

**No. 681,252.**

Patented Aug. 27, 1901.

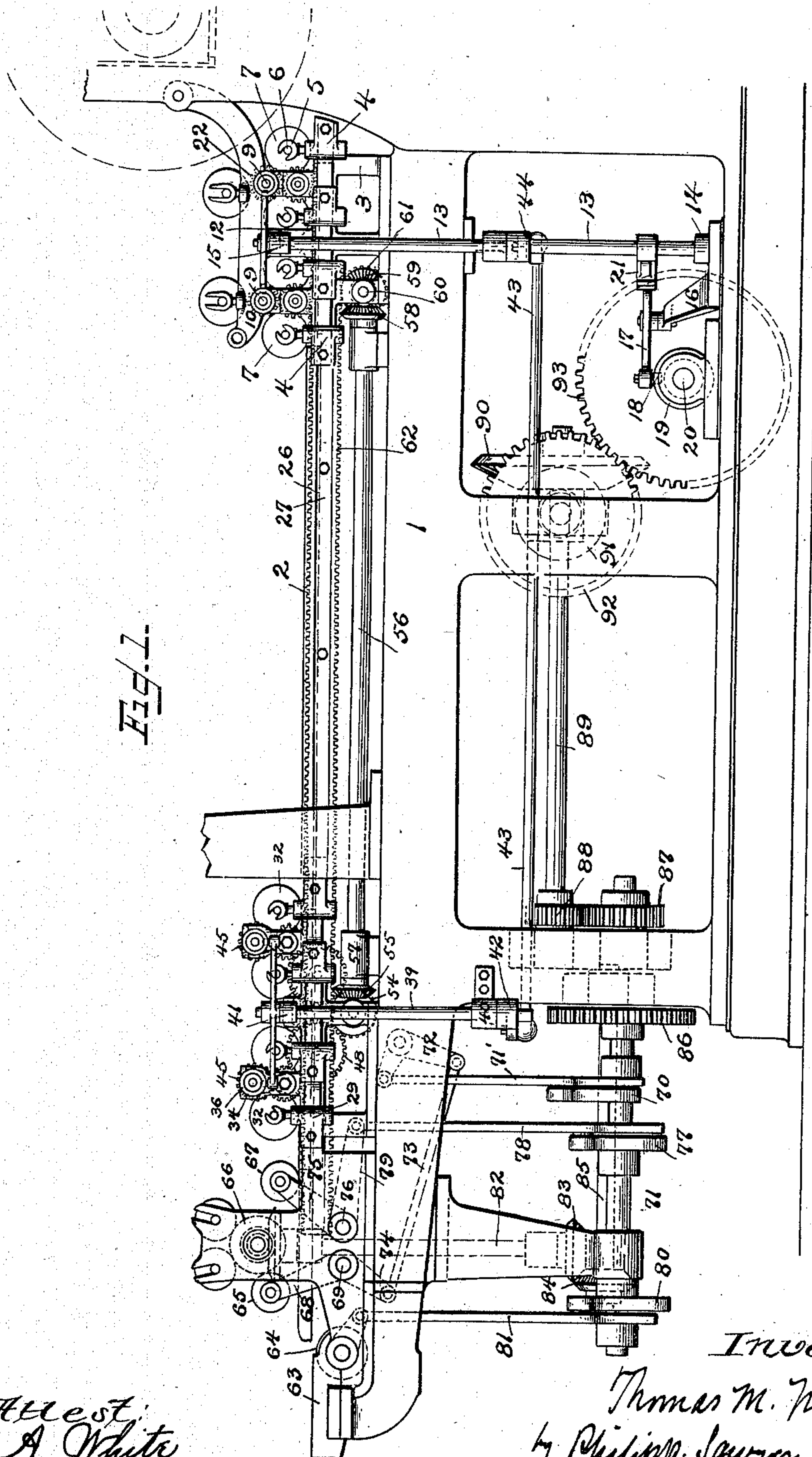
T. M. NORTH.

# INKING MECHANISM FOR PRINTING PRESSES.

(Application filed Sept. 29, 1900.)

(No Model.)

3 Sheets—Sheet 1.



*Inventor:*

Thomas M. Purdie

by Philipp. Sawyer. Rice & Kennedy

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Attest:  
A. White  
J. V. Geaves.



