W. H. SMITH & C. J. WRIGHT.

DELIVERY MECHANISM.

APPLICATION FILED OCT. 14, 1912.

1,093,152.

Patented Apr. 14, 1914.

3 SHEETS—SHEET 1.

Fig. 3.

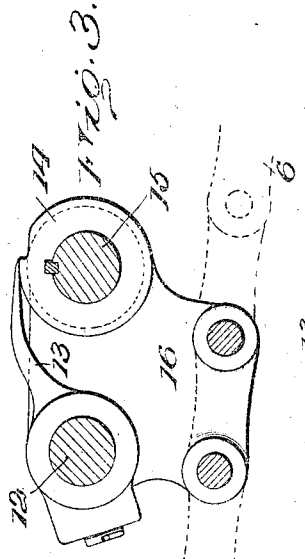


Fig. 1.

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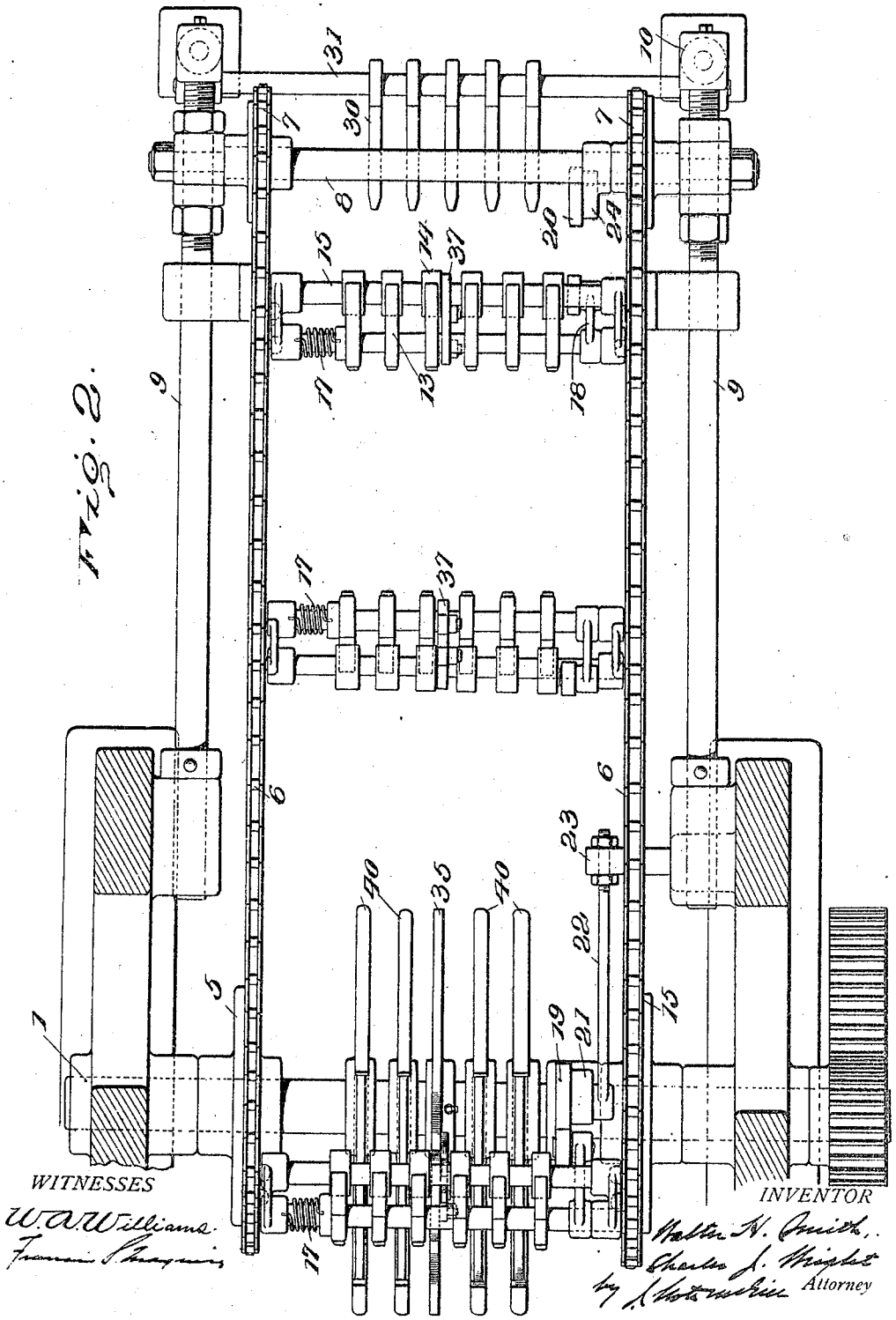
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

