

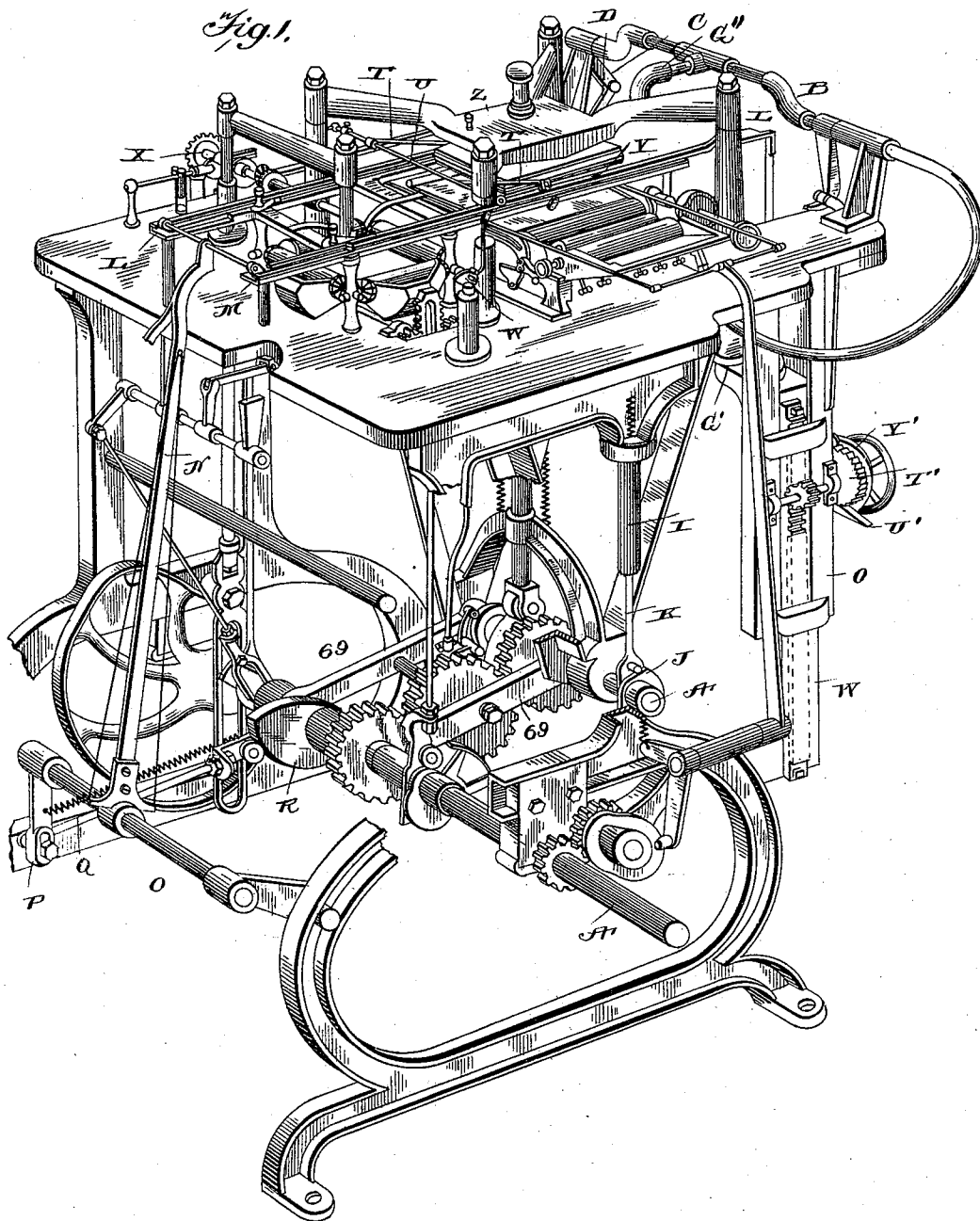
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J. W. HUTT & A. J. PHILLIPS.
PAPER FEEDING APPARATUS.

No. 478,329.

Patented July 5, 1892.



Witnesses

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Thos. E. Robertson.

Inventors
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Arthur J. Phillips.

By their Attorneys
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(No Model.)

