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APPLICATION FILED DEC. 2, 1901.

997,263.

Patented July 11, 1911.

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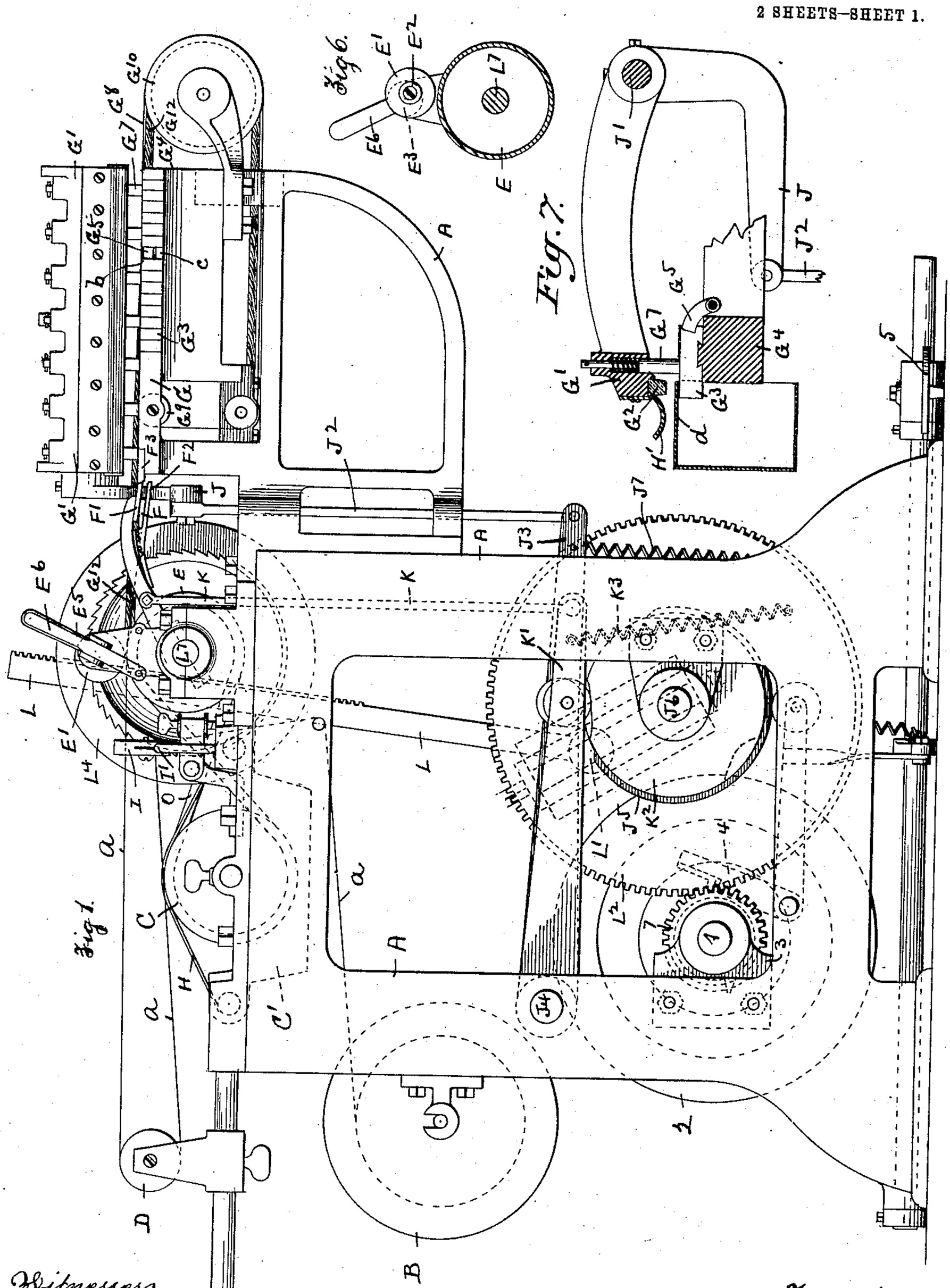

