

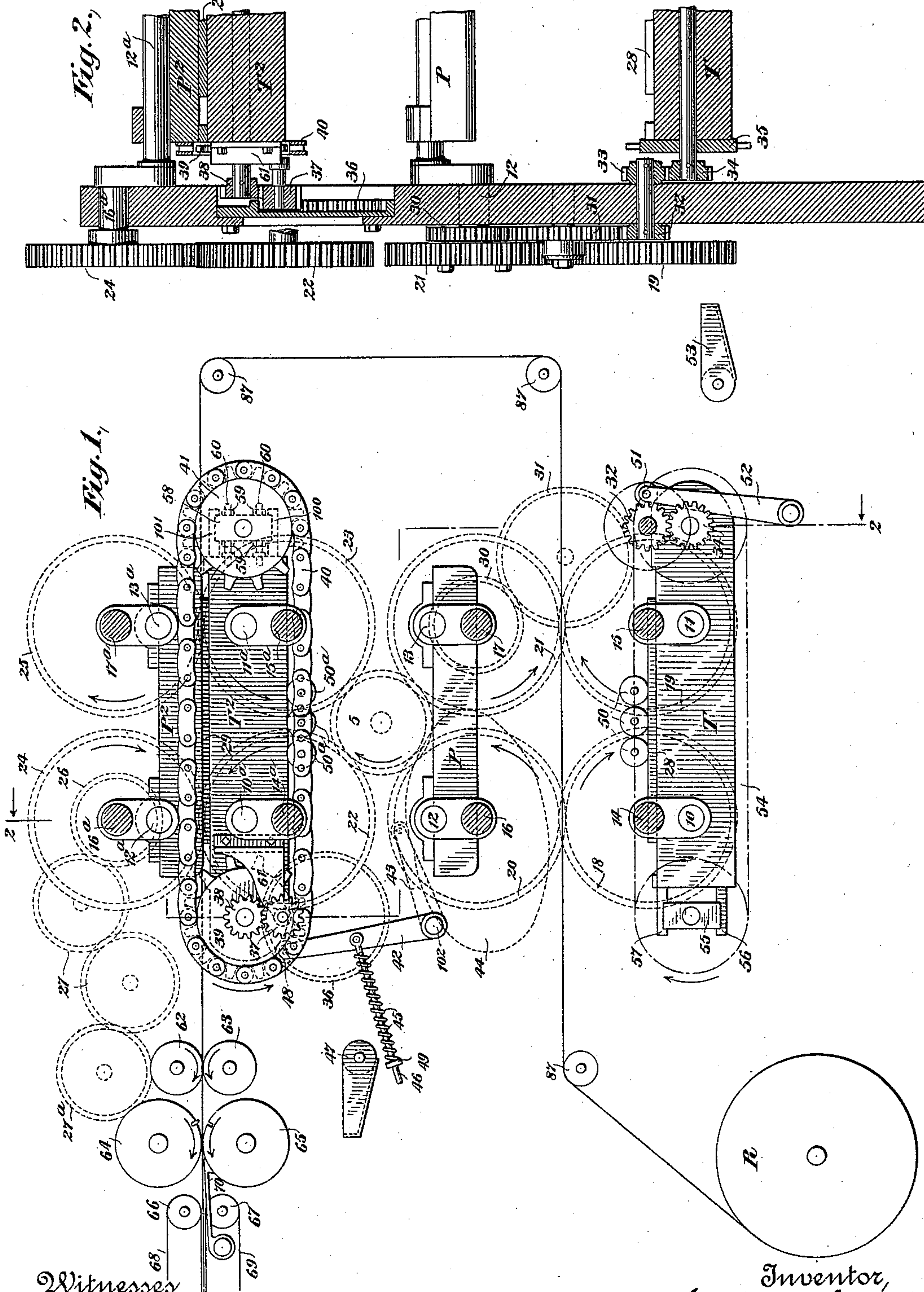
(No Model.)

2 Sheets—Sheet 1.

W. SCOTT.
PRINTING MACHINE.

No. 486,129.

Patented Nov. 15, 1892.



Witnesses
Geo. W. Brick
Henry W. Lloyd.

Inventor,
Walter Scott,
By his Attorneys,
Wilcox & Parkley.

