No. 886,367. PATENTED MAY 5, 1908.

C. G. HARRIS & W. H. SMITH.

PRINTING PRESS.

APPLICATION FILED JAN. 4, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

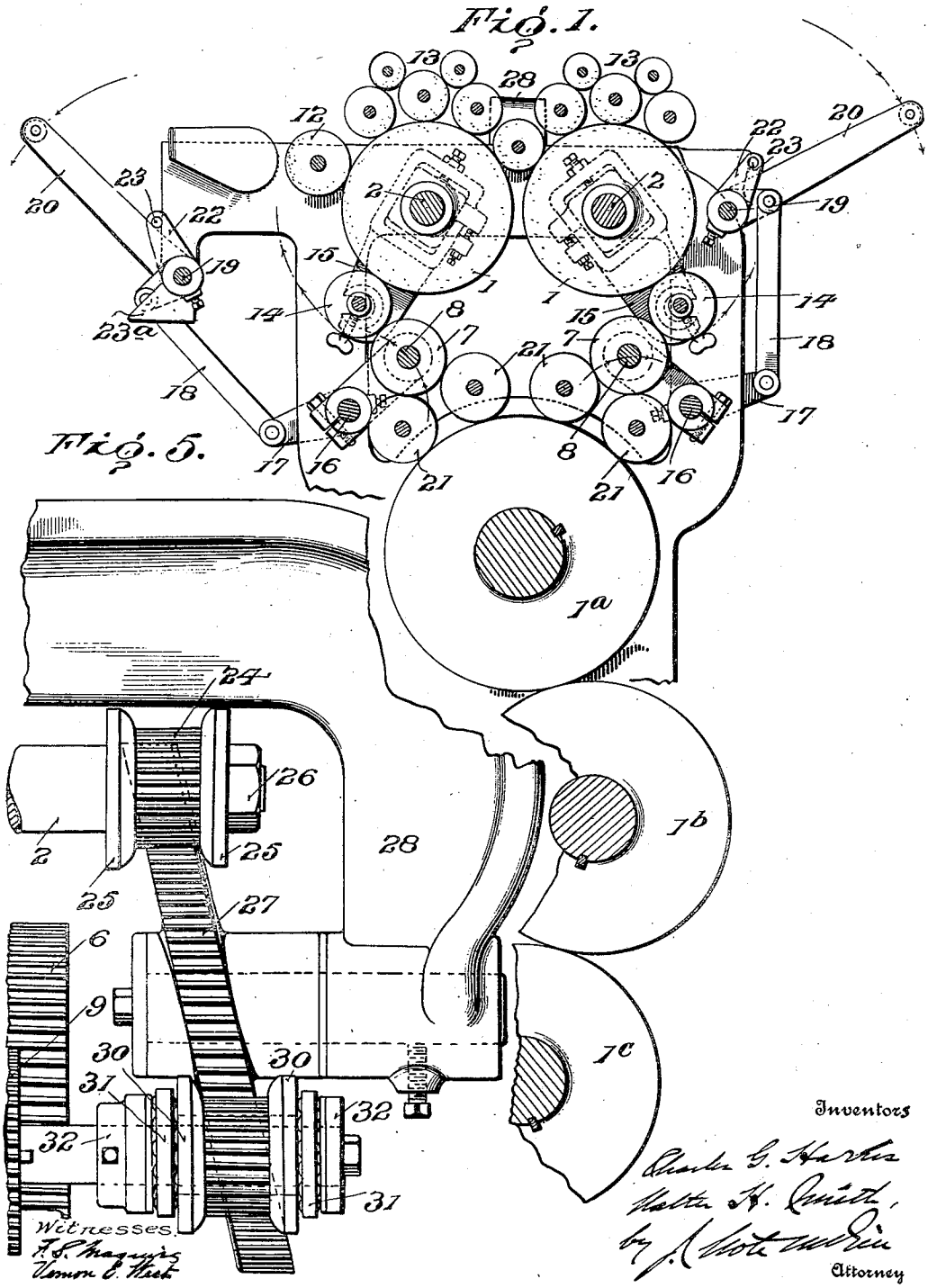


Fig. 5.

Witnesses.
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3 SHEETS—SHEET 2.

Fig. 2.

