(No Model.) 4 Sheets—Sheet 1.

W. ORR, Jr. & G. F. WRIGHT.

MACHINE FOR MAKING PAPER BOXES.

No. 67,669 Patented Aug. 13, 1867.

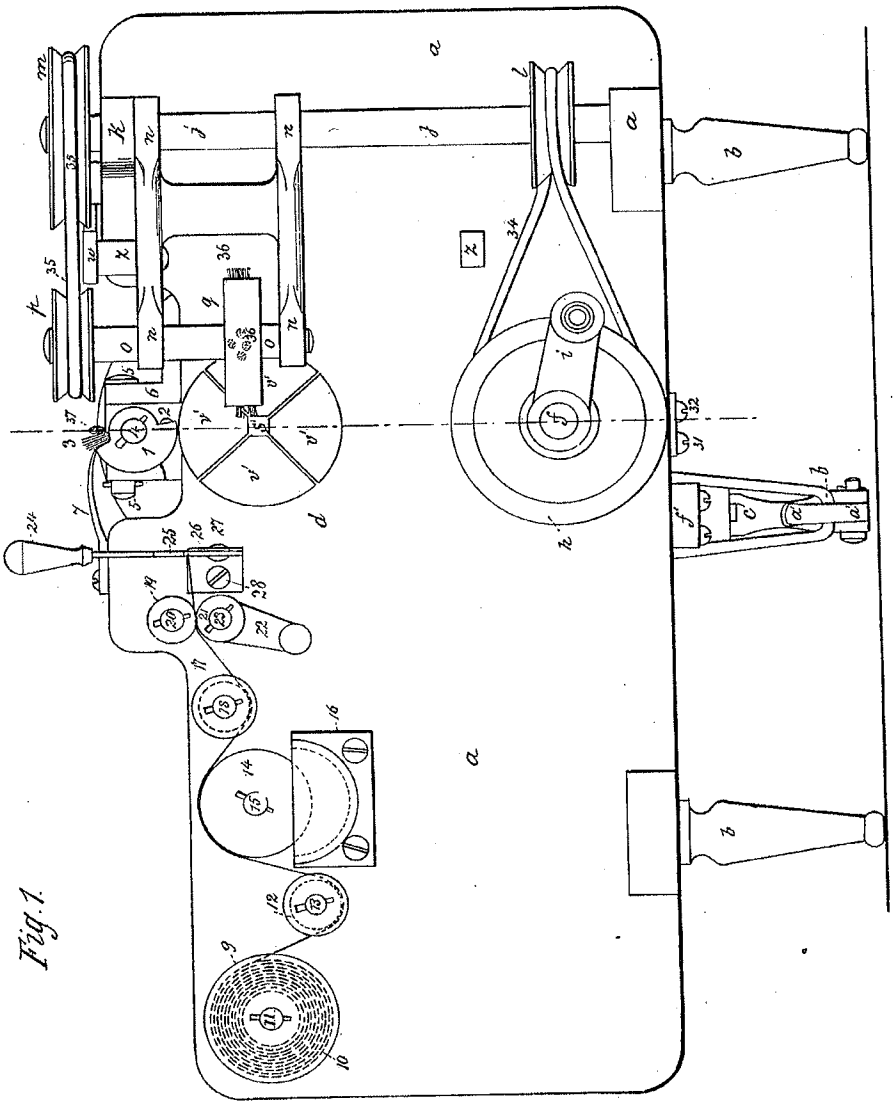

Fig. 1.

