

No. 666,240.

Patented Jan. 15, 1901.

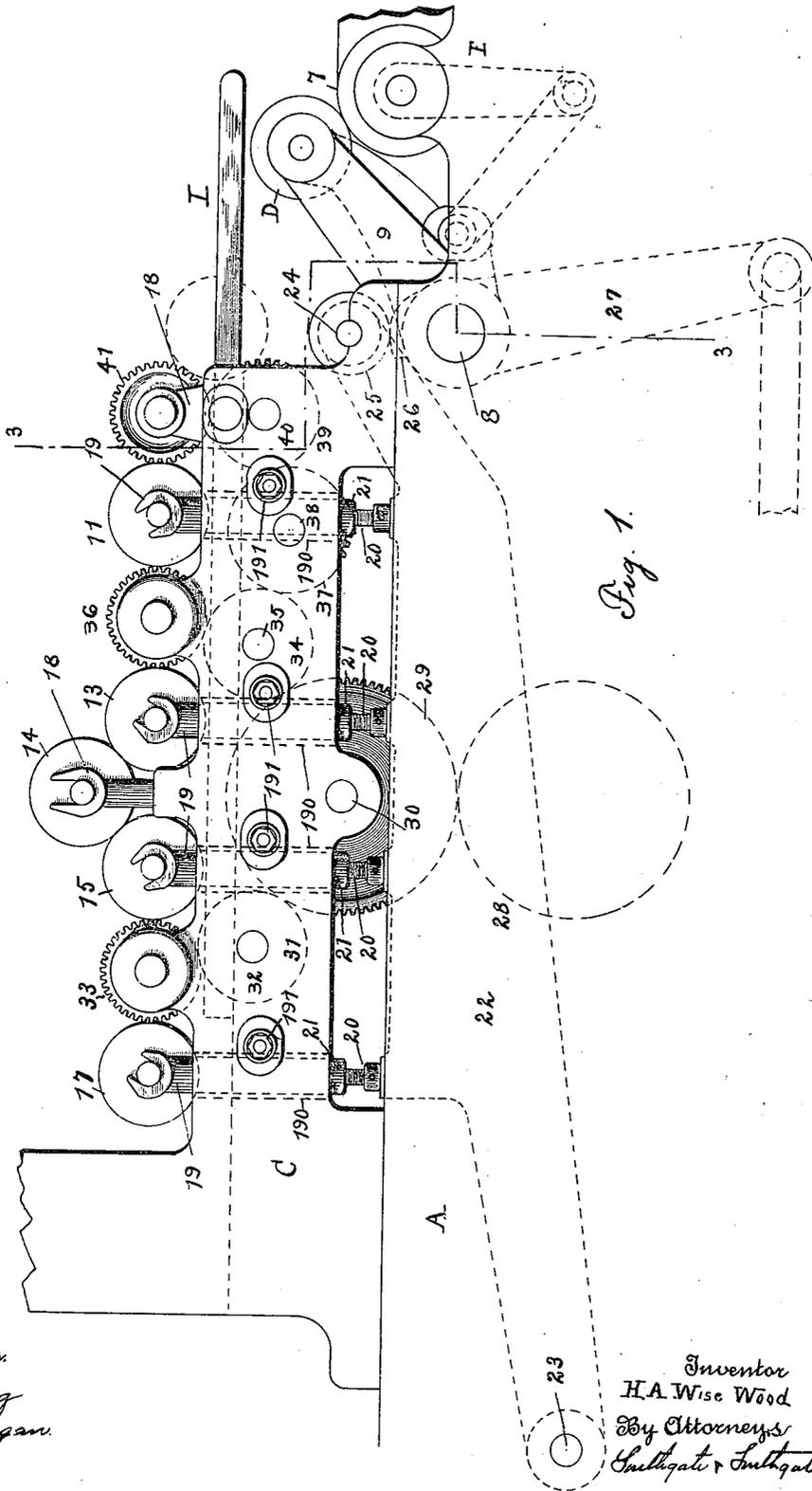
H. A. W. WOOD.

INKING APPARATUS FOR PRINTING PRESSES.

(No Model.)

(Application filed June 8, 1899.)

