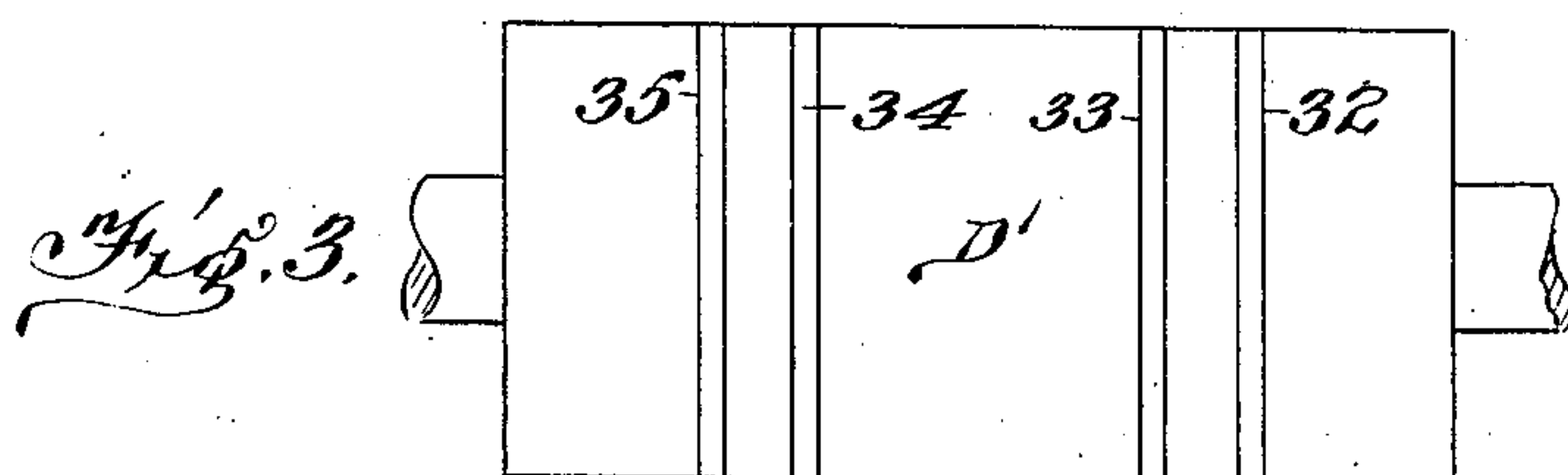
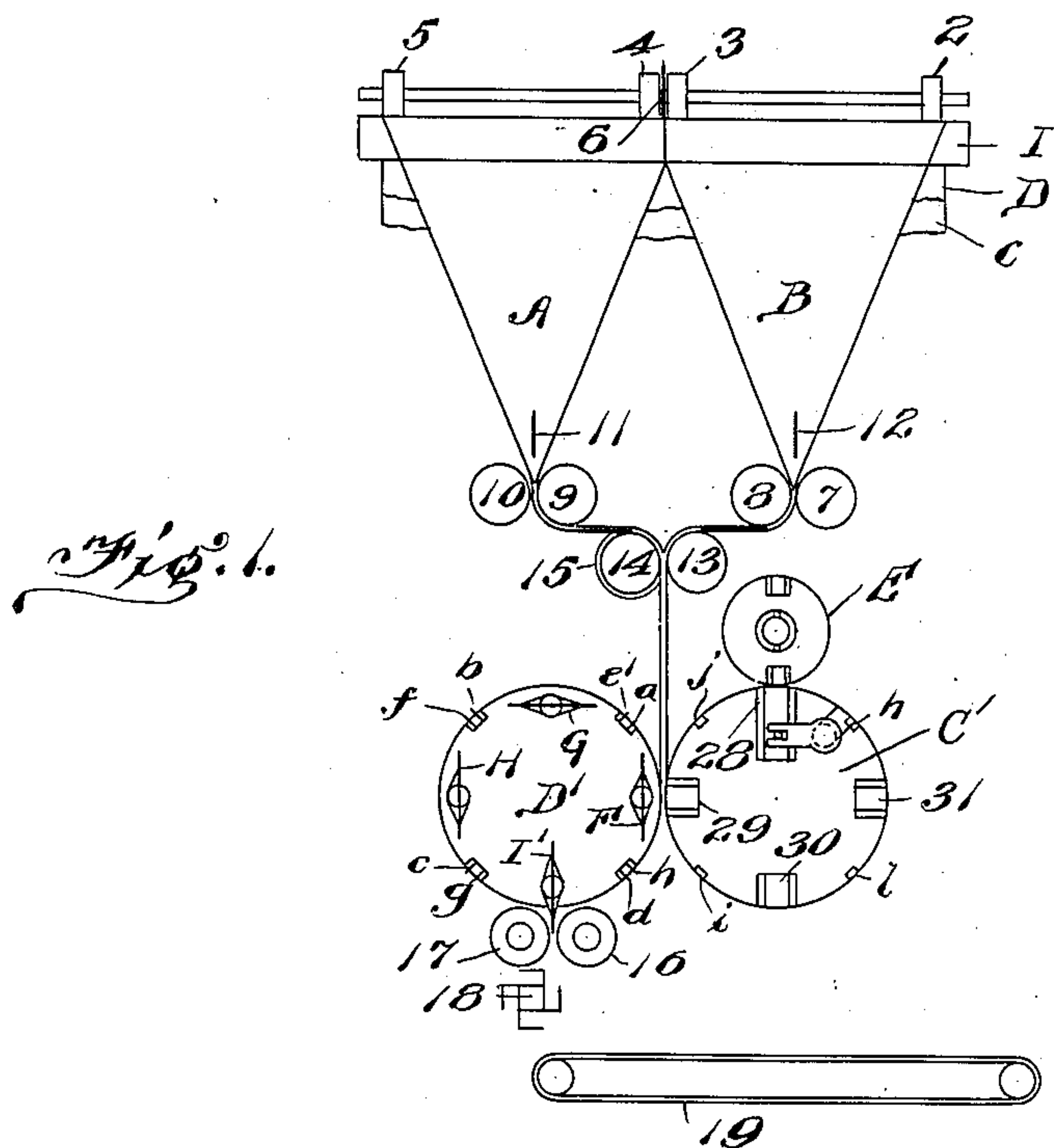


