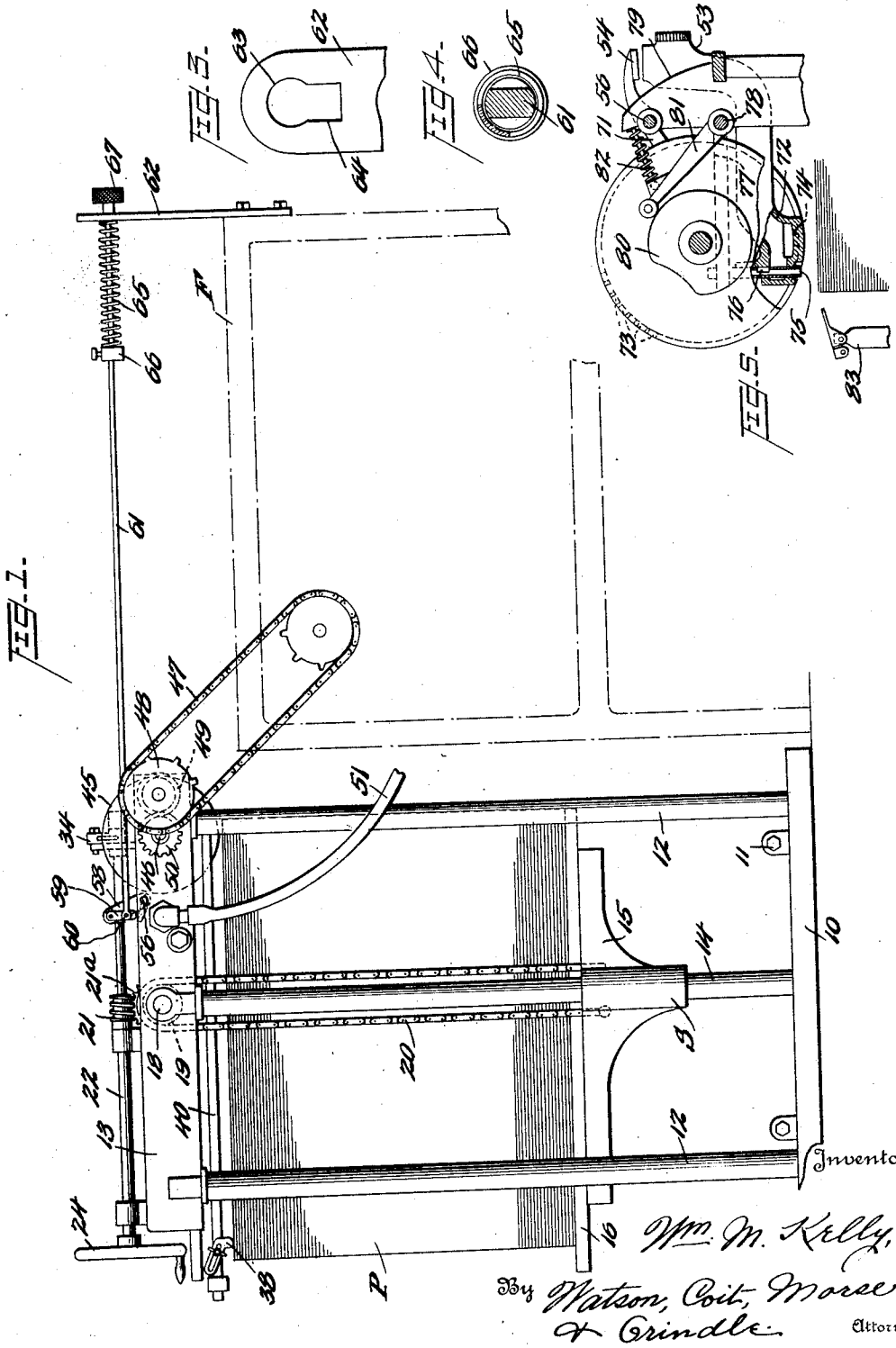
Oct. 30, 1928. 1,689,878

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SHEET FEEDING DEVICE

Original Filed Dec. 27, 1922 2 Sheets-Sheet 1



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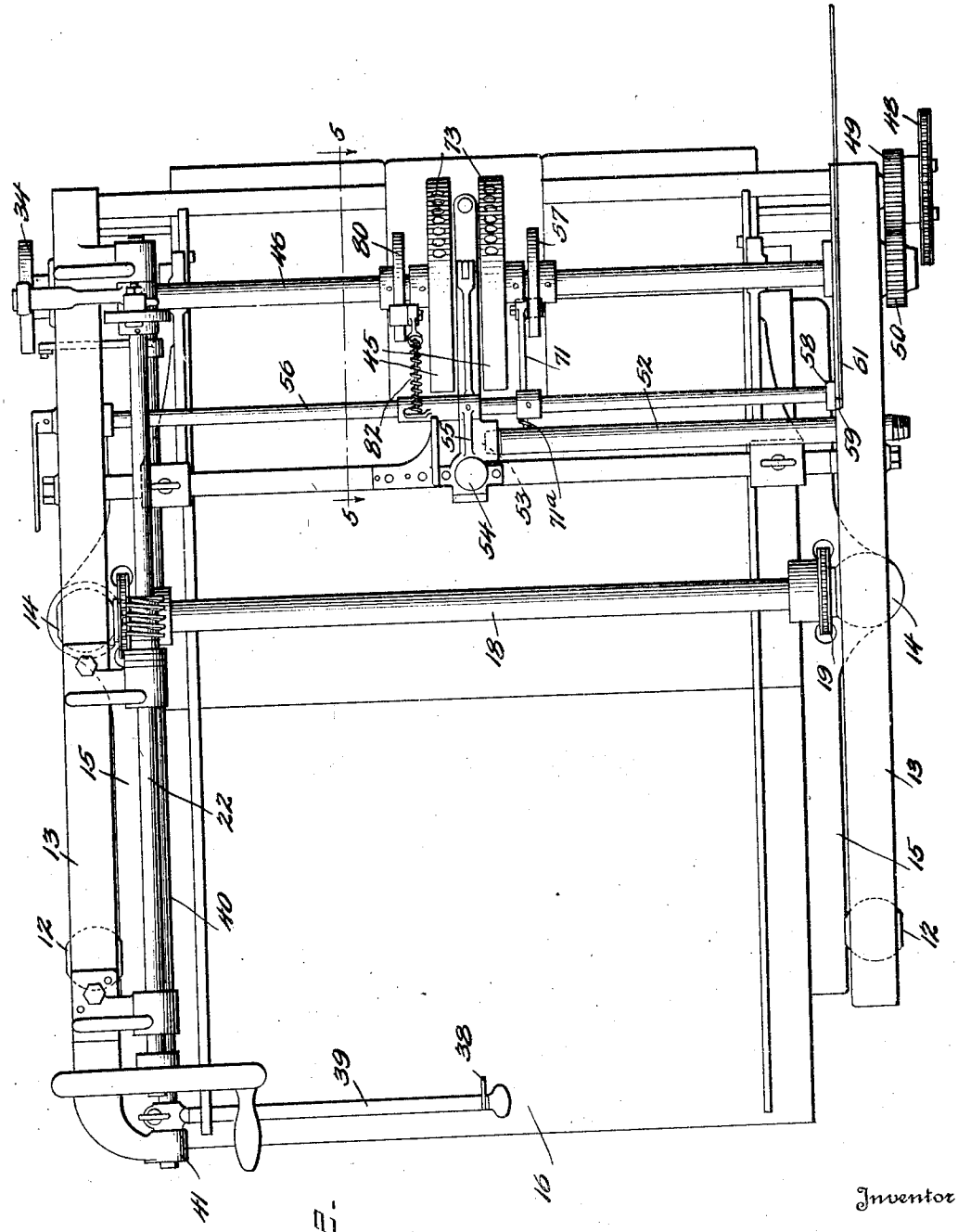


FIG. 2.

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Patented Oct. 30, 1928. 1,689,878

UNITED STATES PATENT OFFICE.

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SHEET-FEEDING DEVICE.

Original application filed December 27, 1922, Serial No. 609,320. Divided and this application filed April 15, 1927. Serial No. 184,118.

This application is a division of my copending application Serial Number 609,320, filed December 27, 1922.

This invention relates to sheet feeding mechanism of the automatic type, and more particularly to control mechanism therefor.

It is an object of the present invention to provide an automatic sheet feeding mechanism with manual means for rendering the feeding mechanism inoperative.

It is a further object to provide a remote control for an automatic sheet feeding mechanism.

Still another object of the invention is to provide a by-pass valve in a pneumatic sheet feeding mechanism, and manual control means therefor.

Other objects and features of novelty will be apparent from the description taken in connection with the drawings, in which

Fig. 1 is a side elevation of a sheet feeder having the present invention incorporated therewith, and showing in dotted lines the outline of a machine that the feeder supplies;

Fig. 2 is a top plan view of the feeder and elevating mechanism;

Figs. 3 and 4 are detail views.