5 Sheets—Sheet 1.



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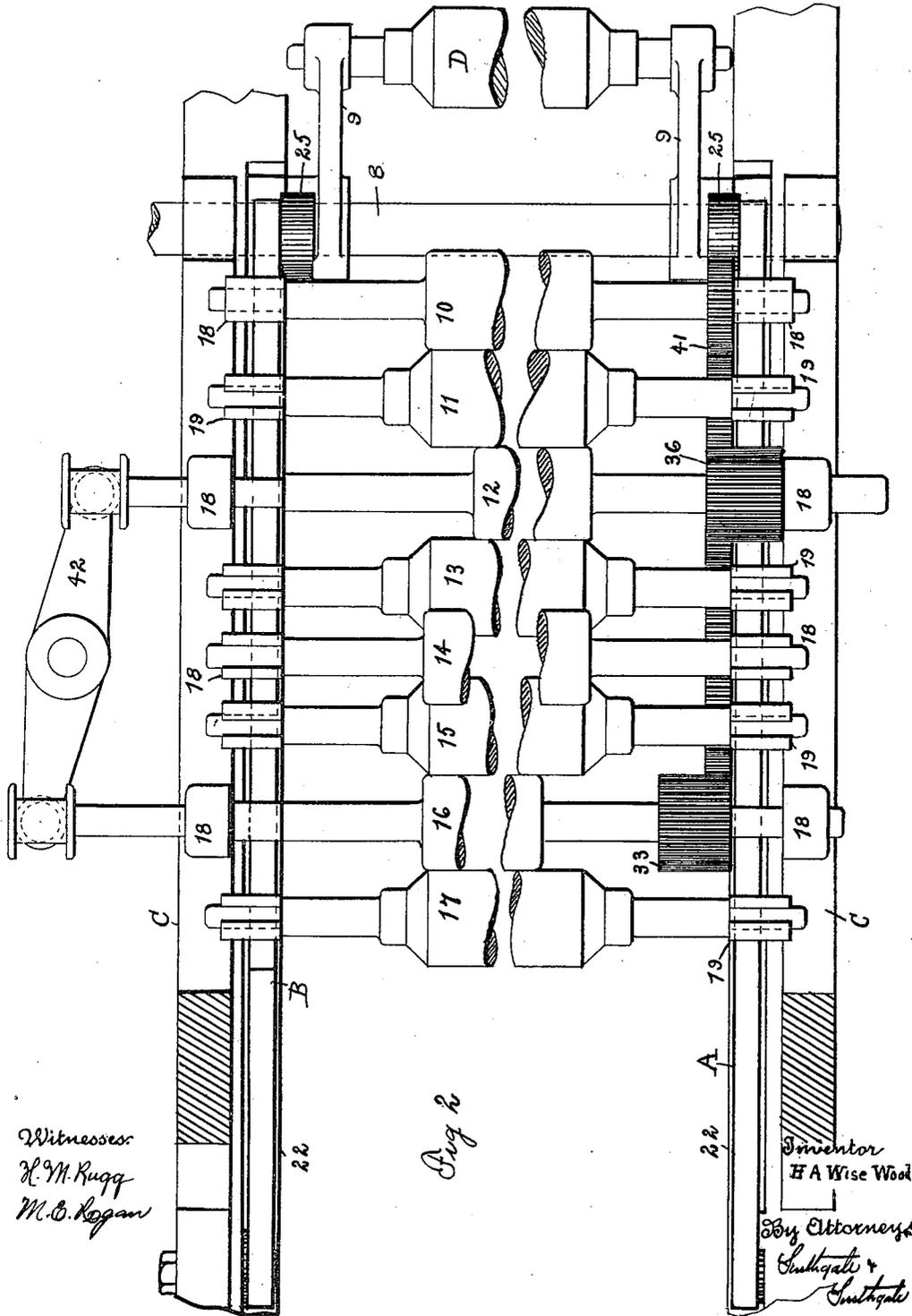
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5 Sheets—Sheet 3.

