M. A. DROITCOUR.

SHEET DELIVERY MECHANISM.

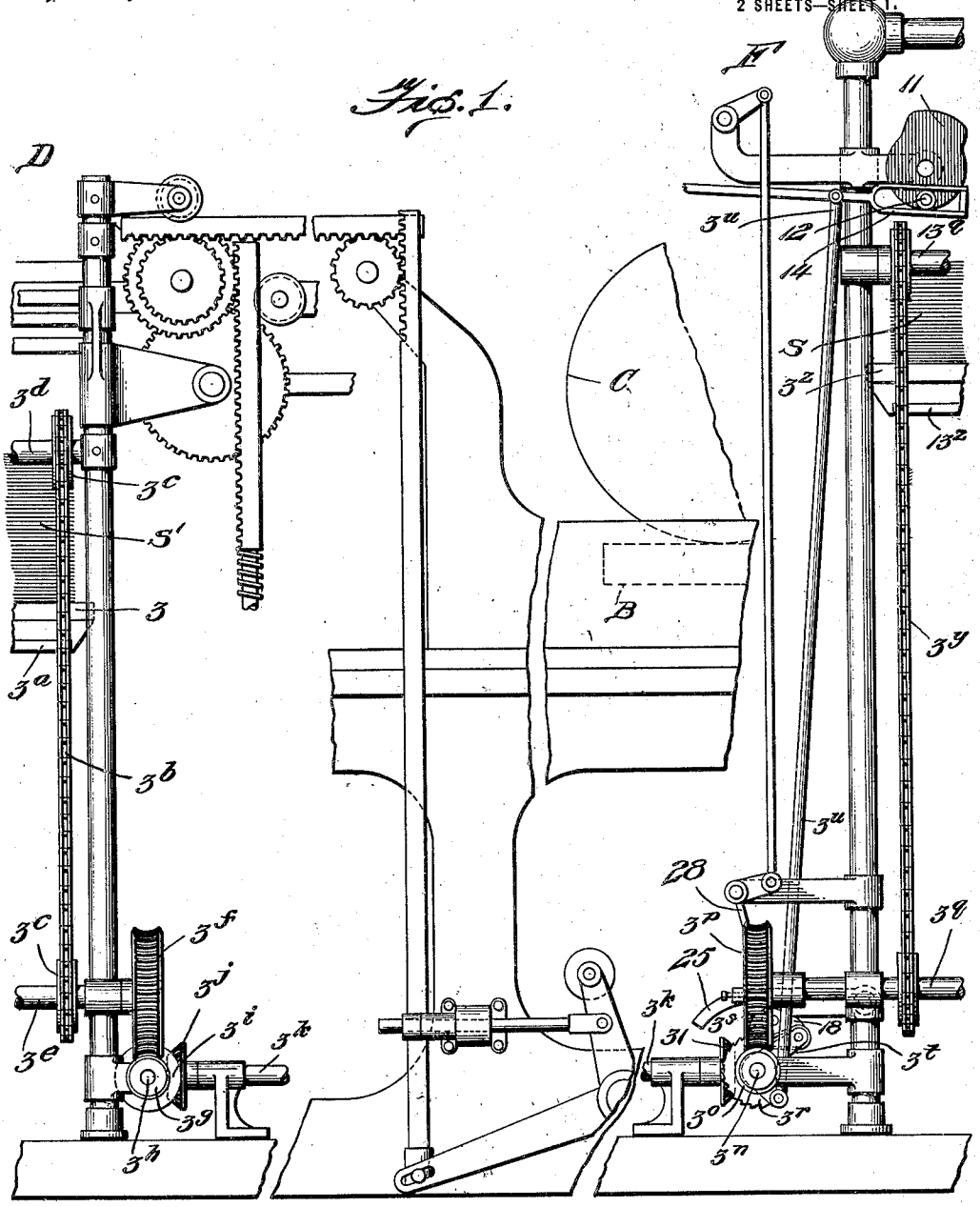
APPLICATION FILED JUNE 11, 1918.

1,303,041.