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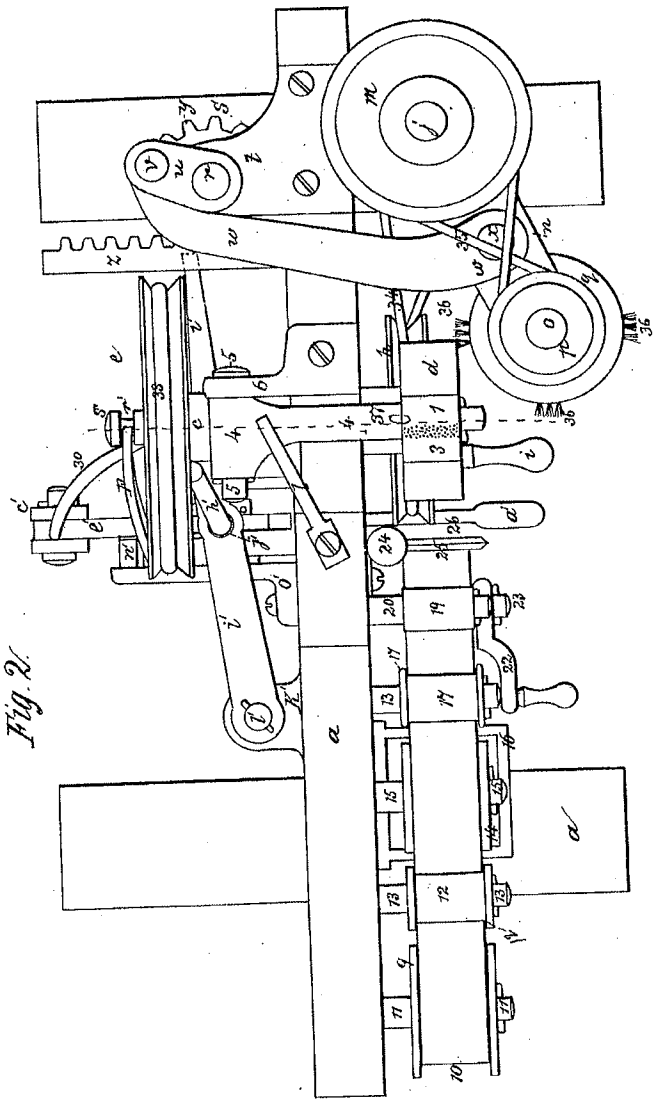

Fig. 2.

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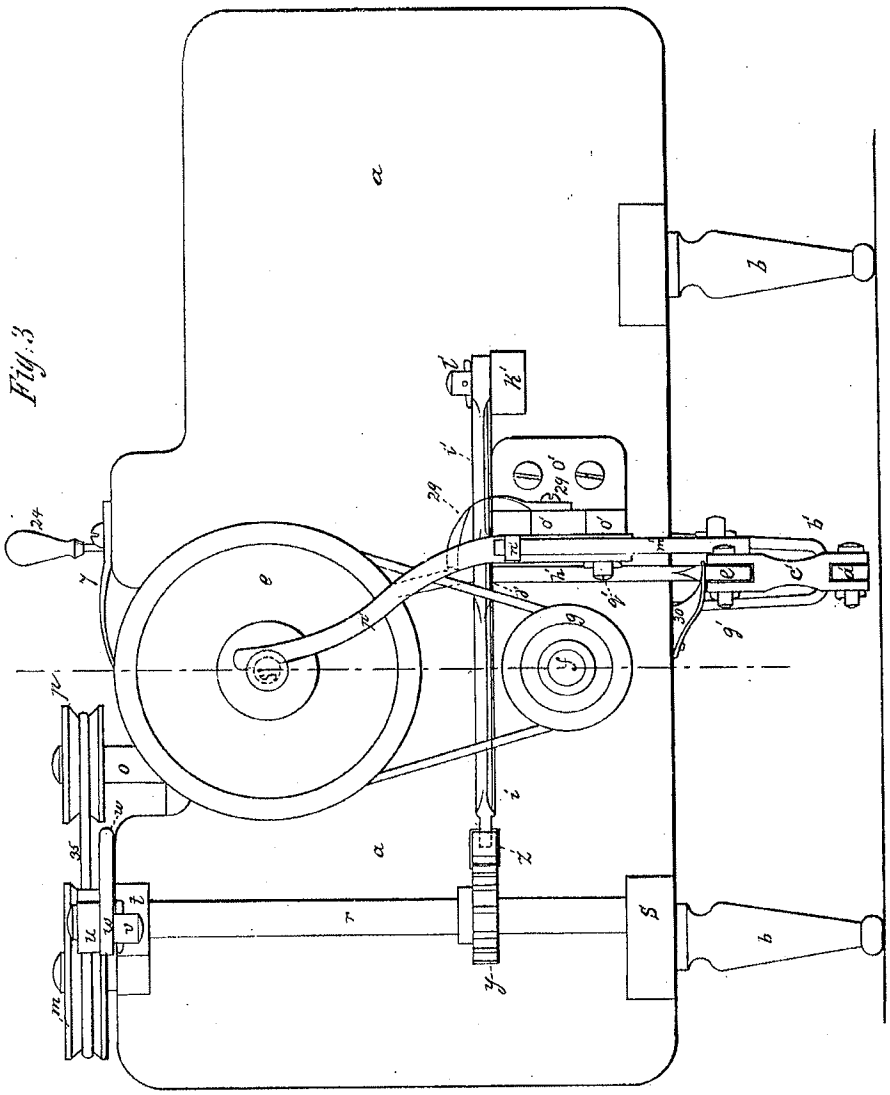
Fig. 3