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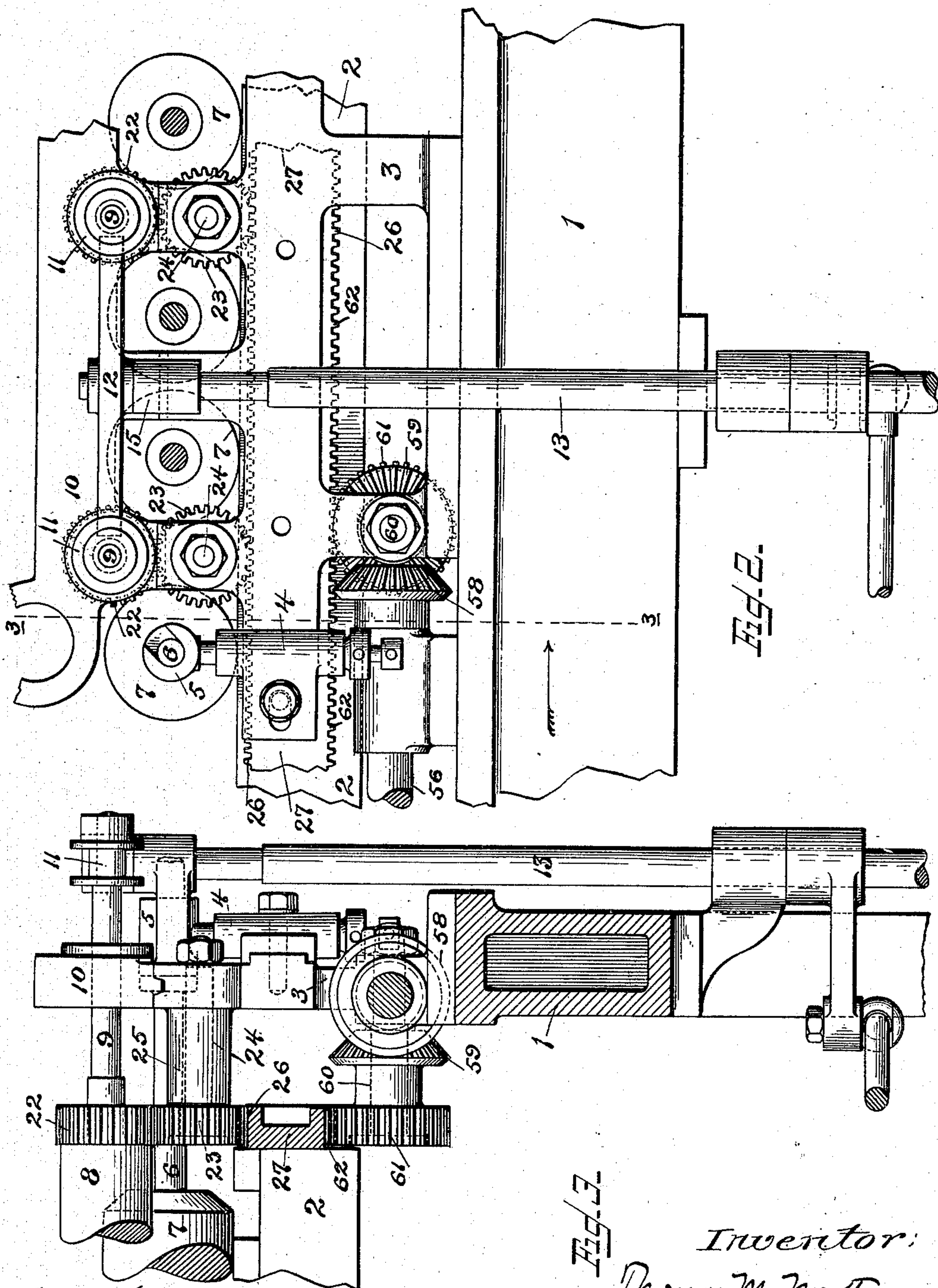
T. M. NORTH.

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(No Model.)