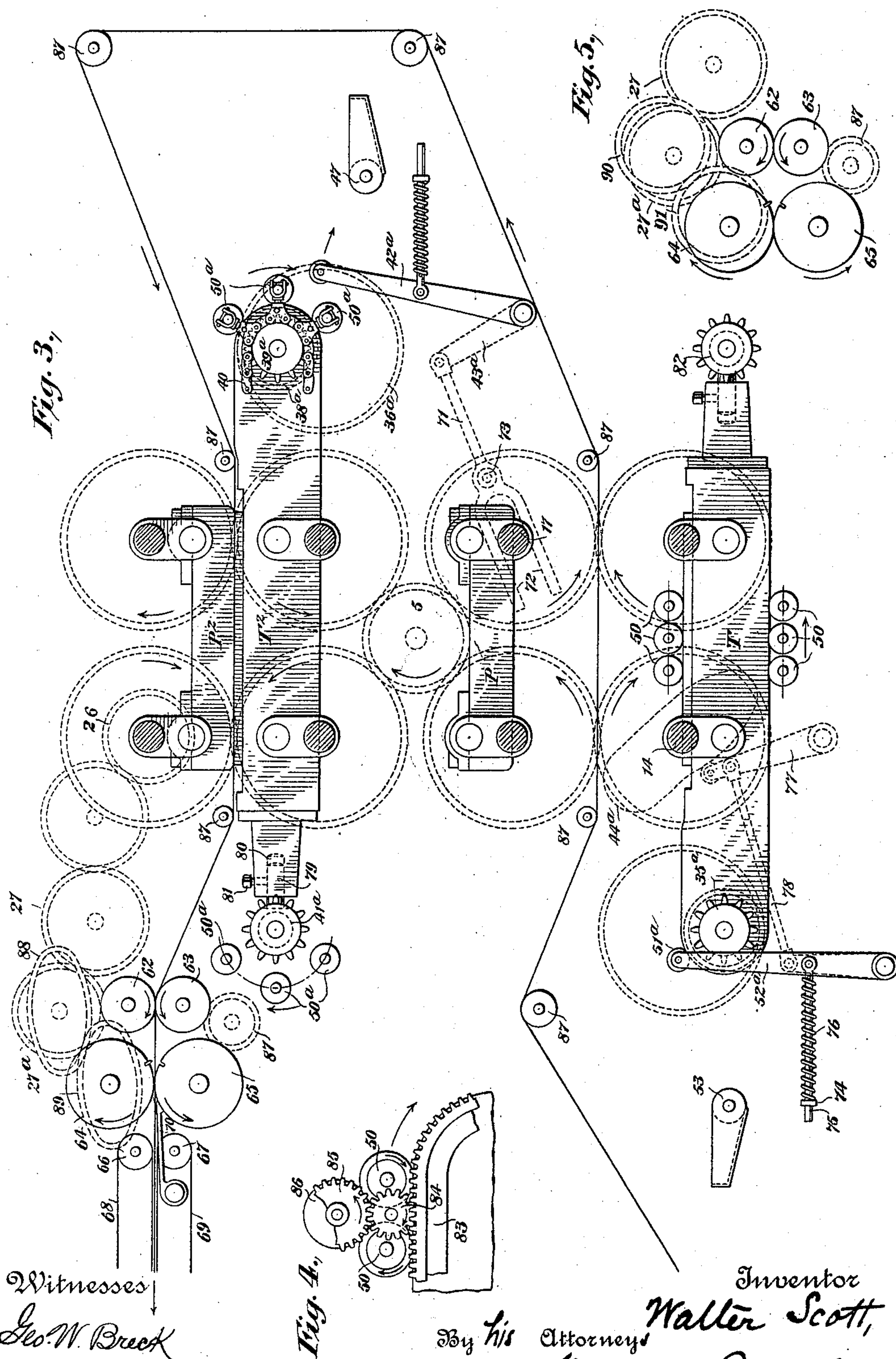
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or Parkley.

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,129, dated November 15, 1892.

Application filed March 9, 1891. Serial No. 384,326. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

My invention relates to that class of printing-machines wherein the impression is taken between a flat platen and a flat type-bed, each of which has a motion of circumduction, and to the inking of forms on the flat beds; and it consists in the combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of the machine. Fig. 2 is a sectional view on the line 2 2 of Fig. 1, looking in the direction of the arrows. Fig. 3 is a side elevation of the machine, showing modifications of certain parts. Fig. 4 is a fragmental view showing a modification of the inking apparatus. Fig. 5 is a view showing a modification of certain parts.

