

No. 860,135.

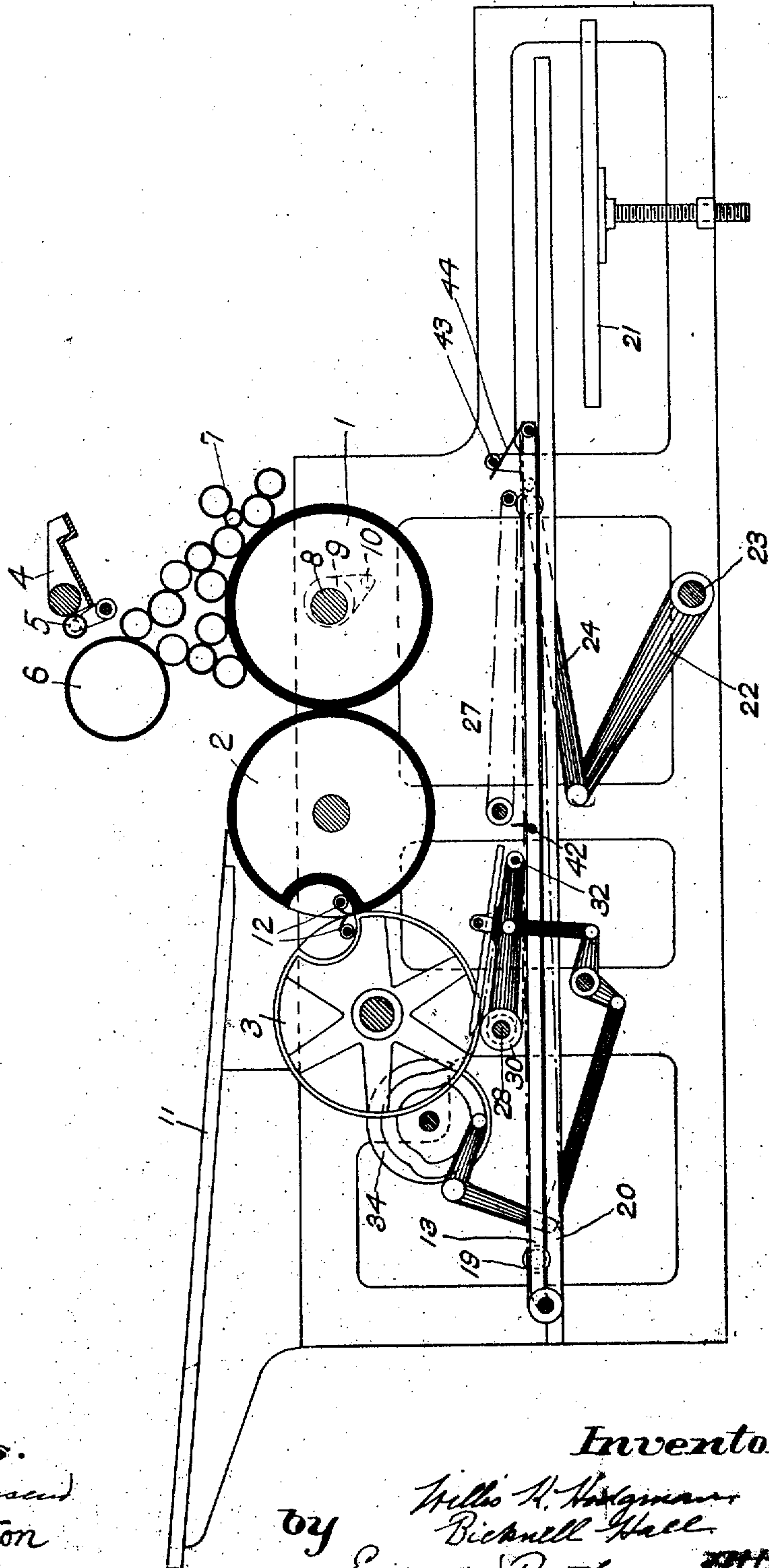
PATENTED JULY 16, 1907.

W. K. HODGMAN & B. HALL.
SINGLE REVOLUTION ROTARY PRINTING PRESS.

APPLICATION FILED AUG. 18, 1906.

58 SHEETS—SHEET 1.

Fig. 1



Witnesses.
Irving U. Brown
Jesse A. Holton

Inventors.
W. K. Hodgman
B. Hall
by Emory and Barth Attys

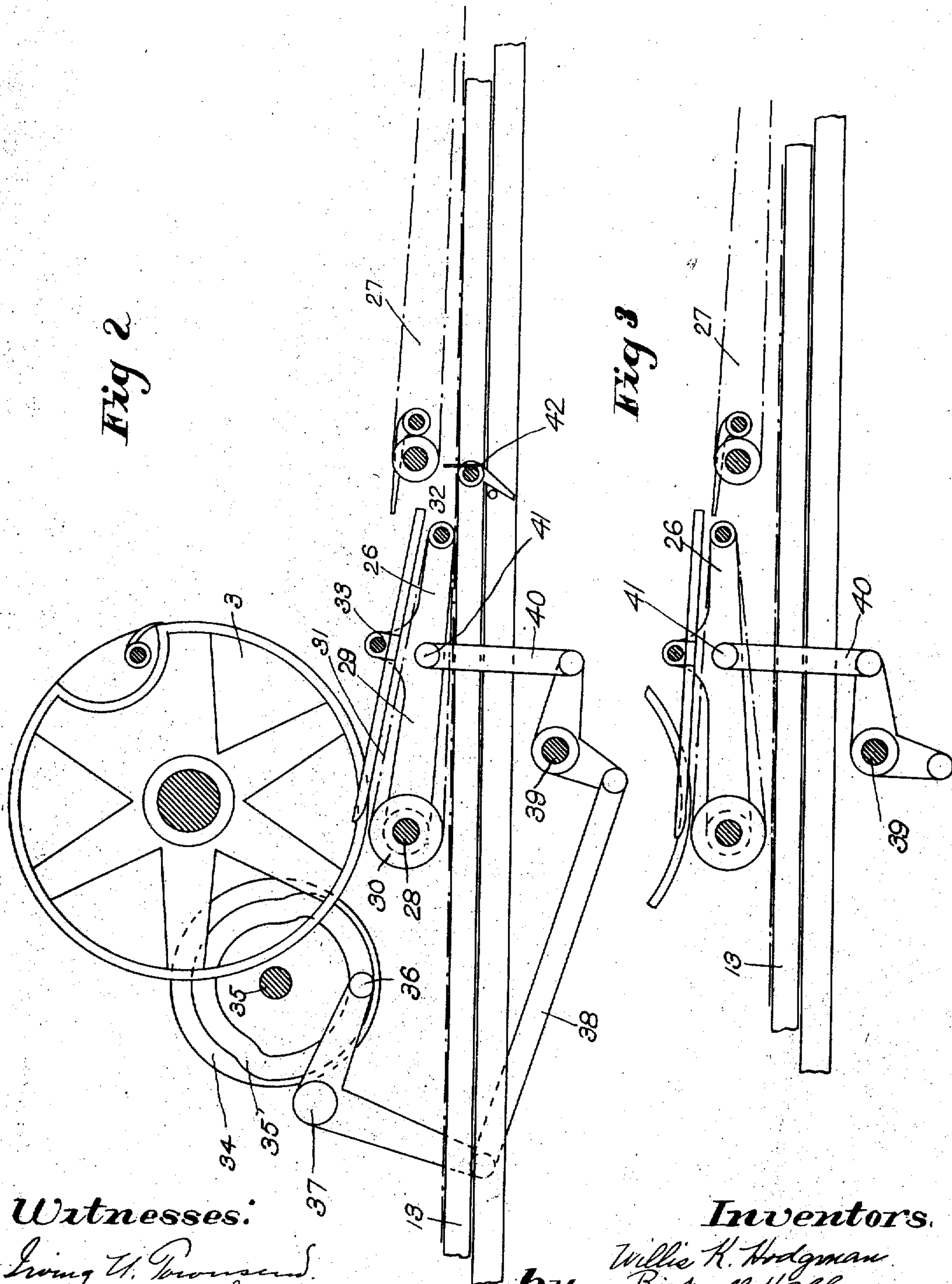
No. 860,135.