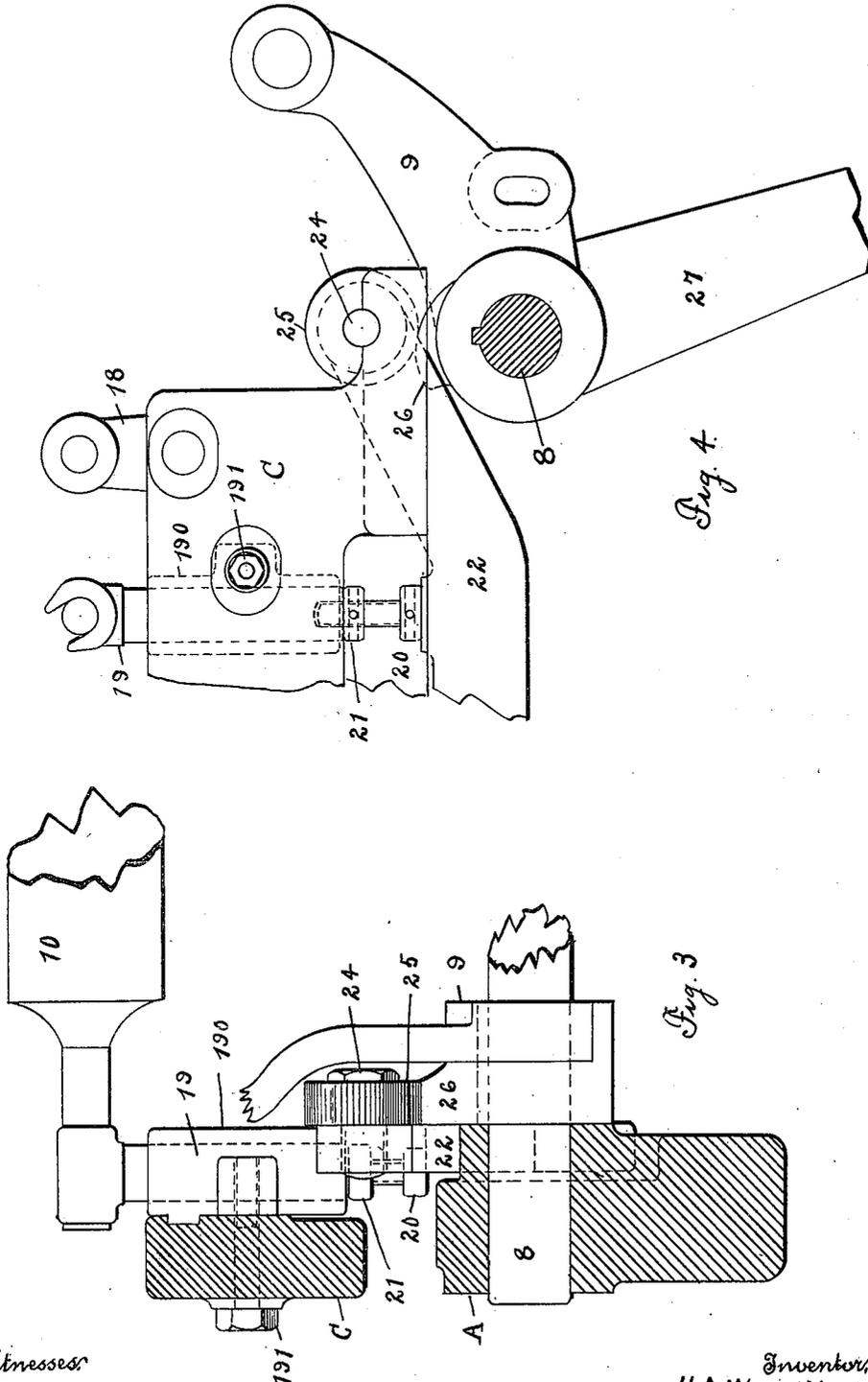


Fig. 4.

Fig. 3.

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5 Sheets—Sheet 4

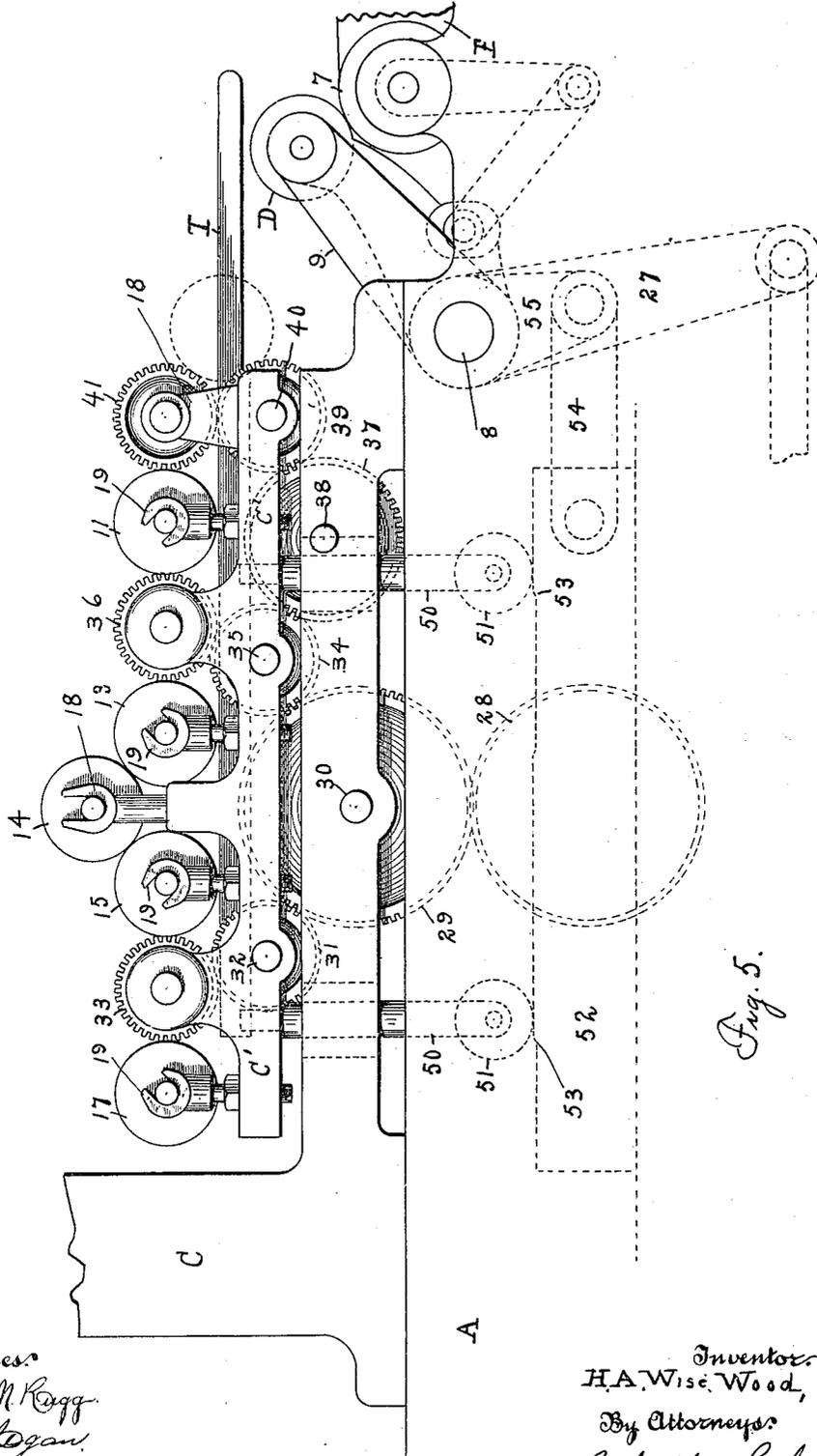


Fig. 5.