3 Sheets—Sheet 2.



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Fig. 2.  
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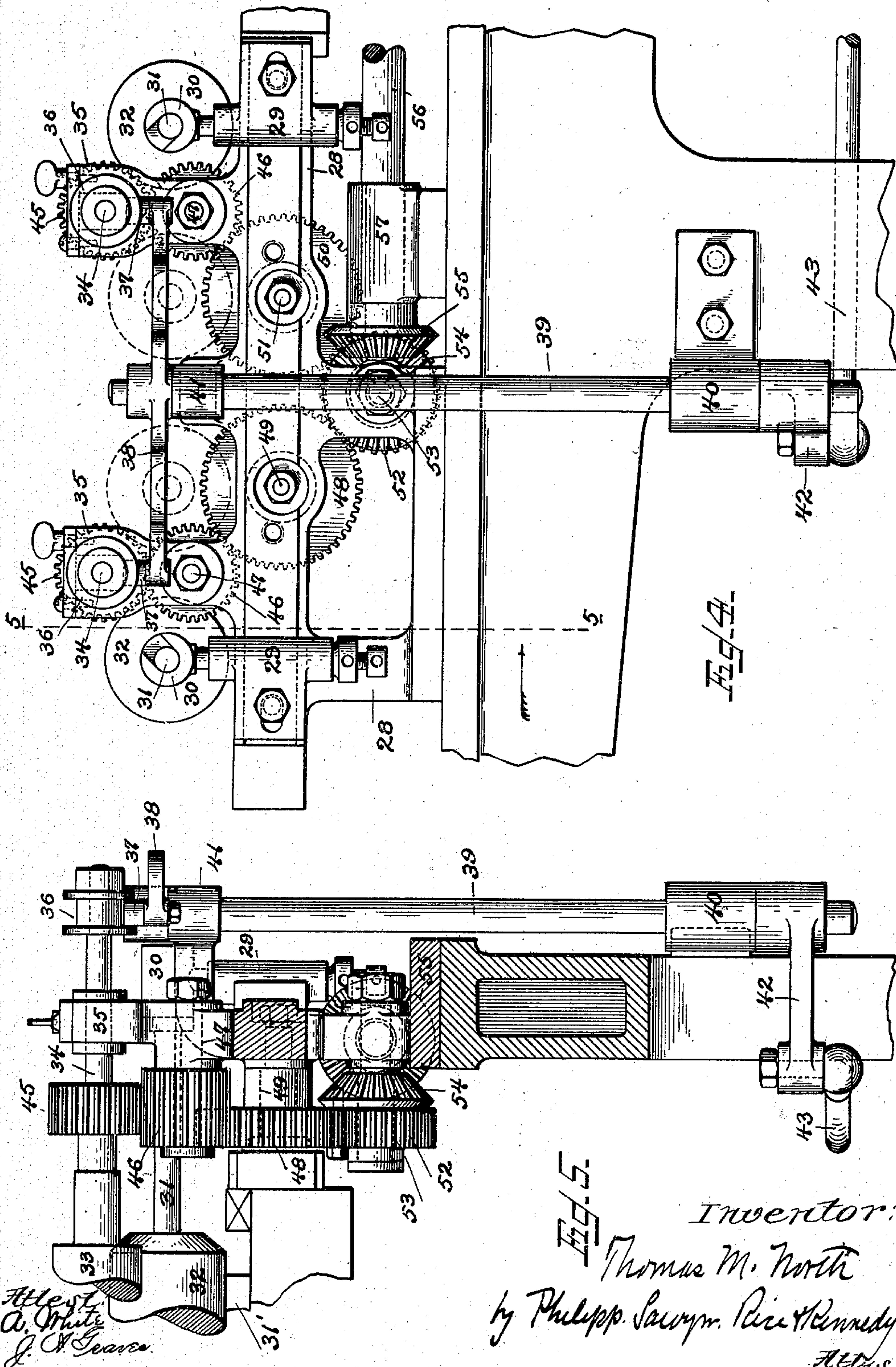


Fig. 5.  
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# UNITED STATES PATENT OFFICE.

THOMAS M. NORTH, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF SAME PLACE.

## INKING MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 681,252, dated August 27, 1901.

Application filed September 29, 1900. Serial No. 31,476. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS M. NORTH, a subject of the Queen of Great Britain and Ireland, residing at New York city, county of Kings, and State of New York, have invented certain new and useful Improvements in Inking Mechanism for Printing-Machines, fully described and represented in the following specification and accompanying drawings, forming a part of the same.