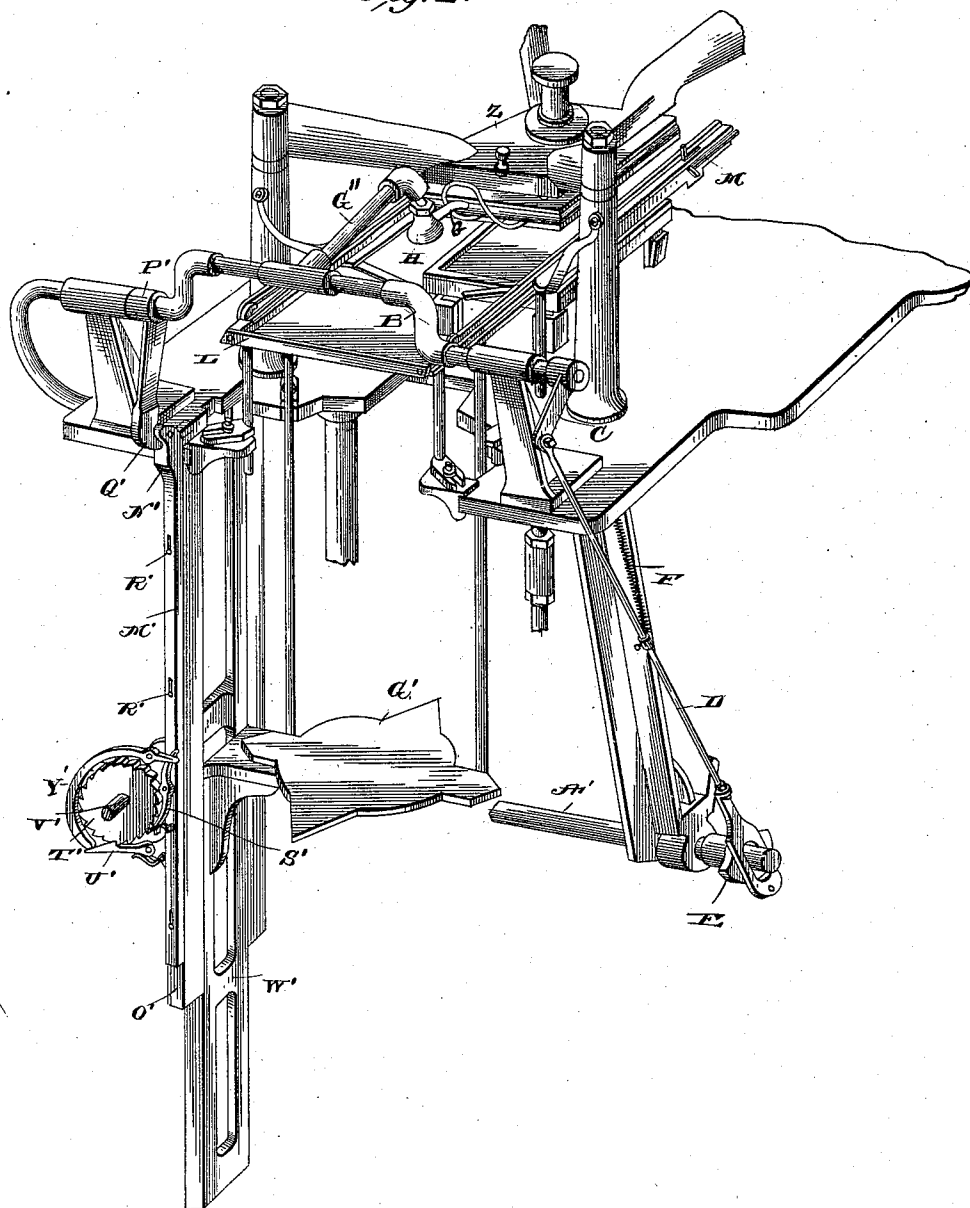
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Fig. 2.