PATENTED JULY 16, 1907.

W. K. HODGMAN & B. HALL.
SINGLE REVOLUTION ROTARY PRINTING PRESS.

APPLICATION FILED AUG. 18, 1908.

5 SHEETS—SHEET 2.



Witnesses:
Living U. Townsend.
Jesse A. Holton.

Inventors.
Willie K. Hodgman
Bicknell Hall
by *Emery and Booth Attys.*

No. 860,135.

PATENTED JULY 16, 1907.

W. K. HODGMAN & B. HALL.
SINGLE REVOLUTION ROTARY PRINTING PRESS.

APPLICATION FILED AUG. 18, 1906.

5 SHEETS—SHEET 3.

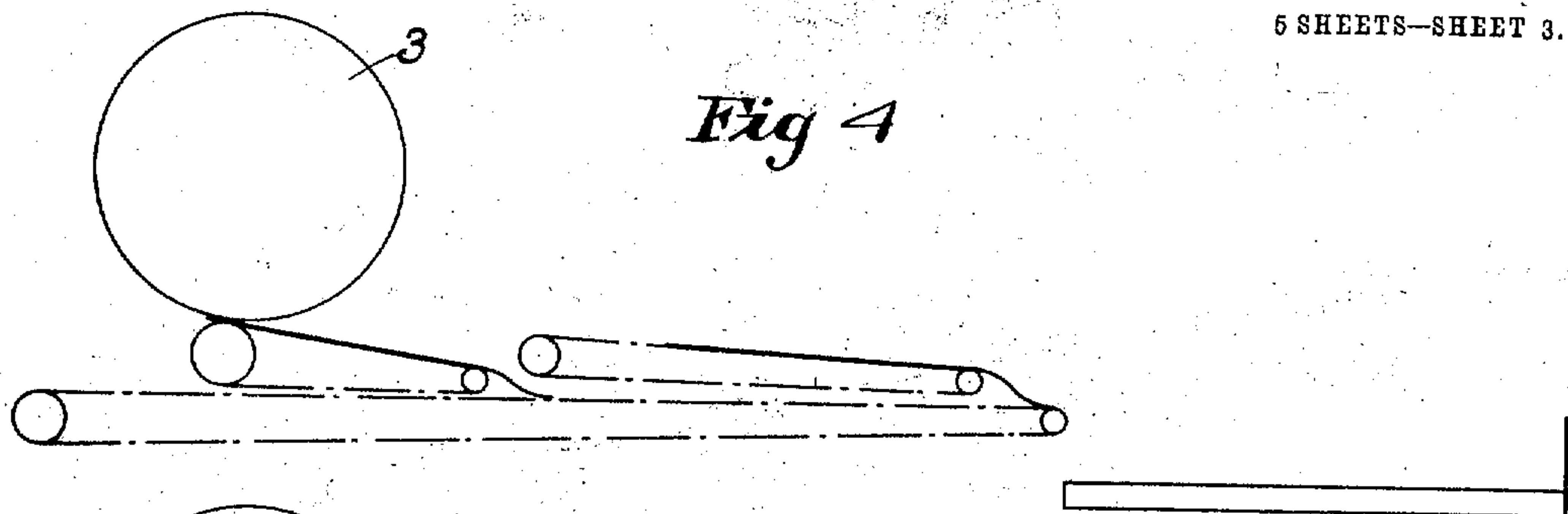


Fig 4

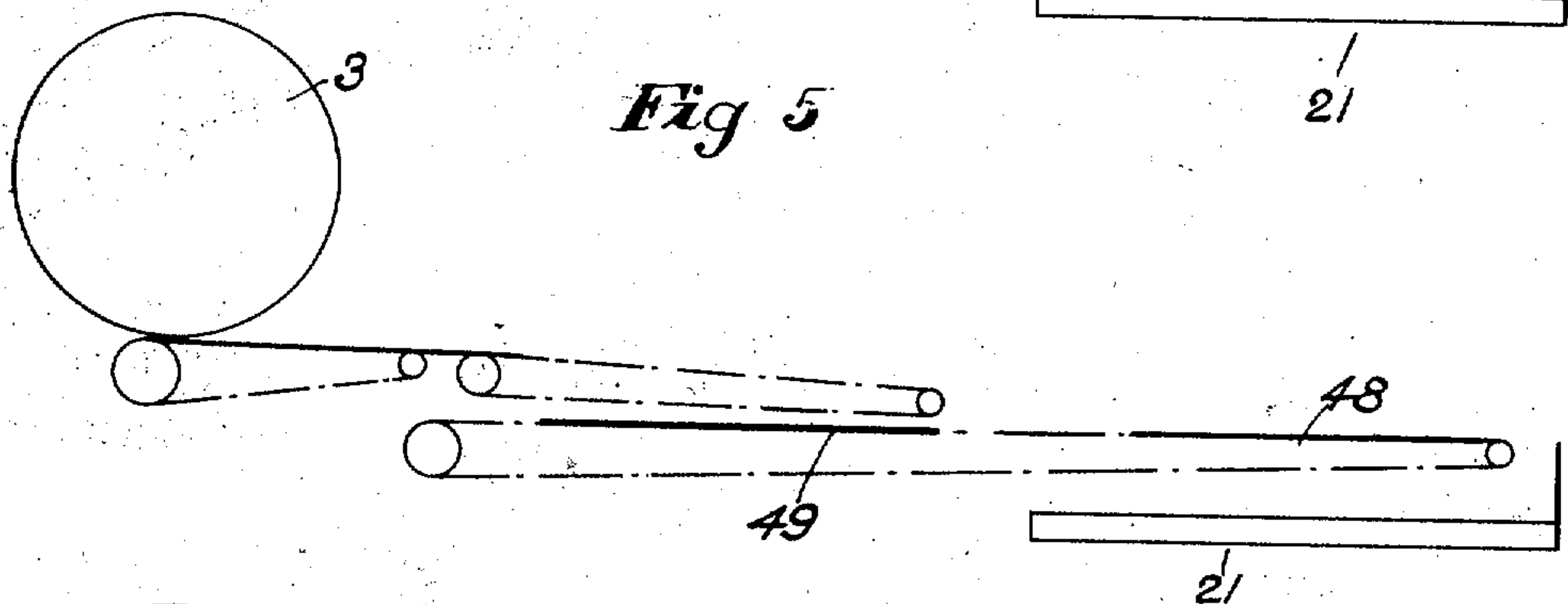


Fig 5

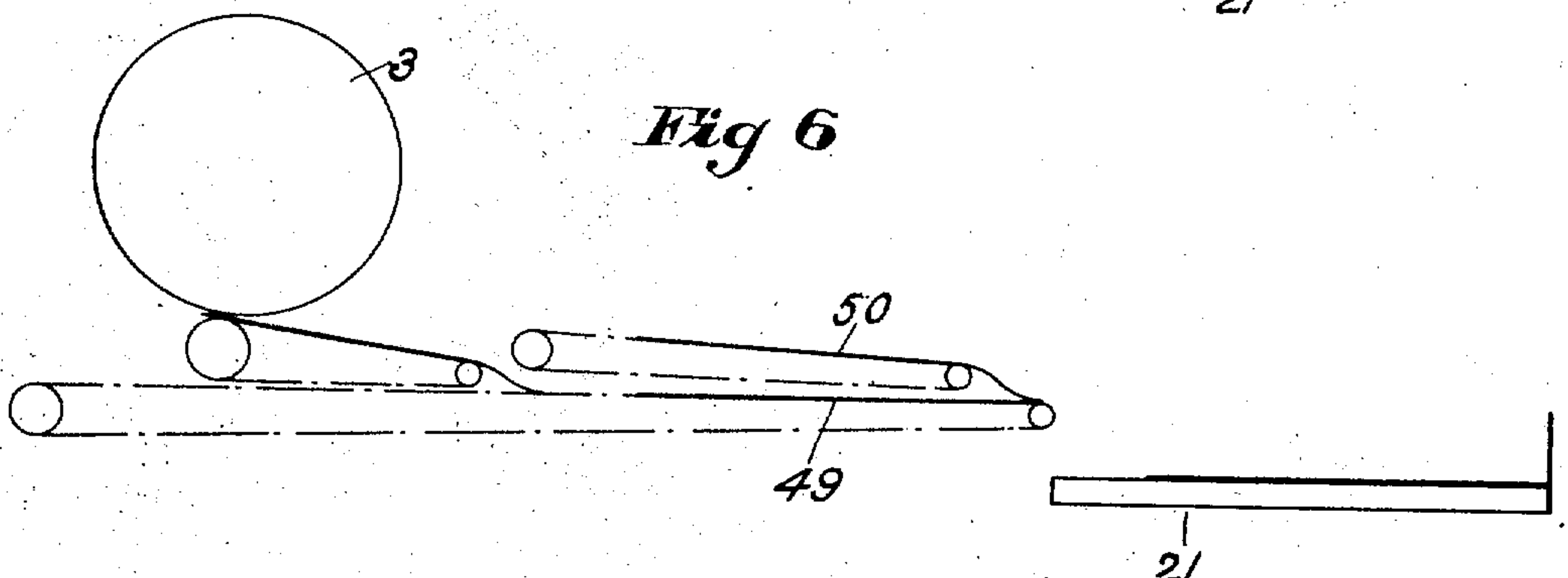


Fig 6