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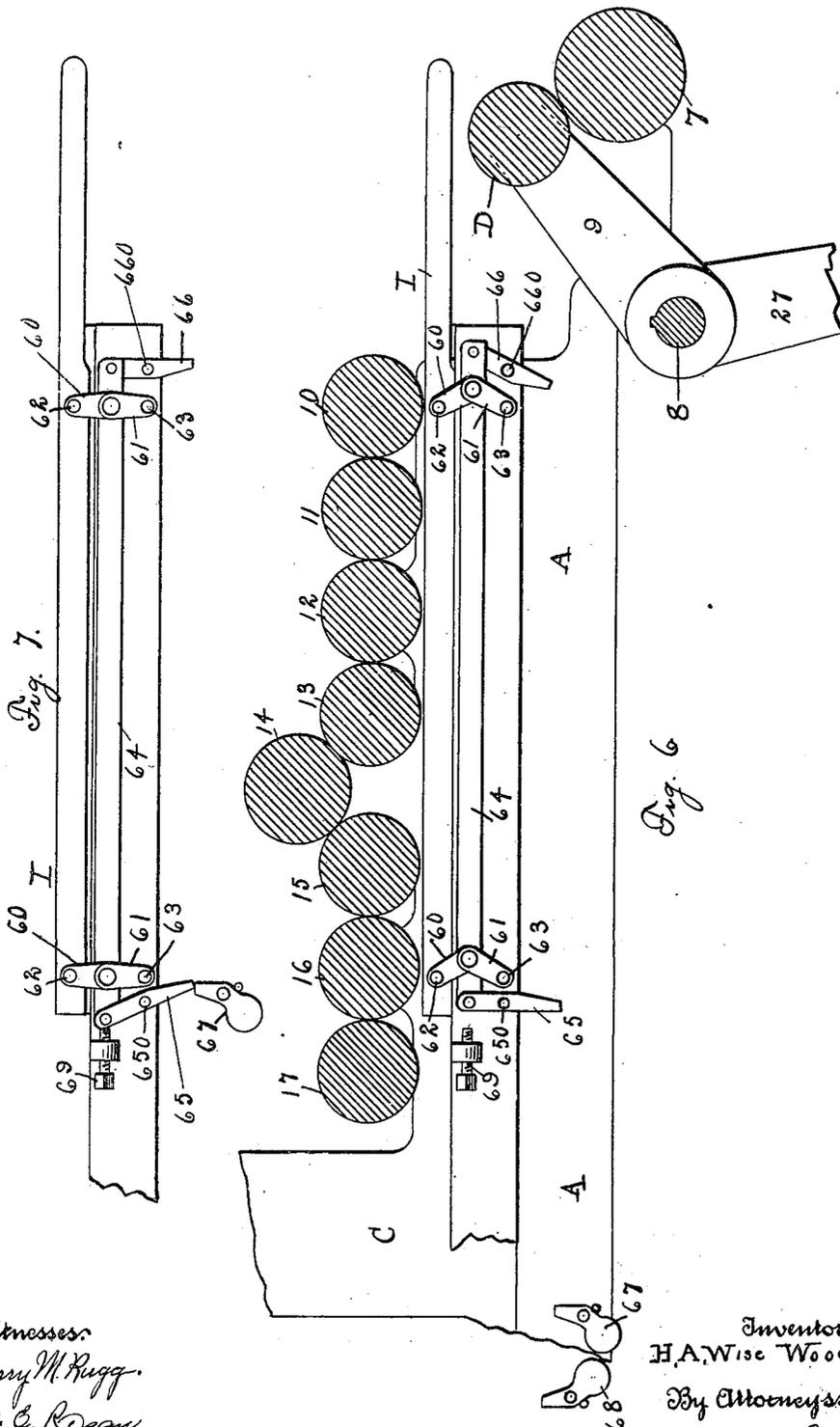
H. A. W. WOOD.

INKING APPARATUS FOR PRINTING PRESSES.

(Application filed June 8, 1899.)

(No Model.)

5 Sheets—Sheet 5



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS AND MANUFACTURING COMPANY, OF SAME PLACE.

INKING APPARATUS FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 666,240, dated January 15, 1901.

Application filed June 8, 1899. Serial No. 719,759. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Inking Apparatus for Printing-Presses, of which the following is a specification.

The aim of this invention is to provide a new and improved inking mechanism to be used at the end of an ordinary reciprocating-bed printing-press to supply ink to the ink-table which is secured to one end of the bed of said press.

The inking mechanism ordinarily employed in reciprocating-bed printing-presses consists of a fountain at one end of the press, an ink table or slab attached to the end of the reciprocating bed, a ductor-roller operated to take ink from the fountain and deposit the same on the ink-table when the bed is at or about its extreme fountainward position, and of a number of form-inking rollers adjacent to the impression-cylinder, which will take the ink from the ink-table and deposit the same upon the printing-forms. It is common in connection with this arrangement to provide a number of distributing-rollers, which are set, usually, at a slight angle to cooperate with the ink-table, so that as the ink-table reciprocates these "angle-rollers," as they are called, will distribute or spread the ink on the surface of the ink-table both longitudinally and laterally. These angle-rollers in some cases are positively geared to oscillate in harmony with the reciprocations of the ink-table.