The flat type-bed T is carried by two cranks 10 11 on shafts 14 15, respectively. Shafts 14 15 are journaled in the framework of the machine. Gears 18 19 on shafts 14 15, respectively, transmit motion to the type-bed. The platen P is carried by two cranks 12 13 on shafts 16 17, respectively. These shafts have gears 20 21, respectively, the gear 20 meshing with gear 18 and the gear 21 with gear 19. Gears 20 21 are driven by the gear 5. The upper type-bed T² is mounted upon similar cranks 10^a 11^a on shafts 14^a 15^a, respectively. Shafts 14^a 15^a have gears 22 23, respectively. The upper platen P² is hung on similar cranks 12^a 13^a on shafts 16^a 17^a, respectively. These shafts have gears 24 25, respectively. The gear 24 meshes with gear 22 and a gear 25 with gear 23. The gears 22 23 are driven by the aforesaid gear 5. It will thus be seen that the type-bed remains parallel to itself, while having a circular motion given it by the cranked shafts 10 11. The same is true of the platen. This is sometimes called a "motion of circumduction." The arrows on the gears show the direction of motion. The type-bed T has a form 28 thereon, as an "outside" form, for instance, and the type-bed T²

has a form 29 thereon, as the "inside," for instance.

On the type-bed T² at one end are mounted sprocket-wheels 39, and at the other end sprocket-wheels 41 are mounted, preferably, in an adjustable bearing 58. This bearing 58 is held and guided by the guides 100 101 and is adjustable by means of screw-bolts 60 and nuts thereon on each side of the bearing 58. The sprocket-chains 40, passing about sprocket-wheels 39 41, carry the inking-rollers 50^a. These inking-rollers are shown as passing along the under side of the type-bed T², the type-bed being in its upper position. When the type-bed is in its lowest position, these inking-rollers are on top and about half-way across the form, they making one circuit about the type-bed to one turn of the cranked shafts that carry the bed. The curved or semicircular left-hand end in Fig. 1 of the type-bed T² is used as an inking-table, across which the inking-rollers are drawn just after crossing or inking the form, and the bottom of the bed is a distributing-table. The sprocket-wheels 39 are given their motion by suitable gearing. I have shown a fixed internal gear 36, secured to the framework of the machine, a double-face intermediate gear 37, turning on a stud fastened to the type-bed T² by a bracket 61, and a pinion on the shaft of the sprocket-wheels 39. The double-face intermediate gear meshes with the internal gear and with the sprocket-pinion 38 and transmits rotary motion from the former to the latter, thus causing the inking-rollers to travel around the bed. As the type-bed T² makes a circuit the intermediate gear describes a circular path of a radius equal to the distance between the centers of the shaft 10^a and the journal 14^a.

Ink is supplied to the curved or semicircular inking-table on the type-bed by means of a fountain 47 and a ductor-roller 48. The roller 48 is carried by arms 42, pivoted at 102 in the framework of the machine. The arms 42 are held against the ink-table by means of a rod 46, pivoted to the arms 42, passing through a stationary lug 49 and surrounded by a spring 45, which abuts against the lug and against a pin in the rod. The ductor-roller is caused to move over to the fountain by means of an arm 43, rigid with shaft 102 and operated by a cam

44 on the journal 16, or a closed cam can be used to move the ductor in both directions.

The operation of the devices for supplying ink to the curved ink-table is as follows:

5 The table at about the time of the printing comes against the roller 48 and the two move together to the left, the roller moving upwardly of the table as the latter moves to the left and downward and to the right and downward. The roller 48 may take ink from the fountain twice during one turn of the table T², the cam 44 being properly shaped for that end. The inking-rollers 50 on the lower type-bed are driven by sprocket-wheels 35 and 15 sprocket-chains. The sprocket-pinion 34 on the shaft of the sprocket-wheels revolves about the circumference of a pinion 33 on a short shaft passing through the framework, on the other end of which shaft is a pinion 32. The 20 pinion 32 is driven by an intermediate gear 31 and a gear 30 on the journal 17. The arrow shows the direction of motion of the sprocket-chains. There is an ink-table at the right-hand end of the bed T in Fig. 1, over which 25 the ink-rollers 50 move. This table is supplied with ink from the fountain 53 by the ductor-roller 51 on pivoted arms 52. These arms are operated in a manner similar to that just described for the arms 42 to supply ink 30 to the table. The sprocket-wheels at the left-hand end of the type-bed T are mounted in adjustable boxes 55, movable on guides 56 57.