Witnesses
Irving U. Townsend.
Jesse A. Holton.

Inventors
Willis H. Hodgman
Bicknell Hall
by *Emery and Brock, Attys*

No. 860,135.

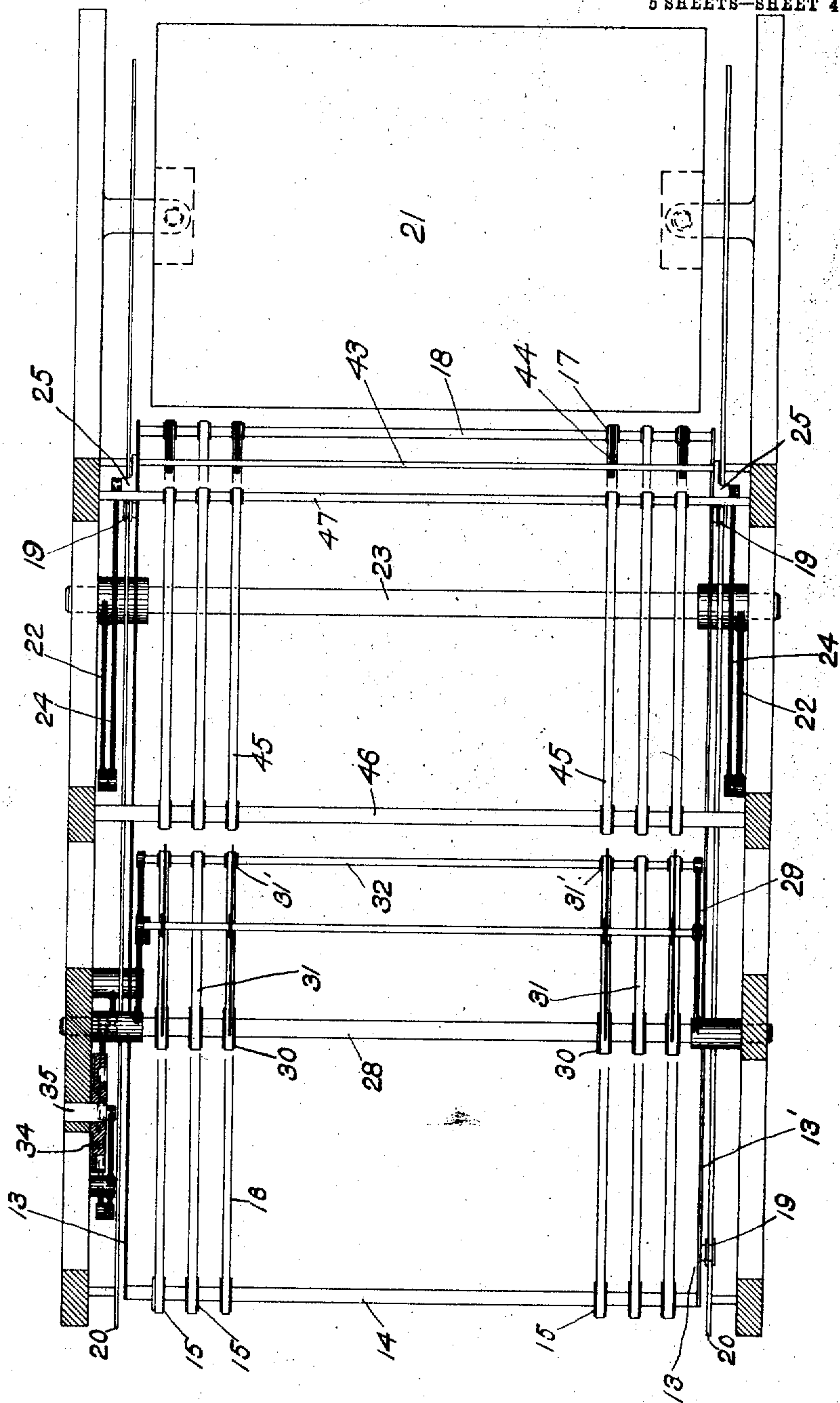
PATENTED JULY 16, 1907.

W. K. HODGMAN & B. HALL.
SINGLE REVOLUTION ROTARY PRINTING PRESS.

APPLICATION FILED AUG. 18, 1906.

5 SHEETS—SHEET 4.

Fig 7



Witnesses
Iwing H. Townsend
Jesse A. Holton.

Inventors:
Willis H. Hodgman
Bicknell Hall
by
Emery and Borch Attys

No. 860,135.

PATENTED JULY 16, 1907.

W. K. HODGMAN & B. HALL.

SINGLE REVOLUTION ROTARY PRINTING PRESS.

APPLICATION FILED AUG. 18, 1906.