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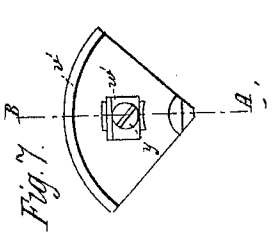

Fig. 7.

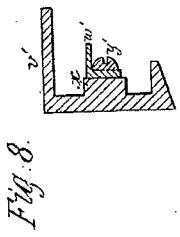

Fig. 8.

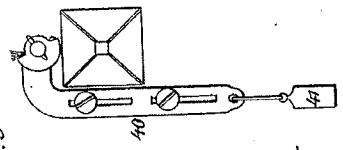

Fig. 9.

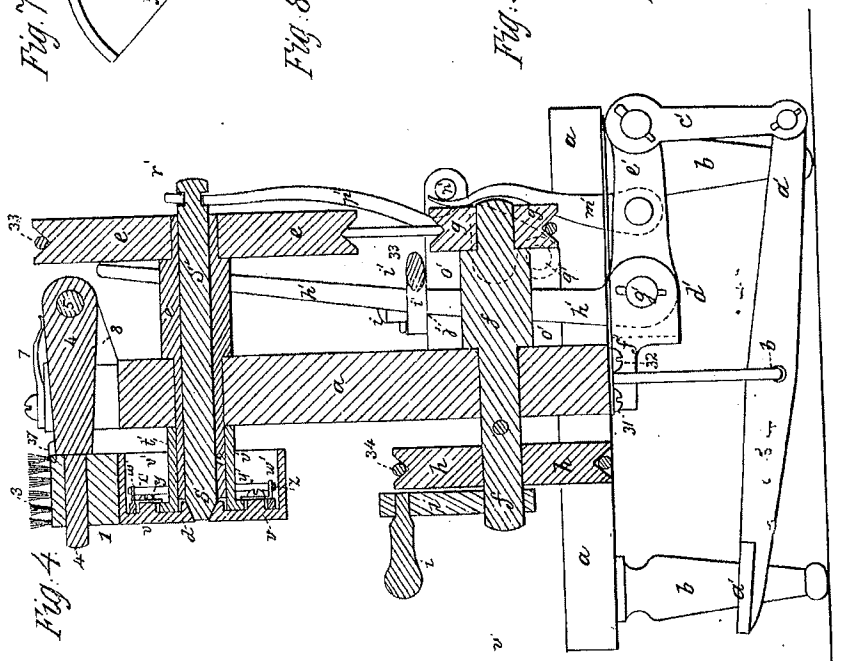

Fig. 4.

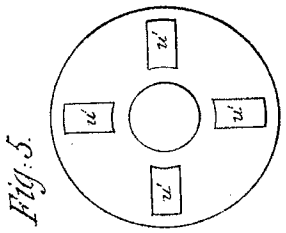

Fig. 5.

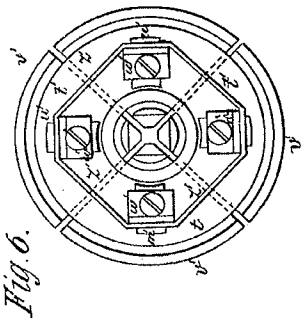

Fig. 6.

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IMPROVEMENT IN MACHINES FOR MAKING PAPER BOXES.