In Fig. 1 the paper is drawn from a roll R around rollers 87 by the feed-rollers 62 63, 35 the surface speed of which is the same as that of the centers of the cranks 12^a 13^a. Fig. 1 shows the lower type-bed and platen separated and the upper type-bed and platen as taking an impression on the paper. The speed of 40 the type-bed and platen at the moment of impression is the same as that of the paper, and the motion of the bed, platen, and paper is in the same direction. The feed-rollers 62 63 feed the paper to cutting-cylinders 64 65. 45 The feed and cutting cylinders are driven by gears 27 from a gear 26 on the journal 16^a. After the perfected copies are cut apart by the cylinders they are delivered to tapes 68 69, running about rollers 66 67, respectively. 50 Guides 70 support the paper from the cutting-cylinders to the tapes.

In the modification shown at Fig. 3 the type-beds, platens, and the gearing for operating these parts are the same as in Fig. 1. There 55 are two sets of inking-rollers on the sprocket-chains for each type-bed. These inking-rollers make a half circuit about the type-bed for one turn of the cranked shafts carrying the same. The sprocket-wheels 39^a are driven 60 by a fixed internal gear 36^a and a gear 38^a on the shaft of the sprocket-wheels which meshes with the internal gear. The sprocket-wheels 41^a are each adjustable by a stud 79, fitting in socket 80 in the type-bed and held in any 65 desired position by the set bolt or screw 81. The right-hand end of the type-bed T² is used as an ink-table and the bottom as a distrib-

uting-table, as before. The ductor-roller on arms 42^a is shown as going to the fountain 47. The arm 43^a, rigid with the shaft of arms 70 42^a, is operated by means of a cam on journal 17, engaging with the roller 73 on the arm 71, the forks 72 of which are guided by the journal 17. The sprocket-chain for the lower inking-rollers passes about sprocket-wheels 35^a 75 and sprocket-wheels 82, the latter being adjustable, as shown. The sprocket-wheels 35^a are driven in a manner similar to that just described for the sprocket-wheels 39^a. The ductor-roller 51^a on arms 52^a is held against 80 the inking-table at the left-hand end of the type-bed T by a spring 76, surrounding the rod 75, jointed to one of the arms 52^a and passing through a lug 74. The ductor-roller is moved over to the fountain 53 by means 85 of a cam 44^a on the journal 14, which engages a roller on the pivoted arm 77. The arm 77 moves the arms 52^a by means of a rod 78, connected to an arm of the shaft of the said arms 52^a. The left-hand end of 90 the type-bed T is used as an inking-table. As long as the speed of the paper is the same at the moment of printing as that of the cranks 12^a 13^a, it is of no moment what its speed may be at other times, whether faster 95 or slower. Fig. 3 shows the gearing by means of which the speed of the paper is varied, subject to the just-named condition. In this figure the gear 27^a is of the same size as the gear 26 and is geared thereto by gears 27. 100 Gear 27^a does not gear directly to the cylinder 64, nor to roller 62, as in Fig. 1, but has the bilobal gear 88 on its shaft, which gear meshes with the bilobal gear 89 on the shaft of the cylinder 64. It will be noted that there 105 are two points in one revolution of the cutting-cylinder and feed-rolls where the speeds of these parts are the same as that of the cranks referred to. This is owing to the fact that in the construction shown the printing 110 devices take impressions alternately and the cutting-cylinders are of the same radius as the cranks of the shafts moving the printing devices. The cylinders 64 65 are geared together and the latter drives the feed-rolls 115 through the intermediate gear 87. In the position shown the speeds of the paper and the bed and platen are the same. The mechanism just described is applicable to such a machine as that shown in Fig. 3—that is, one 120 wherein two forms and two platens are used; but it is not material whether these be flat or cylindrical or whether they rotate, reciprocate, or have a motion of circumduction.

The construction shown in Fig. 5 shows the 125 form of the gearing used when there is but one platen and one type-form. The gears 27 and 27^a are as in the mechanism just described. The shaft of gear 27^a has the eccentric or unilobal gear 90 thereon, which meshes 130 with the eccentric or unilobal gear 91 on the cylinder 64. The cylinders 64 65 and rolls 62 63 are geared together, as just described in connection with Fig. 3. At the moment of

impression the speeds of cylinders 64 65, rolls 62 63, and gear 27^a are the same as that of the impression device.

