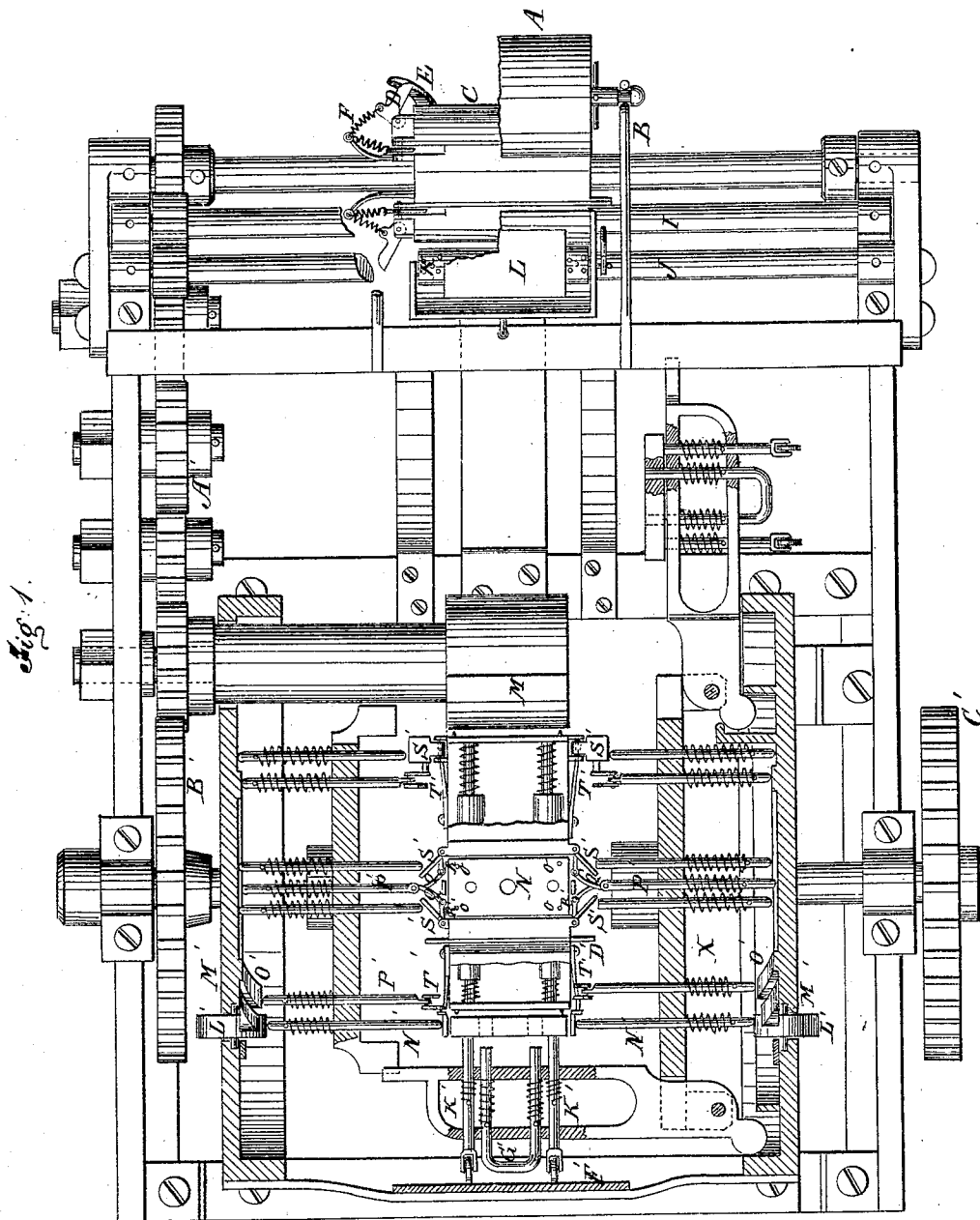


W. GATES.
Paper-Box Machines.

No. 149,389.