Specification forming part of Letters Patent No. 67,669, dated August 13, 1867.

To all whom it may concern:

Be it known that we, WILLIAM ORR, Jr., and GEO. F. WRIGHT, of Clinton, county of Worcester and State of Massachusetts, have invented new and useful Improvements in Machinery for the Manufacture of Paper Boxes; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The present invention relates to certain new and useful improvements in machines for covering boxes, of any suitable foundation, with paper; and consists, first, in the use of a novel and peculiarly-constructed box-holder, so arranged and operated as to hold the box firmly, and revolve while the machine is in motion; second, in the use of a continuous roll of paper, of the proper width to cover the box, and a pasting device, over which the paper is drawn, also, a device to sever the paper when it is wound around the box; third, in the use of a rotary brush, sustained and operated in a swinging frame, for the purpose of laying the paper on the bottom of the box.

There are also other improvements in the detail, construction, and arrangements of the present machine which will be hereinafter particularly described.

In the accompanying plates of drawings, we have represented our improvements, reference being had to the same in the following descriptions, of which—

Figure 1, Plate 1, is an upright front view; Fig. 2, a plan or top view; Fig. 3, Plate 2, an upright back view. Fig. 4 is a cross vertical section; Figs. 5, 6, 7, and 8, detail views of the box-holder, hereinafter referred to.

a a represent an upright stand, supported on legs *b b*, through which a hollow shaft, *c*, passes, having upon one end, and on the front of the machine, an expansive box-holder, *d*, or its equivalent, on which the box-frame, of pasteboard, or its equivalent, is placed to be covered with paper. This shaft has upon its other end the grooved pulley *e*, or its equivalent. *f* is a shaft passing through the stand *a a* in the same vertical plane as the shaft *c*, having a grooved pulley, *g*, or equivalent, in the same vertical line as the grooved pulley *e*, and on the opposite and front end a grooved pulley, *h*, and a crank, *i*. In front of the stand *a a* is an upright shaft, *j*, supported at the lower end by the foot of the stand *a a*, and at the top by the projection *k*, having on the lower part, and opposite the pulley *h*, a grooved pulley, *l*, and upon the upper end the grooved pulley *m*. Fitted loosely upon the shaft *j* is the swinging frame *n*, having supported in it the shaft *o*, with a grooved pulley, *p*, on a level with the pulley *m*, and at the lower part is the rotary brush *q*. On the back side of stand *a a*, Fig. 3, Plate 2, is the upright shaft *r*, supported in the step *s* and projection *t*. On the upper end of the shaft is the crank *u*, with a wrist-pin, *v*, and a connecting-bar, *w*, spanning from the pin *v* to the pin *x* in the swinging frame *n*. On the shaft *r* there is also a segment-gear, *y*, and a rack with corresponding cogs *z* plays in the same and through the stand *a a*, as will be hereafter described. *a' a'* is a treadle, turning on a fulcrum at *b'*, attached to the stand *a a*, and extending under the same. It has attached to its inner end by a pivot-joint (or in any other manner suitable) a vertical rod, *c'*, extending upward, and attached by a pivot-joint to the horizontal arm *e'* of the triangular lever *d'*, Fig. 4, supported by a pivot, *z'*, in a projection, *f'*, attached to the under side of the stand *a a*, and the vertical arm *h'* of same passes through the horizontal lever *i'* at *j'*. One end of lever *i'* is attached to stand *a a* by the projection *k'* and pivot *l'*. The other end is attached to the rack *z* by a simple mortise in the rack and tenon on the end of the lever. *m'* is a peculiar-shaped vertical lever, attached to the horizontal arm *e'* of the lever *d'*, and resting against the pin *n'* in the projection *o'*, attached to the back side of stand *a a*. *p'* is a vertical lever attached to the projection *o'* by the pivot *g'*, and resting against the upper and curved end of the lever *m'*. The upper end of same is fitted in the groove *r'* at one end of the rod *s'*, which rod passes through the center of the hollow shaft *c*, and has its opposite end beveled off on four sides, which acts as a wedge vertically and horizontally upon the four sides of the expansive box-holder *d*.

