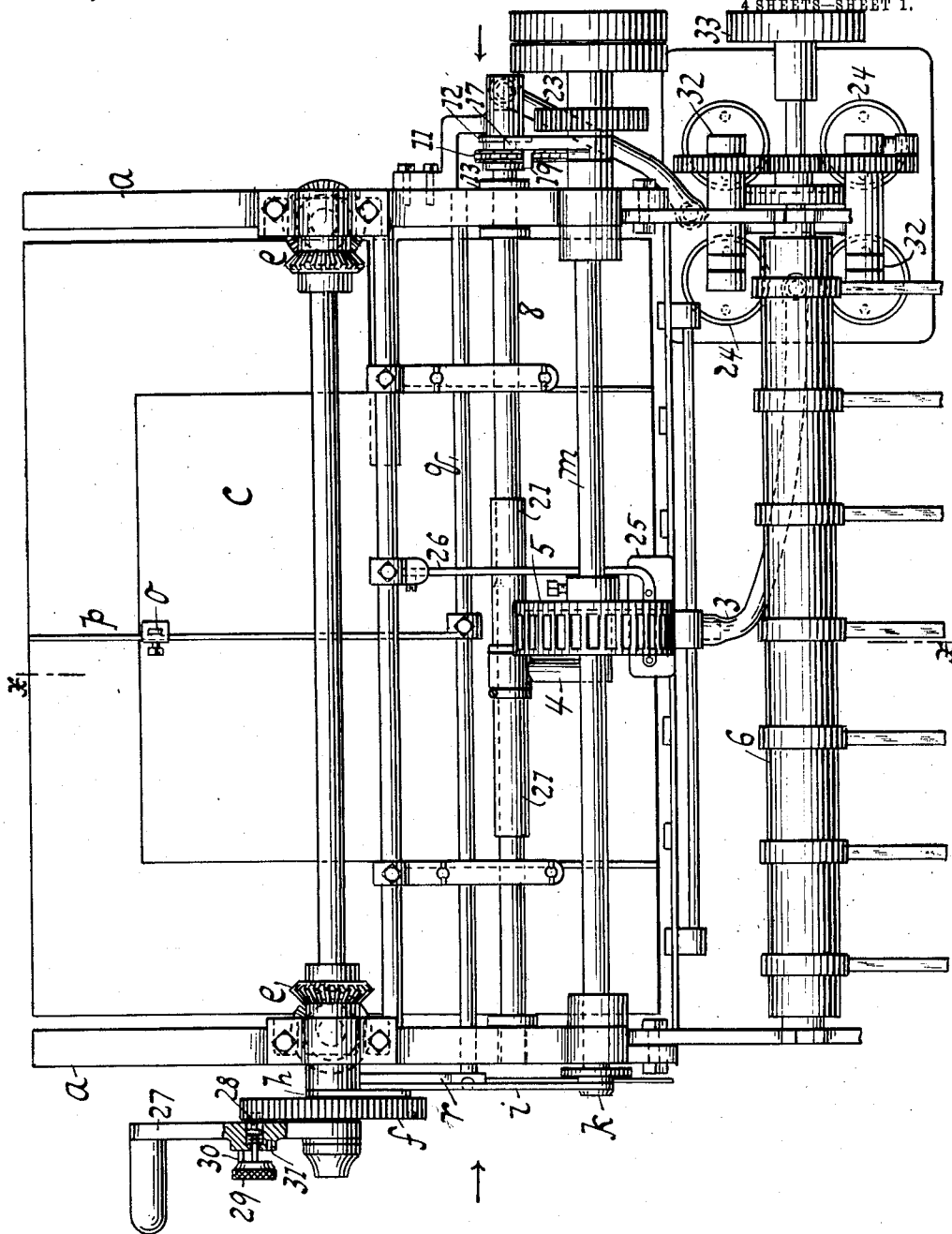


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 AUTOMATIC PAPER FEEDER.
 APPLICATION FILED DEC. 19, 1908.

939,260.

Patented Nov. 9, 1909.

4 SHEETS—SHEET 1.



WITNESSES:

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Fig. 1.