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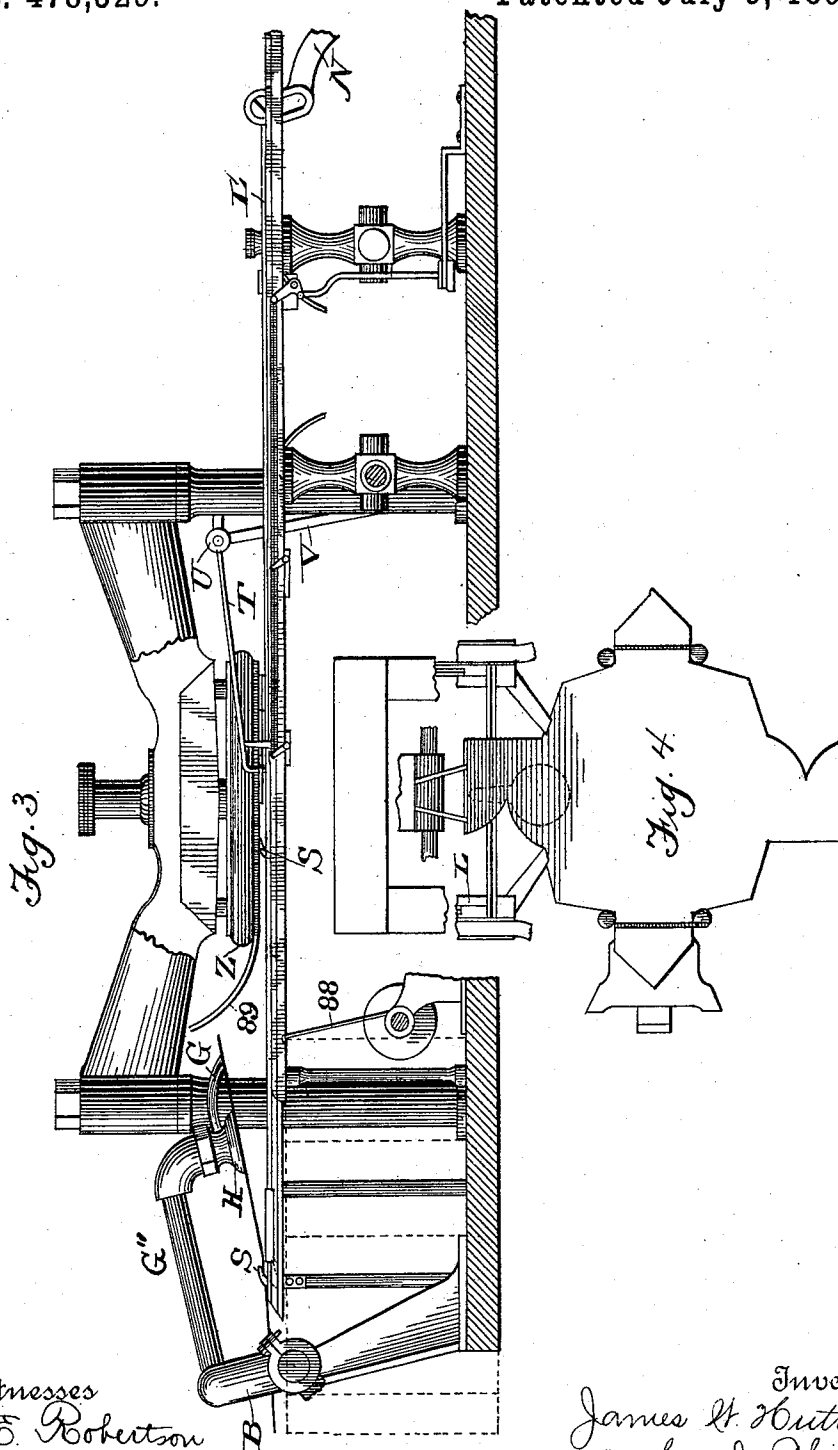
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Fig. 5.

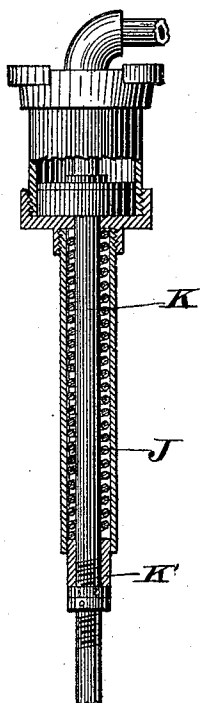
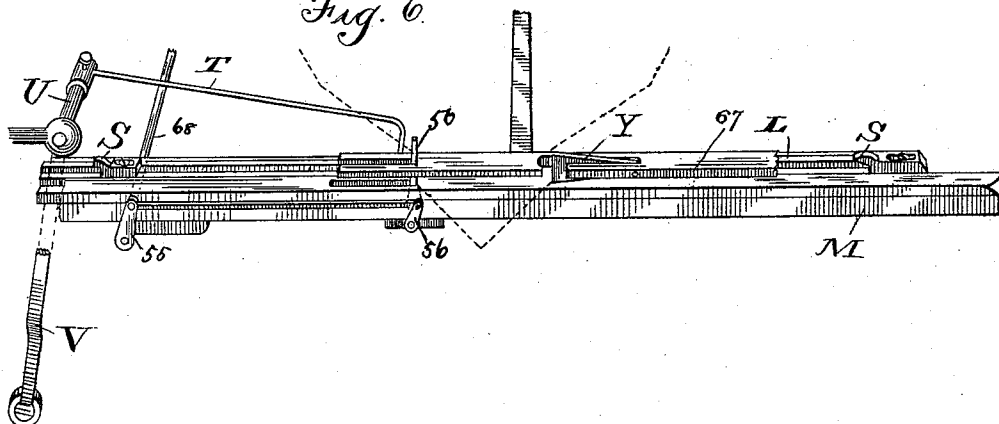