The above-described construction, while advantageous in certain respects, has a number of disadvantages, among which may be noted the following:

First. The angle-rollers, while effecting a certain spread of ink on one movement of the table, will act on the opposite movement to retrace their paths, and consequently to retract or diminish their spreading effect, and as the angle-rollers are in contact with the ink-table during one of the reversing movements thereof a blur of ink will be left on the table where each roller reverses its motion.

Second. The angle-rollers being geared to harmonize with the bed must be driven by the bed-driving mechanism. Thus the strain of distributing the ink, which varies with the

tenacity and amount of ink used, the temperature, and the condition of the atmosphere, is put upon the bed-driving mechanism. This tends to limit the speed of the press and to wear out the bed-driving mechanism by reason of the additional work the latter has to perform.

Third. The ductor-roller is generally arranged to deposit a wad or undigested portion of ink directly upon the ink-table, which wad or mass of ink is not properly distributed by the angle-rollers before it is carried to the form-inking rollers and by them placed on the forms.

Fourth. The ink taken from the fountain at one stroke of the bed is necessarily carried to the forms on the return stroke of the bed, and this limits the means and time which can be used for properly distributing the ink between its release from the fountain and its disposition upon the form-inking rollers.

The aim of my invention is to provide an improved ink-distributing mechanism which can be used at the end of a reciprocating-bed press and one which, while having the advantage of being positively geared, will overcome the above-pointed-out disadvantages and objections that exist in prior devices.

To this end my improved inking apparatus consists of a system of cooperating distributing and table rollers which occupy the space usually given up to the angle-rollers or "wavers" at one end of the machine. This system of rollers or ink-digesting apparatus is so arranged and constructed that it contacts with the ink-table which reciprocates beneath it on but one motion of the said table, and not upon both, as is the present practice. By using this arrangement it is possible to drive the apparatus continuously in one direction, which is contrary to the present method employed with table-rollers, (or wavers,) and to do so regardless of the fact that the table to which my apparatus eventually supplies the ink has two directions of horizontal movement.

The arrangement and operation of the mechanism of my improvement, together with its advantages, are as follows:

In my apparatus said series of rollers is made of hard and soft material (preferably of iron and roller composition) and rests

above and normally out of contact with the plane of travel of the ink-table. One end of this series is in close proximity to the fountain, which is usually at one extremity of the machine. Between the fountain and the end referred to of my roller system a ductor or ink-conveying roller plies, and upon each trip it conveys from the fountain and delivers to the system a given quantity of ink. The ink, instead of being carried to the table in its crude mass by the ductor, is first delivered to said ink-digesting apparatus, which is independent of the ink-table. This independent digesting device consisting of said series of rollers is geared to rotate in harmonious co-operation in one direction, and the crude mass of ink which is conveyed to it by the ductor is rapidly divided among the various rollers of the system and is by their continuous rotation, the many points of their contact, and the lateral vibration of some of them brought to a delicate film of uniform thickness before it is laid down upon the table for conveyance to the form-inking rollers. Furthermore, as my system consists of a plurality of table-rollers cooperating with a plurality of distributing-rollers which are intermediate of the table-rollers, (all of which constitute a chain back and forth through which the ink in process of digestion may pass until delivered,) the digested ink when ready for the table is laid down upon the table in a plurality of layers, one layer passing out through each table-roller. Thus the imperfection of any given layer is remedied by either a preceding or succeeding layer.

The principle upon which my system operates, in brief, will be understood as this: Ink is received from the fountain in a crude mass and is passed back and forth through the continuously-rotating series of rollers until it is completely digested, when it is laid down upon the table for use. The continuously-rotating rollers of the system may (by reason of the fact that they do not oscillate) be so proportioned that their respective coating surfaces will hunt—that is, keep bringing different lines into contact one with another—which insures a more perfect distribution of the ink upon their surfaces, and ink so digested will be better mixed than is possible with oscillating-roller systems, and whereas had it been placed upon the table in its crude mass it would have found its way to the form but partially digested on the return stroke of the bed. On the other hand, with my system the ink is undergoing digestion for the time occupied by one complete operation of the machine in addition before it is applied to the form. To accomplish this cooperation of a system composed of continuously-rotating rollers with a reciprocating ink-plate requires that the system or certain rollers thereof be brought into contact with said plate when the surfaces of both are moving in the same direction and at the same velocity and that the rollers and the plate be not permitted to

contact upon the return stroke of the ink-plate when the direction of travel is opposite.

A very obvious advantage present in my system and not found in others is that the rollers never being called upon to reverse their motion last very much longer than is the case in other systems, where at each end of the bed-stroke the rollers must stop and reverse, and, further, in my continuously-driven system of table-rollers no work is put upon the bed-driving parts to propel and reverse the table-rollers, for I may drive them from any continuously-rotating member of the machine.