This invention relates to certain improvements in inking apparatus for printing-machines employing a reciprocating bed.

In reciprocating-bed printing-machines as ordinarily constructed the ink is supplied to an ink-table which is secured to and reciprocates with the bed, the ink being given to this table from a fountain by means of suitable ductors. The machine is provided with a set of distributing-rolls, the function of which is to mix and break up the ink on the ink-table, and coöperating with these rolls there is a set of iron rider-rolls, which assist the rolls in the discharge of their function and which are usually given a lengthwise reciprocation. The ink after being acted upon by the distributing-rolls is taken from the ink-table by a set of form-rollers, beneath which the table reciprocates, and these form-rollers in turn apply it to the form. These form-rollers are also provided with a set of coöperating reciprocating iron riders, which assist in maintaining an even distribution of ink on the form-rollers. The form and distributing rollers are usually constructed from what is ordinarily known in the art as "roller composition." If the form and distributing rollers were allowed to be driven by frictional contact with the ink-table and the form, they would soon be destroyed, because the roller composition is not sufficiently tenacious to withstand the strain of this manner of driving. Inasmuch, however, as these rollers vary considerably in size, owing to the uneven shrinkage after casting and also because of the wear thereon, it has been customary to drive the iron rider-rolls of both the form and distributing rollers at a surface speed corresponding to the speed of the ink-table and bed. Since these rolls are in frictional contact with the distributing and form rollers, it

follows that the distributing and form rollers will also be driven at a speed corresponding to the speed of the ink-table and bed, so that when they come into contact with the ink-table and bed, respectively, no strain is placed upon them.

Various constructions have been devised for driving the rider-rolls of the distributing and form rollers at a speed corresponding to the speed of the ink-table and bed. All these constructions involve the use of trains of gears driven from a rack on the bed, these trains extending from the point where the rack ceases its movement as the bed reverses to the distributing-rolls. Such constructions involving the use of a number of gears are expensive to build and are cumbersome and awkward in appearance. Furthermore, in order to get them out of the way they are located on the inside of the frame of the machine, and they are not therefore applicable to many forms of machines, because the frames contain features of construction which interfere with this location of the gears.

It is the object of this invention to produce an improved means for driving the rider-rolls of the distributing-rolls which will be simple, cheap, and efficient, which will be compact, which does not involve the use of trains of intermeshing gears, and which is capable of application to all constructions of reciprocating-bed machines.

Referring to the drawings, Figure 1 is a side elevation of so much of a reciprocating-bed machine as is necessary to illustrate the invention. Fig. 2 is a detail side elevation, partly in section, of a portion of the construction shown in Fig. 1, illustrating, on an enlarged scale, the means for driving the rider-rolls of the form-rollers and a part of the connections for driving the distributing-rollers. Fig. 3 is a section on the line 3 3 of Fig. 2 looking in the direction of the arrow in said figure. Fig. 4 is a detail side elevation, on the same scale as Fig. 2, illustrating the means for driving the rider-rolls of the distributing-rolls. Fig. 5 is a sectional view on the line 5 5 of Fig. 4 looking in the direction of the arrow in said figure.

Referring to the drawings, which illustrate a concrete embodiment of the invention, 1 in-



dicates the frame, which may be of any usual or desired configuration. Only a portion of the frame is shown, as an illustration and description of the entire machine is not necessary to an understanding of the invention. The frame is provided with suitable ways or tracks, also of ordinary construction and not illustrated, on which the bed 2, serving to support the form, reciprocates. The mechanism which reciprocates the bed may also be of any usual or desired construction and is not illustrated.