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES W. HUTT AND ARTHUR J. PHILLIPS, OF TORONTO, CANADA.

PAPER-FEEDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 478,329, dated July 5, 1892.

Original application filed January 2, 1891, Serial No. 376,508. Divided and this application filed August 7, 1891. Serial No. 402,050. (No model.)

To all whom it may concern:

Be it known that we, JAMES WILLIAM HUTT and ARTHUR JAMES PHILLIPS, both of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have jointly invented a certain new and Improved Paper-Feeding Apparatus, of which the following is a specification.

The object of this improvement is an apparatus for feeding paper, and is more particularly applicable to the machine for the manufacture of paper boxes, shown in our application, Serial No. 376,508, filed January 2, 1891, of which this application is a division; and the invention consists in the peculiar construction, arrangement, and combinations of parts hereinafter more particularly described, and then definitely claimed.

In the accompanying drawings, Figure 1 shows a perspective view of a machine for making boxes, having our feeding apparatus. Fig. 2 is a similar view of the elevator and picker used therein. Fig. 3 is a side elevation of part of the apparatus. Fig. 4 is a plan view showing the pile of blanks in position to be fed. Fig. 5 is a detail, partially in section, of an air-pump employed in our apparatus. Fig. 6 is a perspective detail of part of the carrier.

In order to better explain our invention, we have shown a general view of the machine in which the same is employed; but as the said machine as a whole is not claimed herein, we shall only refer to it briefly and limit the detail description to that part of the apparatus herein claimed.

Our apparatus, taken as a whole, comprises a device for feeding the blanks, an apparatus to print said blanks, and a box-forming apparatus which makes the blanks into boxes and is provided with an apparatus to form and insert a bail into the boxes as they are made.

In constructing our machine we have endeavored to make the mechanism as simple and effective as possible and have arranged it so that there shall be absolutely no handling from the time that the pile of blanks is first placed in the machine until the box or pail is discharged complete in every respect.

In our machine the pile of blanks is placed

on top of an elevator operated by mechanism which will raise the pile as required to keep the top blank in reach of the picker. This picker is designed to raise the top blank and place it upon a carrier so operated by mechanism that the instant the blank is placed upon it it travels to a point where printing mechanism is placed and which is timed to print and instantly release the blank, so that it may be conveyed by the carrier to a point where a plunger is arranged to instantly come down upon the blank and force it through folding-cams into a position where mechanism is located to form and clamp a wire bail onto the box or pail, which at this period is complete, and is then nested with preceding pails and forced into the discharge-spout.

In the drawings like letters of reference indicate similar parts in the several figures.

A represents the main driving-shaft, from which all moving parts of the machine derive their motion.

B represents a hollow crank-shaft suitably journaled on the frame of the machine, as indicated, and provided with an arm C, which is connected by the rod D to the shaft A', as indicated in Fig. 2. On this shaft a cam E is fixed, which in revolving with the shaft A comes in contact with a friction-roller located on the bottom of the rod D, forcing the said rod down, so as to cause the crank-shaft B to rock in its bearings.

F is a spring to act on the arm C and cause it to move in opposite direction to that in which it is forced by the action of the cam E. On the hollow crank-shaft B we fix a hollow arm G'', communicating with the interior of the shaft B. A solid head H is connected to the end of the arm G'', as shown in Fig. 2, having a hollow finger G, communicating with the hollow arm G''. The hollow crank-shaft B is connected to an air-pump I, operated by a cam J and spring J', which acts against the plunger-rod K of the air-pump I, and is so timed that the plunger of the pump is acted upon by the spring J', (see Fig. 5,) so as to quickly exhaust the air in the shaft B and finger G the instant that the mouth of the finger G comes in contact with the top blank. By operating the plunger by a spring J' a quick motion is secured, which quickly exhausts

the air and makes the picker work more effectually than it would if the plunger were worked slowly.