Figs. 5, 6, 7, and 8, are detail views of the box-holder *d*. Fig. 5 is a front view of the face-

plate t' without the expansive sections $v' v' v' v'$, showing the slots in which the expansive sections slide.

Fig. 6 is a back view of face-plate, with the expansive sections $v' v' v' v'$ upon it. Fig. 7 is a back view of one of the sections $v' v' v' v'$. Fig. 8 is a vertical section of Fig. 7 through the dotted lines A B.

$w' w'$ are triangular pieces of metal attached to the projection x' of the sections $v' v' v' v'$ (see Fig. 8) by a screw, $y' y'$, whose head will overhang the slots $u' u'$ in the face-plate, Fig. 5. z' is an endless rubber cord, extending around on each of the triangular pieces $w' w' w' w'$ to draw the sections $v' v' v' v'$ toward the center. 1 is a segment, weighted at one side by the lead weight 2, Fig. 1. Opposite the weight is a brush, 3, which extends beyond the segment 1. This segment is hung upon a lever, 4, which lever is made to swing upon the pivot 5, attached to the projection 6, Figs. 1 and 2, upon the stand a a. 7 is a spring, one end being attached to the stand a a, and the other end bearing upon the lever 6. 8 is a wedge-shaped projection on the under side of the lever 6, Fig. 4. 9 is a spool, upon which a long strip of paper is wound, (represented by the blue dotted lines 10.) This spool is made to revolve upon the stud 11, attached to the stand a a. 12 is a flanged guide-roll made to revolve upon the stud 13. 14 is a paste-roll, made with fine grooves cut in its surface, and revolves upon the stud 15. The lower part of this roll runs through the paste in the trough 16. 17 is a flanged guide-roll, made to revolve upon the stud 18. 19 is a pressure-roll, covered or made of rubber or any other elastic or metallic substance, and made to revolve upon the stud 20. 21 is a fluted metallic roll, upon which the roll 19 is made to press tightly. It has attached to its outer end a crank, 22, and revolves upon the stud 23. 24 is the handle on one blade of the shears 25, which is attached to lower blade 26 by the rivet 27, and the whole attached to the frame a a by the screw 28.

Having described the manner in which the devices comprising our machine are arranged, we will now proceed to describe how the same operate together.

Pressing down the outer end of the treadle a' by the foot, or in any other manner, the opposite end being connected with the lever d' by means of the rod c', the arm e' of the triangular lever d' is raised, and the upper end of the vertical arm h' is thrown forward against the wedge-shaped projection 8 on the under side of lever 4, and lifts the brush 1 from the box-holder d. The same motion of the lever h', passing through the horizontal lever i' at j', brings forward the lever i', and with it the rack z, which revolves the gear y, and shaft r, and crank u, which being connected to the swinging frame n by the connecting-rod w the frame is made to swing open and away from the box-holder d. The raising of the arm e' of the lever d' raises also the curved-shaped lever m', which, by its peculiar shape, bearing against the pin n' and the lever p' to press forward the rod s', is, by this upward motion, moved away from the lever p', thus allowing the same to be pressed back by the force of the spring 29, attached at one end to the stand o'.

The lever p' being connected with the rod s' at r', the rod s' is thrown back, and the four sections of the expansive box-holder are drawn toward the center by the elastic band 2'. The box-frame of pasteboard or any suitable foundation is then placed upon the box-holder d. The covering-paper to be wound and pasted upon the box-frame, being previously cut to a suitable width and long enough to cover two or more boxes, and wound upon a spool, is placed upon the stud 11, the paper passing under the guide-roll 12 and over the paste-roll 14, which paste-roll passes through the box 16, containing the paste. A sufficient quantity of paste or glue is thus carried to the under side of the paper, to prepare it for winding upon the box-frame. The paper then passes under the guide-roll 17 and between the fluted metallic roll 21 (to which is attached the crank 22) and the pressure-roll 19. The attendant turns the crank 22, and the rolls 19 and 21, revolving upon the studs 20 and 23, draw the paper from the spool in the course just described, and it moves forward between the jaws of the shears 25 and 26 to the box-frame upon the box-holder d, and is laid upon the box-frame. The attendant then removes her foot from the treadle a', and the outer end of the arm e' of the lever d' is pressed down by the force of the spring 30, attached at one end to the stand a by the screws 31 and 32, and the other end resting against the outer end of the arm e', which process draws down the curved lever m', which, bearing against the pin n' and the lever p', forces the rod s' forward to expand the movable sections $v' v' v' v'$ of the box-holder d in the inside of the box-frame to hold it firmly. The same motion of the treadle also throws back the upper end of the vertical arm h' of the lever d', thus allowing the brush and segment 1 and 3, attached to the arm 4, to bear upon the covering-paper as laid upon the box-frame upon the box-holder d, with its weighted part down, the weight 2 being sufficient to keep that part of the segment down only when revolved by the motion of the box-holder as it revolves.