In the modification shown at Fig. 4 the inking-rollers are drawn about the type-beds by sprocket-chains, and I place a rack 83 on the side of the type-bed and gear this rack with a metal distributing-roll 86 by means of gears 84 85. The metal roll is in contact with the inking-rollers 50.

It will readily be understood that the rack 83 extends all around the type-bed and that it has semicircular ends joined by straight portions. Of course in this modification the positions of the sprocket-wheels are fixed relatively to the rack, so that there is no adjustment of the bearings.

It is understood, of course, that the cranked shafts supporting the type-beds and platens are journaled at each end by means similar to those shown.

It will be noted that the paper is printed on one side, is turned over, is then printed on the other side, and is subsequently severed between the perfected copies.

In the machine shown at Fig. 1 the upper bed T² could be used as both type-bed and impression-surface in so far as certain features of my invention are concerned, the lower platen P being omitted, as well as its shafts and gears, and the type-bed T being placed high enough for its form to coact when in its highest position with the bed T² when in its lowest position. At the moment of impression the inking-rollers of bed T would be at the under side thereof, while the rollers of bed T² would be on top inking the form, and in this case that portion of the bottom of the bed T² used as a platen would not be used as a distributing-table.

The ink table and fountain are preferably placed at that end of the bed in all cases which the inking-rollers cross immediately after leaving the forms.

It is obvious that in those cases where there are two impressions made simultaneously, whether one on each side or both on the same side of the web, the construction shown in Fig. 5 can be used. While elliptical gearing is shown in Figs. 3 and 5, other well-known forms of gearing or mechanisms which produce the result (variable speed of the paper) can be used instead without departing from my invention. In some cases, especially where the motion of the printing devices is a rotating one, lobal gears would be used to give the required motion to the paper.

Having thus fully described my invention, what I desire to secure by Letters Patent is—

1. In a printing-machine, the combination of two independent pairs of flat platens and flat type-beds, the components of each of said pairs having a motion of circumduction and being geared together, and a driver-gear common to both of said pairs, substantially as described.

2. In a printing-machine, the combination of two independent pairs of flat platens and flat type-beds, the components of each pair having a motion of circumduction and being geared together, a driver common to both of said pairs, feed-rollers for drawing the paper from a roll between the type-bed and platen of each pair, and rollers for guiding the paper, substantially as described.

3. In a printing-machine, the combination of two pairs of flat platens and flat type-beds, the components of each pair having a motion of circumduction and being geared together, a driver common to both of said pairs, feed-rollers for drawing the paper from a roll between the platen and type-bed of each pair, rollers for guiding the paper, cutting-cylinders for severing the perfected copies, and gearing connecting the feed and cutting devices with the gearing of one of said pairs, substantially as described.

4. In a printing-machine, the combination of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, chains carrying said rollers, and mechanism for causing said rollers to traverse the forms, substantially as described.

5. In a printing-machine, the combination of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, endless chains carrying said rollers, sprocket-wheels, and mechanism for rotating said wheels, whereby the inking-rollers are caused to traverse the forms, substantially as described.

6. In a printing-machine, the combination of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, endless sprocket-chains carrying the rollers, sprocket-wheels, and gear-wheels for rotating said sprocket-wheels, whereby the ink-rollers are caused to ink the forms, substantially as described.

7. In a printing-machine, the combination of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, endless sprocket-chains carrying said rollers, sprocket-wheels at each end of the bed, a sprocket-pinion connected with the sprocket-wheels at one end of the bed, and a gear on the stationary frame for driving the sprocket-pinion, substantially as described.

8. In a printing-machine, the combination of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, chains carrying said rollers, sprocket-wheels at each end of the bed, a sprocket-pinion connected with the sprocket-wheels at one end of the bed, a stationary internal gear, and a gear on the bed intermediate the internal gear and the sprocket-pinion, substantially as described.

9. In a printing-machine, the combination of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, means for causing them to move around the

bed, and an inking-table on the bed, over which the rollers pass, substantially as described.

10. In a printing-machine, the combination
5 of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, means for causing them to move around the bed, an inking-table on the bed, over which the rollers pass, an ink-fountain, and a movable ductor-roller for supplying the table
10 with ink from the fountain, substantially as described.

11. In a printing-machine, the combination
15 of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers moving around the said bed, an inking-table on the bed, a stationary ink-fountain, and a ductor-roller on pivoted arms for supplying ink to the table from the fountain, substantially
20 as described.