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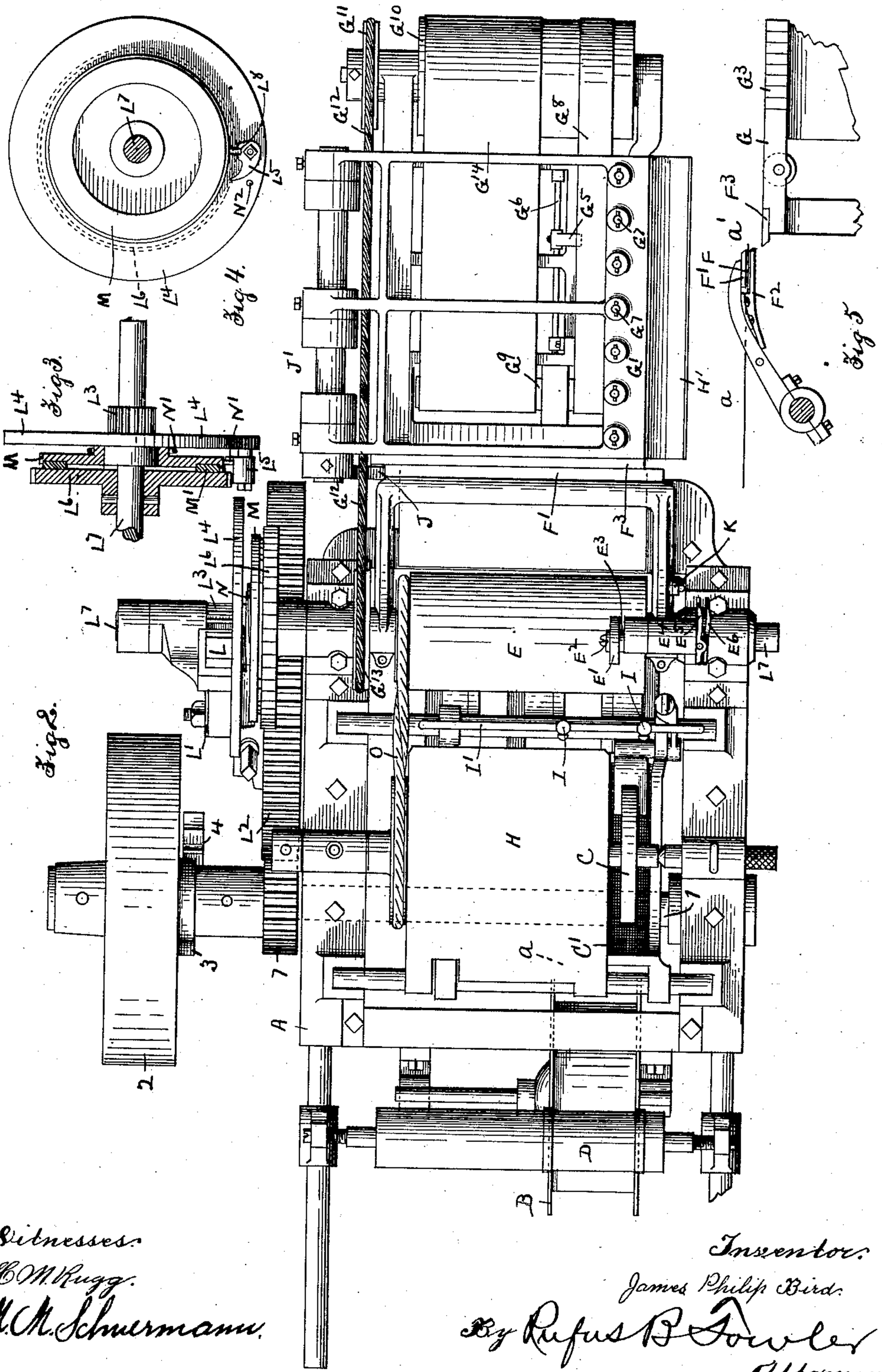

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UNITED STATES PATENT OFFICE.

JAMES PHILIP BIRD, OF WORCESTER, MASSACHUSETTS.

MACHINE FOR ATTACHING FLY-STRIPS TO PAPER BOXES.

997,263. Specification of Letters Patent. **Patented July 11, 1911.**

Application filed December 2, 1901. Serial No. 84,311.

To all whom it may concern:

Be it known that I, JAMES PHILIP BIRD, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Machines for Attaching Fly-Strips to Paper Boxes, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 is a side elevation of a machine, embodying my invention, for attaching fly-strips to boxes. Fig. 2 is a plan view of the same. Fig. 3 is a view, partly in section, of a portion of the feeding mechanism. Fig. 4 is a side view of that portion of the feeding mechanism shown in Fig. 3. Fig. 5 is a side view of the vibrating shear for severing the fly-strip and shown in its raised or highest position. Fig. 6 is a sectional view of the feed roll with an end view of the pressure roll held upon an eccentric stud, and Fig. 7 represents a portion of the pressing mechanism.