Patented May 6, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

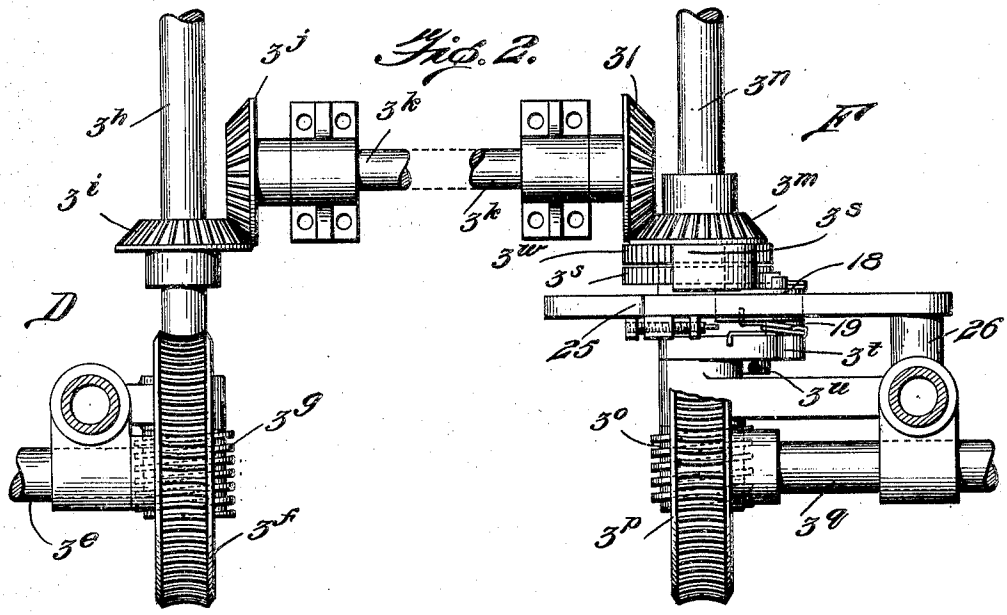


Fig. 3.

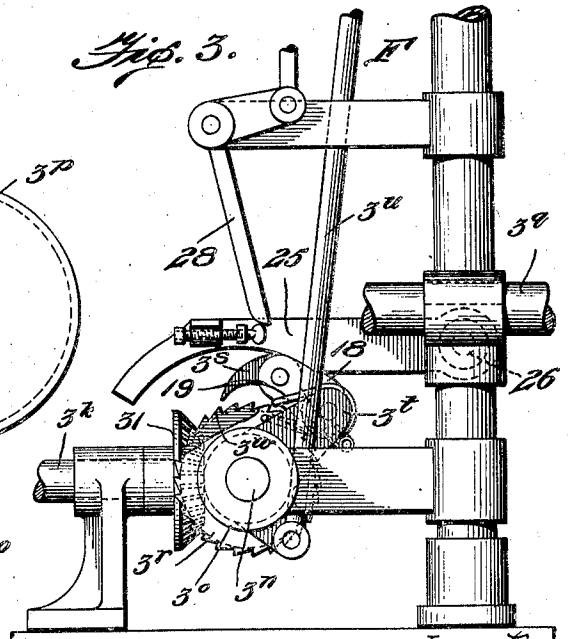
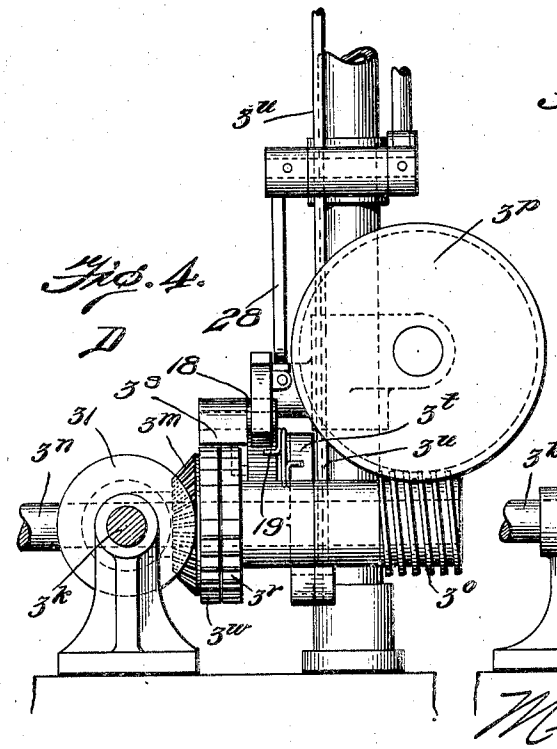


Fig. 4.



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UNITED STATES PATENT OFFICE.

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SHEET-DELIVERY MECHANISM.

1,303,041. Specification of Letters Patent. Patented May 6, 1919.

Original application filed March 8, 1918, Serial No. 221,186. Divided and this application filed June 11, 1918. Serial No. 239,373.

To all whom it may concern:

Be it known that I, MICHAEL A. DROITCOUR, a citizen of the United States, residing at Delphos, in the county of Van Wert and State of Ohio, have invented certain new and useful Improvements in Sheet-Delivery Mechanism; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This application is a division of my application for patent on sheet delivery mechanism, filed March 8, 1918 Serial No. 221,186.

