

(No Model.)

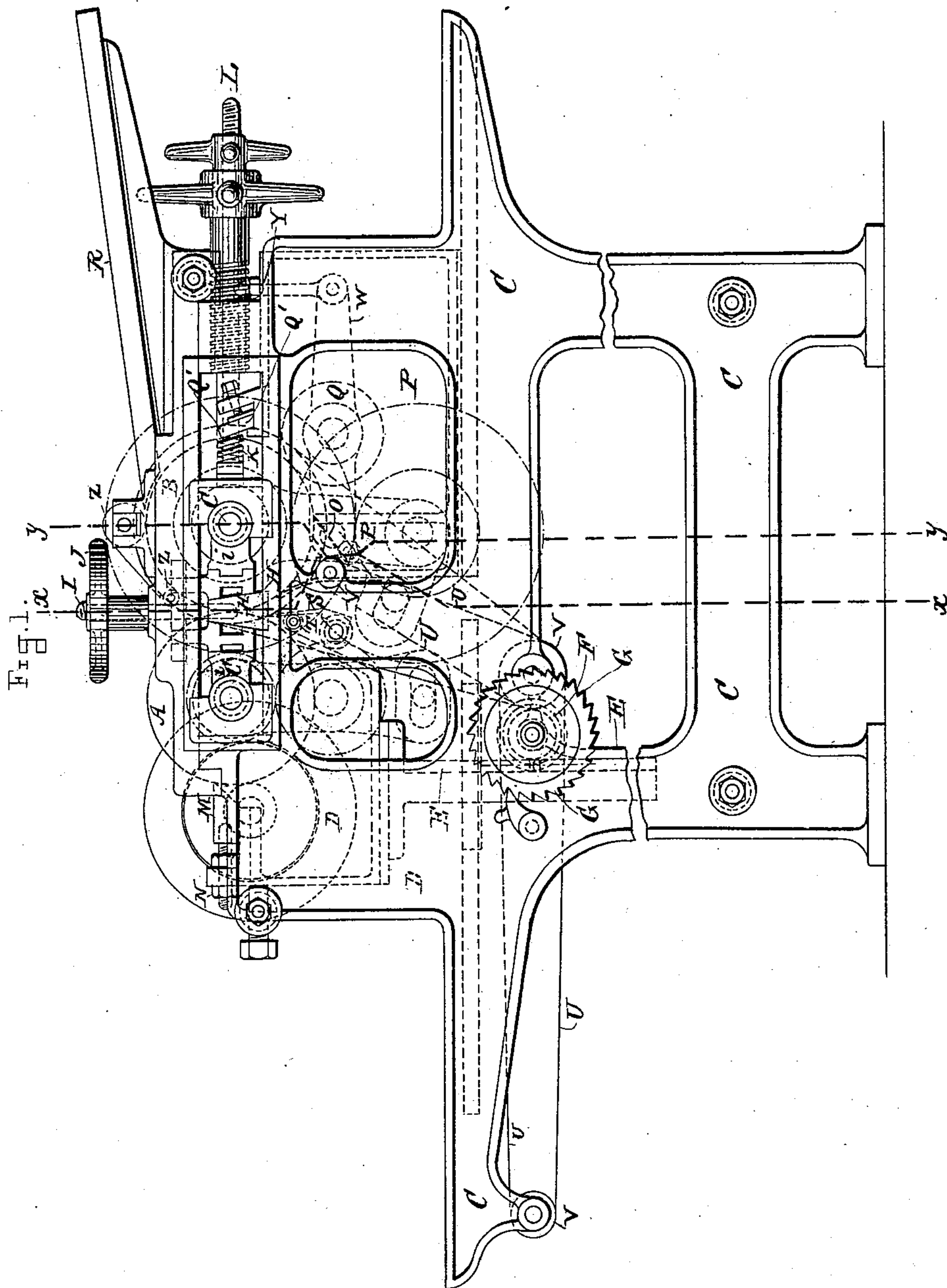
4 Sheets—Sheet 1.

T. FURNIVAL & G. DANIELS.

GUMMING MACHINE.

No. 308,353.

Patented Nov. 25, 1884.



Witnesses.

Walter S. Dodge.
R. S. Ferguson.

Inventors.