J. L. FIRM.
STAPLING MECHANISM.
APPLICATION FILED MAR. 29, 1909.

945,507.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.



Witnesses

Geo L. Thom
Harold Mcgrew

Inventor
Joseph L. Firm.

By

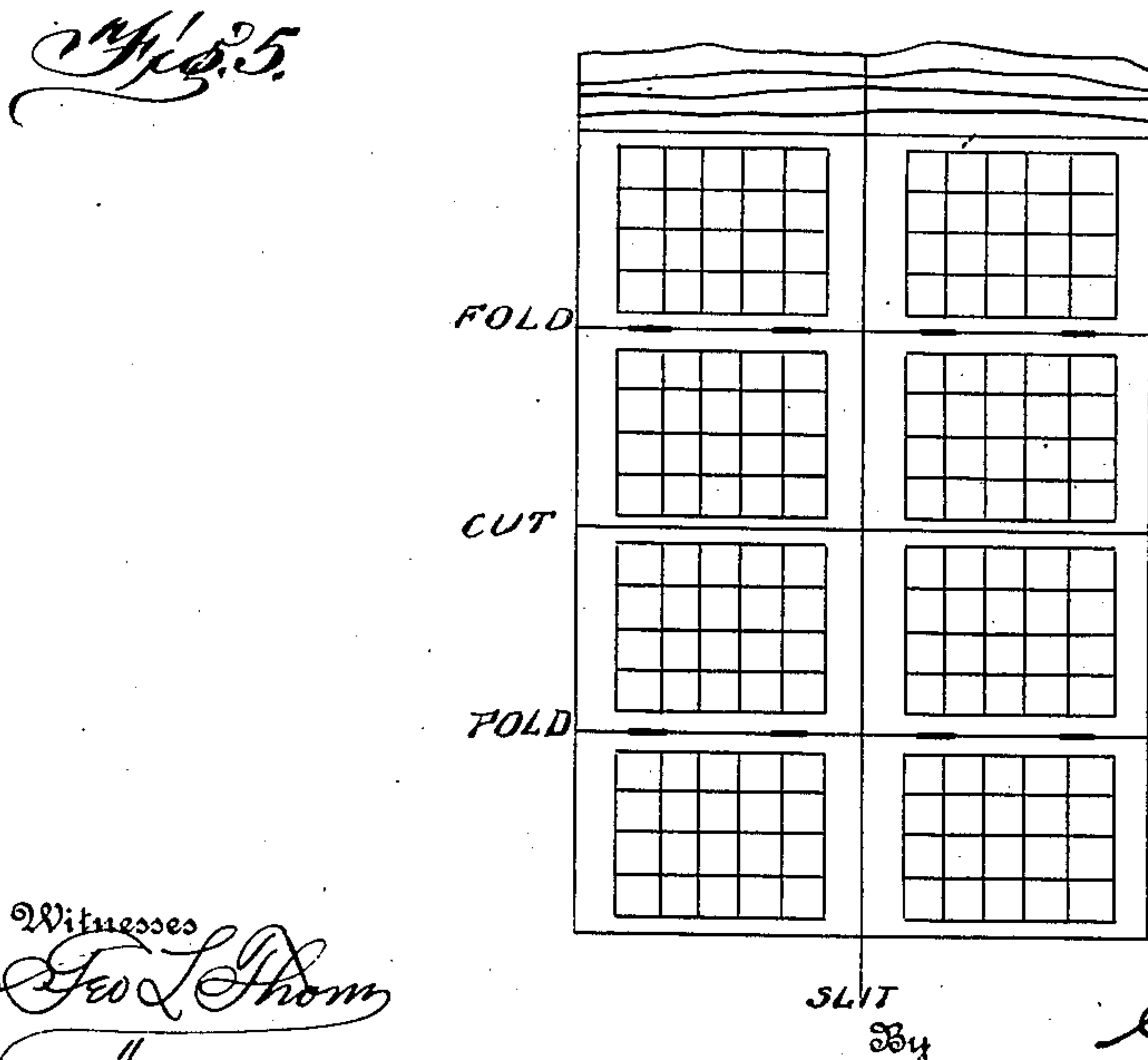
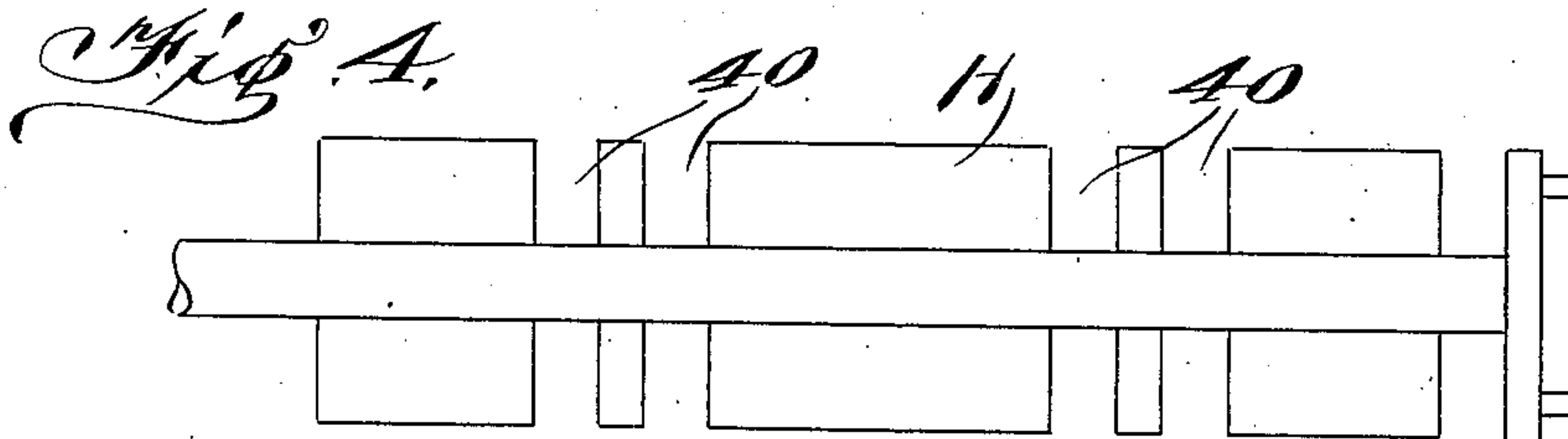
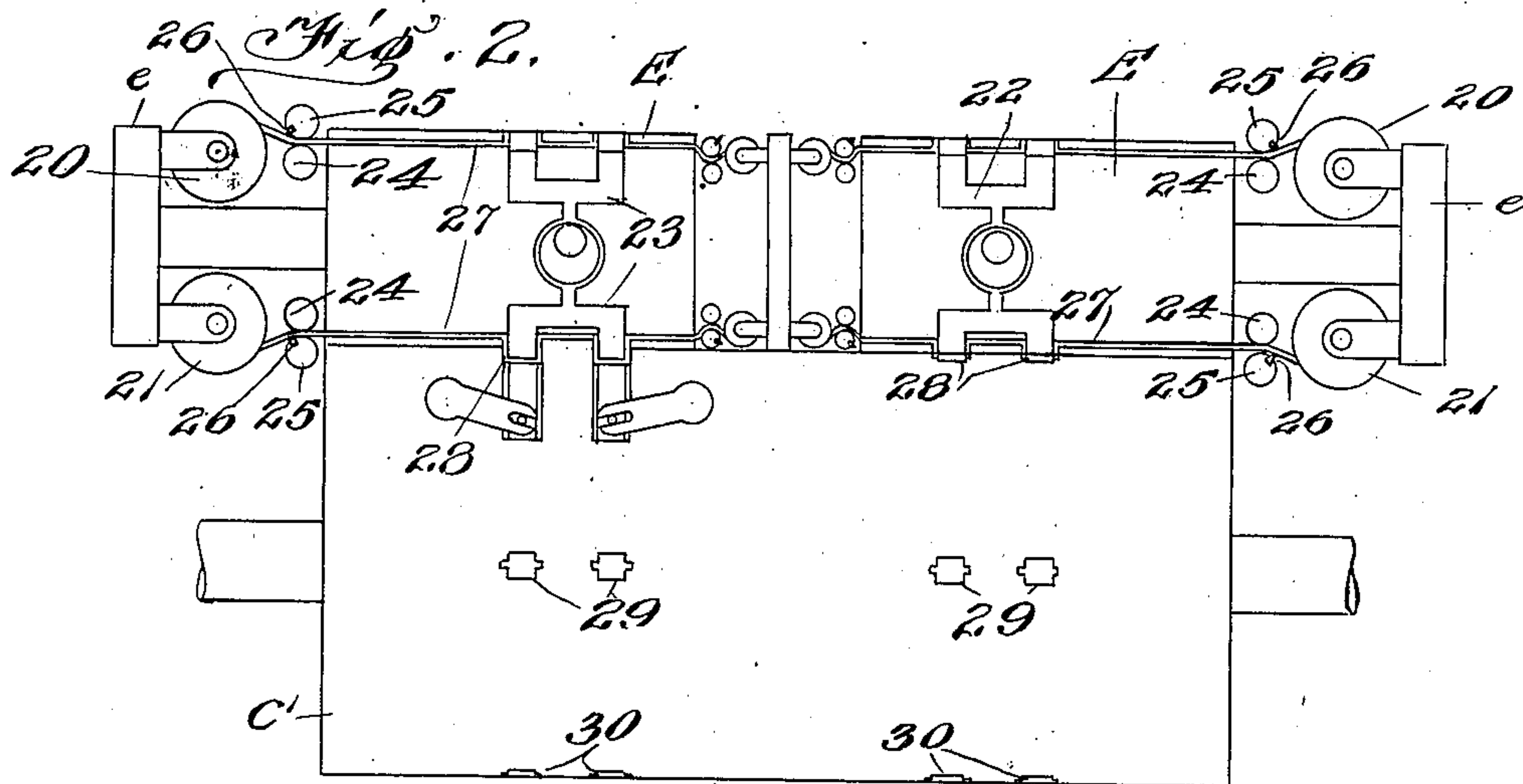
W. E. Tew
Attorney

