

H. FORCE.

APPARATUS FOR WINDING AND STRETCHING FABRICS.

No. 461,954.

Patented Oct. 27, 1891.

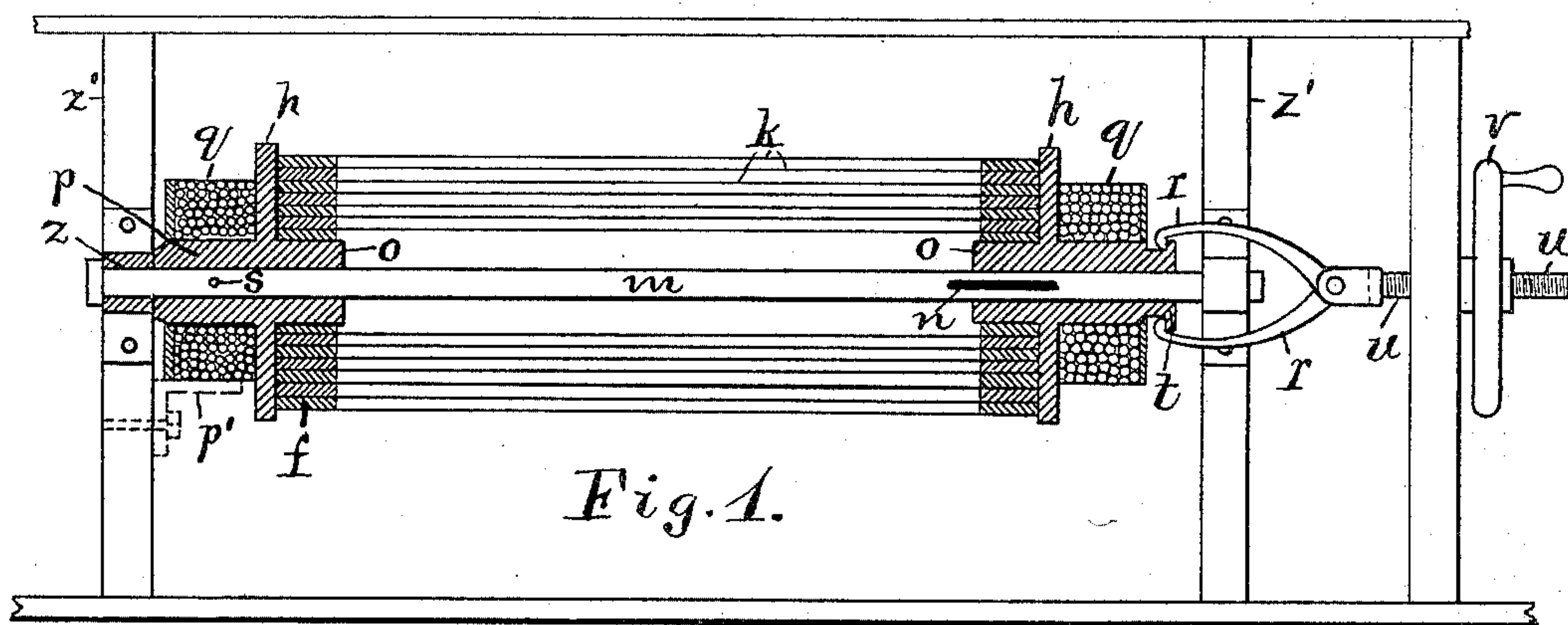


Fig. 1.

Fig. 2.