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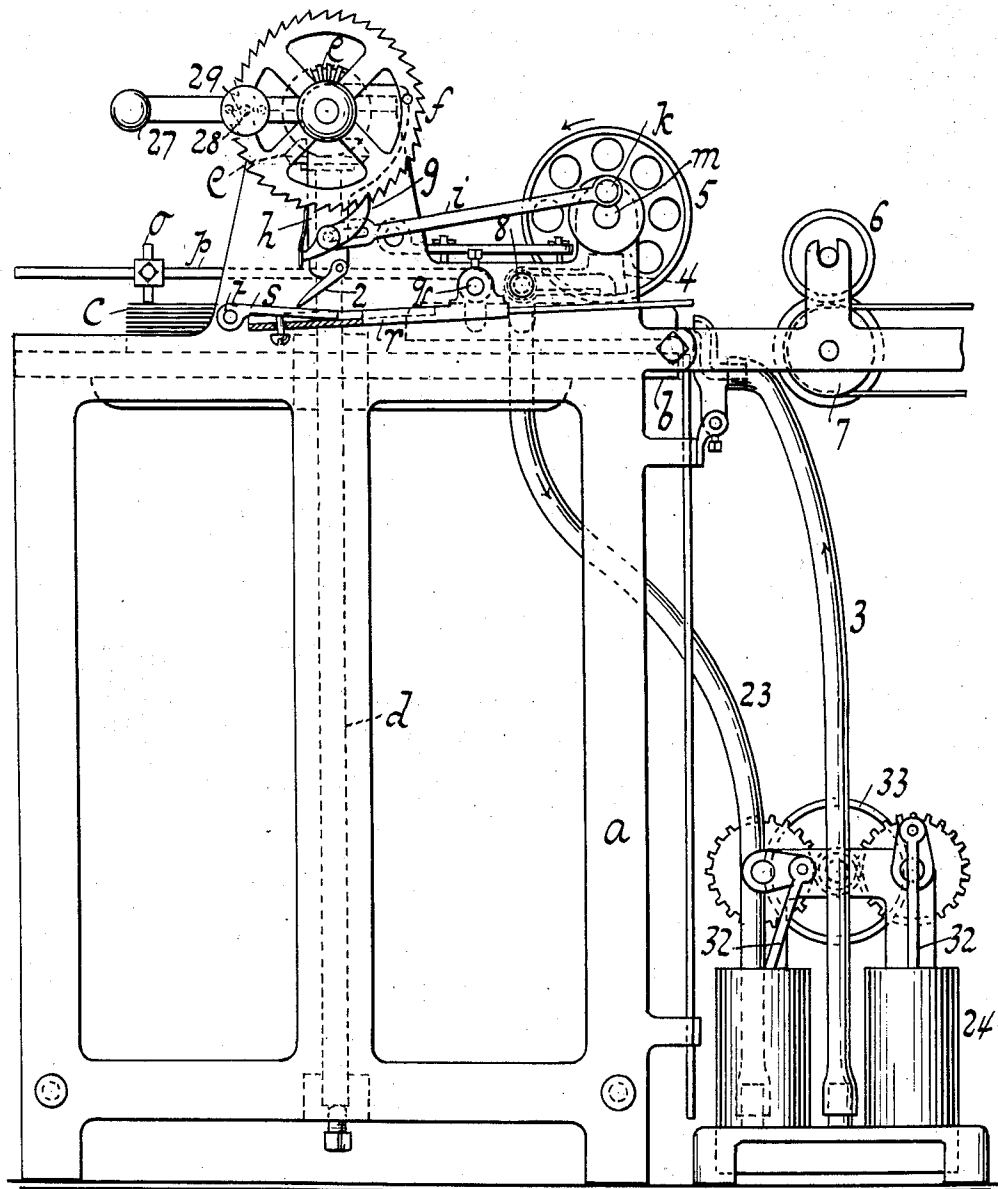
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4 SHEETS—SHEET 2.

Fig. 2.



