

No. 840,402.

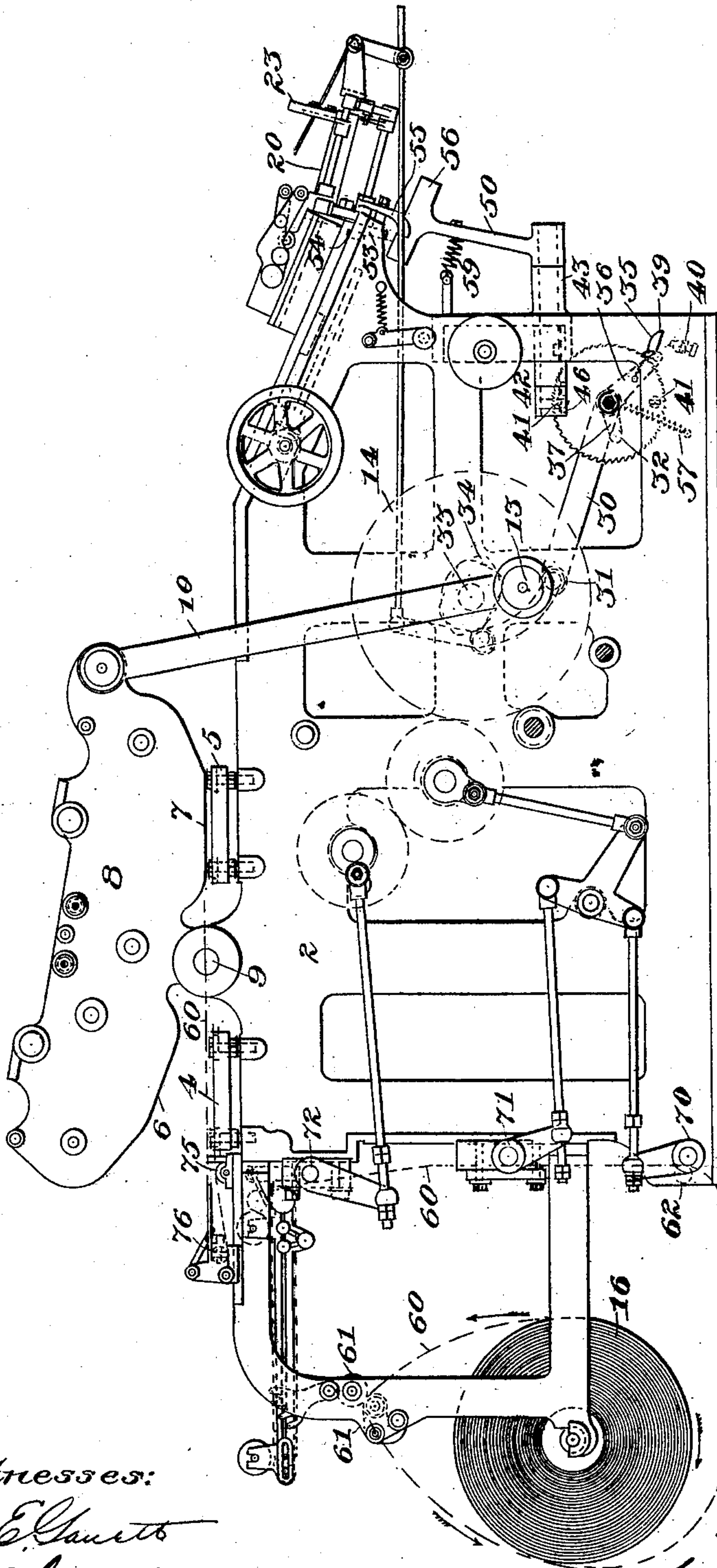
PATENTED JAN. 1, 1907.

F. WAITE.  
COUNTING AND COLLATING DEVICE FOR SHEET DELIVERY MECHANISMS.

APPLICATION FILED OCT. 2, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

*Geo. E. Clauette*  
*E. Thos. Loftis*

Inventor:

*Fred Waite*  
by his attorney  
*Thos. L. Ewin*

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2 SHEETS—SHEET 2.

Fig. 2.