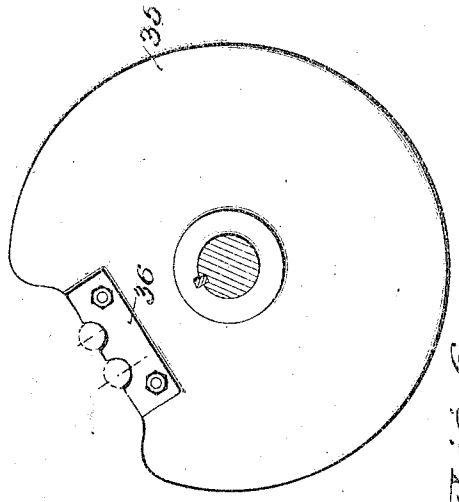


Fig. 6.

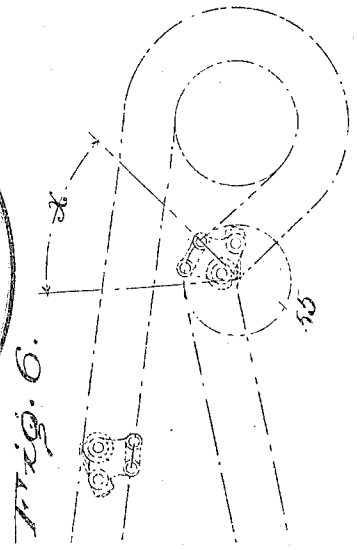
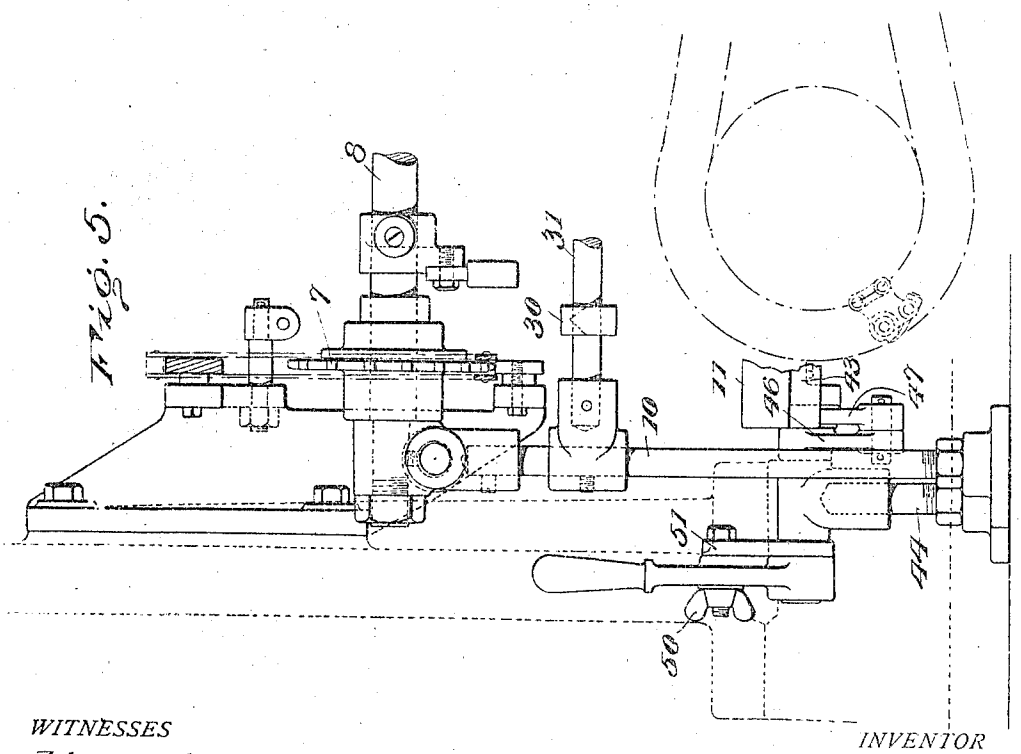


Fig. 5.



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UNITED STATES PATENT OFFICE.

WALTER H. SMITH, OF NILES, AND CHARLES J. WRIGHT, OF WARREN, OHIO, ASSIGNORS TO THE HARRIS AUTOMATIC PRESS COMPANY, OF NILES, OHIO, A CORPORATION OF OHIO.