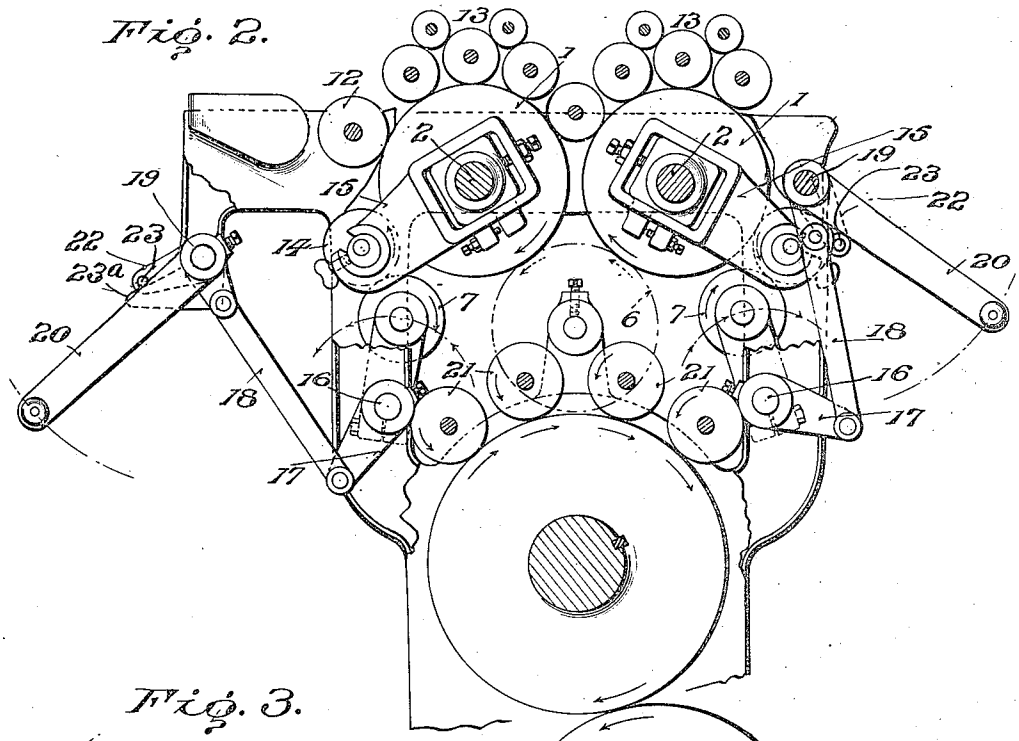
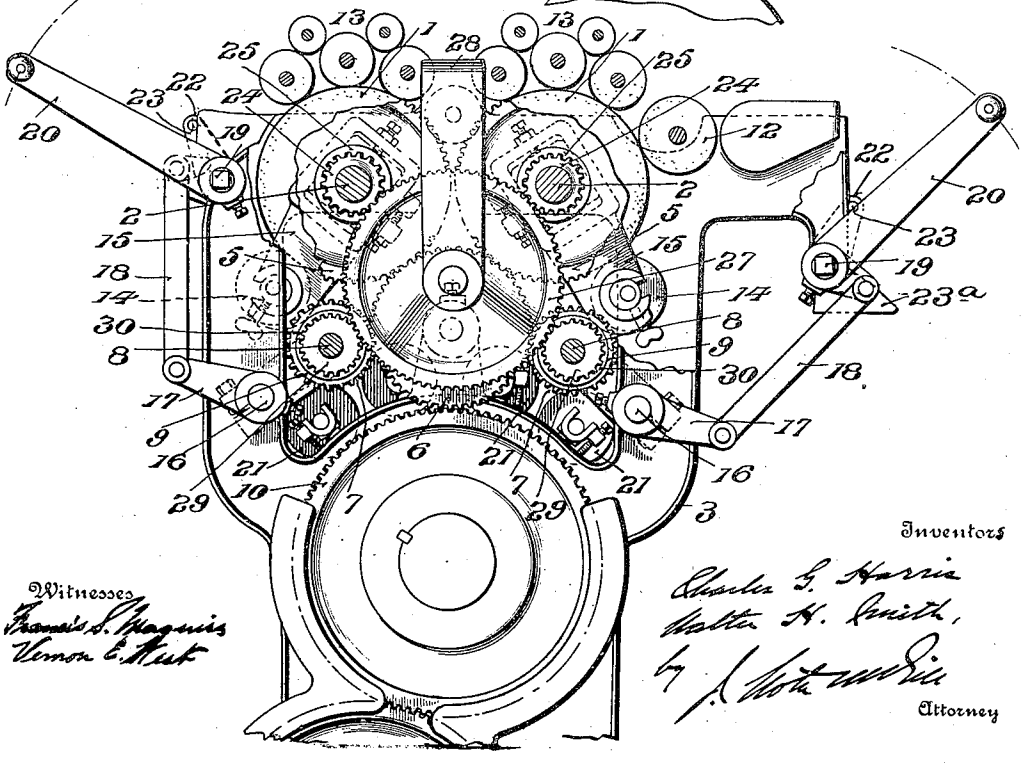


Fig. 3.