To accomplish the alternate contact and non-contact of the table-rollers and the ink-table, I may employ devices to raise and lower the table-rollers without raising and lowering the distributing-rollers, or I may raise and lower all the rollers of my system, or I may permit my roller system to remain fixed with respect to the horizontal plane and alternately raise and lower the ink-table.

In the accompanying five sheets of drawings I have shown various ways for practicing my invention.

Referring to said drawings, Figure 1 is a side view of my improved inking apparatus when I raise and lower the table-rollers only. Fig. 2 is a plan view thereof. Fig. 3 is a sectional elevation taken on the line 3 3 of Fig. 1. Fig. 4 is a detail view showing the mounting of the ink-rollers. Fig. 5 is a view similar to Fig. 1, showing the construction when I raise and lower both the table and distributing rollers. Fig. 6 is a sectional view illustrating the construction when I raise and lower the ink-table, and Fig. 7 is a detail view showing the ink-table of this arrangement in its raised position.

I have only shown in the drawings the inking mechanism at the end of the press, the other parts of the printing-press being arranged as is common and being so well understood that a detail description thereof is not necessary for an understanding of my invention.

I will first describe the device shown in the first three sheets of drawings.

A and B designate the usual side frames of the press. C C designate brackets which are arranged on the top of said side frames, which brackets carry the set of inking-rollers hereinafter described, which brackets may be extended upward to carry the delivery-table of the press in the ordinary way.

F designates an ink-fountain, which may be arranged at the end of the press in any of the usual ways and which ink-fountain has a roller 7, which may be turned by any of the usual ratchet-and-pawl mechanisms.

8 designates a shaft which is journaled in the side frames, which shaft carries arms 9 9, in the ends of which the ductor-roller D is journaled. The ductor-roller is arranged to take ink from the fountain-roller 7 and deposit the same upon a distributing-roller 10.

Beyond the distributing-roller 10 I arrange a number of table-rollers and distributing-rollers, 11 designating the first table-roller, 12 the second distributing-roller, 13 the second table-roller, 14 the third distributing-roller, 15 the third table-roller, 16 the fourth distributing-roller, and 17 the fourth table-roller. The distributing-rollers 10, 12, 14, and 16 are preferably made of metal, and the ductor-roller D and table-rollers 11, 13, 15, and 17 are preferably made of composition. The distributing-rollers 10, 12, 14, and 16 are journaled in sockets 18, which are fitted in or formed on the brackets C C. The table-rollers 11, 13, 15, and 17 are journaled in sockets 19, which sockets are loosely fitted in hubs 190, secured to brackets C C by means of bolts 191, as shown in Figs. 3 and 4.

Tapped into the ends of the sockets 19 are screws 20, which have cheek-nuts 21, by which the vertical position of the table-rollers can be adjusted. These screws 20 rest on levers 22, which are pivoted inside the side frames A and B at 23, whereby the vertical position of the table-rollers will be determined by the position of these levers 22. Fitted into the ends of the levers 22 are studs 24, which carry rollers 25. These rollers 25 bear on cams 26, formed on the arms 9 9.

Extending from the shaft 8 is an arm 27, which is connected to any suitable part of the machine, so that said shaft will be oscillated and the ductor-roller D thereby carried from the fountain-roller 7 to the first distributing-roller 10. This will also operate the levers 22, and the table-rollers thereby will be raised and lowered.

It will be noted by referring to Fig. 3 that the heads of the screws 20 are so positioned as to bear for about one half of their surfaces upon the levers 22 and for their other half on the projecting upper edge of the side frames. In this way by adjusting the screws 20 the lowermost position of the table-rollers can be accurately determined. This permits of an accurate adjustment of each table-roller to the ink-table I.

28 designates a gear which is continuously turned from any suitable part of the mechanism. The same meshes with an intermediate 29, journaled on a stud 30, secured in one of the brackets C. This intermediate 29 meshes with an intermediate 31, journaled on a stud 32, and this intermediate 31 meshes with a gear 33, secured on the shaft of the fourth distributing-roller 16. The intermediate 29 also meshes with an intermediate 34, journaled on a stud 35, which intermediate 34 meshes with a gear 36, secured on the shaft of the second distributing-roller 12. The intermediate 34 meshes with an intermediate 37, mounted on a stud 38, which intermediate 37 meshes with an intermediate 39, journaled on a stud 40, which intermediate 39 meshes with a gear 41 on the first distributing-roller 10. By this gearing the distributing-rollers

10, 12, and 16 will be positively and continuously turned in the same direction.

The gears 33 and 36 on the shafts of the distributing-rollers 12 and 16 are preferably made wide-faced, as shown in Fig. 2, so that said distributing-rollers 12 and 16 may be positively vibrated by means of a cam-actuated arm 42, which may be arranged in the customary way to accomplish this purpose, the socket-pieces 18 for the rollers 12 and 16 being set out so as to permit this vibration.