5 SHEETS—SHEET 5.

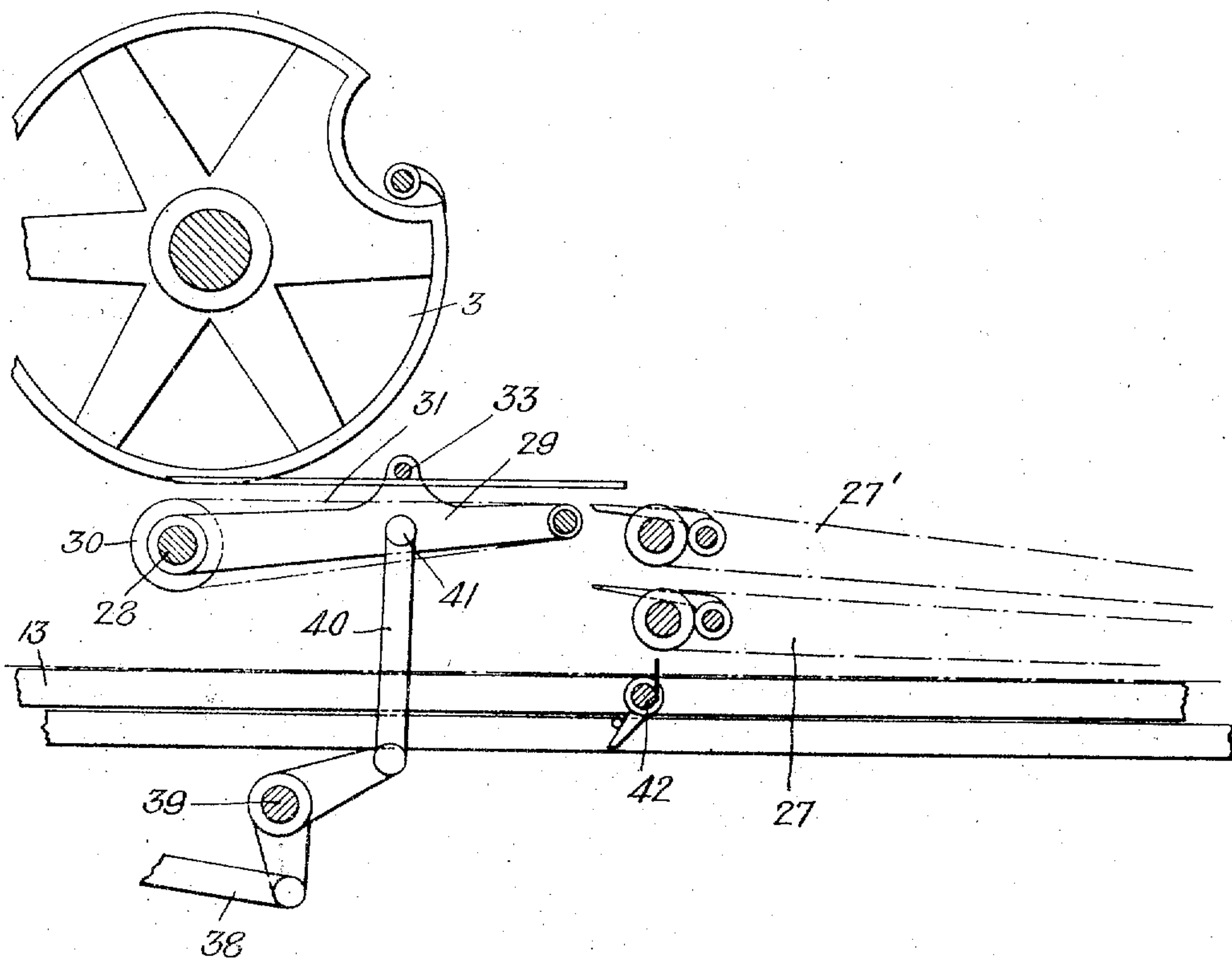


Fig. 8.

Witnesses:

Irving U. Townsend
Robert H. Kammerer.

Inventors

Willis K. Hodgman
Bicknell Hall
By Emery and Booth
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIS K. HODGMAN AND BICKNELL HALL, OF TAUNTON, MASSACHUSETTS, ASSIGNORS
TO HUBER-HODGMAN PRINTING PRESS COMPANY, OF TAUNTON, MASSACHUSETTS, A
CORPORATION OF MASSACHUSETTS.

SINGLE-REVOLUTION ROTARY PRINTING-PRESS.

No. 860,135.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed August 18, 1906. Serial No. 331,170.

To all whom it may concern:

Be it known that we, WILLIS K. HODGMAN and BICKNELL HALL, citizens of the United States, and residents of Taunton, in the county of Bristol and State of Massachusetts, have invented an Improvement in Single-Revolution Rotary Printing-Presses, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates primarily to single revolution rotary printing presses, although in certain aspects thereof it is not restricted thereto, and is particularly intended to improve the sheet delivery mechanism so that the printed sheets may be rapidly and effectively delivered from the press in a satisfactory condition.

15 In order that the principles of the invention may be understood we have herein chosen for description one type or embodiment thereof and have illustrated the same in the accompanying drawings, wherein:—

20 Figure 1 is a side elevation of a single revolution rotary printing press having one type or embodiment of our sheet delivery mechanism operatively connected therewith; Fig. 2 is a side elevation representing a portion of the sheet delivery mechanism and its relation to the delivery cylinder, the parts being positioned to present a sheet to the sheet delivery mechanism; Fig. 25 3 is a side elevation representing a portion of the sheet delivery mechanism, showing the parts in position to present a sheet to the auxiliary sheet presenting or delivery mechanism; Fig. 4 is a diagrammatic view illustrating the preferred manner of delivering sheets printed side up to the sheet delivery mechanism, one sheet being delivered thereto by the primary sheet presenting mechanism and the other sheet being delivered thereto by the auxiliary sheet presenting mechanism; the sheet delivery mechanism being in its rearward position; Fig. 5 is a diagrammatic view of the sheet delivery mechanism, showing the same in its forward position and having two sheets thereon and showing the 30 primary sheet presenting mechanism as conveying a sheet to the auxiliary sheet presenting mechanism for presentation thereby to the sheet delivery mechanism; Fig. 6 is a diagrammatic view of the sheet delivery mechanism in its rearward position and having a single sheet thereon and showing both the primary sheet presenting mechanism and the auxiliary sheet presenting mechanism as presenting sheets to the sheet delivery mechanism; Fig. 7 is a plan view of the sheet delivery 35 mechanism and sheet presenting mechanism and a portion of the operating parts therefor; Fig. 8 is a side elevation representing a modified form of sheet delivery mechanism

and its relation to the delivery cylinder; parts being broken away.

Having now reference to that type or embodiment of 55 the invention which alone is here selected to illustrate the principles thereof, in the drawings;—the printing, impression and delivery cylinders of a single revolution rotary printing press (Fig. 1) are represented at 1, 2 and 3 respectively, the ink being applied to the 60 printing cylinder in any usual or preferred manner. In the present instance the ink is delivered from the ink supply 4 by a ductor roller 5 to the large roller 6, wherefrom the ink is conveyed to the ink distributing and form rollers 7, coöperating in any preferred manner with the printing cylinder 1. Although the sheet 65 delivery mechanism to be described is particularly applicable to a single revolution rotary printing press such as the type here presented, in certain aspects of the invention the same is not restricted thereto. In this embodiment of the invention the shaft 8 of the 70 printing cylinder (see Fig. 1) is preferably mounted in an eccentric bearing 9, pivotally mounted at 10 whereby the same may receive a movement of partial rotation to depress the said cylinder from contact with the ink distributing and form rollers and from contact with 75 the impression cylinder 2, the parts being operated to effect this result by an attendant through a treadle or other suitable mechanism, or, if preferred, it may be done by hand.