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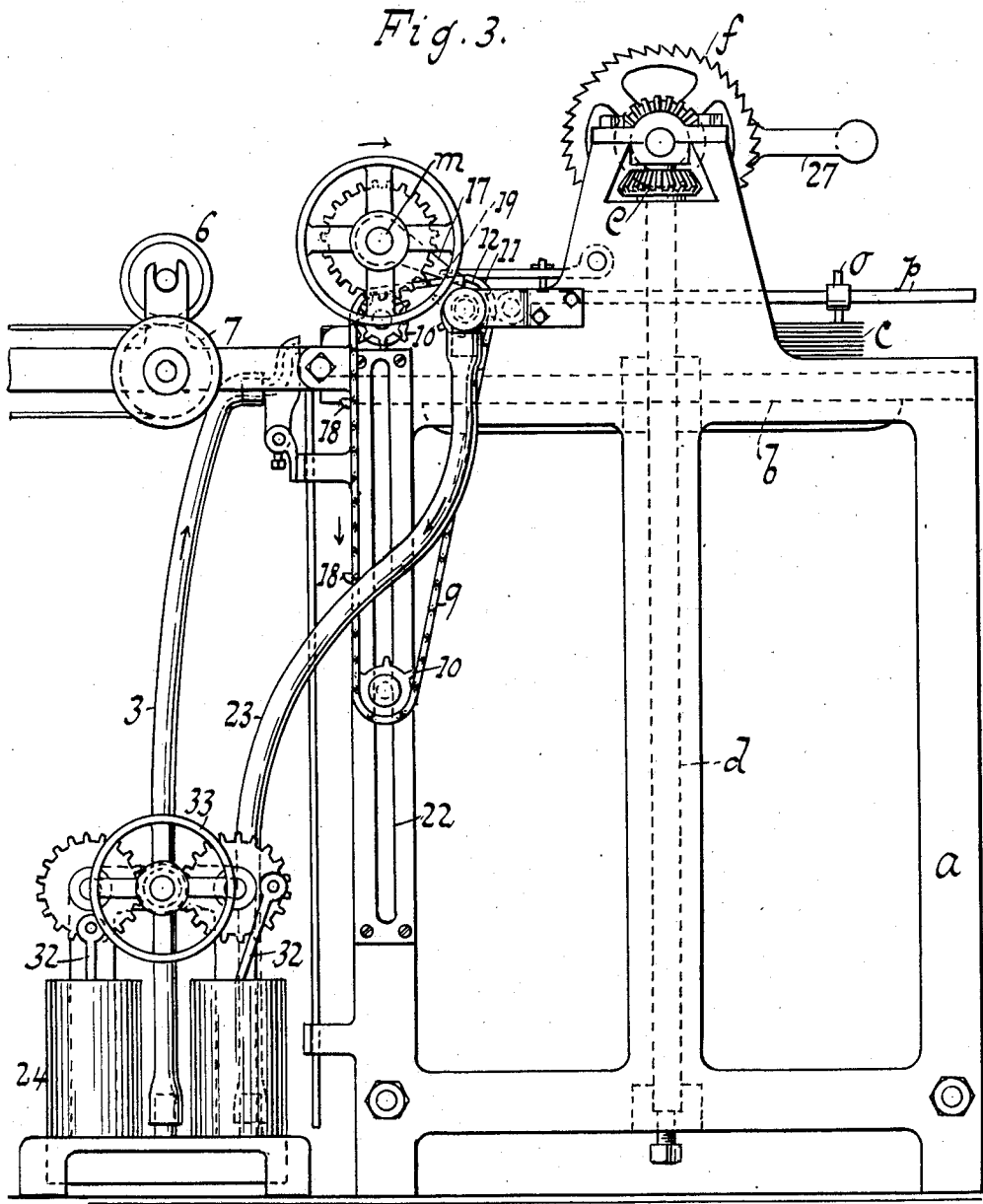
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 4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 4.