In some cases I contemplate gearing the table-rollers to the distributing-rollers; but I find that it is generally sufficient to only positively drive the distributing-rollers. This mechanism constitutes a very simple and perfect inking apparatus. The ink is taken from the fountain-roller by the ductor and is applied to the first distributing-roller 10, and from this roller it is very finely spread and evened out by the system of distributing and table rollers which are positively turned in the proper direction. When the bed makes its backward stroke, the ductor-roller will be in its depressed position and the table-rollers in their raised position, so that they will not contact with said ink-table; but so soon as the bed is well on its forward stroke the ductor-roller will be raised and the table-rollers thereby lowered to contact with the ink-table, and the ink will thereby be very evenly and nicely applied to the surface of said ink-table. When the table-rollers 11, 13, 15, and 17 are in their lowermost position to contact with the ink-table, the chain of the inking mechanism or the contact between the table-rollers and the distributing-rollers preferably is not broken, so that all the ink from the rollers will be applied to the ink-table I. This is accomplished by making the movement of the table-rollers very slight and just enough to clear the ink-table on its retrograde stroke, but not enough to break contact between any of the rollers when the table-rollers are lowered, the spring of the composition rollers and the arrangement of the rollers in line allowing this action. The lateral reciprocation of the distributing-rollers 12 and 16 will provide for the lateral spreading of the ink. I may use any desired number of rollers.

I do not generally find it necessary to positively gear the distributing-roller 14, although this may be done, if desired.

In some cases I contemplate raising and lowering both the table and distributing rollers, and I have shown this construction in Fig. 5. In this arrangement the table and distributing rollers are mounted in supplemental frames C' C', which are supported upon rods or shafts 50, which pass through bearings formed on the insides of the brackets C C. The rods 50 have rollers 51 on the ends thereof which engage sliding cam-plates 52, which have slight inclines 53. The sliding cam-plates 52 are connected by links 54 to arms 55, secured on the shaft 8. With

this construction the entire set of rollers will be raised and lowered. This movement is so slight that it will not affect the mesh between gears 29, 31, and 34 and 37, 34, and 39.

5 In some cases I contemplate raising and lowering the ink-table, and this arrangement is shown in Figs. 6 and 7. In this arrange-
 10 ment the ink-table I is mounted so as to be capable of a slight vertical movement relatively to the bed. The raising and lowering
 15 movement of the table is accomplished by providing toggles 60 61, which are connected at 62 to the ink-table I and at 63 to the bed. The joints of the toggles are connected by a
 20 link 64. The link 64 is connected at its front end to a lever 65, which is mounted on a shaft 650, and at its opposite end to a lever 66, which is mounted on a shaft 660. The shafts
 25 650 and 660 are preferably carried through the bed, and the toggle mechanism is preferably made double, so as to lift the table at each of its two sides. The lever 65 is adapted to cooperate with a pivoted pawl 67, and the lever 66 is adapted to cooperate with a
 30 pivoted pawl 68. The lever 65 and pawl 67 are arranged in the same vertical plane, and the lever 66 and pawl 68 are arranged in another vertical plane. The plane of the lever 65 and pawl 67 is farther away from the bed
 35 than the plane of the lever 66 and pawl 68, so that the lever 65 cannot engage pawl 68. In other words, the lever 66 is arranged on the inside of the link 64 and the lever 65 on the outside thereof, as shown, and the pawls
 40 68 and 67 are set to engage levers 66 and 65, respectively. The lever 66 is made shorter than the lever 65, and the pawl 68 is set somewhat above the pawl 67, so that the lever 66 will always pass over and not engage the pawl
 45 67. A screw 69 is used to limit the left-hand movement of the link 64, so that when the table is in its raised position the centers of the toggles will be slightly to the left, whereby the table will be substantially locked in its raised position.

In operation as the table gets well on in its movement to the left the lever 65 will contact with pawl 67, and the table will thereby be raised into engagement with the table-
 50 rollers. As the bed makes its retrograde stroke and just before the edge of the ink-table I reaches the roller 17 the lever 66 will contact with the pawl 68 and the ink-table will thereby be lowered. With this arrange-
 55 ment the apparatus will work substantially as before described.

Other mechanical arrangements for raising and lowering the ink-table at the proper time will suggest themselves to a skilled mechanic.

60 In all the preceding devices I have described the mechanisms as so arranged as to have the ink-table contact with the table-rollers on the forward stroke of the bed; but it is of course obvious that this arrangement may be re-
 65 versed and that the ink-table may contact with the table-rollers only on the retrograde

stroke of the bed, the only change that is necessary to accomplish this being to arrange the cams or pawls to work in this manner and to drive the ink-digesting apparatus in
 70 the opposite direction. I have thus provided an inking mechanism which while having the advantage of positive gearing for distribution will not have any roller reverse at any time, whether on or off the ink-table
 75 which will not have the strain of distribution put on the bed-driving mechanism, and which will not apply a wad of ink to the ink-table, and also an improved mechanism wherein the ink is retained for a long time and evenly
 80 ground up and spread in the system of inking-rollers before it is applied to the surface of the ink-table.

The details and arrangements herein described may be greatly varied by a skilled
 85 mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters
 90 Patent of the United States, is—

1. An inking mechanism comprising a number of inking-rollers, an ink-table attached to the reciprocating bed, and means for causing the ink-table to contact with the inking-rollers on its movement in one direction, and to pass under said rollers without contact therewith on its movement in the other direction, substantially as described.

2. An inking mechanism comprising a number of inking-rollers, gearing for driving the
 100 same, an ink-table attached to the reciprocating bed, and means for causing the ink-table to contact with the inking-rollers on its movement in one direction, and to pass under said rollers without contact therewith on its movement in the other direction, substantially as described.