80 In the operation of the press the sheets to be printed are delivered from the feed table 11 to the impression cylinder 2 in any preferred manner, but preferably an automatic feed is provided. The impression and delivery cylinders are herein shown as provided with 85 grippers 12 of the type indicated or of any suitable construction. In the operation of the press, the sheets are conveyed by the impression cylinder 2 past the point of contact therewith of the printing cylinder 1 and in the continued rotation thereof in a clockwise 90 direction are, where the same is employed, received by the delivery cylinder 3 which, rotating in a counter-clockwise direction, with the printed side of the sheet in contact therewith, presents the same printed side up to the sheet delivery mechanism of our invention, 95 one type or embodiment of which is herein shown. In this form of the invention it is preferred to employ a delivery cylinder from which the sheets are transmitted to the sheet delivery mechanism, but it is within the scope of the invention to transmit the sheets in any 100 suitable manner from the point of printing thereof to the sheet delivery mechanism.

In the type of the invention herein shown the sheets are delivered preferably printed side up and preferably

to the front of the machine, the sheet delivery mechanism being here shown as located below the plane of the printing and impression cylinders, so that as the sheets are received from the delivery cylinder to which they travel rearwardly they are by the sheet delivery mechanism again conveyed toward the front of the machine or in a forward direction.

While any suitable sheet delivery mechanism may be provided we have here shown the same as consisting of (Figs. 1 and 7) preferably a skeleton reciprocating carriage 13, provided with side members or bars 13', and having at the rear end thereof, and journaled in said side members or bars 13', a horizontally disposed tape driving shaft 14, to which motion is imparted in any preferred manner, and having fast thereon guide pulleys 15, adapted to receive the delivery tapes 16 which in this type of our invention are preferably employed and which at the forward portion of the delivery carriage pass about pulleys 17, loose and suitably positioned upon a stationary rod or similar support 18, arranged transversely of the carriage in said side members or bars 13' and parallel with the tape driving shaft 14. For convenience of illustration only a few delivery tapes are shown, the same being broken away intermediate their ends, but it will be understood that in the preferred form of carriage tapes will be provided at suitable intervals throughout the lateral extent thereof. The said delivery carriage (Fig. 7) is preferably provided with a series of guide rollers as shown at 19, adapted to run upon suitable tracks or guide ways 20, provided for that purpose in the frame of the machine. The said carriage is here shown as adapted to receive a movement toward and from the point of discharge, and which is preferably one of reciprocation, whereby sheets presented thereto are conveyed forwardly to a box 21 or other suitable sheet receiving device, here shown (Fig. 1) as provided with means whereby the same may be lowered as the sheets accumulate thereon.

In order to impart to the carriage the described movement toward and from the point of discharge, and which in this type of the invention is one of reciprocation, any suitable mechanism may be employed. We have here shown (Figs. 1 and 7) as merely a convenient mechanism for imparting the desired movement, crank arms 22, mounted at the opposite extremities of a horizontally disposed shaft 23, underlying the said carriage, to which power is applied in any suitable manner. The opposite ends of the said crank arms 22 are connected by links 24 to the forward portion of the carriage as shown at 25. During the forward movement of reciprocation of the said delivery carriage no relative movement is imparted to the tapes thereof, but preferably as the carriage begins its return movement of reciprocation the said tapes are in any preferred manner, which it is here unnecessary to show, brought into engagement with mechanism whereby a movement of forward travel is imparted thereto.

In order to largely increase the rate of delivery of the printed sheets, and, in the present embodiment of the invention to double the rate of delivery thereof with respect to an unchanged speed of the printing and impression cylinders we have provided devices whereby, from a single printing mechanism, a plurality of printed sheets may preferably simultaneously be presented to

the sheet delivery mechanism, here shown as a reciprocating carriage. The said sheets are in this type of the invention placed upon the sheet delivery carriage with the leading edge of one in advance of the leading edge of another, but they may be suitably spaced thereon, in any other or preferred manner, either laterally or longitudinally throughout the series, which in the present instance is shown as consisting of two, but which obviously may be extended to any suitable or desired number. In order to deliver a plurality of sheets from a single printing mechanism to the sheet delivery mechanism or carriage any suitable means may be provided but for the purpose we have shown primary and auxiliary sheet presenting devices 26 and 27, the former being adapted to receive the sheets preferably printed side up, and preferably directly from the delivery cylinder 3 to deliver the same in any suitable manner and preferably in alternation to the sheet delivery carriage and the auxiliary sheet presenting mechanism, which for the purpose is mounted above and preferably in parallelism with the said sheet delivery carriage, so that a sheet delivered thereto, preferably printed side up, from the primary sheet presenting mechanism may in turn be presented in the same condition to the sheet delivery carriage and preferably at the forward portion thereof, and simultaneously with the direct presentation to such carriage of another sheet by the primary sheet presenting carriage. In the present type of the invention the sheet conveyed by the primary presenting mechanism to the auxiliary sheet presenting mechanism is in turn conveyed to the sheet delivery carriage, but it would be within the scope of our invention to convey the sheet from the auxiliary sheet presenting carriage in any suitable manner to any suitable device or receptacle, so that in such aspect of the invention the sheet delivery carriage constitutes the main sheet delivery mechanism and the auxiliary sheet presenting mechanism constitutes an auxiliary sheet delivery device or mechanism.

In order that the primary sheet presenting mechanism may deliver sheets preferably in alternation to the sheet delivery mechanism and to the auxiliary sheet presenting or delivery mechanism, we may impart any desired or proper relative movement to the primary sheet presenting mechanism and the auxiliary sheet presenting mechanism, but in this type of the invention we prefer to impart movement to the primary sheet presenting mechanism and to that end the same is pivoted so that a movement of oscillation may be imparted thereto, although it is apparent that any desired movement may be employed to convey sheets therefrom to the auxiliary sheet presenting mechanism. The said auxiliary sheet presenting mechanism is here shown (Figs. 1 and 2) as having side members 29 suitably mounted at their rear ends from the sides of the machine frame for oscillating movement and as also having a suitably supported horizontal shaft 28 whereon are preferably fast mounted the tape delivery rollers 30, adapted in this instance to receive a movement of rotation from the surface of the printed sheet delivery cylinder 3 and to communicate the same to preferably constantly traveling tapes 31, of which any suitable number is provided and which at their forward portions pass about pulleys 31' loose upon a guide rod or

member 32. If desired, longitudinally disposed sheet guide fingers may be positioned above the traveling tapes 31, being supported in uprights or extensions 33 extending from the side members of the primary sheet presenting mechanism so as to direct the printed sheets from the delivery cylinder to the proper position upon the said traveling tapes 31. In order to impart the described movement of oscillation to the pivoted primary sheet presenting mechanism any suitable means may be employed but as here shown (Figs. 1 and 2) we provide a cam 34 preferably mounted upon a stud 35 and impart thereto a movement of rotation in any desired manner. Preferably in one face of the cam 34 is provided a cam way 35' adapted to receive therein a projection or roller 36 upon one end of a bell crank lever 37, the other end whereof is connected by a link 38 to one arm of a bell crank lever 39, the opposite arm whereof is pivotally connected by a link 40 to the said primary sheet presenting mechanism at 41.

When the primary sheet presenting mechanism is in the position shown in Fig. 2 a sheet will be presented therefrom preferably printed side up to the then relatively stationary tapes of the sheet delivery carriage 13, which may if desired be provided with positioning clips or members 42 of any desired type to receive thereagainst the forward edge of the sheet delivered from the primary sheet presenting mechanism. We may if desired provide similar or other clips at the forward portion of the sheet delivery carriage to cooperate with the sheets delivered thereto from the auxiliary sheet presenting mechanism, and to that end have provided (Figs. 1 and 7) a fulcrum rod 43 mounted in uprights in the side members or bars of the said carriage and having pivoted thereon for suitable operation the clips 44.