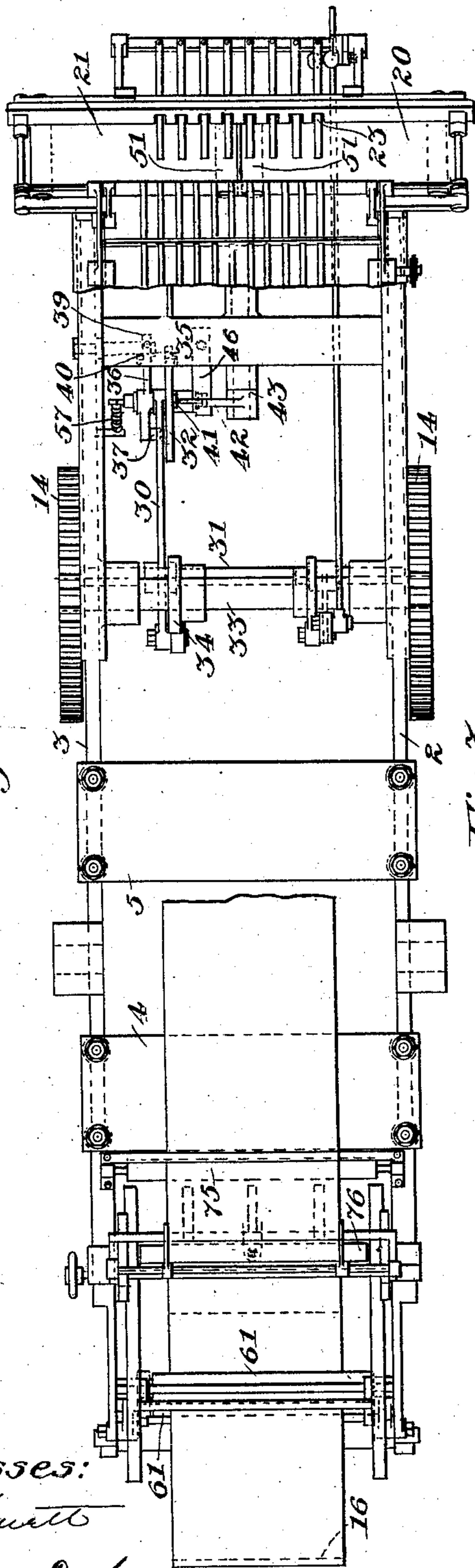
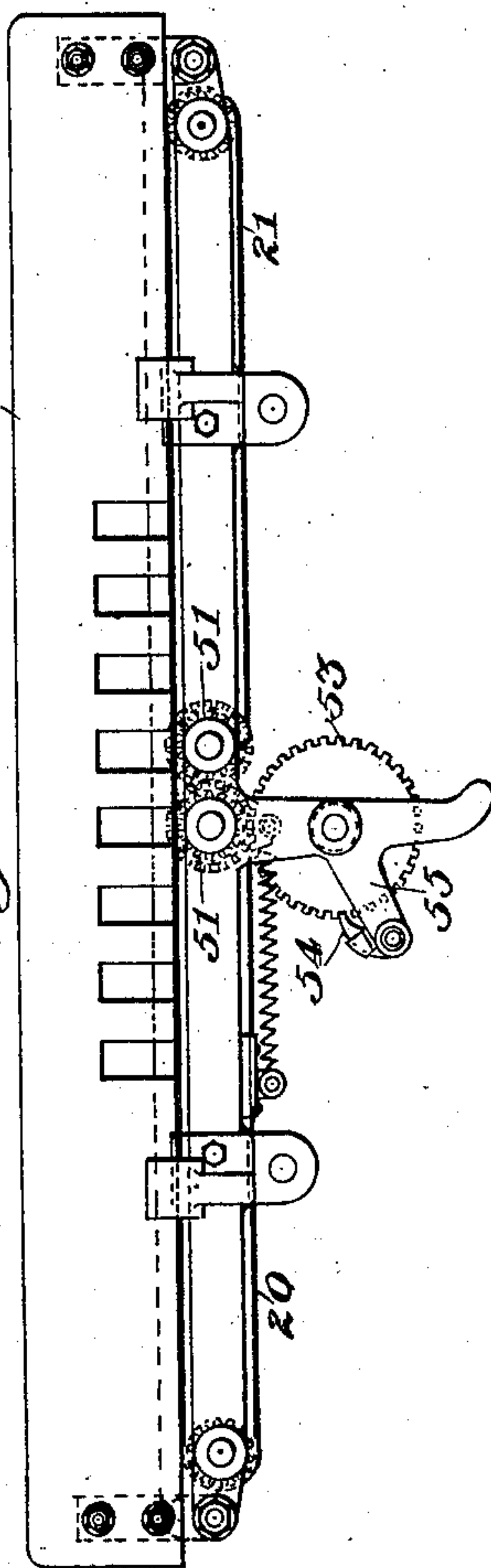


Fig. 3.