THOMAS FURNIVAL,
GEORGE DANIELS,

by Dodge & Son,
Attys

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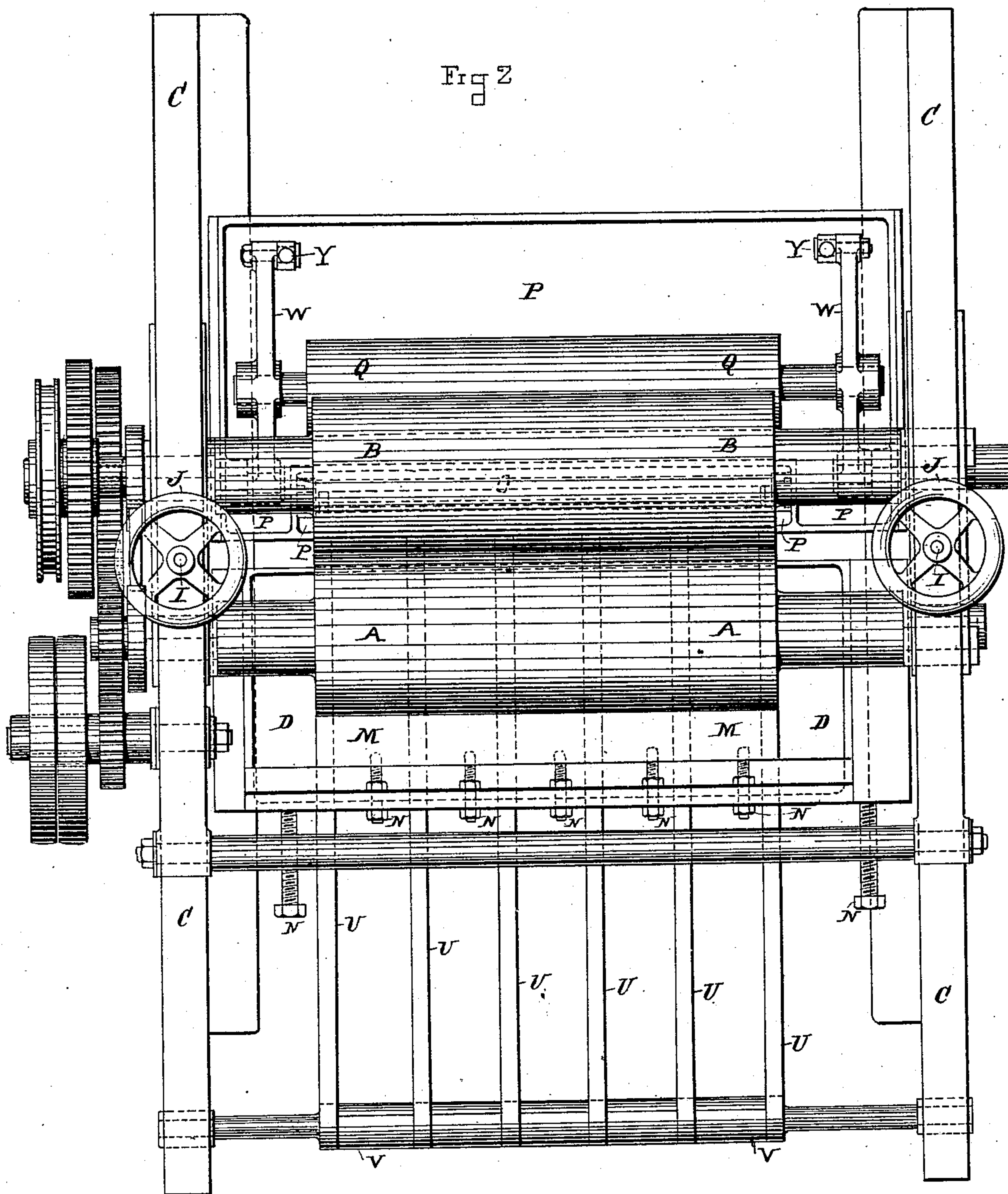
4 Sheets—Sheet 2.