Located on the frame and near the standards which support the cylinder are the frames 3, which constitute the form-roller stands. These frames 3 have secured to them sockets 4, which serve to support the bearings 5, in which are located the shafts 6 of the form-rollers 7. Four of these rollers are shown; but the number may be varied as desired. The form-rollers 7 are arranged in two pairs, and cooperating with each pair of these rollers is a rider-roll 8, these rider-rolls being mounted on shafts 9, which find their bearings in uprights 10 of the form-roller stands. Any suitable means may be provided for giving these rider-rolls an endwise reciprocation. In the construction shown the ends of the shafts 9 are provided with collars 11, which are engaged by the ends of a cross-bar 12, mounted on a vertical rock-shaft 13, suitably supported in a socket 14 at the base of the frame and in bearings 15, secured to the frames 3. Rising from the base which carries the socket 14 is an arm 16, which serves to support a pivoted rock-lever 17. This rock-lever 17 has at one end a projection 18, which engages a cam 19 on a suitably-driven shaft 20, supported in suitable bearings in the frame, and at the other end is suitably connected to an arm 21, secured to the shaft 13. As the cam rotates, therefore, the shaft 13 is rocked in its bearings and the cross-bar 12, which is carried thereby, imparts a slow endwise movement or vibration to the rolls 8.

In addition to the construction for vibrating the rollers 8 means are provided for positively driving these rollers, so that the form-rollers 7, which are in frictional contact with them, may also be positively driven. The means for driving the rollers 8 may be varied widely. In the construction shown each of the shafts 9 is provided with a pinion 22, said pinions being in engagement with pinions 23, which are mounted on studs 24, supported in suitable bearings or bosses 25, extending inwardly from the standards 10. These pinions 22 and 23 have faces sufficiently broad so that the endwise or vibrating movement of the rolls 8, which has been before described, does not carry the pinions out of mesh. The pinions 23 engage with rack-teeth 26, formed on a bar 27, which is bolted or otherwise secured to the side of the bed, and consequently moved therewith. It is apparent, therefore, that as the bed reciprocates the vibrators 8 will be rotated first in one direction and then

in the other, and the driving devices are properly related so that these vibrators may impart to the form-rollers through their frictional contact therewith a surface speed which corresponds to the surface speed of the form carried by the bed.

The construction for supporting the distributing-rolls is substantially similar to that described in connection with the form-rollers. The machine is provided with frames 28, to which are secured sockets 29, which support bearings 30, in which are mounted the shafts 31 of the distributing-rollers 32, said rollers cooperating with an ink-table 31'. This ink-table is, as usual, secured to and moves with the reciprocating bed. Four such distributing-rollers 32, arranged in two pairs, are shown; but it is of course obvious that the number of the distributing-rollers may be varied as desired. Cooperating with each pair of distributing-rolls is a rider-roll 33. These rider-rolls are mounted on shafts 34, which are journaled in bearings supported in standards 35, extending upward from the frames 28. In order to impart to these rider-rolls an endwise movement, they are preferably provided on their ends with grooved collars 36, which are engaged by pins 37 on the ends of a cross-bar 38. The cross-bar 38 is mounted on a vertical rock-shaft 39, which is supported in a bearing 40, secured to the frame of the machine, and in a bearing 41, secured to the distributing-roller frame 28. An arm 42 is secured to the lower end of the shaft 39, and this arm is connected by means of a link 43 to an arm 44, secured to the vertical rock-shaft 13, before described. The two vertical rock-shafts 13 and 39 are therefore moved in unison, and each shaft imparts a slow endwise or vibrating movement to the rider-rolls which it operates.

In addition to the vibrating movement imparted to the rolls 33 these rolls are also positively driven. The means for positively driving these rollers may be varied within considerable limits. In the construction shown each of the shafts 34 is provided with a pinion 45, and these pinions are in mesh with broad-faced pinions 46, mounted on studs 47, which are supported on and extend inwardly from the frames 28. A pinion 48, journaled on a stud 49, mounted in the frame 28, meshes with and drives one of the pinions 46, and a pinion 50, similarly mounted on a stud 51, meshes with and drives the other pinion 46. The pinions 48 and 50 are in mesh with a third pinion 52, said pinion being suitably mounted on a stud 53, secured in the frame 28, and mounted on the same stud and preferably secured to the pinion 52 is a bevel-gear 54, which is in mesh with a similar bevel-gear 55, mounted on a shaft 56, extending longitudinally of the machine. This shaft 56 is preferably mounted, as shown, in bearings 57, located on the top of one of the side rails of the frame 1, and the shaft extends along the machine to a point beneath the form-roll-