Witnesses:  
*W. E. Chubb*  
*E. Thos. Loftis*

Inventor:  
*Fred Waite*  
by his attorney  
*W. L. Durin*



# UNITED STATES PATENT OFFICE.

FRED WAITE, OF OTLEY, ENGLAND.

COUNTING AND COLLATING DEVICE FOR SHEET-DELIVERY MECHANISMS.

No. 840,402.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Original application filed June 28, 1904, Serial No. 214,526. Divided and this application filed October 2, 1905. Serial No. 281,059.

*To all whom it may concern:*

Be it known that I, FRED WAITE, a subject of the King of England, residing at The Lindens, Burras Lane, Otley, in the county of York, England, have invented a new and useful Improvement in Counting and Collating Devices for Sheet-Delivery Mechanisms, of which the following is a specification.

The object of this invention is to provide improved means for counting the sheets or leaves delivered from any sheet-delivery mechanism and for collating them into piles having any predetermined number of sheets and delivering the piles from the machine.

The invention has special reference to machines for manufacturing shop-counter check-books from a web of paper in which the web is numbered, printed, perforated, cut, and folded, and the invention is illustrated in the accompanying drawings as employed in such a machine. It is particularly desirable in machines of this kind to increase the output as far as possible, and the collating device in the present machine is constructed and arranged with this particular object in view. To cooperate with the collating device the web of paper is divided longitudinally along the center, and the machine is adapted to operate on each half of the divided web substantially symmetrically. After the web has passed the other operative mechanisms of the machine it is cut into leaves which are delivered to the collating device at the center line of the machine in piles containing a predetermined number of sheets, according to the counting device, and then the piles are transferred by the collating device from the center of the machine to each side thereof. The counting mechanism, which cooperates with the collating device, is constructed to contain a minimum number of parts and to perform its functions in a reliable manner.

The invention will be more fully described in connection with the accompanying drawings, in which—

Figure 1 is a view in side elevation of a machine for printing shop-counter check-books in which some of the mechanisms have been omitted, but in which the present improvements are embodied. Fig. 2 is a plan view of the same; and Fig. 3 is a detail view, on a larger scale, of a portion of the delivery

end of the machine, showing particularly the collating apparatus.

The web of paper is fed from a roll 16, preferably located at the rear of the machine and takes the course indicated by the broken lines 60 and the arrows adjacent thereto. First it passes up between feed-rollers 61 and then loosely down by and underneath the roll of paper, around a guide 62, up between paging devices which are operated by rock-shafts 70, 71, and 72, respectively, thence over a guide-roller 75, back over an adjustable bar 76, and then on to and over platens 4 and 5. The platens 4 and 5, as well as most of the other mechanisms, are carried upon and between side frames 2 and 3, and type-beds 6 and 7 upon a carrier 8 cooperate with the platens 4 and 5. The carrier 8 is pivoted to oscillate on a rock-shaft 9, the oscillations being effected through connecting-rods 10, which are provided on each side of the machine to connect the carrier with pins 13 on the two main spur-wheels 14. It will thus be seen that the web of paper is first numbered and then printed. After passing the platens 4 and 5 it passes on to the perforators, folders, and cutters, which have been omitted from the present machine for simplicity, and then is delivered in sheets or leaves to the collating-belts 20 and 21, the operation of which will now be explained. These belts are endless belts and are provided at each end with driving-rollers 51. Both belts are arranged in a transverse line upon the forward end of the machine and meet substantially at the center line of the machine. The two rollers near the center of the machine, around which the belts pass, are provided with intermeshing gears, one of which meshes with a gear 53, which is driven intermittently by a pawl 54 upon a pawl arm or carrier 55, pivoted to the frame of the machine. Thus both belts are driven in opposite directions and tend to deliver from the center of the machine to each side thereof. The sheets or leaves are delivered upon each belt near the center of the machine, the web of paper, as will be seen, following a substantially central path in the machine. The web being divided centrally, the sheets obtained from one half of the web will be delivered upon the inner end of the belt on one side and the sheets obtained from the other half of the



web will be delivered upon the inner end of the belt on the other side, a fence 23 being provided to check the further forward movement of the sheets after they have been delivered upon the belts. While the sheets are being delivered the belts are stationary, and, as will presently be explained, are operated at predetermined intervals through the counting mechanism. Upon the movement of the belts two piles of sheets will be delivered simultaneously—one toward one side of the machine and the other toward the other side of the machine—to make room for the delivery of two more piles of sheets upon the inner ends of the belts.