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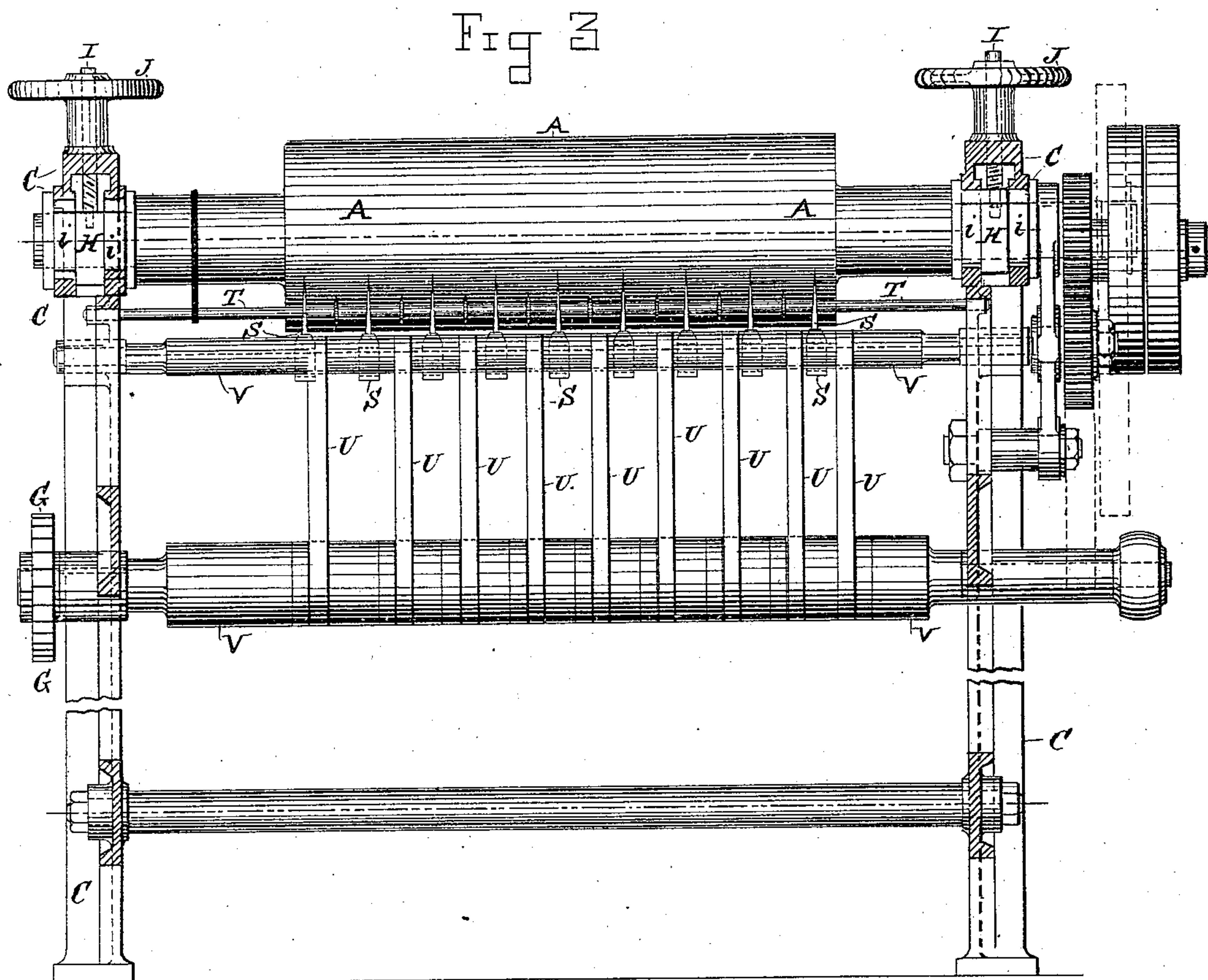
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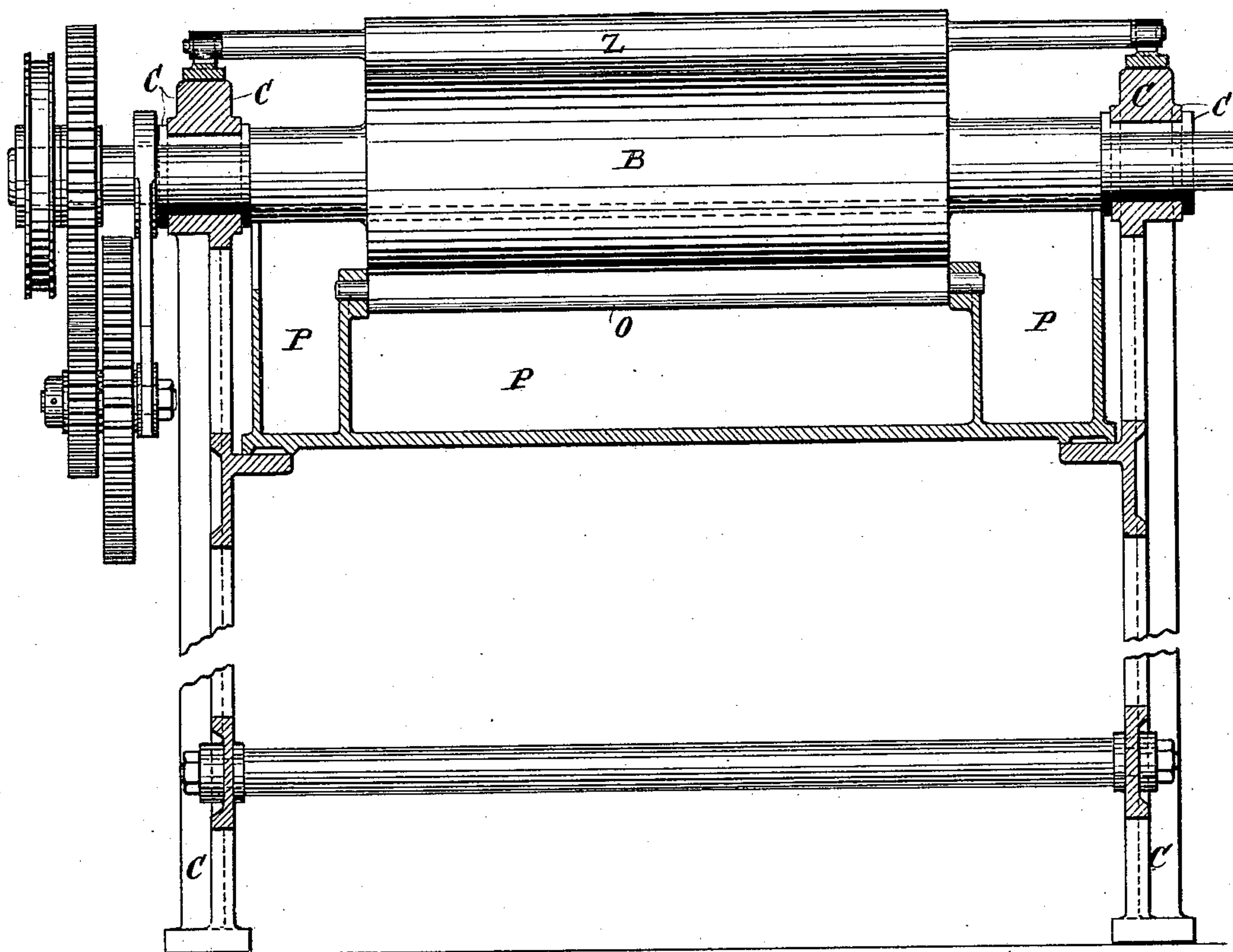
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Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS FURNIVAL AND GEORGE DANIELS, OF REDDISH, COUNTY OF LANCASTER, ENGLAND.