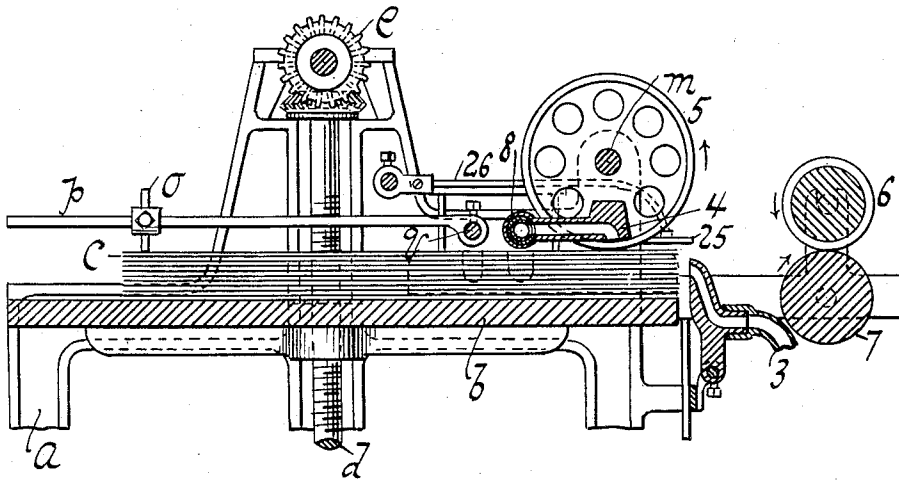


Fig. 5.

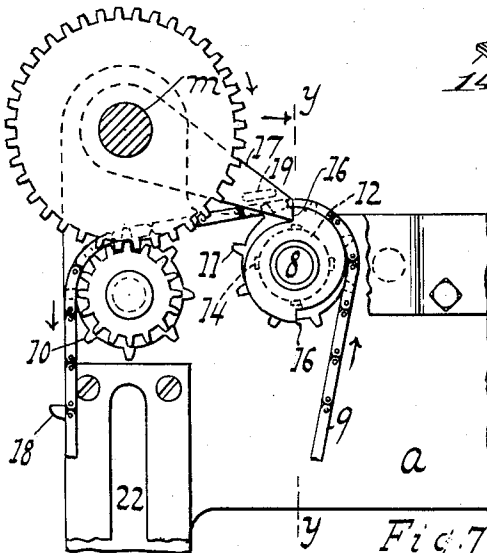


Fig. 8.



Fig. 6.

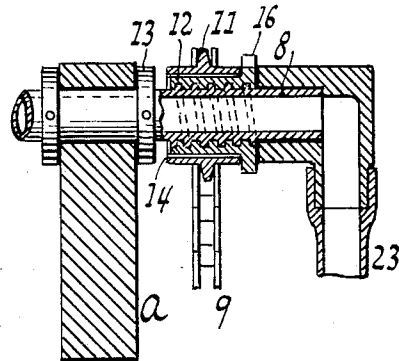
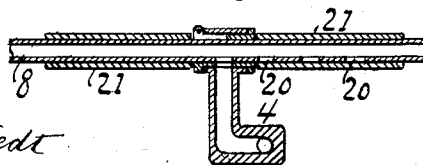


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH HREN, OF BROOKLYN, NEW YORK.

AUTOMATIC PAPER-FEEDER.

939,260.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed December 19, 1908. Serial No. 468,334.

To all whom it may concern:

Be it known that I, JOSEPH HREN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Automatic Paper-Feeders, of which the following is a specification.

This invention relates to an automatic paper feeder and one of the features of the invention consists in means by which excessive feed of paper or sheets is automatically arrested.

Another feature of the invention resides in means for setting a suction tube so that it will lift a sheet and release the same to be carried off.

Other features of the invention are set forth in the following specification and claims and illustrated in the annexed drawing in which:—

Figure 1 shows a plan view of a paper feeder embodying this invention. Fig. 2 shows a view of Fig. 1 looking from the left. Fig. 3 shows a view of Fig. 1 looking from the right. Fig. 4 is a section along the line *x x* Fig. 1. Fig. 5 shows a setting chain for the suction tube with adjacent parts. Fig. 6 is a section along line *y y* Fig. 5. Fig. 7 is a detail view of part of a suction tube with mouth portion. Fig. 8 is a detail view of one of the friction blocks to effect engagement between one of the sprockets and the traveling sleeve.

In this drawing the automatic paper feeder is shown comprising a frame or support *a* with a table *b* adapted to support a pile of sheets *c*. This table can be lifted by a screw stem *d* having miter gear connection *e* with a ratchet wheel *f*. The ratchet is actuated by a pawl *g* Fig. 2 pivoted on pawl arm *h* actuated by a link *i* and crank pin *k* on rotating shaft *m*. When the pile *c* rises beyond a certain level the finger *o* on lever *p* swings the latter with its fulcrum rod *q* carrying an intermediate lever *r*. A stop or catch finger *s* is pivoted at *t* and the free end of this stop *s* rests on the lever *r* or in a channeled or sunken portion of lever *r* so as not to normally project above the top edge of lever *r*. A pawl 2 on pawl arm *h* can then slide back and forth on the lever *r* as the pawl arm *h* is swung back and forth by link *i*. When however the lever *r* is raised by the rising sheet pile swinging up the lever *p* the finger *s* is tilted upward to project its free end above the face of lever *r*.