Patented April 7, 1874.



WITNESSES:

Chas. Nida.
Bridgman

INVENTOR:

W. Gates

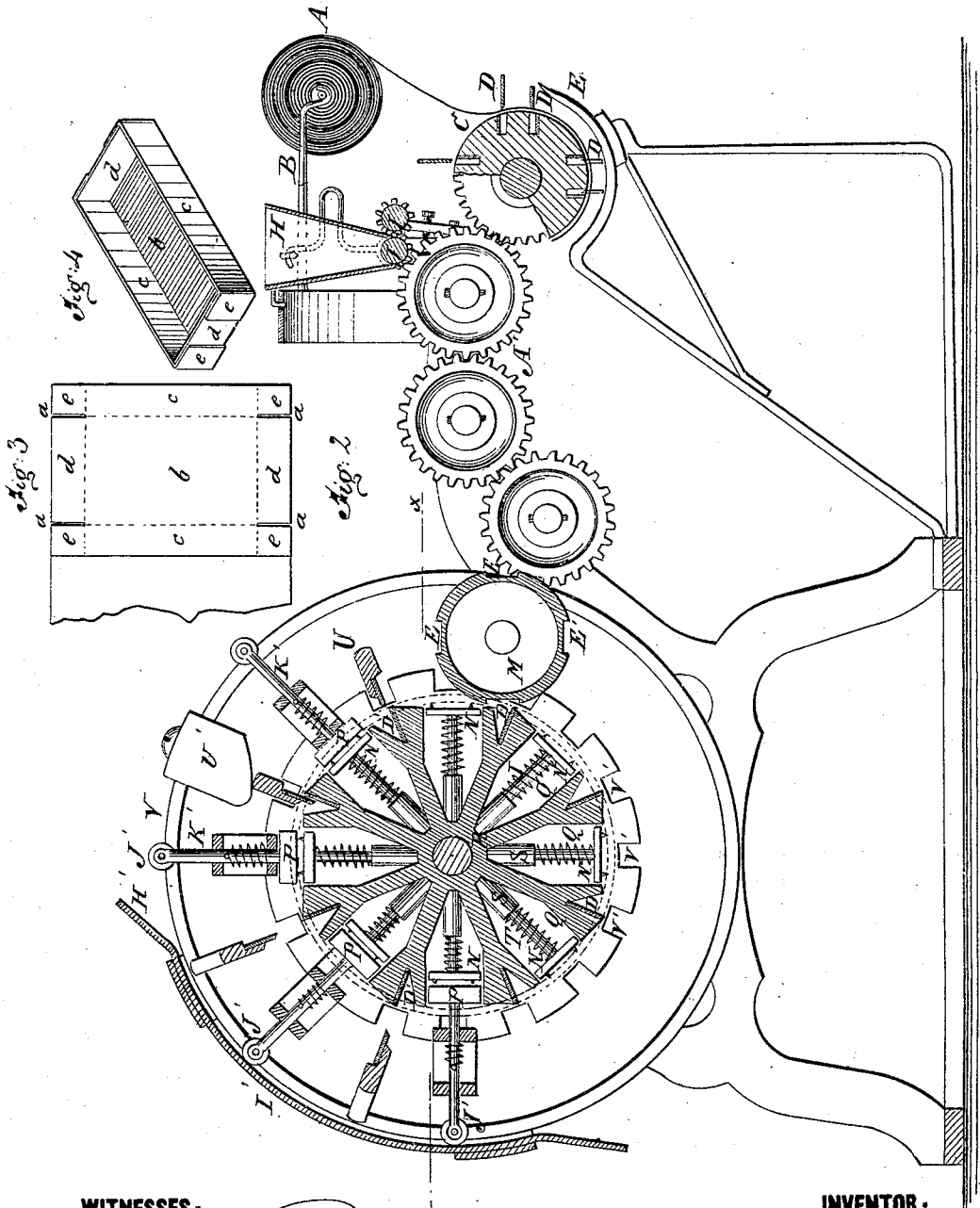
BY

Munn & Co.
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WITNESSES:

Chas. Nida
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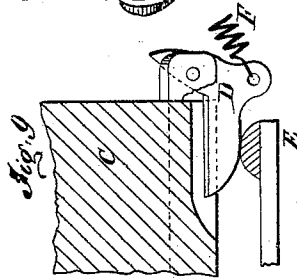
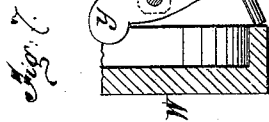
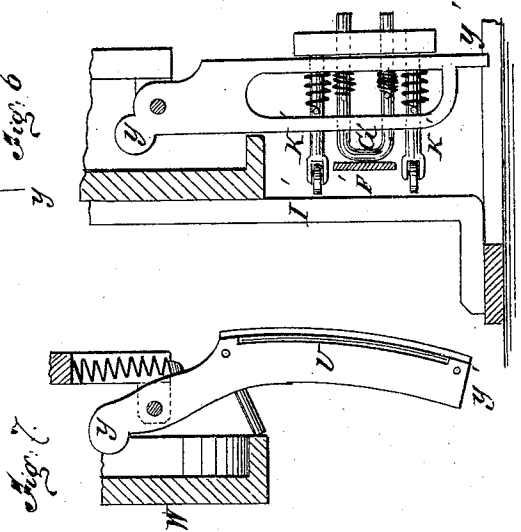
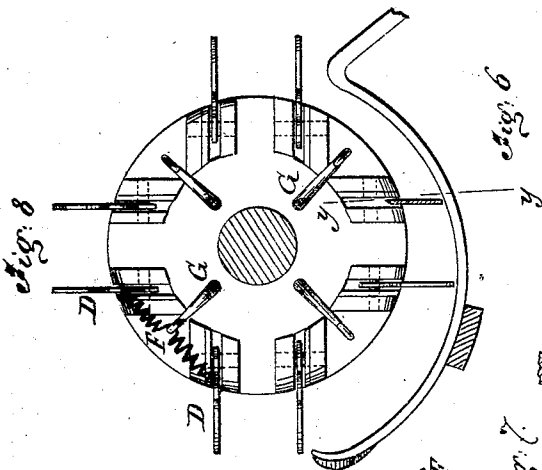
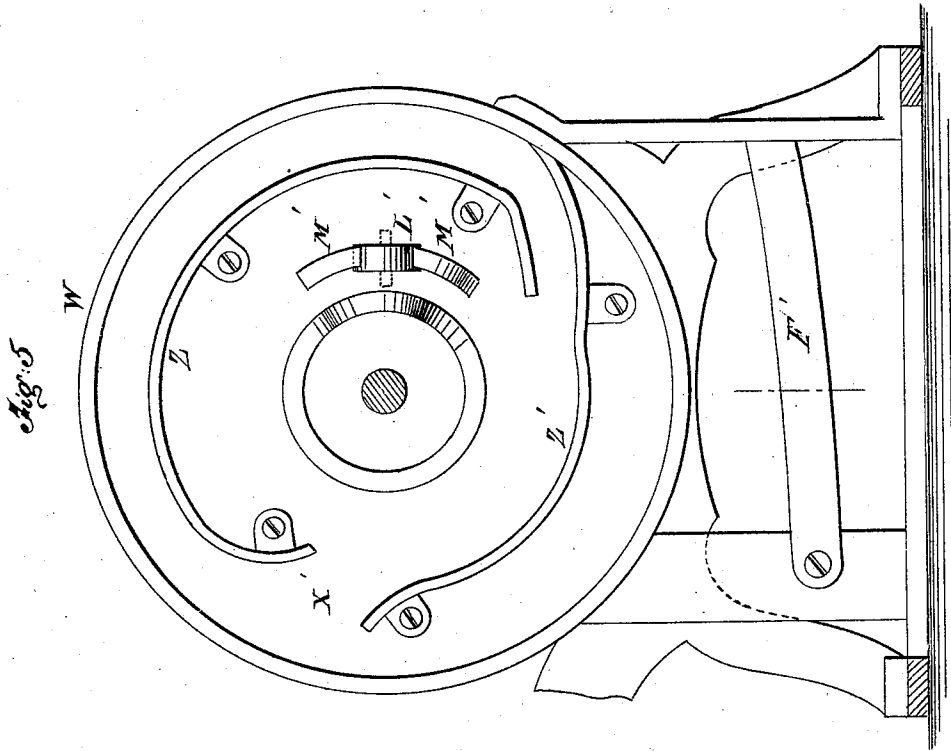
INVENTOR:

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Paper-Box Machines.

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WITNESSES:

Chas. Nida
Original

INVENTOR:

W. Gates

BY

Munn

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM GATES, OF FRANKFORT, NEW YORK.

IMPROVEMENT IN PAPER-BOX MACHINES.

Specification forming part of Letters Patent No. **149,389**, dated April 7, 1874; application filed January 24, 1874.

To all whom it may concern:

Be it known that I, WILLIAM GATES, of Frankfort, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Machine for Making Paper Boxes, of which the following is a specification:

The invention will first be fully described and then pointed out in the claims.

In the accompanying drawing, Figure 1, Sheet 1, is a top view, partly in section, as on the line *xx* of Fig. 2, showing the construction of the machine and the general arrangement of parts. Fig. 2, Sheet 2, is a sectional elevation of the machine. Fig. 3 is a view of the paper after the first operation has been performed. Fig. 4 is a perspective view of the paper box. Fig. 5, Sheet 3, shows the inner sides of the end plates, giving a view of the cams for operating on the knives; and Fig. 6 is a detail side view of one of the plunger-frames, showing also the device for detaching the box from the plunger. Fig. 7 is a detail view of one of the knives for cutting off the paper. Fig. 8 is an end view of the slitting-cylinder where the operation first commences. Fig. 9 is a section of Fig. 8, on the line *yy*, giving a side view of one of the slit-cutters.

Similar letters of reference indicate corresponding parts.

The construction of the box will be understood by referring to Figs. 3 and 4. Fig. 3 represents the end of the roll of paper, the piece marked off being sufficient for the bottom part of the box, the other part or cover being formed in the same machine and same manner. *a* are slits in the paper. *b* is the bottom of the box. *cc* form the sides; *dd*, the ends. The ends *dd* and sides *cc* are turned up at right angles with the bottom *b*, and then the flaps *ee* are folded onto the ends, which completes the box, as seen in Fig. 4.

This description will give an idea of what we do with this machine.

A is a roll of paper or straw board on a spindle supported by the arms B. The end of the paper is carried under the slitting-cylinder C, where the slits *a* are cut by the spring-cutters D. These cutters are pivoted to ears projecting from the ends of the cylinder, and are forced down into slots in the cylinder by the

