adapted to be attached to one of said members, a roll journaled in said frame, means for mounting an ink receptacle in said frame, a plunger working in said frame and adapted to engage said ink receptacle, a swinging arm pivotally connected to said frame, guide rolls carried by said swinging arm for a belt adapted to connect said roll to a shaft journaled in the other of said members from that to which said frame is adapted to be attached, and means acting on said swinging arm to hold said belt taut as said two members move relatively to one another.

3. An inking appliance adapted to be attached to a printing press comprising in combination, a frame, provisions for securing it to said press, a roll journaled in said frame, means for mounting an ink receptacle in said frame, a plunger working in said frame and adapted to engage said ink receptacle and expel ink therefrom against said roll, a bracket detachably secured to said frame and guide rolls carried by said bracket for a belt adapted to connect said roll to a shaft of the printing press.

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