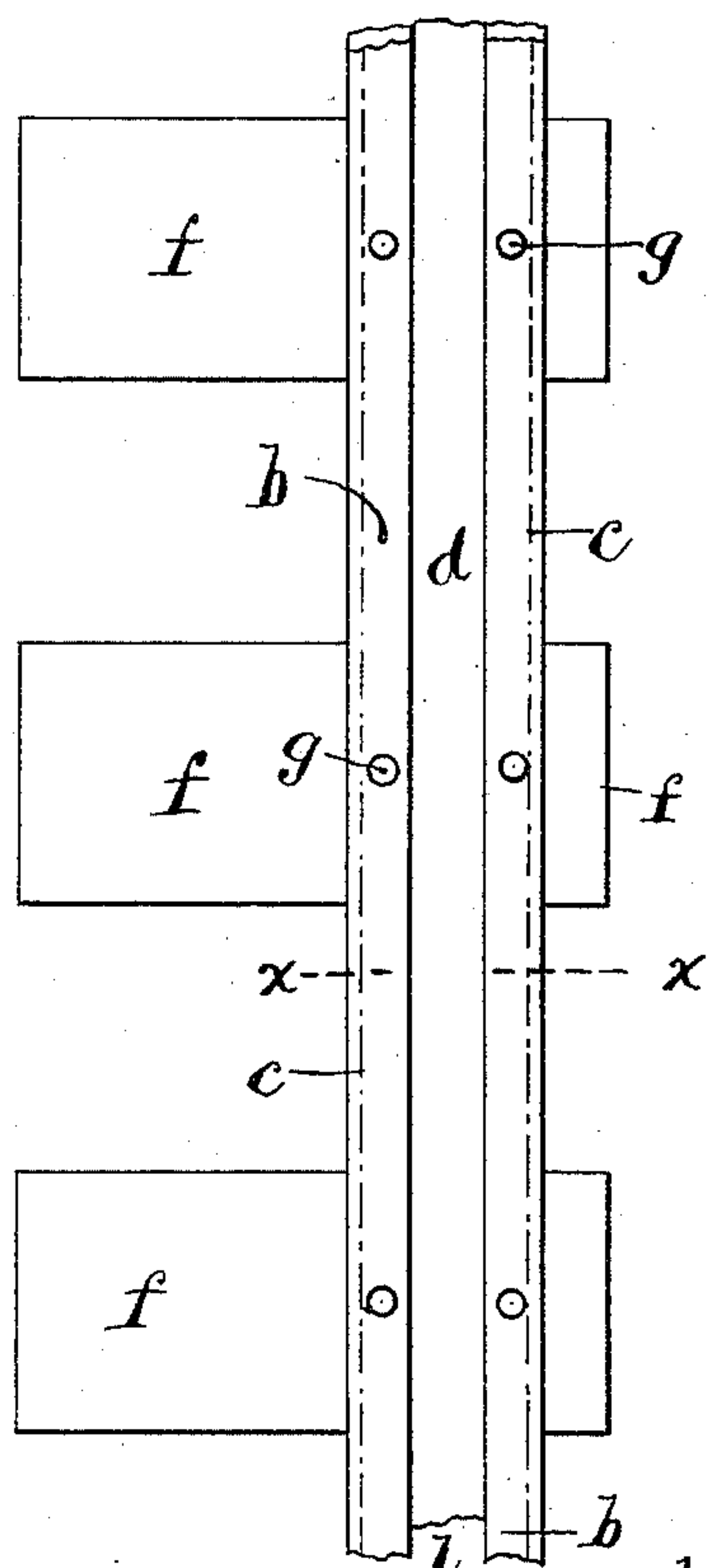
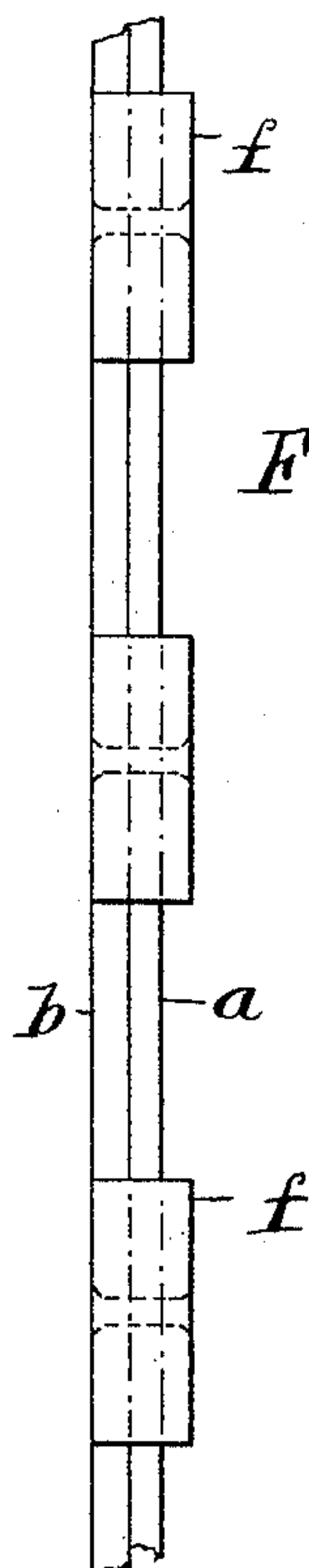