The pawl or stop finger 2 now swinging against the stop *s* will arrest the pawl arm with pawl *g*. The pawl arm is loosely connected to link *i* so that the link can move 60 when the pawl arm is arrested. A pin and slot connection can serve for loosely connecting the link and pawl arm. As the sheet pile diminishes the lever *p* with intermediate lever *r* sinks to allow finger *s* to drop clear 65 of the stop 2 when the pawl *g* can then begin to actuate wheel *f* to raise the sheet table. The arm *h* if left free will swing or oscillate by its weight and if in the position of the parts shown in Fig. 2 the link *i* moves to the 70 right it will pull arm *h* to the right, and as the link *i* returns the arm *h* will oscillate back again unless the swing of arm *h* to the left is arrested by finger 2 striking stop *s*.

The sheets on the table are kept separated 75 by a blast or blow nozzle 3 and the top sheet is lifted off the pile by a suction mouth piece 4 resting on the inner face of a perforated rim forming part of wheel 5 rotating with or on the shaft *m*. The sheet adhering to the rim of wheel 5 is carried forward to be taken off by wheel 6 between 80 which and pulley 7 the sheet is carried off. The mouth piece 4 connects with a suction tube 8 which is set to open and closed position 85 for the sheet to be drawn by mouth piece 4 to the rim of wheel 5 and then to be dropped by cutting off the suction. The rotation or rather oscillation of this suction tube 8 to open and closed position is effected 90 automatically by means to be presently described.

An endless chain 9 is led over guide pulleys or sprockets 10 one of which is actuated by suitable gear connection with 95 main shaft *m* and said chain also engages the sprocket 11 frictionally surrounding a flanged and screwthreaded sleeve 12 Fig. 6. This sleeve has a screw thread connection with tube 8 so that by being turned the 100 sleeve can be screwed to and from a collar 13 fast on tube 8. Two such collars are shown on the tube 8 one on each side of the riser or frame part *a* in which the tube 8 can oscillate and which collars prevent longitudinal movement of the oscillatory tube 8. 105 The frictional engagement between the sprocket 11 and threaded traveling sleeve 12 is effected by suitable means such as blocks 14 Fig. 5. The blocks 14 may be plain pieces 110 or wedges of wood which, when being driven or forced in between the sleeve 12 and

sprocket 11, will cause these parts to turn with more or less friction with respect to one another. As shown in Fig. 8 the friction piece 14 may consist of a somewhat curved or bent piece of spring metal 14 which when placed between the sleeve and the sprocket produces the necessary friction. The flange of sleeve or bushing 12 has shoulders 16 and when either of these shoulders is engaged by pawl 17 the sleeve cannot turn and the chain 9 keeps rotating idly on the sleeve. When however the chain by one of its lugs 18 engaging or tapping lug 19 on pawl 17 lifts the pawl clear of a shoulder 16 the friction of the rotating sprocket 11 rotates the sleeve 12 to move the latter on the tube 8 toward the adjacent collar 13. The sprocket or its hub part projects somewhat beyond the sleeve 12 at the side facing the collar 13 and as the sprocket is carried to contact with the collar the rotation of the sprocket is for the moment imparted to the tube. The sprocket 11, the sleeve 12 and tube 8 now turn together until a shoulder on the flange of sleeve 12 is engaged by pawl 17 when the rotation of sleeve 12 is arrested but the rotation of tube 8 continues momentarily while sprocket 11 remains for an instant in frictional contact or jammed against collar 13. As by this rotation of the tube the screw sleeve 12 with sprocket 11 is screwed away from collar 13 the rotation of the tube immediately stops and the pawl 17 reengaging the sleeve 12 or a shoulder 16 on the sleeve will again arrest its rotation for the sprocket 11 to rotate idly on the sleeve. Two shoulders 16 are shown on the flange of sleeve 12 and as the pawl releases one shoulder and engages the second the result is a half turn of tube 8 to cut off or close the suction through mouth piece 4 whereupon the pawl 17 releasing the second shoulder 16 and reengaging the first shoulder allows tube 8 to be set back to reestablish suction through mouth piece 4. The lateral motion of the disk 16 or its motion back and forth in a line at right angles to the plane of the pawl is so slight and the pawl 17 is of such width that the pawl does not lose its engagement with the disk 16. In other words by such momentary rotation the tube 8 is each time given a partial or half turn for its orifice 20 to be brought first out of register with suction mouth 4 to momentarily cut off the suction through the mouth and allow a sheet to drop off the wheel 15 and then to reestablish the suction for a following sheet to be lifted or taken up to this wheel.