On reference to Fig. 5 it will be seen that simple means for adjusting the tension of the spring J' is provided, and consists of a sleeve K', screwed upon the rod K. The cam J is fixed to the shaft A', which is geared to the main shaft A, as shown in Fig. 1.

When the air is exhausted from the finger G, the top blank is raised by the upward movement of the said finger, the operating mechanism of which is so timed as to elevate the blank at the time that the carrier is moved by its mechanism below the blank so raised. As the mechanism continues to move, the plunger of the pump I is carried in the reverse direction, so as to force the air back into the finger G, and in this way the blank held by the said arm is permitted to drop into the carrier L. It will be observed that the head H rests upon the blanks while the air is being sucked through the finger to raise the top blank. It is absolutely necessary for the proper working of the feed or elevation of the blank that the arm on which the head is carried should be arrested by pressure on top of the blank. If the finger should press hard upon the blanks, it would exclude the air from between the blanks and prevent the top blank being elevated by the exhaustion of the air through the finger. As the head is behind the point of the finger, the pressure of the head near the center of the blanks has a tendency to raise the front of the top blank and admit the air underneath the same.

In order to prevent the hollow finger G raising more than one blank at a time, we provide a pair of fingers, (shown in Figs. 3 and 4,) which fingers have crooked ends which lap over and rest upon the pile of blanks, as shown in Fig. 4. When the finger G raises the top blank, it draws its edge from below the hooked ends of the said fingers 88, which remain on top of the blanks and prevent the next one being raised until the finger comes in actual contact with it.

With the view of preventing the blank being carried against the impression-plate Z, we provide a curved guard 89, which directs below the impression-plate Z any blank which might be accidentally raised above the carrier L.

As the blanks are removed from the pile which rests on the table G', it is necessary that simple mechanism should be provided for the purpose of automatically elevating the said table, so as to keep the top blank within reach of the finger G. With that view (see Fig. 2) we fix on the shaft B an arm P', having a hooked end Q', shaped so as to engage with the head N', formed on the upper end of the bar M'. This bar M' is held to the frame O' by the screws R', which pass through elongated holes in the bar M', so that the said bar may be moved vertically without disturbing its connection with the frame O'. As

the shaft B is rocked, so as to bring its finger G and head H in contact with the pile of blanks, the hooked end Q' moves away from the position close to the neck of the head N', which it occupies when the finger G is elevated, and permits the bar M' to drop slightly by its own gravity; but the head N' of the said bar M' never loses contact with the arm P'. Consequently as the shaft B rocks a reciprocating vertical motion is given to the bar M'. A pawl S' is pivoted on the bar M' and actuated by any suitable spring, so as to hold its hooked end in contact with the periphery of the ratchet-wheel T'.

U is a pawl pivoted on a projection formed on the frame O', and this pawl is held in contact by the action of a suitable spring with the ratchet-wheel T'. The reciprocating vertical movement of the bar M' moves the pawl S' up and down on the back of one of the teeth of the ratchet-wheel T'. As each blank is removed from the pile the rocking movement of the shaft B will to that extent rock a little more, and the bar M' will consequently be permitted to drop farther. When sufficient blanks have been removed from the pile to necessitate its elevation, the hooked end of the pawl S' has been carried so as to engage with the next tooth on the wheel T', and consequently when the bar M' is again raised by the action of the hooked end Q' on the arm P' the ratchet-wheel T' is caused to revolve the distance of the tooth. As this ratchet-wheel is fixed to a spindle V', suitably journaled in the frame O' and having fixed to it a pinion which gears with a rack formed on the back of a slide W', on which the table G' is fixed, the said motion of the ratchet-wheel T' will correspondingly elevate the table G', and as the blanks are carried on this table they are raised the required distance to keep them in contact with the finger G and head H. When it is desired to raise the table G' by hand, the curved finger Y' is moved so as to throw the pawl S' and pawl U' out of contact with the ratchet-wheel T'. It will of course be seen that the pawl U' is for the purpose of holding the ratchet-wheel T' stationary while the pawl S' is rubbing against the back of one of the ratchet-teeth.