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3 SHEETS—SHEET 3.

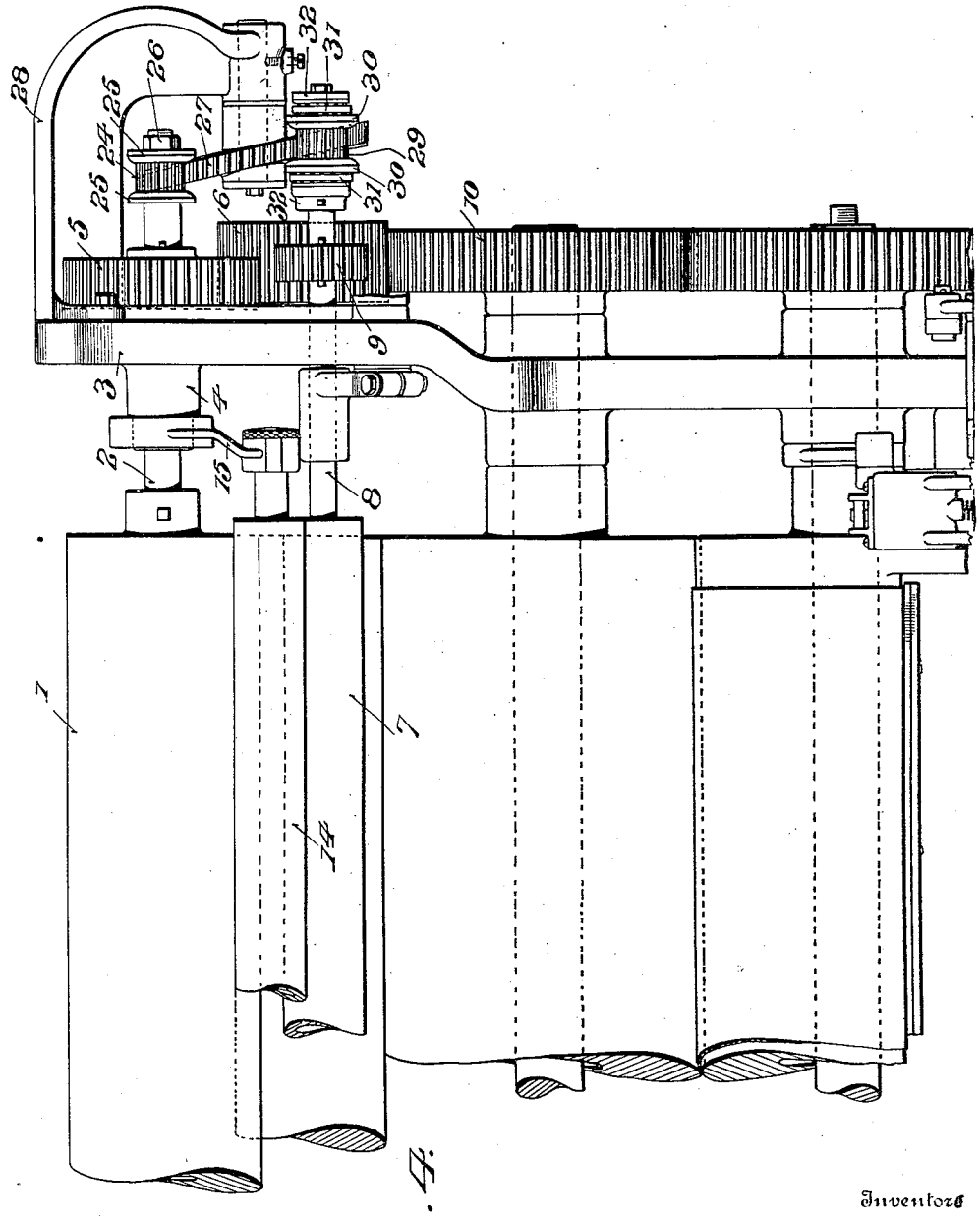


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES GRANT HARRIS AND WALTER HAROLD SMITH, OF NILES, OHIO, ASSIGNORS TO THE HARRIS AUTOMATIC PRESS COMPANY, OF NILES, OHIO, A CORPORATION OF OHIO.