Similar reference letters and figures refer to similar parts in the different views.

My present invention relates to a machine for attaching fly-strips to the inside of a paper box and it comprises instrumentalities for applying adhesive material to one edge of a continuous fly-strip; means for feeding the end of the continuous strip to a pressing mechanism; means for severing the continuous strip into suitable lengths and means for applying sufficient pressure to secure the firm adhesion of the severed strip to the inside of the box; and my invention consists in the construction and combinations of parts as hereinafter described and set forth in the annexed claims.

Referring to the accompanying drawings, A denotes the framework supporting the operating parts of the machine.

B denotes a reel upon which is wound a continuous fly-strip *a*, Fig. 1.

C is a rotating gumming roller partially immersed in an adhesive material contained in a gum box C^1.

D denotes an idler roll around which the continuous strip is conducted as it passes from the gumming roll C to the feeding mechanism, said idler roll serving to bring the gummed surface of the fly-strip uppermost in position to allow the edge of the box to be applied thereto. From the idler roll D the continuous fly-strip *a* passes to the feeding mechanism consisting of a positively driven feed roll E and the narrow pressure roll E^1 preferably provided with a milled periphery and carried upon a stud E^2 projecting from the end of a spindle E^3 journaled in a bearing E^4 and provided at its outer end with a lever handle E^5 by which the spindle is turned in its bearing, said lever handle carrying a pivoted latch E^6 adapted to engage holes in the end of the bearing E^4, thereby allowing the spindle E^3 to be rocked a part of a revolution and locked in position. The stud E^2 carrying the pressure roll E^1 is eccentric to the axis of the spindle E^3 so that the rocking of the spindle E^3 will raise the pressure roll E^1 out of contact with the continuous fly-strip and stop its forward movement. As the continuous fly-strip is fed by the rotation of the feed roll E and pressure roll E^1, its advancing end will be pushed through the narrow opening or slit F between the movable shear blade F^1 and a lifting plate F^2, and over the stationary shear blade F^3 and over a horizontal table G having its upper surface in the plane of the stationary shear blade F^3. The movable shear blade F^1 consists of a plate carried by the free ends of swinging arms and the lifting blade F^2 is carried by the same swinging arms as the movable shear blade and is located a short distance below it. The fly strip as it is projected forward by the feed rolls enters between the movable shear blade and the lifting plate, the latter serving to raise the end of the fly strip above the plane of the table as the movable shear blade moves upwardly. The gummed edge of the fly-strip is interposed between the table G and a reciprocating presser bar G^1 located above and parallel with the table G and preferably provided with an elastic or yielding face G^2. The table G is extended by a series of blocks G^3 sliding on a dovetailed guide bar G^4, the needed number of blocks to equal in width the desired length of the fly strip are held against the end of the table G by means of a finger G^5 adjustably attached to a rod G^6. The table G coöperates with a series of yielding spring-actuated plungers G^7 carried in the presser bar G^1 and arranged to clamp the ungummed portion of the fly-strip against the table as the presser bar G^1 is oscillated. The ungummed body portion of the fly-strip projects over and rests upon a moving carrier belt G^8 held

upon rolls G⁹, G¹⁰, the shaft of the roll G¹⁰ carrying a scored pulley G¹¹ by which the carrier belt G⁸ is driven through a belt connection G¹² with a scored pulley G¹³ on the shaft of the feed roll E. A supplemental carrier belt G¹⁴ is also carried upon the rolls G⁹, G¹⁰ for the purpose of supporting fly-strips of great width.