ers before described. On the end of the shaft opposite to that which carries the bevel-gear 55 is located another bevel-gear 58, which gear is in mesh with a bevel-gear 59, mounted on a stud 60, secured in one of the frames 3. The stud 60 also carries a pinion 61, secured to and preferably cast in one piece with the bevel-gear 58. This pinion 61 meshes with and is driven by rack-teeth 62, formed on the under side of the bar 27, before described, this bar, as before stated, being secured to the reciprocating bed 2. As the bed reciprocates, therefore, it is apparent that the rack-teeth 62 will drive the pinion 61 first in one direction and then in the other, and this pinion, through the gearing described, will rotate the shaft 56 first in one direction and then in the other. The shaft 56, through the gears 55 53 and the pinions 52, 50, 48, 46, and 45, will drive the rolls 33 first in one direction and then in the other. The various parts of this driving mechanism are so related to each other as to impart to the riders 33 a movement which will drive the distributing-rolls 32 at a surface speed which corresponds to the surface speed of the ink-table with which they cooperate.

Any suitable means may be employed for supplying ink to the ink-table. In the construction shown the frame 1 supports at one end thereof a fountain 63, said fountain being provided with the usual fountain-roll 64. A ductor-roll 65 is employed, which takes the ink from the fountain-roll 64 and transfers it to a distributing-roll 66, from which it is again transferred by a second ductor-roll 67 to the ink-table. The ductor-roll 65 is mounted in arms 68, mounted on a rock-shaft 69, said shaft being operated from a cam 70 on a cam-shaft 71, suitably supported in the machine, through a vertical reciprocating cam-rod 71, a bell-crank 72, and a link 73, which link is secured to an arm 74, mounted on the shaft 69. The ductor-roll 67 is mounted in arms 75, mounted on a rock-shaft 76, which is operated from a cam 77 on the shaft 71 through a vertical reciprocating cam-rod 78, which is secured to an arm 79 on the shaft 76. The shaft 71 is further provided with a cam 80, which, through a vertical cam-rod 81, operates the fountain-roll through an ordinary pawl-and-ratchet mechanism such as commonly used for this purpose, and therefore not illustrated. The roll 66 is driven by an ordinary set of bevel-gearing from a vertical shaft 82, which has on its lower end a bevel-gear 83, which is in mesh with a bevel-gear 84 on a counter-shaft 85, which is driven from a pinion 86 on the shaft 71. The cam-shaft 71 may be operated in any suitable or desired manner. In the construction shown it carries on one end a pinion 87, which is in mesh with a pinion 88 on a shaft 89, suitably supported in the frame of the machine. The shaft 89 has on the end opposite to that which carries the pinion 88 a bevel-gear 90, said gear being in mesh with a bevel-pinion 91,

which is connected to a gear 92, said gear being in mesh with a gear 93, mounted on the shaft 20, before described as carrying the cam 19.

The operation of the various parts which have been described will be readily understood from the foregoing description and need not, therefore, be particularly set forth.

It is obvious that the specific details of construction described may be varied widely. The invention is not, therefore, to be limited to the particular construction shown and described.

What I claim is—

1. In an inking apparatus for printing-machines, the combination with a reciprocating bed, an ink-table moving therewith, a set of distributing-rollers cooperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for positively driving the riders of the form-rollers at a surface speed corresponding to the speed of the bed, gears driven from the bed, a shaft lying along and above the top of one side of the frame and extending from said gears to the distributing-rolls, and gears between the shaft and the riders of the distributing-rollers, whereby the shaft drives the riders, the gears which drive the shaft being arranged to impart to it a movement which enables the distributing-rollers to be driven at the speed of the ink-table, substantially as described.

2. In an inking apparatus for printing-machines, the combination with a reciprocating bed, an ink-table moving therewith, a set of distributing-rollers cooperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for vibrating the rider-rolls of both the form and distributing rollers, means for positively driving the riders of the form-rollers at a surface speed corresponding to the speed of the bed, gears driven from the bed, a shaft lying along and above the top of one side of the frame and extending from said gears to the distributing-rolls, and gears between the shaft and the riders of the distributing-rollers, whereby the shaft drives the riders, the gears which drive the shaft being arranged to impart to it a movement which enables the distributing-rollers to be driven at the speed of the ink-table; substantially as described.