DELIVERY MECHANISM.

1,093,152. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed October 14, 1912. Serial No. 725,720.

To all whom it may concern:

Be it known that we, WALTER H. SMITH, of Niles, and CHARLES J. WRIGHT, of Warren, both in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Delivery Mechanism; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The primary object of this invention is to provide improved delivery mechanism for printing and like presses, by which stock may be transferred from the press to a receiver or jogger-board at a slower speed than that at which it is discharged by the press, and thus lessen the chances of injury to the stock which is liable to occur when the speed of travel to the deliverer is as fast as the face-speed of the impression-cylinder.

A further object is to enable the receiver, or jogger-board, to be readily adjusted and held in different positions relative to the delivery mechanism while the latter is in operation.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a plan view with parts omitted. Fig. 3 is a section through a gripper mechanism. Fig. 4 is a detail. Fig. 5 is a fragmentary rear view. Fig. 6 shows a modification.

Referring to the drawings, 1 designates a printing press frame; 2 the impression cylinder, a part only of which is shown; 3 a shaft mounted in frame 1; and 4 a gear wheel on said shaft which is preferably in mesh with and driven by the impression cylinder gear. On shaft 3 are two sprocket wheels 5 which are of less diameter than gear 4 and the corresponding gear of the impression cylinder.

6, 6 designate two spaced-apart sprocket chains which engage with wheels 5 and also with two smaller sprocket wheels 7, which latter are mounted on a cross rod 8 supported by side rods 9 of an extension frame, these latter rods being held by adjustable uprights 10. These chains carry means for transferring stock from the press, and such means while traveling with the carrier chains will, when in juxtaposition to the press-cylinder, travel at the face speed of such cylinder, but for the major portion of the travel the stock-engaging means will move at a lesser speed than the face speed of the cylinder. The speed of travel of the carrier, however, remains constant. In the present instance we have shown the stock-engaging means in the form of grippers, in three separate sets, but the number may be varied, as may also the distance between the various sets. We have found that advantageous results are obtained in using three sets of grippers so that each sheet as it is being transferred to the receiver or jogger-board 11, will travel approximately one third slower than the face speed of the press cylinder. The particular construction of the grippers may be widely varied. According to the means shown, each set comprises a rock-shaft 12 carrying grippers 13 which are normally held in engagement with collars 14 on a rod 15 paralleling and in close relation to gripper shaft 12. The latter and said rod travel on a different plane from that of the carrier, that is, they are held outwardly away from the latter. The means shown for this purpose consists of frames 16 secured to the sprocket chains. The grippers are normally held in engagement with collars 14 by a spring 17 attached to and wound around the gripper shaft and fastened to frame 16. At one end each gripper shaft 12 carries an arm 18 bearing at its free end a frictional roll which upon engagement with either of two cams, 19, 20, will effect the opening of the grippers.

The cam 19 is located in close relation to the impression cylinder and is designed to open the grippers at the proper point to receive the stock from the impression cylinder. This cam is shown as mounted on an arm 21 loosely journaled on shaft 3 and to which arm an adjusting rod 22 is connected, said rod being adjustably held to a noddle pin 23 by nuts on opposite sides thereof which allow the rod to be adjusted to position the cam at the proper point for operating the grippers. The other gripper-operating cam, 20, is adjustably secured to an arm 24 fast on cross rod 8, and the function of this cam is to cause the grippers of the delivery mechanism to release the stock at the desired point for discharging onto the jogger-board. By adjusting this cam, the time of opening the grippers may be changed. When the grippers are opened to release the stock the latter is stripped from the mechanism by forwardly projecting

fingers 30 mounted on a cross rod 31 supported by uprights 10,

In order to obviate vibration which is liable to occur, especially in large presses between the gripper shafts of the delivery mechanism and the impression cylinder, when the former are making the turn beneath such cylinder, we mount on shaft 3 a wheel 35 having in a segmental cut-out a notched plate 36 which is designed to be engaged by two rollers carried by a common frame 37 mounted on each gripper shaft and its coöperating rod 15, the center of the rollers being the pitch line of sprocket wheels 5. Upon shaft 3 we also mount a series of guide members in the form of disks 40 of the same diameter as the impression cylinder or cylinder from which the sheets are to be taken, so that while the grippers of the deliverer are traveling at a relatively increased speed and moving around with these disks, the stock from the cylinder will be supported by the latter. These guides may be of any desired formation. The grippers continue to travel at the face-speed of the press-cylinder until they reach the point V, Fig. 1, when they travel in a horizontal plane at a greatly reduced speed, that is to say, at about two-thirds the face speed of the press-cylinder.