The same motion of the treadle a' and the triangular lever d' carries back the lever i' and rack z, and, revolving the gear y, causes the swinging frame n to come back to its original position. The attendant then turns the crank i, which revolves the pulleys h and g and the shaft f, which, by the use of the belt 33, revolves the box-holder d, upon which is the box-frame with the end of the paper attached, as before described, being held on firmly by the segment 1. The belt 34 around the pulleys h and l revolves the vertical shaft j and pulley m, which, by the use of the belt

35 and pulley *p*, the brush-wheel *q* and the shaft *o* are made to revolve.

The covering-paper, being wider than the box-frame, it overhangs toward the front, and is doubled down toward the center of the box on the bottom of same by the brushes 36 36 36 set in the brush-wheel *q*. As the box is revolved, the segment 1 rolls down the covering-paper until the brush 3 comes in contact with the covering-paper, and the weighted side of the segment comes in contact with the pin 37 in the lever 4. The segment then remains in this position, and the brush drags on the paper to lay it closely to the box-frame.

When the attendant has caused the box-frame to make one revolution, she then cuts the covering-paper by the use of the shears 24, or their equivalent, and the rotary motion continued until the end thus made is wound upon the box. The attendant now puts her foot upon the treadle *a'*, and the segment 1 is raised, the swinging frame thrown open, and the expansive box-holder allowed to contract. The box is now easily removed, and another frame put in its place.

From the above description it will be seen that much time will be saved by the use of our machine, as one, two, or more strips of paper may be pasted and wound upon the box-frame, and laid over upon the bottom of the same, also severed from the roll, all at the same time.

Heretofore the paper has been obtained only in sheets for covering paper boxes. We are having it finished so that we can cut it into long rolls of proper widths to cover the boxes, and attach these rolls to our machine, thus saving much time and waste over the old system.

These and the other advantages of our machine we have endeavored to make apparent, and they apply not only to machines for making round boxes, but any regular shape, as square or six or eight sided. (See, Fig. 9, a plan of adjusting a brush-segment for square boxes.) The brush-segment is attached to a sliding bar, 40, which moves up or down to accommodate any difference there may be in the size of the box, or to allow the brush-segment to travel over the corners of the box. Pressure is given to the segment by means of a weight, 41, or its equivalent.

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

1. The expansive holder *d*, made of two or more adjustable sections, in the manner and for the purpose specified, for round, square, or any other shaped box.

2. The combination of treadle *a'*, levers *d'*, *m'*, *i'*, and *p'*, rack *z*, and gear *y*, when used in connection with the expansive holder *d*, in the manner and for the purpose specified.

3. The swinging frame *n*, when used in the manner and for the purpose specified.

4. The revolving brush *q*, or its equivalent, when used in the manner and for the purpose specified.

5. The pressure-roller 19 and 21, when used in the manner and for the purpose specified.

6. The segment-brush 1, when used in the manner and for the purpose specified.

7. The combination of the treadle *a'*, the triangular lever *d'*, the levers *m'*, *p'*, and *i'*, the rack *z*, and pinion *y*, and swinging frame *n*, the revolving brush *q*, expansive holder *d*, segment-brush 1, the continuous strip of paper 10, guide-rolls 12 and 17, paste-roll 14, and rolls 19 and 21, shears 25 and 26, arranged and constructed as herein described, and operating substantially as and for the purpose set forth.

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