The carrier L is supported in suitable guides M and is operated by an arm N, (see Fig. 1,) which is fixed to the rock-shaft D. This rock-shaft is provided with a crank-arm P, to which a suitable rod Q is attached, which rod extends back to the main shaft A and is arranged to derive a longitudinal motion by the action of the cam R, which is fixed to the shaft A, as shown in Fig. 1. An elongated hole is made in the crank-arm P at the point where the rod Q connects. This oblong hole is for the purpose of adjusting the rod and crank so as to shorten or lengthen the crank with the view of altering the movement of the arm N, by which the carrier L is operated. A spring, connected at one end to the crank-arm P and at the other to one of

the arms 69, supporting the gearing which operates the shaft A, returns the carrier L after it has been thrown forward by the action of the cam R. When the carrier L passes below the blank, the adjustable hook S, one of which is fixed to each side of the carrier, (see Fig. 3,) passes the edge of the blank, so that when the carrier is moved back the hook S comes in contact with the blank and holds it in position on the carrier.

In order to hold the blank in exactly the proper position to be printed, we provide two fingers T, connected to the rock-shaft U, which is operated by a rod V, connected at its upper end to the rock-shaft U, the lower end carrying a friction-roller in contact with cam W, connected to the end of the revolving shaft X.

The driving mechanism by which the rock-shaft is operated is so timed that the fingers T shall be in the path of the blank on the carrier L when the said carrier has conveyed the said blank to the proper position to be printed. (See Fig. 6.) In this way the blank is held in exactly the proper position by means of the gravity-stops Y and fingers T. The instant that the printing is completed the fingers T are raised by the action of their mechanism, so as to leave the path clear for the passage of the blank, which is then fed to the folder.

It will be observed that there are two sets of adjustable hooks S on the carrier L, one set being at the end of the carrier, while the other set is located near its middle, the end set being located, as shown in Fig. 3, at the point ready to remove the blank from the picker, while the other set is located at the printing device. By this arrangement the carrier L conveys a blank from the picker to the printer, and simultaneously conveys the blank from the printer to the folder. As there will be a preceding blank at the printer at the time that the carrier returns for a fresh blank from the printer, it is necessary to provide means to prevent the carrier conveying the said blank away from the printer. With that view we provide gravity-stops Y, pivoted in the guide 67. (See Fig. 6.) The blank in going forward passes under this guide 67 and raises the stops Y, which will then drop down behind the blank as it passes beyond said stops, and thus hold the blank stationary while the carrier is returning.

The blank is indicated by dotted lines in said Fig. 6, and on the side thereof opposite

to the stops Y two arms 56 are shown connected to a rock-shaft and one of which is connected to another arm 55 by a link, which arm is connected to another lever 68 by a rock-shaft. These parts are intended to operate certain other parts of the complete machine, and as they have no function in the mechanism herein claimed it is unnecessary to describe their operation.

No claim is herein made to the box-making apparatus proper nor to the printing devices, as the former is claimed in our application, Serial No. 376,508, before referred to, and the latter is claimed in another application filed August 7, 1891, Serial No. 402,051.

What we claim as new is—

1. A hollow shaft connected to an air-pump and deriving a rocking movement from the driving mechanism of the machine, in combination with a solid head and a hollow finger connected to said head and to the hollow shaft, the driving mechanism being so timed as to bring the hollow finger and solid head in contact with the top of a pile of blanks the moment that the pump is about to exhaust the air from the hollow finger, substantially as and for the purpose specified.

2. A table designed to support the pile of blanks and movably supported in a frame, a rack formed on the back of a table designed to engage with a pinion fixed to a spindle suitably journaled in the frame and having a ratchet-wheel fixed to the said spindle, and a spring-pawl pivoted on a vertically-movable bar and held in contact with the teeth of the ratchet-wheel, in combination with an arm fixed to the rock-shaft on which the hollow finger is attached, and a friction-roller formed on the end of the vertically-movable bar and designed to engage with the hook end of the arm, substantially as and for the purpose specified.

3. The fingers T, connected to the rock-shaft U, which is operated by a rod V, deriving motion from a cam W, in combination with carrier L and gravity-stops Y, pivoted in the guide M, substantially as and for the purpose specified.

Toronto, July 22, 1891.

JAMES W. HUTT.
ARTHUR J. PHILLIPS.

In presence of—

A. M. NEFF,
T. E. ROBERTSON.