Fig. 5 is a sectional elevation taken substantially on the line 5—5 of Fig. 2, illustrating one form of pneumatic sheet feeding means.

Referring to the drawings and more particularly Fig. 1, the sheet feeder S is shown as associated with the machine F to which sheets from the pile P of the feeder are delivered. The machine F may be of any type, for example, a folding machine.

As shown in the drawings, the sheet feeder includes a frame consisting of two parallel spaced base pieces 10 connected by the bars 11. From the corners of the base thus formed four rods 12 extend upwardly to two upper side bars 13. In addition to the upright rods 12 there are two vertical guide bars 14, one at each side of the frame and connecting the upper and lower frame members 13 and 10 respectively. These guides 14 have mounted thereon for vertical adjustment the brackets 15 which support the table 16 on which the pile P of sheets is carried.

For raising and lowering this pile supporting table, a transverse shaft 18 is rotatively mounted in the top frame members 13 and adjacent said members carrying the sprocket wheels 19, said sprockets being secured to the shaft so that they rotate therewith. Chains 20 each secured at one end to one of the brackets 15 pass over the sprockets 19 and thence depend therefrom. When the shaft 18 is rotated the table will be either raised or lowered through the sprockets 19 and chains 20.

For rotating the shaft 18 to raise the table, as shown in Fig. 2, the shaft 18 at one end thereof, adjacent the sprocket 19, carries a worm wheel 21ª, meshing with a worm 21 on a shaft 22 extending substantially parallel with the adjacent upper frame member 13, and carrying a handwheel 24. Rotation of this handwheel, through the worm and worm wheel will effect raising or lowering of the pile supporting table.

Means is also provided for rotating the shaft 23 automatically to maintain the top of the pile at substantially constant elevation, but forms no part of the present invention and is therefore not described in detail, as it forms part of the subject matter of my copending application Serial Number 609,320, of which this application is a division. As described therein, this means for automatically elevating the pile is adapted to be rendered inoperative when the pile is sufficiently high by a latch mechanism indicated generally at 34, and the latch mechanism is released when the top of the pile falls below a predetermined level. These mechanisms are controlled by a feeler 38 which is adapted to rest on the top of the pile of sheets, and is carried by an arm 39 secured to a rock shaft 40 extending lengthwise of the mechanism and carried in bearings 41 on the member 13 of the frame. When the feeler falls, due to sheets being withdrawn from the top of the pile, the elevating means is rendered inoperative. As the pile is elevated the feeler 38 is raised, and the elevating means is again set in operation.

This pile elevating mechanism is adapted to be used in connection with various forms of sheet feeding or forwarding devices, and in the present instance a pneumatic feeding means has been illustrated, the same being

of the type described in my Patent No. 1,401,707. This mechanism includes two wheels 45 secured to rotate with shaft 46 which extends transversely across the frame, being carried in bearings in the top side members 13. As shown, the sheet feeder is driven from the machine F in any suitable manner as by a chain 47 driving the sprocket 48 which through gears 49 and 50 rotates the feeding shaft 46. Of course the connection is such that the feeding of the sheets is timed with the operation of the machine F. An exhauster or suction pump (not shown) through the flexible connection 51 and the pipe 52 (Figure 2) has communication with a chamber 53 of the pneumatic sheet forwarding mechanism. A valve 54 controls communication between the chamber 53 and the atmosphere, this valve being carried on an arm 55 secured to a transverse rock shaft 56 which in turn carries an arm 71 actuated by a cam 57 on shaft 46, the end of the arm being held in contact with the cam by any suitable means as a spring 71ª. The valve 54 through this mechanism is opened and closed for each revolution of the shaft 46. The type of feeder referred to is illustrated more in detail in Fig. 5. It comprises a nozzle 72 having communication with the valve chamber 53. This nozzle is disposed between the wheels 45 and rests on the inner cylindrical surfaces of the flanges thereof. The flanges of the wheel are provided with a series of apertures 73 which extend around the periphery of the wheels only a sufficient distance to effect movement of the sheet to the folder or other machine to which the feeder is delivering. The nozzle 72 is provided with two apertures 74 adapted to register with the apertures 73 in the flanges so that when these holes are in register air is drawn in through the same producing a suction action effective on the top sheet of the pile. To positively lift the top sheet into the field of this suction effect, a tube 75 is provided slidable through the nozzle 72. This suction tube is formed with an aperture 76 which is adapted to register at certain times with the interior of the nozzle 72. The tube is reciprocated to bring the lower end close to the top sheet of the pile and to bring the aperture 76 into an out of communication with the nozzle, by means of an arm 77 secured to a short shaft 78 carried by the bracket 79 which also supports the chamber 53 and associated parts. This short shaft 78 is rocked by a cam 80 acting on an arm 81 secured to said shaft. This arm is held in contact with the cam by means such as a spring 82 interposed between the arm and the bracket 79.