Fig. 3.



Fig. 4.



Attest:
L. Lee.
J. Vanhus Jr.

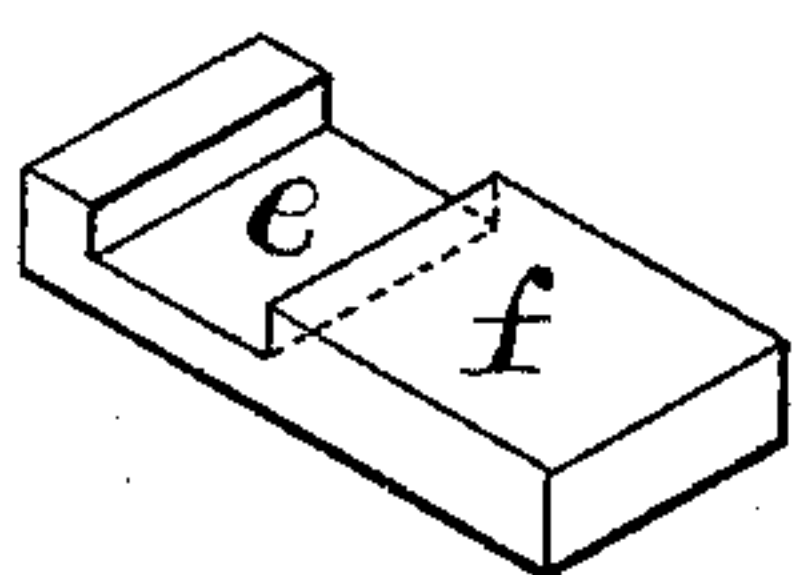
