H. & J. DOUGLAS.

Making Cop Tubes.

No. 95,670. Patented Oct. 12, 1869.

Fig. 1.

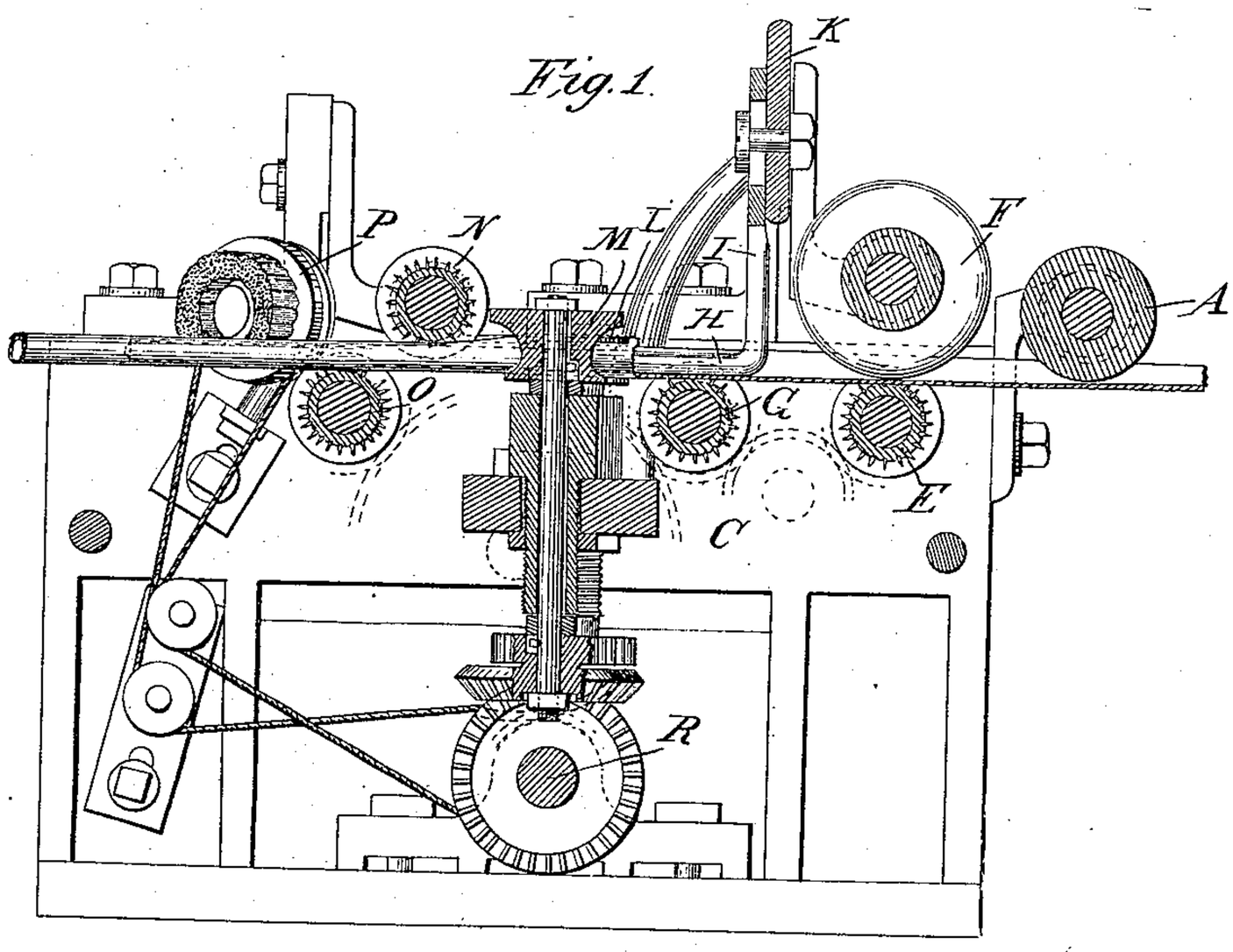
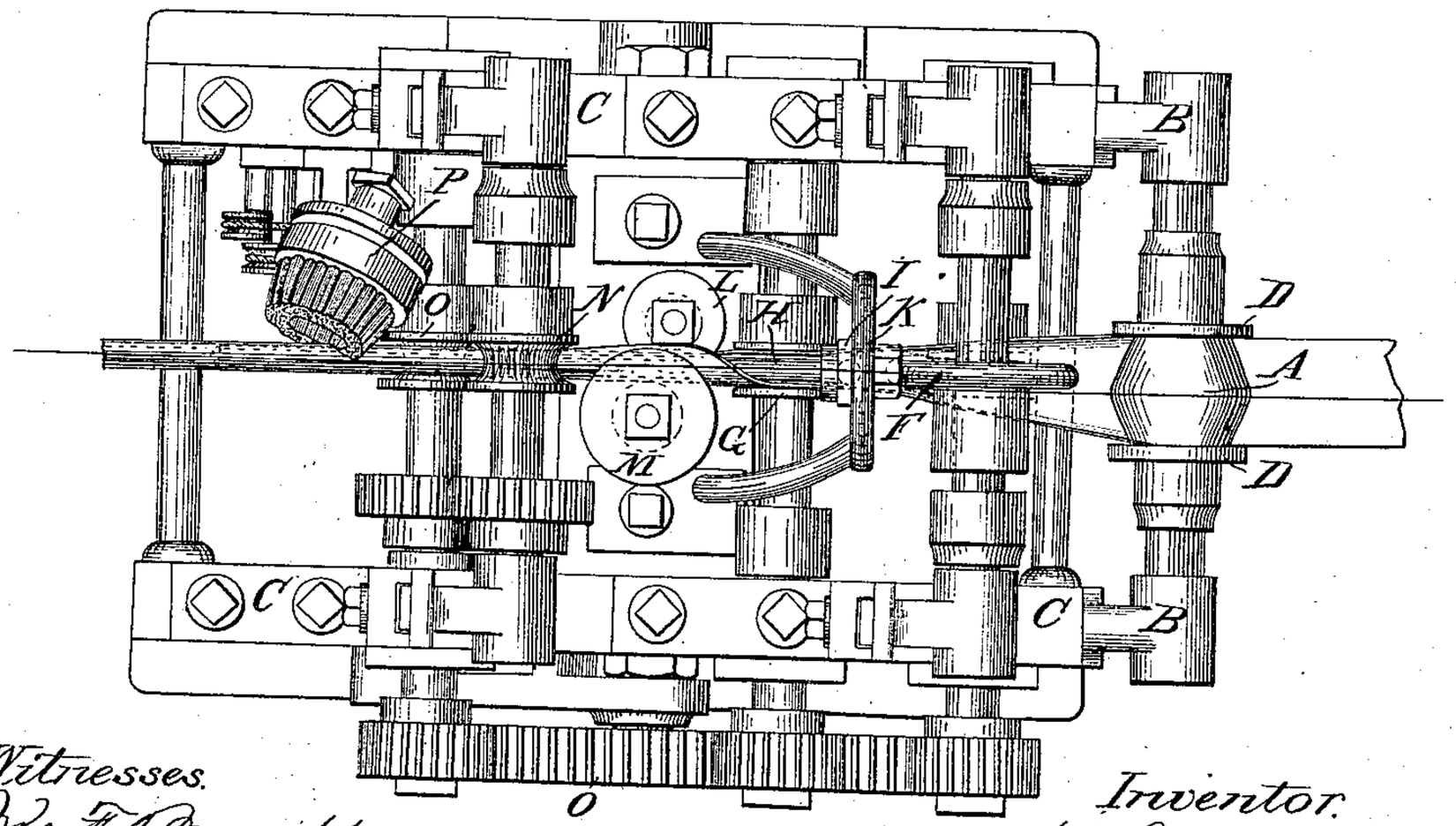