PRINTING-PRESS.

No. 886,367. Specification of Letters Patent. Patented May 5, 1908.

Application filed January 4, 1907. Serial No. 350,805.

To all whom it may concern:

Be it known that we, CHARLES GRANT HARRIS and WALTER HAROLD SMITH, both of Niles, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Printing-Presses; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to effect the reciprocation of a plurality of ink-drums and transfer rolls from a common source. And further objects are to enable the form rolls to be removed without the necessity of removing any coacting roll from the press; to permit the several ink-rolls and drums to be readily viewed from one side of the press; and to enable the ink to be worked up or thoroughly mixed on all the rolls save the form-rolls, avoiding all accumulation on the latter.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic end view, partly in section. Fig. 2 is an end view with the transfer rolls out of engagement with the form-rolls. Fig. 3 is an end view looking in the direction opposite to Figs. 1 and 2. Fig. 4 is a rear elevation, with parts broken away. Fig. 5 is a fragmentary rear elevation on an enlarged scale.

Referring to the drawings, 1, 1, designate two ink drums whose shafts 2 are journaled at their ends in the sides of main frame 3, (see Fig. 4) such shafts being capable of moving longitudinally in their bearings 4 in shifting the drums back and forth. On each shaft 2 is a gear wheel 5, both of which mesh with, and are driven by, an intermediate gear wheel 6 of greater width than the gear wheels 5.

7, 7, designate transfer rolls which are of less diameter than the ink drums. The shafts 8 of these rolls 7 carry gear wheels 9 in mesh with the intermediate gear 6, and the latter derives its motion from gear wheel 10 of the form cylinder of the press. The ink is transferred from a suitable fountain by a ductor roll 12, and is thoroughly distributed on the two drums by two series of ordinary leather covered rolls 13, and from the drums it is transferred to the transfer rolls 7 by intermediate transfer rolls 14. These transfer rolls 14 have their bearings in hangers 15 hung from bearings 4 of shafts 2, concentrically with drums 1, while the bearings of the transfer rolls 7 are mounted on shafts 16 which extend through the frame, and carry arms 17, connected by links 18 to the arms of crank shafts 19 having manipulating handles 20. By depressing the latter, the transfer rolls 7 can be swung up and held away from the series of form rolls 21, the transfer rolls 14 moving with them since they rest upon said rolls 7.

The shafts 19 carry arms 22 having laterally projecting pins 23 which contact with the edges of the frame to limit the swing of the transfer rolls 7 both into and out of their normal positions. The frame at the front is overhung, and has a plate or projection 23^a with which the pin 23 of the arm of the front shaft 19 contacts when the rolls 7 are elevated. The toggles formed by links 18 are slightly broken when these rolls are held out of engagement with the form rolls, as shown in Fig. 2. By the described construction, when the transfer rolls are thrown out of engagement with the form rolls, ink may be thoroughly worked, or mixed with an oil or other reducing agent, without the necessity of removing the form rolls from the press. These form rolls are shown as arranged on an arc of a circle above the form cylinder 1^a beneath which (see Fig. 1) are the transfer cylinder 1^b and the impression cylinder 1. The stop pins 23 by engaging with the frame when the handles 20 are thrown up, as shown in Figs. 1 and 3, prevent the gears of the rolls 7 meshing too deep in the co-acting gears, and likewise avoid all tendency of such rolls to crowd against the form rolls.

The ink drum-shafts 2 carry gear pinions 24 fixed thereon between collars 25 held on such shafts by nuts 26. These gear pinions 24 mesh with a gear wheel 27 in the form of a shifting cam journaled in an overhanging arm or bracket 28, such gear being driven by said pinions 24. On the shafts 8 of the two transfer rolls are gear pinions 29 located between collars 30, such pinions and collars being pressed upon sleeves which turn loosely

on said shafts. These pinions 29 mesh with and are driven by gear wheel 27. The collars 30 engage ball bearings 31 held in place by collars 32, the purpose being to minimize the friction caused by the difference in speed between the gear pinions 29 and their respective shafts 8, said pinions revolving at the same face speed as the periphery of the shifting gear 27. The rotation of the latter effects the longitudinal shifting or reciprocation of the ink drums 1 and the transfer rolls 7, the shifting of all being effected simultaneously, the drum of one series and the transfer roll of the other series always traveling in opposite directions.