3. An inking mechanism comprising a set of table and distributing inking rollers, an ink-table attached to the reciprocating bed,
 110 and means for causing the ink-table to contact with the table-rollers as it moves in one direction, and to move in the other direction under said table-rollers without contacting therewith, substantially as described.

4. An inking mechanism comprising a set of table and distributing inking rollers, gearing for driving the same, an ink-table attached to the reciprocating bed, and means for causing the ink-table to contact with the table-rollers as it moves in one direction, and to move in the other direction under said table-rollers without contacting therewith, substantially as described.

5. An inking apparatus consisting of a set
 125 of table and distributing inking rollers, gearing for causing the distributing-rollers to turn continuously in one direction, and the table-rollers continuously in the other direction, an ink-table attached to the reciprocating bed,
 130 and means for causing the ink-table to engage the table-rollers on its movement in one

direction, and to move under the table-rollers in the other direction out of contact therewith, substantially as described.

6. An inking mechanism comprising a set of inking-rollers, an ink-table attached to the reciprocating bed, and means for causing the ink-table to only engage said rollers on the forward stroke of the bed, substantially as described.

7. An inking apparatus comprising a set of table and distributing inking rollers, gearing for driving the same, an ink-table attached to the reciprocating bed, and means for causing the ink-table to engage the table-rollers only on the forward stroke of the bed, substantially as described.

8. An inking apparatus consisting of a set of table and distributing inking rollers, gearing for causing the distributing-rollers to turn continuously in one direction, and the table-rollers to turn continuously in the other direction, an ink-table attached to the reciprocating bed, and means for causing the ink-table to engage the table-rollers only on the forward stroke of the bed, substantially as described.

9. An inking mechanism comprising a reciprocating ink-table, a set of table and distributing inking rollers, gearing for driving the same, and means for raising and lowering the rollers to cooperate with said ink-table only as the same moves in one direction, substantially as described.

10. An inking mechanism comprising a reciprocating ink-table, a set of table and distributing inking rollers, gearing for driving the same, and means for raising the rollers on the backward stroke, and for lowering the same on the forward stroke of said ink-table, substantially as described.

11. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, gearing for turning the distributing-rollers continuously in one direction, and the table-rollers continuously in the other direction, and means for raising and lowering the rollers to cooperate with said ink-table only as the same moves in one direction, substantially as described.

12. The combination in an inking mechanism, of a reciprocating ink-table, a set of table and distributing inking rollers, a ductor-roller for depositing ink on one of said rollers, and means for raising and lowering said rollers to cooperate with said ink-table only as the same moves in one direction, substantially as described.

13. An inking mechanism comprising a reciprocating ink-table, a set of table and distributing inking rollers, gearing for driving the same, and means for raising and lowering the table-rollers to cooperate with said ink-table only as the same moves in one direction, substantially as described.

14. An inking mechanism comprising a reciprocating ink-table, a set of table and dis-

tributing inking rollers, gearing for driving the same, and means for raising the table-rollers on the backward stroke, and for lowering the same on the forward stroke of the said ink-table, substantially as described.

15. The combination in an inking mechanism, of a reciprocating ink-table, a set of table and distributing inking rollers, supports for the table-rollers, levers on which said supports rest, and means for raising and lowering said levers, so that said table-rollers will cooperate with said ink-table only as the same moves in one direction, substantially as described.

16. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, supports for said table-rollers, levers on which said supports rest, adjustable means between said supports and levers, and means for raising and lowering said levers to raise and lower said table-rollers, so that the same will cooperate with said ink-table only as the same moves in one direction, substantially as described.

17. An inking apparatus, consisting of a set of table and distributing inking rollers, movable supports for the table-rollers, and vibrating levers for said supports, said supports being arranged to bear in their lowermost position upon the framework of the machine, substantially as described.

18. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, levers for raising and lowering said table-rollers, and a shaft carrying cams for raising and lowering said levers, so that said rollers will only contact with said table as the same moves in one direction, substantially as described.

19. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, means for raising and lowering said rollers, an oscillating shaft carrying a ductor-roller, and having operating connections to the same for raising and lowering the inking-rollers, so that said rollers will only contact with said table as the same moves in one direction, substantially as described.

20. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, gearing for driving said rollers, means for vibrating one or more of said distributing-rollers, and means for raising and lowering the rollers to cooperate with said reciprocating ink-table, substantially as described.

21. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, gearing for rotating said rollers, means for raising and lowering the rollers so that said rollers will only contact with said table as the same moves in one direction, means for vibrating one or more of the distributing-rollers, an ink-fountain, and a vibrating ductor for taking ink from the

ink-fountain and depositing the same on one of said rollers, substantially as described.

22. An inking apparatus consisting of a reciprocating ink-table, a set of table and distributing inking rollers, an ink-fountain, an oscillating shaft carrying a ductor for taking ink from the fountain and depositing the same on one of said rollers, and operative means from said shaft to raise and lower the table-
5 rollers, so that said rollers will only contact
10

with said table as the same moves in one direction, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

H. A. WISE WOOD.

Witnesses:

STEPHEN B. HORTON,
ANNIE B. WALTERS.