The movement of the tube is such that it comes in contact with the top sheet of the pile and because the suction formed therein lifts the said sheet thereby permitting a blast of air from the nozzle 83 to enter under the sheet and separate it from the pile and at the same time to bring the same positively within the field of action of the suction produced through the perforations 73 of the wheels 45.

When the valve 54 is open, no sheet forwarding operations take place because the valve being open, the suction is broken. This effect is employed in providing a device for discontinuing the sheet feeding operations, from a remote part of the machine. Thus at one end, the rock shaft 56 is provided with an arm 58 just inside the frame member 13 and a dog 59 is pivoted to the free end of this arm so that when it is in normal position such as shown in Fig. 1, the dog catches on the top of the frame member 13 and holds the valve 54 open. A stop 60 on the arm 58 prevents the dog from swinging to the left as viewed in Fig. 1. The dog 59 is normally held to the right, as viewed in Fig. 1, so that the valve may be periodically opened and closed and the sheet feeding operations take place. As shown, a rod 61 extends from the dog 59 through a bracket 62 on the machine F. The aperture 63 in the bracket for the rod 61 is shown at Fig. 3, the rectangular portion 64 of the aperture being shaped to receive a slabbed off portion of the rod, a section of this slabbed off portion being shown in Fig. 4. The remainder of the rod is round in cross section. The slabbed off portion is formed at such a point that it will engage with the slot 64 when the dog 59 is retracted. A spring 65 is provided between the bracket 62 and a collar 66 on the rod, which is compressed when the rod is held in the slot 64. The end of the rod 61 is provided with a knob 67 to aid in manipulating the same. It will be apparent that a mere upward movement of the knob 67 will free the rod from the notch 64 permitting the spring 65 to force the rod 61 toward the left, thus moving the dog 59 into its locking position.

Although an embodiment of the invention has been described in detail, it is understood that the invention is not thus limited but includes modifications and changes which come within the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a device of the character described in combination, a pneumatic sheet forwarding means including a valve, means to open and close said valve during each cycle of operations, and manual means operable from a remote point, to maintain said valve open and thereby render the forwarding means inoperative.

2. In a device of the character described in combination, a pneumatic sheet forwarding means including a valve, means to open

and close said valve during each cycle of operations, and manual means operable from a remote point, to maintain said valve open and thereby render the forwarding means inoperative, said manual means being also operative to release said valve to render the forwarding means operative again.

3. In a device of the character described, in combination, a machine adapted to receive sheets, a separately mounted sheet forwarding means, and manual means operable from said receiving machine to render the forwarding means inoperative.

4. In a device of the character described, in combination, a machine adapted to receive sheets, a separately mounted pneumatic sheet forwarding means, and manual means operable from said receiving machine to render the forwarding means inoperative.

5. In a device of the character described, in combination, a machine adapted to receive sheets, a separately mounted pneumatic sheet forwarding means, manual means operable from said receiving machine to render the forwarding means inoperative, and means to retain said manual means in the position in which it renders the forwarding means inoperative.

6. In combination with a machine adapted to receive sheets of paper, separately mounted means for feeding sheets thereto and manually controlled means mounted on the machine and connected to said sheet forwarding means for rendering it inoperative.

7. In a device of the character described, in combination, a pneumatic sheet forwarding means including a valve, means to open and close said valve during each cycle of operations, a member adapted to be moved into a position in which it retains the valve in open position to render the sheet forwarding means inoperative, and manual remote control means for operating said member.

8. In a device of the character described, in combination, a pneumatic sheet forwarding means including a valve, means to open and close said valve during each cycle of operations, a member adapted to be moved into a position in which it retains the valve in open position to render the sheet forwarding means inoperative, manual remote control means for operating said member, locking means to hold said manual means in its position when the forwarding means is inoperative, and spring return means for said control operative when said locking means is released.

In testimony whereof I hereunto affix my signature.

WILLIAM M. KELLY.