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2 SHEETS—SHEET 2.



Witnesses
Geo L. Thom
" *Harold Megrew*

Inventor
J. L. Firm.

Geo. E. Tew
Attorney

UNITED STATES PATENT OFFICE.

JOSEPH L. FIRM, OF BERWYN, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS.

STAPLING MECHANISM.

945,507.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed March 29, 1909. Serial No. 486,496.

To all whom it may concern:

Be it known that I, JOSEPH L. FIRM, citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stapling Mechanism, of which the following is a specification.

In my pending application, No. 483,237, filed March 12, 1909, there is disclosed a stapling mechanism for binding pamphlets from a rotary printing machine, the arrangement therein disclosed being particularly applicable for stapling a plurality of pamphlets formed by superposed webs which are slit along longitudinal lines, but not longitudinally folded, the axes of the staple forming and setting rolls being parallel to the axes of the form and impression cylinders of the rotary printing machine. The present invention covers the use of a similar stapling mechanism with axes at right angles to the cylinders of the press, a plurality of pamphlets being produced by longitudinally folding a set of webs and slitting the same, whereby the size of the product is increased with respect to the number of pages, as compared to the mechanism disclosed in said pending application. The present case utilizes the idea of a plurality of stapling devices with double devices for making two staples and inserting the same at a single operation, and completing a plurality of pamphlets at each operation. All the disadvantages due to the use of paste or glue are avoided, and the stapling devices always move in the same direction as the run of the webs, whereby a high degree of speed can be obtained. The products are all bound together before being transversely cut and folded, and no tapes or guides are needed to insure the travel of the webs to the delivery. The web printing mechanism is adapted to print a plurality of webs, which are then longitudinally slit and folded, then cut transversely on the leading margin, then stapled on a transverse line, then folded on the same line after they are severed, and thence delivered to a rotary fly and a delivery apron.