GUMMING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 308,353, dated November 25, 1884.

Application filed July 19, 1884. (No model.)

To all whom it may concern:

Be it known that we, THOMAS FURNIVAL and GEORGE DANIELS, both of Reddish, Lancaster county, England, have invented certain
5 Improvements in Gumming-Machines, of which the following is a specification.

The object of this invention is to provide a machine which will lay or spread upon sheets or rolls of paper and the like a thin layer of
10 varnish, gum, or other liquid or viscous material. It is best described by aid of the accompanying drawings, in which—

Figure 1 is a longitudinal elevation of the machine; Fig. 2, a plan; Fig. 3, a sectional elevation on line *x x*; Fig. 4, a sectional elevation on line *y y*.

In the drawings A B are two main metallic cylinders or rollers mounted in bearings upon suitable framing, C. The axes of these two
20 cylinders are maintained parallel to each other, and they are preferably in the same horizontal plane, and the two cylinders equal in size.

Below the roller A, hereinafter called the “varnishing-roller,” is placed a trough, D,
25 containing the varnish (gum or other liquid) to be applied to the surface of the paper. In the liquor in this trough roller A is partially immersed; but, if desired, the liquid could be fed to it by a subsidiary roller revolving in
30 the liquid. There is no advantage, however, in this arrangement, except in those rare cases where a sheet has to be gummed in a series of narrow streaks, leaving parts between bare, then using a subsidiary grooved roller or series of rollers with washers between is a
35 useful plan. The trough D is raised into and lowered out of position by screws, or, preferably, by means of a pair of racks, E, and pinions F, held in position by ratchet-wheel G.
40 The surface of the impression-roller B may be adjusted in the following manner to revolve at any required distance from that of the varnishing or gumming roller A, to regulate the thickness of the coating of varnish or gum, and allow for the thickness of the paper under
45 operation in the following manner: Between the journals of the two cylinders is placed a wedge, H, which is raised and lowered by a screw, I, to which it is attached.
50 This may be placed with broad end either

above or below, but preferably with the broad end below and the thinner edge pointing upward. A handle, J, to turn the screws, may be placed over each wedge, or two screws may be connected together by gearing to work synch-
55 ronously when one handle is operated. *i i* are a pair of casings with sloping sides in each side of the wedge, into which the bearings are tongued and grooved, as shown, and supported on a horizontal slide on frame. The
60 object of these blocks is to present perpendicular surfaces to the bearings and complementary sloping surfaces to the wedge. This fills up the space between the bearings without making them or the screw of too heavy a
65 build, and without bringing upon the bearings the vertical resultant of the pressure of the screw. The bearings of the varnishing or gumming roller A are preferably bolted im-
70 movably to the framing, and those of the impression-roller B adjusted to slide thereon, and held to their work or against the wedge by means of a spring, K. This secures a yielding pressure upon the paper. Of course the bearings of the varnishing or gumming roller
75 might be made movable and those of the impression-roller fixed; but it is preferred to have them as described. A screw, L, is used to advance or withdraw the roller from its work. This screw works in a screwed nut in
80 the frame, as shown, so that by screwing the nut in or out greater or less pressure can be put on the spring, and by manipulating the screw itself the maximum distance between the bearings can be regulated. A doc-
85 tor-scraper, M, formed of metal, or, if desired, a small roller, is applied to the surface of the varnishing or gumming roller to regulate the amount of the liquid adhering to the roller. This doctor or roller is adjusted
90 by screws N behind it, so as to regulate the thickness of the aperture between it and the roller A, and so as to leave only the requisite film of gum or varnish to cover the paper to the required degree.

To remove any of the varnish or gum that may be deposited on the impression-roller B, there is placed in contact with its under surface a metal or india-rubber scraper, O, which scrapes the liquid off into the front division of
95 100

trough P, placed for the purpose. After passing this scraper the roller comes in contact with a sponge or pad kept moist with water (if the machine be used for gumming) or with a solvent, if used for varnish or other material. This liquid is kept in the second division of trough P, the object of using two divisions being to save the strong gum or varnish scraped off by the doctor separate from the washing solution. The washing solution removes all traces of the varnish or gum. The sponge or pad is preferably cylindrical, as shown in the drawings at Q, and is caused to revolve in an opposite direction or at a differential speed from roller B, so as to have a frictional contact with the surface of the impression-roller. This sponge or pad revolves partially immersed in the liquid in trough P. This sponge-pad may be stationary. A rotary motion is not necessary in the sponge, as it might have a reciprocating motion.

To remove the moisture left on the impression-roller by the sponge, an india-rubber scraper or doctor, Q', is made to press tightly against its surface, thus leaving a dry and clean surface to receive the paper on the next revolution. The rotary pad is kept to its work by being supported on levers V V, which are pivoted at X, and adjusted by screws Y at their other ends, so as to regulate the pressure of the pad against the impression-roller. This pad can be run at a differential speed to the roller by gearing from the roller to the pivot of lever W, and from there to the revolving pad.