This invention is applicable to sheet-printing presses and other machines to which the sheets are fed preferably by an automatic feeder and after being operated upon are automatically delivered.

The object of the invention is to feed the sheets of paper to the machine from a pile and deliver them onto a pile, so that the sheets need not be handled except in piles, thus allowing the machine to have a more continuous operation; and the invention consists in novel means whereby the pile of printed sheets may be gradually lowered and the descent of the pile of sheets at the delivery end controlled by the ascent of the pile of unprinted sheets at the feed end of the machine.

Another object is to enable the operator to adjust either the feeder pile or table; or the delivery pile or table manually at will, without disturbing the adjustment of the other pile or table in so doing.

To enable others to understand and utilize the invention, I will describe one practical embodiment thereof as illustrated in the accompanying drawings; but I do not consider the invention restricted to such particular application thereof or to the specific construction of parts illustrated in said drawings; and therefore have set forth in the claims the essential features and novel combinations and novel constructions of parts for which protection is desired. In said drawings:

Figure 1 is a diagrammatic side elevation of parts of the sheet feeding, and sheet delivery mechanisms of a machine for operating upon sheets, such as a printing press, showing the operative connections between the parts pertaining to the present invention.

Fig. 2 is an enlarged top plan view, partly broken away, of the driving connections between the feed and delivery mechanism.

Fig. 3 is a side view of such connections; and Fig. 4 a front view thereof.

I will explain the invention as applied to a sheet printing press, and in the drawings have shown so much and such parts of the press and the feeding and delivery mechanism thereof as will enable those familiar with such machines to readily understand the invention, but the invention is adapted to a variety of other machines such as perforating machines, and folding machines, and is not limited to use with any specific machine.

The sheet feeding mechanism, indicated at F, may be of any suitable or desired construction in which the sheets are fed from a pile that is gradually elevated as the sheets are removed therefrom.

Sheet-feeding means such as shown and described in my Patents No. 1,146,929 and No. 1,146,930 dated July 20, 1915 may be employed, but any other suitable mechanisms may be used for gradually raising the feed pile of sheets as the sheets are removed therefrom.

A pile of sheets of paper S is shown as placed upon a board or platform 3^z resting at its side margins upon angle irons 13^z carried by vertically disposed endless sprocket chains 3^y which pass over sprocket wheels on a shaft 13^q at the upper limit of their travel and over sprocket wheels on a shaft 3^q at the lower limit of their travel; the shaft 3^q being shown as driven by worm gearing from a shaft 3^n.

The pile of sheets S is elevated from time to time, to compensate for the reduction in the height of the pile, as the sheets are fed therefrom. As shown in my said patents a member 11, rotating at uniform speed, carries a pin 12 operatively engaging a slot in a lever 14 to oscillate the latter. Said lever 14 is connected by a link 3^u to one arm of a bell crank lever 3^t upon whose other arm a pawl-carrier 18 is pivotally mounted, and a pawl 3^s is pivotally mounted upon the carrier 18 and is adapted to engage a ratchet wheel 3^r on shaft 3^n. A spring 19 is arranged to normally hold the pawl-carrier 18 in such position that the pawl 3^s will be out of engagement with ratchet wheel 3^r and said spring also upholds the normally idle pawl-depressor 25 pivoted at 26, which is

adapted to be automatically operated at the proper time so as to cause the pawl 3^s to engage the ratchet 3^r; as explained in my aforesaid patents.

The parts of the feeder are so constructed and arranged (as explained in my aforesaid patents) that when the pile of sheets on support 3^z has been so far reduced in height as to require its bodily elevation to enable the feeding of the sheets therefrom properly to continue, a finger 28 is automatically moved into position to engage and hold the depressor 25 in position to cause the pawl 3^s to engage the ratchet 3^r and turn the same a slight distance so that its teeth will engage ratchet wheel 3^r; and at such time the pawl-carrier 18 will be operated by lever 3^t and rod 3^u so that said pawl will turn the ratchet 3^r; and as said ratchet 3^r is fixed upon the shaft 3^n, the worm 3^o upon shaft 3^n will turn worm wheel 3^p and shaft 3^q in a direction to cause chains 3^y to elevate the platform 3^z to bring the upper surface of the pile of paper S to the proper level. When the platform 3^z has been elevated the finger 28 is moved out of position to engage depressor 25 until the pile of sheets S has been again so reduced that it needs to be again elevated.

The fed sheets are passed to and through the operating mechanism, which may be of any suitable or desired kind, (being conventionally indicated as a press having a bed B and coöperating cylinder C) and after being printed or operated upon such sheet is delivered in the usual manner, or by any suitable means, onto the receiving board or table of the delivery, indicated at D, and as the pile of delivered sheets S′ increases in height, due to the sheets dropping on this board, the top of such pile is automatically maintained approximately at the same level by means hereinafter explained.