The shifting gear 27, and the gear pinions of the ink drums and the transfer rolls are located at the same side of the press as are the gears for rotating the ink drums and transfer rolls. In consequence the other end of the frame may be left open, and permit of ready and easy inspection as well as access for the removal of foreign substances without the necessity of removing the rolls from the frame.

By the means described the thorough working of the ink is accomplished through two series of rolls and drums before it reaches the form rolls. Not only is the ink transferred to two drums whereon it is thoroughly distributed by separate sets of rolls, but these drums are being constantly reciprocated longitudinally while revolving, as are also the two transfer rolls by which the ink is distributed to the form rolls. This is of special advantage in planographic printing where the ink must be well worked before it is applied to the plate on the form cylinder. When the transfer-rolls are elevated from the form rolls, any one or all of the latter may be removed by being moved upwardly from their bearings without the necessity of removing any other roll. Another advantage resulting from the described arrangement is that the means for shifting and rotating the ink-drums and transfer rolls being located at one side of the press, the supporting frame may be of skeleton formation at the other side, thus leaving a clear opening through which the several rolls may be inspected from time to time to ascertain the conditions thereof, and to locate and, in some instances, remove foreign substances, such as pieces of paper adhering to the rolls.

We claim as our invention:

1. In a printing press, the combination of two ink drums, ink-distributing rolls engaging said drums, form rolls, two transfer rolls engaging said form rolls and to which ink is supplied from said drums, and a single member common to both drums and both transfer rolls for effecting a uniform longitudinal reciprocation of said drums and transfer rolls.

2. In a printing press, the combination of two ink drums, ink-distributing rolls engaging said drums, form rolls, transfer-rolls engaging said form rolls and to which ink is transferred from said drums, rotating means common to said drums and transfer rolls, and means also common to said drums and transfer rolls for shifting said drums and rolls longitudinally.

3. In a printing press, the combination of two ink drums, ink-distributing rolls engaging said drums, form rolls, transfer rolls engaging said form rolls and to which ink is supplied from said drums, rotating means common to said drums and transfer rolls, and means also common to said drums and transfer rolls for shifting said drums and rolls longitudinally, both such means being located at one side of the press.

4. In a printing press, the combination of two ink drums, ink-distributing rolls engaging said drums, form rolls, transfer rolls engaging said form rolls and to which ink is transferred from said drums, gear-wheels carried by said drums and transfer-rolls at one side of the press, a driven gear-wheel with which all of said gear wheels engage, and means common to said drums and transfer-rolls for shifting said drums and rolls longitudinally.

5. In a printing-press, the combination of two ink drums, ink-distributing rolls engaging said drums, form rolls, transfer rolls engaging said form rolls and to which ink is transferred from said drums, gear-wheels carried by said drums and transfer-rolls at one side of the press, a driven gear-wheel with which all of said gear-wheels engage, and means, at the same side of the press as said driven gear-wheel, common to said drums and transfer-rolls for shifting said drums and rolls longitudinally.

6. In a printing press having a form-cylinder, and a gear-wheel therefor, of two ink-drums having gear-wheels, ink-distributing rolls engaging said drums, form-rolls, transfer-rolls engaging said form rolls and to which ink is supplied from said drums, gear-wheels carried by said transfer rolls, a gear-wheel driven by the form cylinder gear-wheel and with which the gear-wheels of the drums and transfer rolls engage, and means common to said drums and transfer rolls for shifting them longitudinally.

7. In a printing press, the combination of two ink-drums, gear-pinions carried thereby, ink-distributing rolls engaging with said drums, form rolls, transfer rolls engaging said form rolls and to which ink is supplied from said drums, gear pinions carried by said transfer rolls, and a shifting gear wheel engaging all of said pinions.

8. In a printing press, the combination of two ink-drums having gear pinions on their shafts, ink-distributing rolls engaging said

drums, form rolls, transfer rolls engaging said form rolls and to which ink is supplied from said drums, gear pinions on the shafts of said transfer rolls, one set of gear pinions being loose and the other set fixed, means located at the same side of the press as said gear pinions for rotating said drums and transfer rolls, and a shifting gear wheel engaging with all of said pinions and driven by the fixed set of pinions.