cams E, which cut the slits *a*. The back motion of the cutters when they leave the cams is produced by the spiral springs F, which are attached to the bent rods G in the ends of the cylinder, (see Fig. 8, Sheet 3,) the operation being plainly seen in Fig. 9. The paper is carried from the slitting-cylinder upward to the base of the paste-box H, where it runs over the roller I, and under the pasting-roller J. K are small holes in the pasting-roller which receives the paste, and, as the roller revolves, delivers it onto the flaps *e*. L is an inverted box in the paste-box H, over the pasting-roller, which prevents the delivery of the paste except at the desired points. From the pasting-roller J the paper is carried under the cylinder M, and onto the "platen" N, the face of which is provided with small points O, which hold the paper in place over the mold ready for the plunger P. Q represents the mold or recess in the revolving cylinder R of the machine. The platens N work on the studs S, and are forced into the recesses Q against the spiral springs T of the studs, which turns up the sides *cc* of the box. Each plunger is preceded by a knife, *n*, which cuts off the paper for the box. The cylinder R is revolved between two stationary heads, V W, carrying plungers and knives, both of which are hinged or pivoted to the head-plate X of the cylinder R. The ends Y of the plunger-frame and the knives are carried around the cam Z of the stationary head-plate W, and down onto the cam Z'. This cam Z' throws the plunger-frame and the knife out to nearly a right angle with the face or periphery of the cylinder R, which position they retain until they are carried up to the opening X', when the plunger drops onto the paper on the platen, which position it retains while the cylinder is making nearly one-fourth of a revolution, the ends Y' being held by the recesses V' of the other head of the cylinder R. The ends Y' of the knives also enter these recesses V', being forced down when the knife cuts off the paper by the stationary cam U', attached to the head V. (See Fig. 2.) At each end of the recess Q there is a small vertical plate, T', which stands at right angles with the platens, which, as the platen is forced into the recess Q, turns up the end *d* of the paper. At each end of the recess there are also two

small hinged flaps or doors, S', with each a short arm, R', by which they are connected with rods Q', which rods are pivoted to the spring-bars P'. These bars work through the head of the cylinder R, and close the flaps or doors by means of cams O' on the stationary heads V W; but this latter operation is not performed until the plunger has forced the paper on the platen into the recess Q. As the paper is crimped by the plunger, the end of the spring-bar P' strikes the cam O', and forces the doors against the flaps e of the box, which completes the box as far as the form of the box is concerned; but immediately after the flaps e have been thus forced and stuck to the ends of the box, they are subjected to a pressure by means of the two pressure-bars, N', and the cams M' and adjustable rollers L'. This pressure of the ends of the box is simultaneously applied, and is increased or diminished by varying the position of the adjustable rollers L'.

I have ascertained by experiment that a pressure applied at this point sticks the flaps e tightly to the ends of the box, and is equivalent to drying the paste. This I deem a very important feature of the invention.

The plungers are attached to the rods K', which work through the plunger-frames. These rods are provided with friction-rolls J' on their ends. I' is a cam-plate attached rigidly to the stationary head-plates V W. The end H' of this cam-plate is turned up to receive the friction-rolls and force down the plungers for crimping the paper, as already described. After the ends of the box have been subjected to the pressure before referred to, the plunger-rods leave the cam-plate I'. The reaction of the spring T forces the platen from the recess Q, and leaves the box on the plunger. The box is detached from the plunger by means of

the staple-shaped "pusher" G', the back end of which strikes the stationary cam-plate F', which forces the pushers through the holes in the plunger, as seen in Fig. 6, and delivers the box from the machine. When the box is thus delivered, the plunger-frame is at about right angles with the face of the revolving cylinder R, as seen in Fig. 1, and it retains that position until it is carried round past the paper and cylinder M, ready to drop and repeat the revolution. The plunger and the knife in this manner are made to avoid the paper which is coming from the roll, as well as the cylinder M. This cylinder revolves on a spindle attached to the stationary head V, and is grooved as seen at E', that it may shun the edges of the knife-plates D', which latter are stationary in the sides of the molds Q of the cylinder R, the knife cutting with them like a shears.

The machine is driven by means of a pinion, (not shown,) which meshes into the gear-wheel C'. The shaft of the wheel C' extends through the center of the cylinder R, on the end of which is a gear-wheel, B', which is connected with a train of gear-wheels, A', by which the other parts of the machine are actuated, as seen in Fig. 1.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of slotted cylinder C, pivoted spring-cutters D, and cams E, operating together, as and for the purpose described.

2. The combination of the presser-bars N', rolls L', and cams M', as and for the purpose described.

WILLIAM GATES.

Witnesses:

J. F. SHELDON,
WM. B. GATES.