In the accompanying drawings—Figure 1 is a diagrammatic end elevation, partly in section, showing longitudinal folders and the stapling rolls. Fig. 2 is a diagrammatic elevation of the stapling former and drum. Fig. 3 is a diagrammatic elevation of

the carrier roll with the ribs for clenching the staples. Fig. 4 is an elevation of one of the folding blades showing openings for passing the ribs. Fig. 5 is a plan of the product.

In Fig. 1, A and B are longitudinal folders at the end of a printing mechanism not shown. The webs C and D pass over the roller I and under the wheels 2, 3, 4 and 5, and are slit longitudinally by the slit-ter 6, at the middle, and thence pass from the longitudinal folders between the rollers 7, 8, 9 and 10, having been slit again at the apex of the formers A and B by the known slitters 11 and 12. Thence the webs pass between the rollers 13 and 14 where they are associated, and are slit again by the slit-ter 15 which is at the middle of the roller 14. Thence the associated webs pass between the carriers C' and D' where they are stapled as hereinafter described, and then folded transversely and taken off between the rollers 16 and 17 and delivered by the rotary fly 18 to the apron 19.

With respect to the wire stapling devices E indicates a pair of rotary cylinders mounted upon the same shaft which is provided with rotary heads e at each end and at the middle for holding the wire spools 20 and 21. For forming the staples each cylinder E has a pair of double armed staple formers 22 and 23 each of which simultaneously forms two staples. The wire having been fed from the spools 20 and 21 passes between the rollers 24 and 25 and is cut by the cutters 26 to the desired length and thence passes through guide-ways 27 where the formers 22 and 23 press the wire into pockets 28, 29, 30 and 31 which are arranged in pairs on the cylinder C', in position corresponding to the arms of the double formers 22 and 23. The staples so inserted in these pockets are by known mechanism driven through the webs as they pass between the cylinders C' and D', two staples being simultaneously inserted in each section of the product, or four in all at each operation, there being two sets of webs passing between the cylinders C' and D' in consequence of the longitudinal slit made by the knife 15.

The folding cylinder D' has four transverse folding blades F, G, H and I' which fold the pamphlets complete between the rollers 16 and 17. This cylinder also carries

the means for pinning and cutting the webs by the knives *a*, *b*, *c* and *d*, and the pins, *e*', *f*, *g* and *h*, operating against the carrier *C'* which holds the matrixes *i*, *j*, *k* and *l*. The carrier *D'* also has two pairs of ribs 32, 33, 34 and 35 for clenching the staples when they are driven against them. As shown in Fig. 4, the folding blades have openings 40 to enable them to pass the ribs.

Aside from the features above indicated the mechanical devices and details for forming and setting the staples may be those in common use or otherwise as desired.

The drawings show two webs which are transversely folded and associated. By increasing the number of webs the product will be correspondingly increased, and it is obvious that at each operation of the transverse folders *F*, *G*, *H* and *I'*, two signatures or pamphlets, located side by side, are folded off between the rolls 16 and 17. The book or pamphlet is printed with the column rules parallel with the axes of the printing cylinder, which enables the products to be stapled at the middle and on the transverse folding line, two staples being simultaneously inserted on this line so that the book or pamphlet is completed at one operation. This is a decided improvement over those machines which only staple one staple at a time and require two sets of mechanisms for completing a book or pamphlet.

I claim:

1. The combination with longitudinal web folding and slitting devices, folding and transverse cutting carriers to which the

slitted webs are delivered in a plurality of sections side by side, said carriers being provided with rows of plural staple holding and setting devices, arranged for simultaneous operation on a line transversely of the webs, and rotary wire-spool-carrying and staple-forming means to supply staples to said devices.

2. The combination of a plurality of longitudinal web folders and slitters, transverse folding and cutting carriers, means to associate webs from said folders and deliver the same to the carriers, a longitudinal slitter operating on the webs after they are associated and before they reach the carriers, whereby they are delivered thereto in parallel longitudinal sections, and means to simultaneously insert staples in said sections on a transverse folding line.

3. The combination of a pair of transverse web folding and cutting carriers, a plurality of staple holding and setting devices arranged in a row on said carriers, means to deliver associated webs to said carriers in longitudinal sections running side by side between the carriers, and means to supply staples to said devices, including rotary coaxial cylinders and heads and wire spools carried by said heads.

In testimony whereof, I affix my signature in presence of two witnesses.

JOSEPH L. FIRM.

Witnesses:

AMELIA B. FIRM,
MATILDA GEDERT.