12. In a printing-machine, the combination
25 of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers moving around said bed, an inking-table on the bed, a stationary ink-fountain, a ductor-roller on pivoted arms for supplying ink to the table from the fountain, and a cam for moving the roller to the fountain, substantially
30 as described.

13. In a printing-machine, the combination
35 of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers moving around the said bed, an inking-table on the bed, an ink-fountain, a ductor-roller on pivoted arms, a cam for moving the ductor into contact with the fountain, and a spring for moving the ductor against the inking-table, substantially as described.

14. In a printing-machine, the combination
40 of a flat type-bed carrying the form and having a motion of circumduction, inking-rollers, endless sprocket-chains carrying said rollers, sprocket-wheels at each end of the bed, and means for adjusting the bearings for the
45 wheels at one end of the bed, substantially as and for the purpose described.

15. In a printing-machine, the combination
50 of a flat bed carrying the form, inking-rollers, a distributing-roller, sprocket-chains carrying said rollers, sprocket-wheels at each end of the bed, a rack having semicircular ends on the bed, and gearing connecting the distributing-roller and said rack, substantially as and for the purposes described.

16. In a printing-machine, the combination
55 of a flat platen and a flat bed, each having a motion of circumduction and being geared together, a driver-gear, feed-rolls drawing the paper between the platen and bed, cutting-cylinders geared together, lobal gearing driving one of said cylinders, and gearing from one part of the printing device driving said lobal gears, as and for the purposes described.

17. In a printing-machine, the combination
65 of two pairs of flat platens and flat beds, the components of each pair having a motion of circumduction and being geared together, a

driver common to said pairs, feed-rolls drawing the paper between the platen and bed of each pair, cutting-cylinders geared together, lobal gearing driving one of said cylinders, and gearing from one pair of the printing devices driving said lobal gears, as and for the purposes described.

18. In a printing-machine, the combination
75 of printing devices taking impressions intermittently upon a web, feed-rolls drawing the web from a roll, and variable-speed mechanism, substantially as described, driving the feed-rolls at or near the speed of the printing devices while the impressions are being taken and at a varying speed at other times, substantially as and for the purposes described.

19. In a printing-machine, the combination
85 of printing devices taking impressions intermittently upon a web, feed-rolls drawing the web from a roll, cutting-cylinders, and variable-speed mechanism, substantially as described, driving the rolls and cylinders at or near the speed of the printing devices while the impressions are being taken and at a varying speed at other times, as and for the purposes described.

20. In a printing-machine, the combination
95 of two pairs of printing devices taking impressions intermittently and alternately upon a web, feed-rolls drawing the web from a roll, and variable-speed mechanism, substantially as described, driving the rolls at or near the speed of each of said pairs while such pair is taking an impression and at a varying speed at other times, substantially as and for the purposes described.

21. In a printing-machine, the combination
105 of two pairs of printing devices taking impressions alternately and intermittently upon a web, feed-rolls drawing the web from a roll, cutting-cylinders, and mechanism, substantially as described, driving the rolls and cylinders at or near the speed of each of said pairs while such pair is taking an impression and at a varying speed at other times, substantially as and for the purposes described.

22. In a printing-machine, the combination
115 of a flat platen, a flat type-bed, each having a motion of circumduction and being geared together, feed-rolls drawing the web between the platen and bed, and lobal gears and gearing connecting said rolls and the gearing of the printing devices, substantially as described.

23. In a printing-machine, the combination
120 of a flat platen, a flat type-bed, each having a motion of circumduction and being geared together, feed-rolls drawing the web between the platen and bed, cutting-cylinders, and lobal gears and gearing connecting said rolls and cylinders and the gearing of the printing devices, substantially as described.

24. In a printing-machine, the combination
130 of two pairs of flat platens and flat type-beds, the components of each pair having a motion of circumduction and being geared together, feed-rolls drawing the web between the platen and bed of both pairs, and lobal gears and

gearing connecting said rolls and the gearing of the printing devices, substantially as and for the purposes described.

25. In a printing-machine, the combination
5 of two pairs of flat platens and flat type-beds, the components of each pair having a motion of circumduction and being geared together, feed-rolls drawing the web between the platen and bed of each pair, cutting-cylinders, and
10 lobal gears and gearing connecting said rolls

and cylinders and the gearing of the printing devices, substantially as and for the purposes described.

Signed at New York, in the county of New York and State of New York, this 7th day of 15 March, A. D. 1891.

WALTER SCOTT.

Witnesses:

ISAAC N. FALK,
R. W. BARKLEY.