Above the impression-roller are placed two small pulleys or rollers, L L, over which, or on tapes or a band on which, the sheets of paper are guided from the table R to rollers A and B. The paper is passed down between the two cylinders at the speed at which the impression-roller B revolves, and as the varnishing or gumming roller is caused to revolve at a greater speed, or has a greater surface-speed, (at least four times as much,) the liquid adhering to it is laid on the paper with an even coat. A transverse reciprocating movement could be given to one or both of the cylinders, if required.

To remove the paper from the varnishing or gumming roller, a number of thin steel points or fingers, S, abut against the roller and lift the sheets away. These fingers are assisted by a small revolving ridge-roller, T, or rod armed with a series of sharp steel wheels, which raises and passes the paper on to traveling tapes U, which are led over a series of rollers, V V. The paper is then removed by an assistant and placed in drying-room, or a long traveling band or table may receive it and carry it away.

We claim as our invention—

1. In a gumming or varnishing machine, a gumming or varnishing roller, A, geared to go at a greater circumferential speed than the impression-roller B working against it, by

which means the gum or varnish is more evenly spread, substantially as described.

2. In a gumming or varnishing machine, a gumming or varnishing roller, A, applied directly to the paper partially immersed in the gum or varnish, in combination with an adjustable scraping device—such as a doctor or roller—to scrape off the superfluous fluid, whereby an even stream of varnish is applied to the paper, substantially as described.

3. In a gumming or varnishing machine, the combination of a roller, A, conveying the gum or varnish to the paper, and a roller, B, over which the paper is fed, the two rollers being at an adjustable distance apart, just sufficient to admit the paper and requisite thickness of the fluid, substantially as described.

4. The method of insuring an even layer of gum or varnish on paper, which consists in feeding the paper between a carrying-surface and a gumming or varnishing surface traveling forward at a greater speed than the carrying-surface, the two surfaces being such a distance apart that only the requisite thickness of film can pass between the two surfaces along with the paper.

5. The process of gumming or varnishing sheets or webs of paper, which consists in feeding the paper against the gumming-surface in such manner that the paper shall be fed through at a less speed than that at which the gumming-surface travels, but in exactly regulated close contact with it, whereby the liquid adhering to the gumming-surface is laid on the paper in an even and uniform coat.

6. In combination with the roller-bearings of a machine, such as described, for gumming or varnishing paper or other sheet or piece of fabric, the wedge H, for regulating the distance apart of the rolls, and a device for pressing those bearings toward each other, substantially as described.

7. In combination with the wedge H and the bearings of the rollers of a varnishing-machine, a pair of blocks, i i, with sloping surfaces next the wedge, at an angle complementary to the angle of the wedge, and supported on horizontal slides in the frame, whereby the horizontal resultant of the thrust of the screw is conveyed to the bearings, but not the vertical thrust.

8. In combination with the varnish or gum trough of a varnishing or gumming machine, a rack-pinion and ratchet apparatus for raising or lowering it in place, substantially as described.

9. In combination with the impression-roller B of a gumming or varnishing machine, the india-rubber scraper O, for scraping off the waste varnish or gum into one trough, and the washing-pad working against the roller in another trough, substantially as and for the purposes described.

10. In combination with the impression-roller B, the washing-pad Q, revolving against

its surface, and the drying india-rubber scraper Q', for the purposes described.

11. The process of cleaning the carrying or impression roller from waste gum or varnish, which consists in causing it to pass successively against a scraping device, scraping the bulk of the material off, a washing device supplied with a solvent of the material (gum or varnish) used, and a wiping device scraping off from the roller the film of liquid still adhering, substantially as described.

12. In combination with the impression-roller B, the two pulleys or rollers L L, for the purposes described.

13. In combination with the gumming-roller of a gumming or varnishing machine, a series of fingers, S, taking the sheets off from the wet varnished surface, and the ridge-rollers T, lifting them in turn from the fingers and delivering them onto tapes U, substantially as described.

14. The method of removing the sheets from the adhesive surface of the gumming or varnishing rolls, which consists in passing a sharp surface between the paper and the rolls, and then relieving this sharp surface of the paper by means of a series of projecting traveling ridges having such minute surface exposed to the paper that there is not sufficient adhesion for the paper to stick to them, and therefore it falls off into a suitable carrier, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS FURNIVAL.
GEORGE DANIELS.

Witnesses:

WILLIAM HENRY PEACOCK,
EDWD. TUDOR, Jr.