The gumming roll C is a narrow roll arranged to apply adhesive material to one edge only of the fly-strip, the remaining portion of the fly-strip, as it passes over the gum box C¹, is supported upon a sheet metal cover H, and as the fly-strip leaves the gumming mechanism, it is conducted around the idler roll D from which it passes between the guides I, I adjustably held upon a horizontal rod I¹ by which the fly-strip is held in proper alinement with the pressing mechanism. The vibrating shear blade F¹ and lifting plate F² also serve as guides for the fly-strip which passes through the narrow opening or slit F which, during the feeding motion of the fly-strip, is maintained in the raised position shown in Fig. 5 with the slit F a short distance above the upper surface of the table G by which the end a^1 of the continuous fly-strip a is raised above the plane of the upper surface of the table G forming a gap or space between the end a^1 of the continuous fly-strip and the severed strip supported upon the table G wide enough to allow the introduction of the side of the box. During the feeding motion of the continuous strip, while the lifting plate F² is in its raised position, as shown in Fig. 5, the advancing end of the fly-strip falls upon the table G with a portion of its ungummed surface overlapping the carrier belt G⁸ which is driven by means of the belt connection G¹² at a slightly greater speed than the speed of the fly-strip as fed forward by the feeding roll E, so that the frictional contact between the carrier belt G⁸ and the fly-strip will exert a slight pulling strain upon the advancing end of the fly-strip to insure its forward movement over the table G as fast as it is delivered by the rotation of the feeding roll E.

When a sufficient length of the fly-strip has been projected over the table G to fit the inside of the box, the shear blade F¹ is depressed with a quick movement into the position shown in Fig. 1 coöperating with the fixed shear blade to sever the fly-strip and at the same instant the presser bar G¹ is depressed to bring the yielding plungers G⁷ against the severed fly-strip between its gummed edge and the edge of the carrier belt G⁸ and clamp the severed fly-strip firmly upon the table G in order to hold it from further movement and in proper registration with the side of the box when the latter is applied to the projecting edge of the table.

The severed fly-strip is held by the pressure of the yielding plungers G⁷ with one end coinciding with the cutting edge of the fixed shear blade F³ and with the opposite end coinciding with the edge b of the gap or space c formed in the table by the adjustment of the blocks G³. When held in this position the gummed edge of the severed fly-strip lies uppermost and the edge of a box side d is applied between the gummed edge of the fly-strip and the yielding face G² of the presser bar G¹ when a downward movement is given to the presser bar to pinch the box and fly-strip between the table G and the yielding face G² with sufficient pressure to secure the firm adhesion of the fly-strip to the inner surface of the box side d. Attached to the front edge of the presser bar G¹ is a curved sheet metal guide plate H¹ to facilitate the introduction of the box side between the pressing surfaces. When the pressing has been accomplished, the presser bar G¹ is raised to its highest position in order to elevate the yielding plungers G⁷ and provide a clear space for the introduction of the succeeding fly-strip which is then fed forward by the intermittent motion of the feed roll E. The successive movements of the pasting, feeding, cutting and pressing mechanism is accomplished as follows: The presser bar is given its proper reciprocating movement by means of an arm J attached to the rocking shaft J¹, by which the presser bar is carried, said arm J being connected by a link J² with the free end of a vibrating lever J³ pivoted at its opposite end J⁴ to the framework and actuated at the proper time by a suitable cam J⁵ carried upon a cam shaft J⁶, the cam roll of the lever J³ being held against it by a spring J⁷. The oscillating movement of the shear blade F¹ and lifting plate F² is accomplished in a similar manner by means of a link connection K with one end of a lever K¹ pivoted at its opposite end to the frame and actuated by a cam K² on the cam shaft J⁶ and a spring K³. An intermittent motion is given to the feed roll by means of a rack L carried upon a radially adjustable crank pin L¹ upon the side of the gear wheel L² on the cam shaft J⁶, by which an intermittent oscillating motion is imparted to the pinion L³ and attached disk L⁴. The disk L⁴ carries a driving pawl L⁵ engaging the teeth of the ratchet wheel L⁶ which is attached to the shaft L⁷ of the feed roll E. Between the disk L⁴ which turns upon the shaft L⁷ and the ratchet wheel L⁶ is a disk M provided with a friction surface M¹ held in contact with one side of the ratchet wheel L⁶ by means of a spiral spring N. The disk M carries in its periphery a pin N¹ which engages a notch L⁸ in the driving pawl L⁵ which is pivoted upon a stud held in the

disk L^4 so that a movement of the disk L^4 in one direction will cause the driving pawl L^5 to be rocked on its stud by means of its engagement with the pin N^1 and carry it into engagement with the teeth of the ratchet wheel and cause the rotary movement of the plate L^4 to be imparted to the shaft L^7. The movement of the disk L^4 in the opposite direction will cause the driving pawl L^5 to be rocked on its stud to disengage the pawl from the teeth of the ratchet wheel and throw it against a fixed stud N^2 carried by the disk L^4.