Fig. 2.



Witnesses.

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HENRY DOUGLAS AND JAMES DOUGLAS, OF GLASGOW, SCOTLAND

Letters Patent No. 95,670, *dated October* 12, 1869.

IMPROVEMENT IN MACHINE FOR MAKING COP-TUBES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, HENRY DOUGLAS and JAMES DOUGLAS, of Glasgow, in Scotland, have invented a new and improved Machine for Making Cop-Tubes; 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.

This invention relates to new and useful improvements in machinery for making cop-tubes, whereby it is designed to provide more efficient machines than those now in use.

The invention consists in an arrangement of forming-rollers, a forming-mandrel, and a finishing-brush, as hereinafter specified.

Figure 1 represents a longitudinal sectional elevation of our improved machine, and

Figure 2 represents a plan view of the same.

Similar letters of reference indicate corresponding parts.

The strips of paper to be formed into tubes are first wound upon reels, which are so arranged relatively to the machine which is the subject of this application, that the said strips may be passed over a paste or dressing-roller, and under the bending-roller A, placed in suitable bearings, B, at the front ends of the housings C, which also support the other working-parts.

This roller A is provided with two guiding-collars, D, between which it is shaped in the form of two cones, with their bases joining centrally between the collars.

By this form, the paper strips, which are drawn under the said roller with considerable tension, are bent downward, at the centre, to some extent, which is the first step in the forming-operation.

From this roller, the paper strip passes to a pair of rollers E F, which stand a little to one side of the centre of the roller A, the object of which is to provide for forming the lap properly, as will hereafter appear.

The roller E, which is at the bottom, is grooved, and the roller F, which is larger than the roller E, has a convex face working into the groove of the said roller E, bending the strip therein, and further bending it into form, producing the curvature for one side of the required tube.

From these rollers, the strip passes into the groove of another roller G, similar in size and shape to the roller E.

In the groove of this roller, a horizontal forming-mandrel, H, is arranged, being suspended adjustably from a bracket, K, by a vertical extension, I.

This former has the form and size required for the interior of the required tubes.

Beyond the roller G, a pair of horizontally-revolving grooved rollers L M are arranged, to further bend the flaps of the strip, which now stand nearly vertical over the mandrel.

The roller L, which stands on that side where the flap is narrowest, stands the lowest and slightly in advance of the other, so that its upper flange presses the flap down close upon the mandrel, while the upper flange of the other roller, M, for the wider flap, stands considerably above the mandrel, and projects over it, so as to bend the said wide flap over as far as possible.

From these rollers, the strip passes into a pair of vertically-revolving grooved rollers N O, which roll the flaps down completely, and beyond these is arranged, upon an axis oblique to the mandrel, a brushing-roller, P, which brushes the upper wide flap down upon the other, completely joining them and causing the paste to permanently unite the edges at any places which fail to become permanently united by the action of the rollers.

A short distance beyond the brush, the mandrel terminates, but the tube is carried by suitable grooved carrying-rollers through a drying-oven, for drying the paste, and as it emerges from the oven, it is cut into the proper lengths, by shears suitably arranged and operated.

These rollers are serrated or roughened in their grooves, to cause them to adhere to the tubes, to insure the regular and uniform feed through the machine.

The rollers E, G, N, and O, are driven by suitable gearing, deriving motion from a crown-wheel, Q, gearing with the driving-shaft R; the rollers A and F are revolved by the friction of the paper strips; and the horizontal rollers M L are arranged upon vertical shafts gearing with the said main shaft.

We do not, however, desire to limit ourselves to any particular arrangement of operating gearing.

Good results may be obtained without the use of the initial roller A, and we propose, in some cases, to dispense with it.

Having thus described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the mandrel H, adjustable arm I, and bracket K, as and for the purpose set forth.

2. The combination of a mandrel H and supporting-roll G with a pair of folding-rolls L M, constructed as described, and arranged respectively with reference to the narrow and wide flaps of the tube.

blank, and to operate upon each, to fold one end of the material under the other, in the manner described.

3. The combination, with the preliminary and finishing-folders L, M, N, O, and mandrel H, all operating together as described, of a brushing-roller P, acting upon the tube at an angle to its line of movement, and causing the contiguous pasted faces of the flap edges to coincide and adhere at every point, as set forth.

The above specification of our invention signed by us, this 10th day of August, 1869.

HENRY DOUGLAS.
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Witnesses:
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