The diameters of the respective parts may be widely varied, and likewise the number of gripper sets and the distance between the different sets may be correspondingly altered. According to the means shown the spacing of the gripper sets is approximately the size of the sheet being run through the press, so that while the sheets are traveling from point V, Fig. 1, to the discharging point, they stand practically end to end although they are separated a greater distance on the impression cylinder. As the several sets of grippers begin to travel at the face speed of the impression cylinder they are severally opened to receive the sheet from the impression cylinder by the engagement of their arms 18 with cam 19, and as the sheets reach the limit of their horizontal travel away from the press they are released by the engagement of said arms with cam 20, and being stripped by fingers 30, they will fall on jogger-board 11. This jogger-board at its rear end, is provided with upwardly projecting stops 40′, which are preferably hinged thereto to permit a pile of sheets to be readily withdrawn. The board is capable of longitudinal adjustment in a horizontal plane, and may be moved, either forward or backward, at the will of the operator. This board at its front end is supported by the frame of the machine, and at its rear end the board rests on a cross rod 43 which is supported at its ends by uprights 44. On this cross rod 43 is a handle 45 by which said rod may be partially turned. Arms 46 carried by this cross rod 43 are connected by links 47 to castings 48 on the underside of the board, near the forward end thereof. Hence by manipulating handle 45 the jogger-board may be horizontally adjusted, and it may be held at the desired point by a set screw 50 projecting through an arcual slot in a fixed plate 51.

In practice the operator first adjusts the jogger-board according to the size of the sheet it is to receive, and likewise adjusts the two cams 19 and 20 to insure the opening of the grippers at the necessary points in their travel. As each set of grippers is brought into proper relation to the press cylinder the sheet will be taken from the latter and held by the grippers against collars 14 of the coöperating rods 15. At this time, and also during the time required for the withdrawal of the sheet from the press cylinder, the grippers of the deliverer will be traveling at the face speed of the press cylinder, but coincident with the point at which the grippers leave the guide-wheels 40, the sheets will travel at a reduced speed. When the gripper actuating arm engages cam 20 the sheet is released and deposited on the receiving table.

It is manifest that the invention is open to various modifications without departing from the essential idea of having the stock-engaging grippers travel at a differential speed whereby the stock may be deposited at a speed less than the face speed of the press-cylinder. While for all practical purposes the stock may be discharged while the grippers are in motion, but at a less speed than the face speed of the press cylinder, yet if desired the grippers may be brought wholly to rest at the time of the discharge without stopping the operation of the gripper-carrier. Thus, in Fig. 6 we have shown diagrammatically an arrangement of this character, wherein the lower or outward flight of the delivery chain is passed over an idler sprocket 55 located at a point near the outer sprocket of the carrier chain. In passing over this idler sprocket 55 each set of grippers is brought to a standstill during that period of time required for the carrier chains to move or cover the distance represented by the angle X. In this way each sheet is brought to a stop, or ceases to travel, although the carrier continues to run at its uniform speed, there being no time that the carrier chains and sprockets do not revolve uniformly. We have shown the lower flight of the chain as being carried up an incline in approaching sprocket 55, but this is not essential. Hence it will be seen that according to our invention it is not only possible to transfer the sheets at a slower speed than the face speed of the press cylinder, but it is also possible, without interrupting the uniform travel of the carrier, to bring the

grippers to a complete stop at a portion of their travel while the stock is being released. By changing the position of this idler sprocket, and necessarily the position of the releasing cam, in running small sheets they may be dropped at any place at will.

In Fig. 6 the height of the grippers relatively to the diameter of the sprocket is somewhat exaggerated. In practice, the idler sprocket should have a radius equal to the height that the grippers are above the pitch line of the carrier chain, that is to say, if the height of the grippers is two inches above the pitch line of the chains when passing around the guiding disks 40, the idler sprocket should be four inches in diameter to enable the grippers and sheets to be brought to a stop through a portion of the travel around the sprocket.

We claim as our invention:

1. In combination with a press having a cylinder, delivery mechanism comprising stock engaging means, adapted to receive stock directly from said cylinder, a continuously-operating carrier therefor traveling at a slower speed than such cylinder, and means for accelerating the speed of travel of the stock-engaging means at the point of receiving the stock from the press cylinder without affecting the operation of the carrier.