The counting mechanism is operated in synchronism with the delivery mechanism, and for this purpose a cam 34 may be provided upon the main shaft 33. Coöperating with the cam is a bell-crank lever 30, pivoted upon a cross-bar 31. This lever is provided with a roller upon one of its arms, which is held in operative engagement with the cam 34 by a spring 57 on the other arm, the spring connecting said arm with a fixed portion of the machine. On the same end of the lever 30 there is pivoted a ratchet counting-wheel 32, and at the axis of the counting-wheel there is also pivoted upon said lever an arm 36, carrying a pawl 35, which engages the ratchet-teeth in the counting-wheel 32. The arm 36 is provided with a stop 37, which so engages the lever 30 as to permit the movement of said arm in a direction to advance the counting-wheel, but to limit the movement of said arm in the reverse direction. As the lever 30 is moved by the cam 34 it imparts to the ratchet counting-wheel 32 and its pawl 35 an up-and-down movement, and upon the downward movement the pawl 35 is brought into engagement with a fixed part 40, and the ratchet-wheel is thus moved a certain distance. Upon the ratchet-wheel are two projections 41, and these projections by the movement of the wheel are brought alternately to the topmost part of the wheel, where they coöperate with an arm 42 on a rock-shaft 43, which latter is also provided with a second arm 50, adapted to engage the pawl-carrier 55, hereinbefore referred to. When either of the projections 41 has reached the top of the ratchet counting-wheel 32, the upward movement of the wheel as the lever 30 rises effects the rocking of the shaft 43 and the movement of the pawl-carrier 55 to such an extent as to operate the ratchet-wheel 53 sufficiently to impart the requisite motion to the belts 20 and 21. The arm 50 is provided with a spring 59, which is stretched between the same and a fixed part of the machine, so as to hold the arm 50 normally away from the pawl-carrier 55, and a stop 46 is provided to arrest the movement of the arm 50, due to

the spring 59, after the actuation of the pawl-arm 55 through the counting mechanism. The arm 50, furthermore, is provided with an elongated head 56, so that the collating mechanism may be adjusted longitudinally of the machine without disturbing the connections between the counting mechanism and the collating mechanism.

It will be understood that the counting mechanism and its actuating mechanism may be so constructed and related to each other and that the relation between the counting mechanism may be such that any desired number of sheets may be delivered to the collating mechanism between the successive movements of the belts 20 and 21. It will also be understood that various changes may be made in the construction herein shown and described without departing from the invention.

I claim as my invention—

1. In a sheet-delivery mechanism, the combination of a lever, means to operate the lever in synchronism with the mechanism, a counting-wheel on the lever adapted to be operated by the movement of the lever, and collating mechanism in operative relation with the counting-wheel.

2. In a sheet-delivery mechanism, the combination of a cam, a lever operated thereby, a counting-wheel on the lever and adapted to be operated by the movement of the lever, and collating mechanism in operative relation with the counting-wheel.

3. In a sheet-delivery mechanism, the combination of a cam, a lever operated thereby, a ratchet-wheel on the lever, a pawl carried by the lever and coöperating with a fixed part of the mechanism to move the ratchet-wheel, and collating mechanism in operative relation with the ratchet-wheel.

4. In a sheet-delivery mechanism, the combination of a cam, a bell-crank lever one arm of which is in operative engagement with the cam, a ratchet-wheel upon the other arm of the lever, an arm pivoted to the lever at the axis of the ratchet-wheel, a pawl carried by the arm and coöperating with a fixed part of the mechanism to move the ratchet-wheel, and collating mechanism in operative relation with the ratchet-wheel.

5. In a collating device for sheet-delivery mechanism, the combination of two endless belts in line with each other, shafts around which the belts turn, driving-gears upon the shafts, said gears meshing with each other whereby the belts are driven in opposite directions, and means to drive one of the gears.

6. In a machine for producing sheets of paper from a web of paper in which the web is divided longitudinally, the combination of a collating device for the sheets including two endless belts in line with each other and ex-



tending from the center of the machine to each side thereof respectively and means to drive the belts in opposite directions to deliver the sheets from the center of the machine to each side of the machine.

coöperating therewith to turn the wheel and periodically vibrate the rocking shaft for the purpose specified.

FRED WAITE.

Witnesses:

JOHN JOWETT,  
VANCE E. GALLOWAY.

7. A web-fed platen printing-press having a rocking shaft 43, counting mechanism including a vibrating counting-wheel and parts