In Fig. 7 a number of orifices 20 are shown in tube 8 and by setting a mouth piece 4 to one orifice or another and closing up the remaining orifices by a slidable sleeve or rubber tube 21 the mouth piece 4 can be set for sheets of varying widths.

To accommodate sheets of varying lengths

the chain 9 can be lengthened and a slotted bearing piece 22 allows the lower pulley or sprocket 10 to be set up or down to accommodate varying lengths of chain.

The suction of tube 8 is established by a hose or flexible tube 23 extending to pump 24. The suction hose 23 connects with the inlet mouth of pump 24 while the blast hose 3 connected to the outlet of the pump will establish the blast for separating the sheets. The sheets or their leading edges can be kept from blowing up too high under the action of blast 3 by an overhanging disk or plate 25 carried by arm 26 which can be connected or carried by a suitable cross piece of the frame. Said overhanging plate 25 also prevents the blast from passing upward and compels the same to blow in between the sheets.

The main shaft *m* can be actuated in any suitable way and can be provided with the usual fast and loose pulleys for starting and stopping.

The sheet table *b* can be set by hand to any desired level when starting the machine. On the shaft of ratchet wheel *f* is a hand crank 27 which has a spring pressed finger 28 tending normally to snap into engagement with the ratchet *f*. This finger carries a button 29 with stem 30 and when the stem rests against the side of the crank 27 it holds the finger 28 retracted out of engagement with ratchet *f*. When however the button 29 is turned to allow stem 30 to enter a recess 31 in the side of the crank 27 the spring pressed finger 28 can pass into engagement with ratchet *f* to lock the ratchet and crank handle to one another and enable the screw stem *d* to be rotated for setting the sheet table to any desired level.

It has been mentioned that the suction tube 8 or its suction is interrupted at intervals but the blast through tube 3 is continuous or never shut off. The pump has the links 32 of its pistons so geared or connected to fly wheel 33 that when in motion one of the pistons always expels air through outlet and blast tube 3 irrespective of whether air is being sucked through tube 8 or not.

What I claim is:—

1. In a machine of the class described a suction tube for lifting sheets, means for setting the tube to open and to closed position a stop pawl for arresting the setting means and a chain with lugs for releasing the stop pawl, said chain having sections which can be removed or inserted as required by sheets of varying lengths.

2. In a machine of the class described a suction tube adapted to be set into open and closed position, a screw threaded sleeve engaged by and lengthwise movable on the tube, a pinion or sprocket having frictional engagement with the screw threaded sleeve and carried lengthwise thereby to engage

ment with the tube to rotate and set the latter, and a stop pawl for arresting the rotation of the screw threaded sleeve to allow the rotation of the tube to move the sleeve
5 with sprocket free from the tube and arrest its rotation.

3. In a machine of the class described a suction tube adapted to be rotatively set into open and closed position, a screw
10 threaded sleeve engaged by the tube and movable along the same, a shoulder or collar on the tube, a pinion or sprocket in frictional engagement with the sleeve and moved

thereby to engage the collar to rotate the tube, and a stop pawl to arrest the rotation
15 of the sleeve for the rotation of the tube to longitudinally move the sleeve with the sprocket clear of the shoulder.

In testimony whereof I have hereunto set my hand in the presence of two subscribing
20 witnesses.

JOSEPH HREN.

Witnesses:

CHRISTIAN ALMSTAEDT,
W. C. HAUFF.