3. In an inking apparatus for printing-machines, the combination with a reciprocating bed, of an ink-table moving therewith, a set of distributing-rollers cooperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for positively driving the rider-rolls of the form-rollers at a surface speed corresponding to the speed of the bed, a rack secured to the bed, gears driven by the rack, a shaft lying along and above the top of one side of the



frame and extending from said gears to the distributing-rollers, and gears between the shaft and the riders of the distributing-rollers, the gears which drive the shaft being arranged to impart to it a movement which enables the distributing-rollers to be driven at the speed of the ink-table, substantially as described.

4. In an inking apparatus for printing-machines, the combination with a reciprocating bed, of an ink-table moving therewith, a set of distributing-rollers coöperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for vibrating the rider-rolls of both the form and distributing rollers, means for positively driving the rider-rolls of the form-rollers at a surface speed corresponding to the speed of the bed, a rack secured to the bed, gears driven by the rack, a shaft lying along and above the top of one side of the frame and extending from said gears to the distributing-rollers, and gears between the shaft and the riders of the distributing-rollers, the gears which drive the shaft being arranged to impart to it a movement which enables the distributing-rollers to be driven at the speed of the ink-table, substantially as described.

5. In an inking apparatus for printing-machines, the combination with a reciprocating bed, of an ink-table moving therewith, a set of distributing-rollers coöperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for positively driving the riders of the form-rollers at a surface speed corresponding to the speed of the bed, a rack on the bed, a gear driven by said rack, a bevel-gear operated by said gear, a shaft extending along and above the top of one side of the frame having a bevel-gear which meshes with the before-mentioned bevel-gear, and gearing including a set of intermeshing bevel-gears, one of which is carried by the shaft between the rider-rolls of the distributing-rollers and the shaft, whereby the shaft drives said rider-rolls, the gears which drive the shaft being arranged to impart to it a movement which enables the distributing-rollers to be driven at the speed of the ink-table, substantially as described.

6. In an inking apparatus for printing-machines, the combination with a reciprocating bed, of an ink-table moving therewith, a set of distributing-rollers coöperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for vibrating the rider-rolls of both the form and distributing rollers, means for positively driving the riders of the form-rollers at a surface speed corresponding to the speed of the

bed, a rack on the bed, a gear driven by said rack, a bevel-gear operated by said gear, a shaft extending along and above the top of one side of the frame having a bevel-gear which meshes with the before-mentioned bevel-gear, and gearing including a set of intermeshing bevel-gears, one of which is carried by the shaft between the rider-rolls of the distributing-rollers and the shaft, whereby the shaft drives said rider-rolls, the gears which drive the shaft being arranged to impart to it a movement which enables the distributing-rollers to be driven at the speed of the ink-table, substantially as described.

7. In an inking apparatus for printing-machines, the combination with a reciprocating bed, of an ink-table moving therewith, a set of distributing-rollers coöperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for positively driving the riders of the form-rollers at a surface speed corresponding to the speed of the bed, a rack on the bed, a shaft extending along the top of one side of the frame, gearing including a pair of intermeshing bevel-gears, one of which is carried by the shaft between the rack and the shaft, a bevel-gear mounted on the shaft, a second bevel-gear driven by said gear, a pinion driven by said second bevel-gear, and trains of gearing leading from said pinion to the rider-rolls of the distributing-rollers, substantially as described.

8. In an inking apparatus for printing-machines, the combination with a reciprocating bed, of an ink-table moving therewith, a set of distributing-rollers coöperating with the ink-table, rider-rolls in contact with the distributing-rollers, a set of form-rollers, rider-rolls in contact with the form-rollers, means for vibrating the rider-rolls of both the form and distributing rollers, means for positively driving the riders of the form-rollers at a surface speed corresponding to the speed of the bed, a rack on the bed, a shaft extending along the top of one side of the frame, gearing including a pair of intermeshing bevel-gears, one of which is carried by the shaft between the rack and the shaft, a bevel-gear mounted on the shaft, a second bevel-gear driven by said gear, a pinion driven by said second bevel-gear, and trains of gearing leading from said pinion to the rider-rolls of the distributing-rollers, substantially as described.

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

THOMAS M. NORTH.

Witnesses:

J. A. GRAVES,  
A. A. V. BOURKE.