The method of imparting an intermittent motion to the feed roll E forms no part of my present invention as the mechanism for driving the feed roll is substantially the same as that shown and described in Letters Patent of the United States for a machine for securing flies to boxes, issued to me March 13, 1906, Number 815,003. The rolls supporting the carrier belt G^8 are driven by a belt connection G^{12} from the shaft L^7 but at a slightly increased speed and the gumming roll is driven at a reduced speed from the shaft L^7 by means of a belt connection O. Power is applied to the main driving shaft 1 by means of a belt pulley 2 and a clutching connection is provided between the shaft and belt pulley by which the shaft 1, when engaged by the clutch, makes one complete revolution and automatically disengages itself from the rotating pulley 2 by the contact of a projecting lip 3 with a stop lever 4 interposed in the path of the lip 3 and withdrawn therefrom by the operation of a foot treadle 5; the clutching mechanism being of the wellknown type known as the "Horton clutch" and fully described in Letters Patent of the United States Number 260,394, granted to James A. Horton July 4, 1882. Power is communicated from the shaft 1 to the shaft J^6 by means of the pinion 7 and spur gear L^2. The gear L^2 is supplied with a radially adjustable crank pin L^1 of the common and wellknown form of construction by which an intermittent, oscillating motion is given to the feed roll E as above described. The radial adjustment of the crank pin L^1 varies the angular movement of the feed roll E and consequently the length of the feeding movement of the fly-strip.

The operation of the machine is as follows: The continuous fly-strip *a* carried upon the reel B is conducted across and in contact with the gumming roll C by which adhesive material is applied to one edge of the fly-strip. From the gumming roll C the fly-strip is conducted around the idler roll D between the feed roll E and pressure roll E^1 and through the slit F between the lifting plate F^2 and the movable cutting knife F^1, in position to be fed forward over the table G and beneath the presser bar G^1 and spring-actuated plungers G^7. A rotary movement is imparted to the feed roll E sufficient to project the end of the continuous strip *a* over the table G far enough to form the fly-strip for the box. When the feeding movement of the continuous strip has been accomplished, the movable shear blade F^1 is depressed past the stationary shear blade F^3, thereby severing the strip lying on the table G from the continuous strip. At the moment of severing the strip, the presser bar G^1 is depressed to bring the yielding plungers G^7 against the severed fly-strip and hold it firmly in contact with the table. The movable shear blade F^1 and lifting plate F^2 are then raised to carry the end of the continuous strip far enough above the upper surface of the table G to allow the box to be inserted between the end a^1 and the severed fly-strip. One side of the box is then placed between the gummed edge of the fly-strip and the elastic face G^2 of the presser bar. A second downward movement is then given to the presser bar causing the box to be firmly pressed against the gummed edge of the fly-strip when the presser bar is then raised, releasing the box and attached fly-strip which are removed, leaving room for the next forward feeding movement of the continuous fly-strip *a*.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a machine for attaching fly strips to boxes, the combination with intermittent feeding and cutting mechanisms whereby a continuous fly strip having one of its edges gummed is fed and severed, of stationary means for supporting the gummed edge of the severed fly-strip, and a movable member for supporting the ungummed portion of the fly strip.

2. In a machine for attaching fly strips to boxes, the combination with intermittent feeding and cutting mechanisms whereby a continuous fly strip having one of its edges gummed is fed and severed, of a supporting table, a movable belt resting on and covering a portion of said table, means for moving said belt in the direction of the feeding movement of the fly strip but at a higher rate of speed, and a presser bar coacting with the uncovered portion of said table.

3. In a machine for attaching fly strips to boxes, the combination of means for gumming one edge of a continuous fly strip, a supporting table arranged to receive said gummed strip, a movable belt covering a portion only of said table, means for moving said gummed strip into position with its ungummed surface over said belt and with its gummed surface over the uncovered portion of said table, and means for severing said gummed strip in said position.

4. In a machine for attaching a fly strip to a box, the cutting mechanism comprising

a stationary shear blade and a movable shear blade and a lifting plate carried by said movable shear blade by which the end of a fly strip is raised above the plane of the severed strip.

5. In a machine for attaching a fly strip to a box, the combination with a box supporting table and mechanism for feeding a continuous fly strip over said table, of a movable belt covering a portion of said table, means for moving said belt in the direction of the movement of the continuous fly strip but at a higher speed, means for severing the fly strip, and means for raising the end of the continuous strip above the plane of the strip severed therefrom.

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