The auxiliary sheet presenting or delivery mechanism 27 is preferably provided with a series of traveling tapes 45, of which any desired number may be employed, the same being preferably mounted upon a rear transverse shaft 46 and a front transverse rod 47 preferably provided respectively with fast and loose guide pulleys thereon.

Viewing particularly Figs. 4, 5 and 6, it will be observed that a sheet delivered to the auxiliary sheet presenting mechanism is thereby preferably presented or transferred to the delivery carriage and is herein shown as delivered to the forward extremity thereof, while at the same time (Fig. 4) another sheet is being delivered to the said carriage directly from the primary sheet presenting mechanism preferably, and as here shown, to the rear of the said first sheet. When the said sheets are so presented the said delivery carriage is preferably at the rear extremity of its movement of reciprocation, and as the carriage has imparted thereto its forward movement, the tapes thereon being relatively stationary, the said two sheets are drawn from the said primary and auxiliary sheet presenting mechanism respectively so as to be positioned upon the said delivery carriage at or before the time the same has reached its forward position as shown in Fig. 5. The said delivery carriage now begins its return movement of reciprocation during which a forward traveling movement is imparted to the tapes thereof, so that the leading sheet 48 is stripped or delivered therefrom into

or upon the box or receptacle 21. The rate of traveling movement of the tapes of the delivery carriage is such that the rear sheet 49 is during the return reciprocation of the carriage not only moved forward its own length but also preferably a slight additional extent so that the forward edge thereof is positioned substantially at the front edge of the carriage (see Fig. 6) so that the next sheet 50 delivered to the said carriage from the auxiliary sheet presenting mechanism will be placed upon the said sheet 49 and preferably co-incident therewith. Upon the next forward movement of reciprocation of the said carriage the two superposed sheets 49 and 50 will be together stripped or discharged from the carriage and deposited in the box or receiver 21. The printing cylinders make two complete cycles while the delivery carriage makes one complete cycle. At the first cycle of the cylinders (see Fig. 2 and Fig. 4) the sheet is delivered by the primary sheet delivery mechanism to the delivery carriage. At the second cycle of said cylinders (Figs. 3 and 5) a sheet is delivered by the primary sheet delivery mechanism to the auxiliary sheet delivery mechanism. These two cycles of the printing cylinders occur during one complete cycle of the delivery carriage. Thus, the delivery carriage, during a complete cycle thereof, delivers two sheets, but such cycle of the carriage occurs while the cylinders make two complete cycles.

It will be apparent from the description of this embodiment of the invention that sheets may be delivered printed side up to the delivery mechanism and conveyed thereby forwardly and that the rate of delivery is herein duplicated for a given speed of the printing mechanism. It is obvious that a plurality of auxiliary sheet presenting mechanisms of the type shown or of any preferred type may be employed, sheets being delivered thereto in any desired sequence and in any proper manner, either directly by the primary sheet delivery mechanism or otherwise, so that the rate of delivery from the printing mechanism may be multiplied in any desired ratio with respect to any desired speed of the printing mechanism.

In Fig. 8 is illustrated a modification wherein a second auxiliary sheet presenting mechanism 27' is shown. This auxiliary mechanism may be constructed in any suitable manner and is here shown as mounted above the auxiliary sheet presenting mechanism 27, and is indicated as broken away at its forward end. In the practical operation of this mechanism the second auxiliary presenting mechanism 27' would be extended far enough forward to deliver sheets in advance of those delivered by the auxiliary presenting mechanism 27, the reciprocatory delivery apparatus being, in this embodiment of the invention, sufficiently elongated for the purpose. The sheets may be delivered from the delivery cylinder 3 in any desired sequence by the primary sheet presenting device 26 to the reciprocatory carriage 13 direct to the lower auxiliary sheet presenting device and to the upper auxiliary sheet presenting device 27'. In this type of the invention, one cycle of the reciprocatory carriage 13 occurs during each three cycles of the delivery cylinder.

While the plural or multiple sheet delivery is here shown as embodied in a delivery mechanism whereby the sheets are forwardly delivered, we may if preferred

deliver them in any desired direction. We prefer, however, to deliver them forwardly and printed side up in the manner stated.

Having thus disclosed one embodiment or type of our invention and described the same specifically with reference to the illustration thereof, we wish it to be understood that while we have employed specific descriptive terms the same are used in a broad or general sense and that the scope of the invention is set forth in the following claims.

Claim.

1. A single revolution rotary printing press comprising rotating printing mechanism requiring a single rotation for each printing operation, and forwardly carrying reciprocatory delivery means located below the plane of the printing mechanism and adapted to receive spaced apart thereon sheets printed side up and to deliver the same forward in such condition.
2. A single revolution rotary printing press comprising rotating printing mechanism requiring a single rotation for each printing operation, a co-acting delivery device, and forwardly carrying reciprocatory delivery means located below the plane of the printing mechanism and adapted to receive spaced apart thereon sheets printed side up from the said delivery device and to deliver the same forward in such condition.
3. A single revolution rotary printing press comprising a printing cylinder, an impression cylinder, a delivery cylinder, and means to receive a plurality of non-associated sheets from the delivery cylinder and to deliver, during alternate revolutions of said delivery cylinder, such plurality of sheets issuing singly from said delivery cylinder.
4. A single revolution rotary printing press comprising a printing cylinder, an impression cylinder, a delivery cylinder, and a forwardly carrying reciprocatory delivery means to receive spaced apart thereon sheets printed side up from the delivery cylinder and to discharge the same in such condition.
5. A single revolution rotary printing press comprising rotary printing cylinders, sheet delivery means to receive all sheets issuing from said cylinders and to deliver the same and provisions whereby during a single revolution of a series of revolutions of said cylinders a plurality of sheets is delivered by said delivery means and whereby no sheets are delivered by said delivery means during the other revolution or revolutions of said series of revolutions of said rotary printing cylinders.
6. A single revolution rotary printing press comprising rotary printing cylinders and delivery mechanism adapted to receive sheets from said rotary printing cylinders and to deliver the same and provisions whereby during alternate revolutions of said rotary printing cylinders said delivery mechanism delivers a plurality of sheets, no sheets being delivered by said delivery mechanism during the intervening rotation of said cylinders.
7. A single revolution rotary printing press comprising a printing cylinder, an impression cylinder, a delivery cylinder, and reciprocatory means to receive sheets spaced apart thereon printed side up from the lower side of the printing cylinder and to discharge the same in such condition.
8. A single revolution rotary printing press comprising a printing or impression mechanism, sheet delivery mechanism to deliver a plurality of sheets during a single revolution of said printing or impression mechanism, and presenting means to present a plurality of spaced sheets to the delivery mechanism from a single printing or impression mechanism.
9. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism, and presenting means simultaneously to present to the latter a plurality of non-associated sheets from a single printing or impression mechanism.
10. A single revolution rotary printing press comprising printing or impression mechanism, horizontally reciprocatory

sheet delivery mechanism, and presenting means to align upon the latter a plurality of spaced sheets from a single printing or impression mechanism.

11. A single revolution rotary printing press comprising printing or impression mechanism, bodily reciprocatory sheet delivery mechanism, and presenting means to align simultaneously upon the latter a plurality of spaced sheets from a single printing or impression mechanism.

12. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism, and presenting means to align simultaneously upon the latter for successive discharge therefrom, a plurality of sheets from a single printing or impression mechanism.

13. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying reciprocatory sheet delivery mechanism, and presenting means to align simultaneously upon the latter for successive discharge therefrom, a plurality of sheets from a single printing or impression mechanism.

14. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism and presenting means to present substantially in unison to the latter a plurality of spaced sheets printed side up from a single printing or impression mechanism.

15. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism, and presenting means to present a plurality of sheets from a single printing or impression mechanism to different positions thereon.

16. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism, and presenting means to present to different portions thereof a plurality of sheets printed side up from a single printing or impression mechanism.

17. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism, and presenting means to present simultaneously to different portions thereof a plurality of sheets printed side up from a single printing or impression mechanism.

18. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism, and a plurality of means to present non-associated sheets thereto from a single printing or impression mechanism.

19. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism, and presenting means to present thereto during a single movement of reciprocation thereof a plurality of non-associated sheets from a single printing or impression mechanism.

20. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism, and presenting means to present simultaneously thereto during a single movement of reciprocation thereof, a plurality of non-associated sheets from a single printing or impression mechanism.

21. A single revolution rotary printing press comprising printing or impression mechanism, a forwardly carrying reciprocatory sheet delivery mechanism, and presenting means to present simultaneously thereto during a single movement of reciprocation thereof, a plurality of spaced sheets from a single printing or impression mechanism.

22. A single revolution rotary printing press comprising printing or impression mechanism adapted to deliver a plurality of sheets during a single revolution of the printing or impression mechanism, bodily reciprocatory sheet delivery mechanism receiving all sheets and delivering them in one direction, and primary and auxiliary sheet presenting mechanisms to present sheets thereto.

23. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism and primary and auxiliary sheet presenting mechanisms to present non-associated sheets thereto.

24. A single revolution rotary printing press comprising printing or impression mechanism, right line reciprocatory

sheet delivery mechanism, and primary and auxiliary sheet presenting mechanisms to present sheets thereto printed side up.

25. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying horizontally reciprocatory sheet delivery mechanism, and primary and auxiliary sheet presenting mechanisms to present sheets thereto printed side up.

26. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism, an auxiliary sheet presenting mechanism to present printed sheets to the sheet delivery mechanism, and means to present sheets alternately to the sheet delivery mechanism and to the auxiliary sheet presenting mechanism.

27. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying reciprocatory sheet delivery mechanism, an auxiliary sheet presenting mechanism to present printed sheets to the sheet delivery mechanism, and means to present sheets alternately to the sheet delivery mechanism and to the auxiliary sheet presenting mechanism.

28. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms, and means to operate them to present simultaneously non-associated sheets to the delivery mechanism from a single printing or impression mechanism.

29. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms, and means to operate them to present simultaneously non-associated sheets to the delivery mechanism from a single printing or impression mechanism.

30. A single revolution rotary printing press comprising bodily reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms adapted to present sheets to the delivery mechanism, and means whereby alternate sheets received by the primary presenting mechanism are conveyed to the auxiliary sheet presenting mechanism.

31. A single revolution rotary printing press comprising forwardly carrying horizontally reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms adapted to present sheets to the delivery mechanism, and means whereby alternate sheets received by the primary presenting mechanism are conveyed to the auxiliary sheet presenting mechanism.

32. A single revolution rotary printing press comprising reciprocatory sheet delivery mechanism, means to present certain sheets of a series directly thereto, an auxiliary sheet presenting mechanism to present sheets to a different portion of said delivery mechanism, and means to present the remaining sheets of the said series to the said auxiliary sheet presenting mechanism.

33. A single revolution rotary printing press comprising horizontally reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism delivering in substantially the same direction and means to present printed sheets alternately to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism.

34. A single revolution rotary printing press comprising forwardly carrying horizontally reciprocatory sheet delivery mechanism, a forwardly carrying auxiliary sheet delivery mechanism and means to present printed sheets alternately to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism.

35. A single revolution rotary printing press comprising a horizontally reciprocatory sheet delivery mechanism, and an auxiliary sheet delivery mechanism delivering in substantially the same direction, and means to present sheets from a single printing mechanism in alternation to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism.

36. A single revolution rotary printing press comprising a forwardly carrying horizontally reciprocatory sheet delivery mechanism, a forwardly carrying auxiliary sheet delivery mechanism, and means to present sheets from a

single printing mechanism in alternation to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism.

37. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocating sheet delivery mechanism, means to deliver a plurality of spaced sheets thereto during a single revolution of said printing or impression mechanism and means to discharge the leading sheet therefrom and to simultaneously advance the succeeding sheet to the position previously occupied by the leading sheet.

38. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying reciprocating sheet delivery mechanism, means to deliver a plurality of spaced sheets thereto during a single revolution of said printing or impression mechanism and means to discharge the leading sheet therefrom and to simultaneously advance the succeeding sheet to the position previously occupied by the leading sheet.

39. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms adapted to present sheets to the delivery mechanism in succeeding and leading positions thereon respectively, and means to advance a succeeding sheet upon the delivery mechanism during the discharge of the leading sheet therefrom to a position to have superimposed thereon another sheet from the said auxiliary presenting mechanism.

40. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms adapted to present sheets to the delivery mechanism in succeeding and leading positions thereon respectively, and means to advance a succeeding sheet upon the delivery mechanism during the discharge of the leading sheet therefrom to a position to have superimposed thereon another sheet from the said auxiliary presenting mechanism.

41. A single revolution rotary printing press including an impression cylinder, reciprocating sheet delivery mechanism, having provisions whereby during one of a series of revolutions of said cylinder a plurality of sheets is delivered from the delivery mechanism, no sheets being delivered from the delivery mechanism during the remaining revolution or revolutions of said cylinder, and means to deliver a plurality of spaced sheets to said sheet delivery mechanism.

42. A single revolution rotary printing press including an impression cylinder, reciprocatory delivery mechanism receiving all the printed sheets from said cylinders and adapted to receive a plurality of superposed sheets, and means to discharge from such delivery mechanism during one revolution of a series of revolutions of said impression cylinder a plurality of sheets, no sheets being delivered from the delivery mechanism during the remaining revolution or revolution of said impression cylinder.

43. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism and presenting means simultaneously to present to the latter a plurality of non-associated sheets from a single printing or impression mechanism.

44. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism and presenting means to align upon the latter a plurality of non-associated sheets from a single printing or impression mechanism.

45. A single revolution rotary printing press comprising printing or impression mechanism, a horizontally reciprocatory sheet delivery mechanism and a plurality of means to present non-associated sheets thereto from a single printing or impression mechanism.

46. A single revolution rotary printing press comprising printing or impression mechanism, forwardly carrying bodily reciprocatory sheet delivery mechanism and primary and auxiliary sheet presenting mechanism to present non-associated sheets thereto.

47. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet de-

- livery mechanism and primary and auxiliary sheet presenting mechanisms to present sheets thereto printed side up for delivery therefrom in that condition.
48. A single revolution rotary printing press comprising printing or impression mechanism, right line reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms and means to present simultaneously non-associated sheets to the delivery mechanism from a single printing or impression mechanism.
49. A single revolution rotary printing press comprising printing or impression mechanism, horizontally reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms and means to operate them to present simultaneously sheets to the delivery mechanism from a single printing or impression mechanism.
50. A single revolution rotary printing press comprising reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms adapted to present non-associated sheets to the delivery mechanism, and means whereby alternate sheets received by the primary presenting mechanism are conveyed to the auxiliary sheet presenting mechanism.
51. A single revolution rotary printing press comprising forwardly carrying reciprocatory sheet delivery mechanism, primary and auxiliary sheet presenting mechanisms adapted to present non-associated sheets to the delivery mechanism and means whereby alternate sheets received by the primary presenting mechanism are conveyed to the auxiliary sheet presenting mechanism.
52. A single revolution rotary printing press comprising sheet delivery mechanism, means to present a sheet of a series of sheets thereto, an auxiliary sheet presenting mechanism to present sheets to a different portion of said delivery mechanism, and means to present a second sheet of the said series of sheets to the said auxiliary sheet presenting mechanism.
53. A single revolution rotary printing press comprising horizontally reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism delivering sheets in substantially the same direction and means to present printed sheets alternately to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism.
54. A single revolution rotary printing press comprising a bodily reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism delivering sheets in substantially the same direction and means to present sheets from a single printing mechanism printed side up in alternation to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism.
55. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocating sheet delivery mechanism, means to deliver substantially in unison a plurality of alined sheets thereto during a single revolution of said printing or impression mechanism and means to discharge the leading sheet therefrom and simultaneously to advance the succeeding sheet to the position previously occupied by the leading sheet.
56. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism means to deliver a plurality of alined sheets thereto to leading and succeeding positions thereon, and means to discharge a sheet therefrom and simultaneously to advance the succeeding sheet to the position previously occupied by the leading sheet.
57. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism and presenting means to present to the latter to leading and succeeding positions thereon a plurality of spaced sheets printed side up from a single printing or impression mechanism.
58. A single revolution rotary printing press comprising printing or impression mechanism, a reciprocatory sheet delivery mechanism and presenting means to present to the latter to leading and succeeding positions thereon and during a single revolution of said printing or impression mechanism a plurality of sheets printed side up from a single printing or impression mechanism.
59. A single revolution rotary printing press comprising printing or impression mechanism, horizontal reciprocatory sheet delivery mechanism and presenting means simultaneously to present to the latter a plurality of sheets from a single printing or impression mechanism.
60. A single revolution rotary printing press comprising printing or impression mechanism, a bodily movable reciprocatory sheet delivery mechanism and presenting means simultaneously to present to the latter a plurality of sheets from a single printing or impression mechanism.
61. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism and presenting means simultaneously to lay upon the latter a plurality of non-associated sheets from a single printing or impression mechanism.
62. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism to receive sheets printed side up and to deliver them in that condition and presenting means simultaneously to present to the latter a plurality of sheets from a single printing or impression mechanism.
63. A single revolution rotary printing press comprising printing or impression mechanism, reciprocatory sheet delivery mechanism to receive sheets and to deliver them without turning them and presenting means simultaneously to present to the latter a plurality of non-associated sheets from a single printing or impression mechanism.
64. In a single revolution rotary printing press the combination of the following instrumentalities; a printing cylinder, an impression cylinder, a delivery cylinder, horizontally reciprocatory sheet delivery mechanism making one complete cycle while said cylinders make a plurality of complete cycles so as to deliver a plurality of printed sheets printed side up at each complete cycle of such sheet delivery mechanism and intermediate sheet carrying means between said delivery cylinder and said horizontally reciprocatory sheet delivery mechanism.
65. In a single revolution rotary printing press the combination of the following instrumentalities; a printing cylinder, an impression cylinder, delivery cylinder, horizontally reciprocatory sheet delivery mechanism making one complete cycle while said delivery cylinder makes two complete cycles, so as to deliver two printed sheets side up at each complete cycle of said sheet delivery mechanism, and intermediate sheet carrying means between said delivery cylinder and said horizontally reciprocatory sheet delivery mechanism.
66. In a single revolution rotary printing press the combination of the following instrumentalities; a printing cylinder, an impression cylinder, delivery cylinder, and horizontally reciprocatory sheet delivery mechanism making one complete cycle while said delivery cylinder makes two complete cycles, so as to deliver two printed sheets printed side up at each complete cycle of said sheet delivery mechanism.
67. In a single revolution rotary printing press, the combination of the following instrumentalities; a printing cylinder, an impression cylinder, a delivery cylinder and bodily reciprocatory sheet delivery mechanism receiving all sheets issuing from said printing and impression cylinders and making one complete cycle while said delivery cylinder makes a plurality of complete cycles, so as to deliver a plurality of printed sheets at each complete cycle of said sheet delivery mechanism.
68. A single revolution rotary printing press comprising rotary printing cylinders, sheet delivery means to receive all sheets issuing from said cylinders and to deliver the same in one direction and provisions whereby during a single revolution of a series of revolutions of said cylinders a plurality of sheets is delivered by said delivery means and whereby no sheets are delivered by said delivery means during the other revolution or revolutions of said series of revolutions of said rotary printing cylinders and auxiliary means to receive a sheet or sheets from said rotary printing cylinders during another revolution or revolutions of such series of revolutions.
69. A single revolution rotary printing press comprising printing or impression mechanism, bodily reciprocatory sheet delivery mechanism and presenting means to present to the latter during a single revolution of the printing or impression mechanism a plurality of non-associated sheets from a single printing or impression mechanism.
70. A single revolution rotary printing press comprising

printing or impression mechanism adapted to deliver a plurality of sheets during a single revolution of the printing or impression mechanism, a single bodily reciprocatory sheet delivery mechanism, and primary and auxiliary sheet presenting mechanisms to present sheets to such single delivery mechanism.

71. A single revolution rotary printing press comprising printing or impression mechanism adapted to deliver a plurality of sheets during a single revolution of the printing or impression mechanism, bodily reciprocatory sheet delivery mechanism, and primary and auxiliary sheet presenting mechanisms to present sheets to the same sheet delivery mechanism.

72. A single revolution rotary printing press comprising horizontally reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism and means to present printed sheets alternately to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism, and provisions to transfer sheets from the auxiliary sheet delivery mechanism to the sheet delivery mechanism.

73. A single revolution rotary printing press comprising forwardly carrying horizontally reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism and means to present printed sheets alternately to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism, and provisions to transfer sheets from the auxiliary sheet delivery mechanism to the sheet delivery mechanism.

74. A single revolution rotary printing press comprising a reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism, and means to present sheets from a single printing mechanism printed side up in alternation to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism, and provisions to transfer sheets from the auxiliary sheet delivery mechanism to the sheet delivery mechanism.

75. A single revolution rotary printing press comprising

horizontally reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism and means to present printed sheets alternately to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism, and provisions to transfer sheets from the auxiliary sheet delivery mechanism to the sheet delivery mechanism.

76. A single revolution rotary printing press comprising a bodily reciprocatory sheet delivery mechanism, an auxiliary sheet delivery mechanism and means to present sheets from a single printing mechanism printed side up in alternation to the sheet delivery mechanism and to the auxiliary sheet delivery mechanism, and provisions to transfer sheets from the auxiliary sheet delivery mechanism to the sheet delivery mechanism.

77. A single revolution rotary printing press comprising a printing cylinder, an impression cylinder, a delivery cylinder, and means to receive a plurality of non-associated sheets from the delivery cylinder and to deliver, during one only of a series of revolutions of said delivery cylinder, such plurality of sheets issuing singly from said delivery cylinder.

78. A single revolution rotary printing press comprising a printing cylinder, an impression cylinder, a delivery cylinder, and means to receive a plurality of non-associated sheets printed side up from the delivery cylinder and to deliver, during one only of a series of revolutions of said delivery cylinder, such plurality of sheets issuing singly from said delivery cylinder, printed side up at the front of the printing cylinder.

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

WILLIS K. HODGMAN.
BICKNELL HALL.

Witnesses:

FREDK. M. ATWOOD,
IRVING U. TOWNSEND.