The board 3 may be removably mounted upon angle-irons 3^a attached to endless chains 3^b running over sprockets 3^c attached to upper and lower shafts 3^d and 3^e journaled in bearings attached to the framing; and said shafts may be operated by means of a worm gear 3^f on shaft 3^e engaging a worm 3^g on a shaft 3^h carrying a bevel gear 3^i meshing with a bevel gear 3^j on a shaft 3^k, which is preferably operated by the pawl 3^s, as hereinafter described, so as to lower the pile of sheets S′ on board 3 at the same speed as the pile of sheets S is elevated.

I preferably lower the pile S′ in the delivery from and by the means used to lift the pile in the feeder. For this purpose the shaft 3^k, which operates the means for lowering the receiving table 3, is preferably extended as indicated in Fig. 1, to the automatic feeder, and has on its end adjacent the feeder a bevel gear 3^l meshing with a corresponding gear 3^m loosely mounted on the shaft 3^n. Loosely mounted on shaft 3^n beside gear 3^m is a ratchet 3^w similar to and adjacent ratchet 3^r. Ratchet 3^w is fast to gear 3^m and is adapted to be engaged by the pawl 3^s when the latter engages the pawl 3^r, so that when pawl 3^s is operated both ratchets 3^r and 3^w will be operated thereby and shafts 3^n and 3^k will be simultaneously turned.

By this means the delivery table 3 is operated when the feed table is operated; and the delivery table 3 is lowered as and just in proportion to the upward movement of the feed table 3^z. In this way any possibility of the operator forgetting to lower the delivery table is eliminated and a great saving of printed paper is effected.

The sheet delivery table may be operated by hand, to either lower or raise the pile, without operating the feeder pile or disarranging the adjustment of the feeder mechanism; and when the operator desires to remove a pile of paper S′ from the delivery table and wishes to lower this pile onto a truck, he can do so without affecting the feeder pile S; or he can reload his feeder table and make the necessary adjustments of the feeder pile S without disturbing the delivery table. For this purpose double ratchets 3^r, 3^w, are used with one common wide-faced pawl 3^s which engages both wheels.

The turning of either ratchet 3^r or 3^w does not effect the other, except when both are simultaneously engaged and operated by the pawl 3^s, at which time the delivery pile is connected with the feeder pile through the pawl and ratchets 3^r and 3^w.

The feeder pile S is raised and the delivery pile S′ lowered automatically only when same are actuated by the mechanisms provided, and the manual raising or lowering of either pile S or S′ does not affect the other.

Operation.

The sheets are fed automatically from the feed pile S on table 3^z to the machine and operated upon, and are then automatically delivered onto delivery pile S′ on the board 3; and the board 3 is automatically lowered as the sheets are deposited thereupon in accordance with the depletion of the pile of sheets on the feed table 3^z; and table 3^z and board 3 can be independently manually adjusted to raise or lower the pile of sheets thereon without affecting the adjustment of the other.

What I claim is:—

1. In combination a feed table; means for automatically elevating said table as sheets are removed therefrom; a table onto which the sheets are delivered after they have been operated upon; means for automatically lowering the said board as the feed table is elevated; and means controlling the lowering of the receiving table by the elevation

of the feed table, said means including a pair of ratchets and a common pawl adapted to simultaneously engage said ratchets.

2. In a machine having means for elevating a pile of sheets to be fed; and means for lowering the pile of sheets delivered; adjacent ratchets respectively adapted to operate one of said means, and a common pawl adapted to engage and operate both ratchets.

3. In a machine having means for elevating a pile of sheets to be fed; and means for lowering the pile of sheets delivered; a ratchet for operating each means located adjacent and intermediate the feed and delivery piles, a common pawl adapted to engage both ratchets; and means for operating said pawl.

4. In combination; a support for a feed pile of sheets; means for elevating such support; a receiver into which the sheets are delivered after they have been operated upon; means for lowering such receiver; and means controlling the lowering of the receiver by the means for elevating the support said means including adjacent side by side ratchets and devices for simultaneously operating said ratchets.

5. In combination; a support for a pile of sheets to be fed; means for elevating such support; a receiver onto which the sheets are delivered after they have been operated upon; means for lowering such receiver; and means for controlling the lowering of the receiver by the means for elevating the support said means including a pair of adjacent side by side ratchets and common devices for simultaneously engaging and operating said ratchets.

In testimony that I claim the foregoing as my own, I affix my signature.

MICHAEL A. DROITCOUR.