9. In a printing press, the combination of two ink drums having gear pinions on their shafts, ink-distributing rolls engaging said drums, form rolls, transfer rolls engaging said form rolls and to which ink is supplied from said drums, said transfer rolls being of less diameter than said ink drums, gear pinions loose on the shafts of said transfer rolls, means located at the same side of the press as said gear pinions for rotating said drums and transfer rolls, and a shifting gear wheel engaging with all of said pinions and driven by the pinions of said drums.

10. In a printing press, the combination of a plurality of form rolls, an ink drum, ink distributing rolls engaging said drum, a transfer roll engaging said form rolls, a second transfer roll for transferring ink from said drum to the first mentioned transfer roll, bearings for said second transfer roll movable concentrically to the axis of said drum, bearings for the first mentioned transfer roll, and means for rocking said latter bearings to disengage said first mentioned transfer roll from said form rolls.

11. In a printing press, the combination of a plurality of form rolls, an ink drum, ink-distributing rolls engaging said drum, a transfer roll engaging said form rolls and to which ink is supplied from said drum, rotating means common to said drum and said transfer roll, a shaft having bearings for said transfer roll, and means for moving said shaft to disengage said transfer roll from said form rolls.

12. In a printing press, the combination of a plurality of form rolls, an ink drum, ink distributing rolls engaging said drum, a transfer roll engaging said form rolls and to which ink is supplied from said drum, means for rotating said drum and said transfer roll, bearings for said transfer roll, a shaft, means connecting said shaft to said bearings, a handle for actuating said shaft, and means for limiting the movement of the latter for holding the transfer roll either in or out of engagement with the form rolls.

13. In a printing press, the combination of a plurality of form rolls, an ink drum, ink distributing rolls engaging said drum, a transfer roll engaging said form rolls and to which ink is supplied from said drum, rotating means common to said drum and said transfer roll, bearings for said transfer roll, a shaft, arm-and-link connections between said shaft and said bearings, a handle for said shaft, and stops for holding the transfer roll either in or out of its normal position.

14. In a printing press, the combination of a plurality of form rolls, an ink drum, ink distributing rolls engaging said drum, a transfer roll engaging said form rolls, a second transfer roll for transferring ink from said drum to the first mentioned transfer roll, bearings for said second transfer roll movable concentrically to the axis of such drum, bearings for the first mentioned transfer roll, a shaft, arm-and-link connections between said shaft and said last mentioned bearings, a handle for said shaft, and means for limiting the movement of the latter to hold the transfer rolls either in or out of their normal position.

15. In a printing press, the combination of a plurality of form rolls, an ink drum, ink-distributing rolls engaging said drum, a transfer roll engaging said form rolls and to which ink is supplied from said drum, rotating means common to said drum and said transfer roll, means for shifting said drum and said transfer roll longitudinally, both such means being located at one side of the press, a shaft having bearings for said transfer roll, and means for moving said shaft to disengage said transfer roll from said form rolls.

16. In a printing press, the combination of a plurality of form rolls, an ink drum, ink-distributing rolls engaging said drum, a transfer roll engaging said form rolls, a second transfer roll for transferring ink from said drum to the first mentioned transfer roll, a bearing for said second transfer roll movable concentrically to the axis of said drum, a shaft having bearings for said first mentioned transfer roll, and means for moving said shaft for raising both of said transfer rolls.

17. In a printing press, the combination of two ink drums, ink-distributing rolls engaging with said drums, a series of form engaging rolls, two transfer rolls engaging said form rolls and to which ink is transferred from said drums, means located at one side of the press for rotating said drums and transfer rolls, means located at the same side of the press for shifting said drums and transfer rolls longitudinally, and means for holding said transfer rolls out of engagement with said form rolls.

18. The combination with the two ink drums having gear pinions on their shafts, and collars on each shaft between which said gear pinions are located, of the transfer rolls of less diameter than the ink drums, gear pinions loose on the shafts of said transfer rolls, collars on the shafts of the transfer rolls and

between which the gear pinions thereof are located, ball bearings for said collars also on said shafts, and a shifting gear wheel driven by the gear pinions of said drums and in mesh with the gear pinions of said transfer rolls for shifting the drums and transfer rolls longitudinally.

In testimony whereof, we have signed this specification in the presence of two subscribing witnesses.

CHARLES GRANT HARRIS.
WALTER HAROLD SMITH.

Witnesses:
J. C. FRYE,
H. A. PORTER.