2. In combination with a press having a cylinder, delivery mechanism comprising a plurality of separate stock engaging means adapted to receive stock directly from said cylinder, a constantly-operating endless carrier therefor traveling at a slower speed than such cylinder, and means for accelerating the speed of travel of the several stock engaging means at the point of receiving the stock from the press cylinder, the acceleration of the travel of one stock engaging means having no effect on the speed of travel of the remaining stock engaging means.

3. In combination with a press having a cylinder, delivery mechanism comprising a constantly-operating carrier traveling at a slower speed than such cylinder, separate sets of grippers carried by said carrier, and adapted to receive stock directly from said cylinder, means for operating the grippers to receive and discharge stock, and means for effecting a differential movement in the travel of the grippers as between the points of receiving the stock from the press cylinder and discharging the stock.

4. In combination with a printing press having a cylinder, delivery mechanism comprising a constantly-traveling carrier, separate sets of grippers mounted on said carrier, and adapted to receive stock directly from said cylinder, means for operating the grippers to receive and discharge stock, and means for effecting a differential movement in the travel of the grippers at the points of receiving stock from the press cylinder and discharging the stock, the grippers traveling at the face speed of said cylinder when receiving stock therefrom.

5. In combination with a press having a cylinder, delivery mechanism comprising a plurality of sets of stock-engaging grippers, adapted to receive stock directly from said cylinder, a continuously-operating endless carrier for said grippers, a receiver above which said carrier is located, means for accelerating the speed of travel of the grippers through a portion of their travel while the speed of travel of the carrier remains unaltered, and means for actuating the grippers to receive the stock while they are traveling at an accelerated speed, said grippers discharging the stock on said receiver.

6. In combination with a printing press having a cylinder, a deliverer having a plurality of sets of stock-engaging grippers, adapted to receive stock directly from said cylinder, a continuously-operating endless carrier for said grippers, a receiver above which said carrier is located, said carrier traveling at a slower speed than the face speed of the press cylinder, means for imparting to each set of grippers a speed equal to the face speed of the press cylinder when receiving and after taking stock therefrom, and means for actuating said grippers to receive and release the stock.

7. In combination with a press having a cylinder, delivery mechanism comprising an endless carrier, rotating means engaging said carrier at the end of one of the flights thereof, several sets of grippers mounted on said carrier and extending outwardly therefrom, said grippers in moving around such rotating means traveling at the face speed of the cylinder and adapted to receive stock directly from said cylinder, and guiding members of greater diameter than said rotating means for supporting stock taken from said cylinder by said grippers.

8. In combination with a printing press having a cylinder, a deliverer comprising an endless carrier normally traveling at a slower speed than said cylinder, rotating means with which said carrier engages, several sets of grippers mounted on and projecting from said carrier, and adapted to receive stock directly from said cylinder, and stock guiding members of diameter approximately equal to that of the press cylinder and with which said grippers are designed to travel when and after receiving stock from said cylinder, and means for operating the grippers.

9. In combination with a printing press having a cylinder, a deliverer comprising two endless chains, two sets of sprocket wheels with which said chains engage, several sets of grippers mounted on and projecting outwardly from said chains, one set

of sprocket wheels being located adjacent to said press cylinder, and a series of stock-supporting disks located between the latter sprocket wheels, the face speed of said grippers being increased in passing around said sprocket wheels to an extent equal to the face speed of the cylinder, said grippers receiving the stock from said cylinder at the commencement of the increase in the face speed thereof.

10. A deliverer comprising a carrier, stock engaging means mounted thereon, means for releasing the stock, a jogger-board for receiving the stock from the carrier, and means for adjusting the jogger-board longitudinally, said means comprising a swinging arm, a link connecting said arm to said board, an operating handle for said arm, and means for locking said handle.

11. A deliverer comprising a carrier, stock engaging means mounted thereon, means for releasing the stock, a jogger-board for receiving the stock from the carrier, and means for adjusting the jogger-board longitudinally, said means comprising a rod upon which said board is designed to bear, an arm projecting from said rod, a link connecting said arm to said board, an operating handle for said rod, and means for locking said handle.

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

WALTER H. SMITH.
CHARLES J. WRIGHT.

Witnesses for Walter H. Smith:
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L. L. HECKER.
Witnesses for Charles J. Wright:
T. A. WINFIELD,
A. D. LOOP.