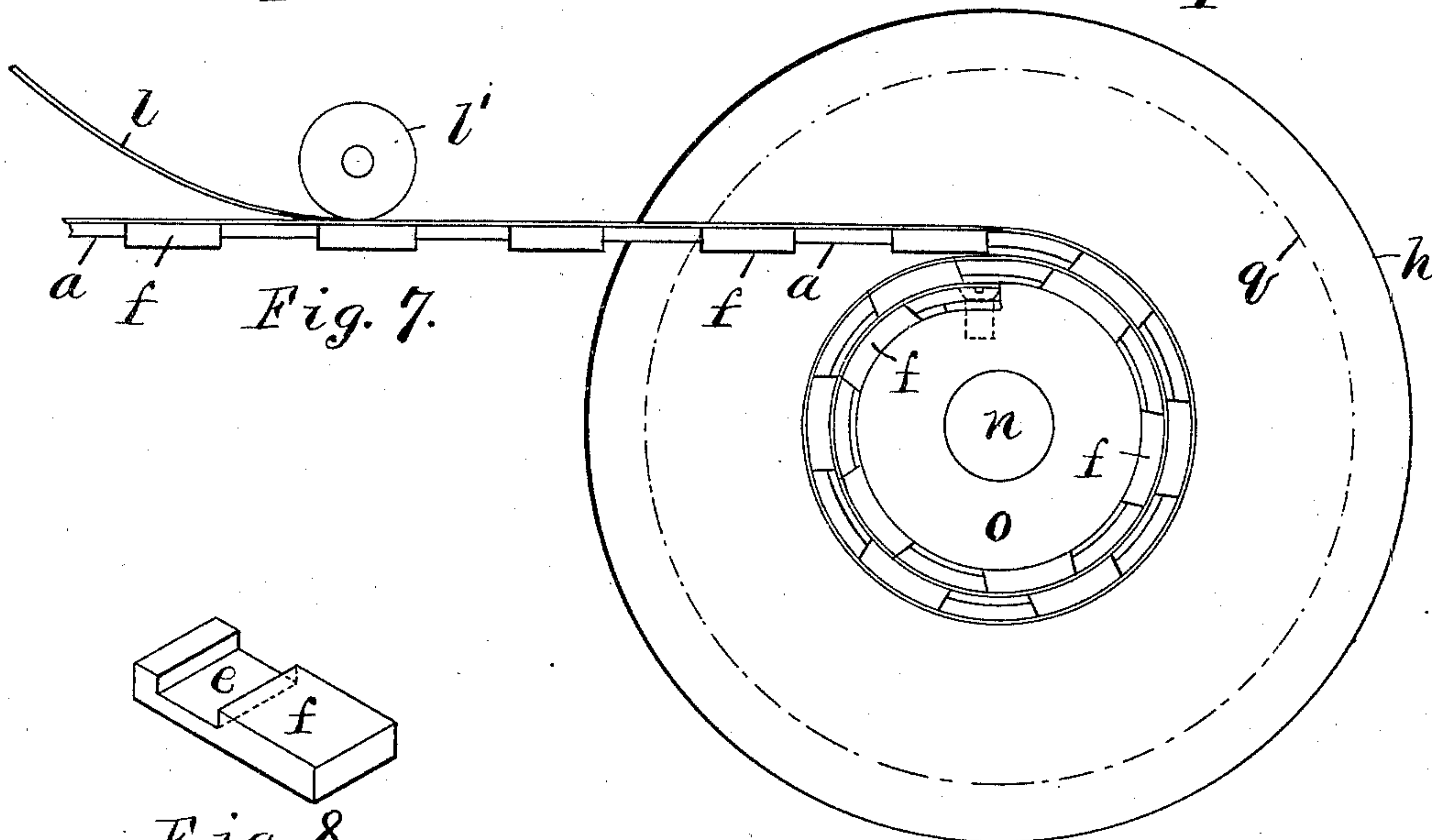
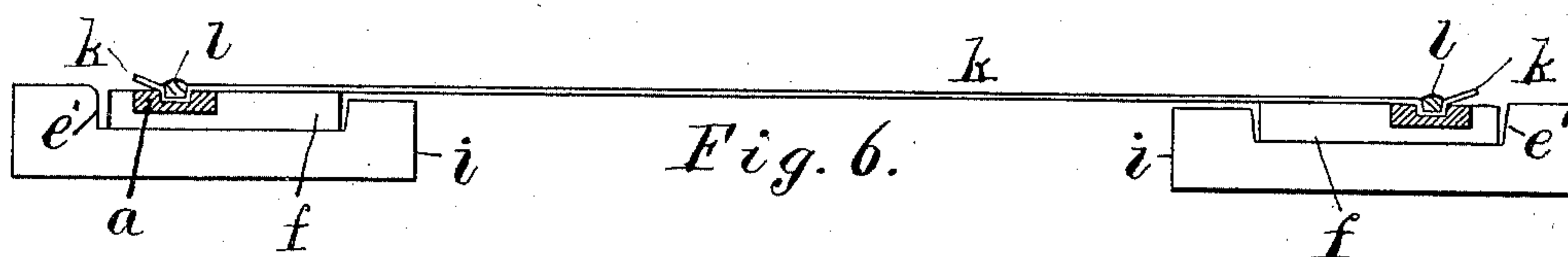
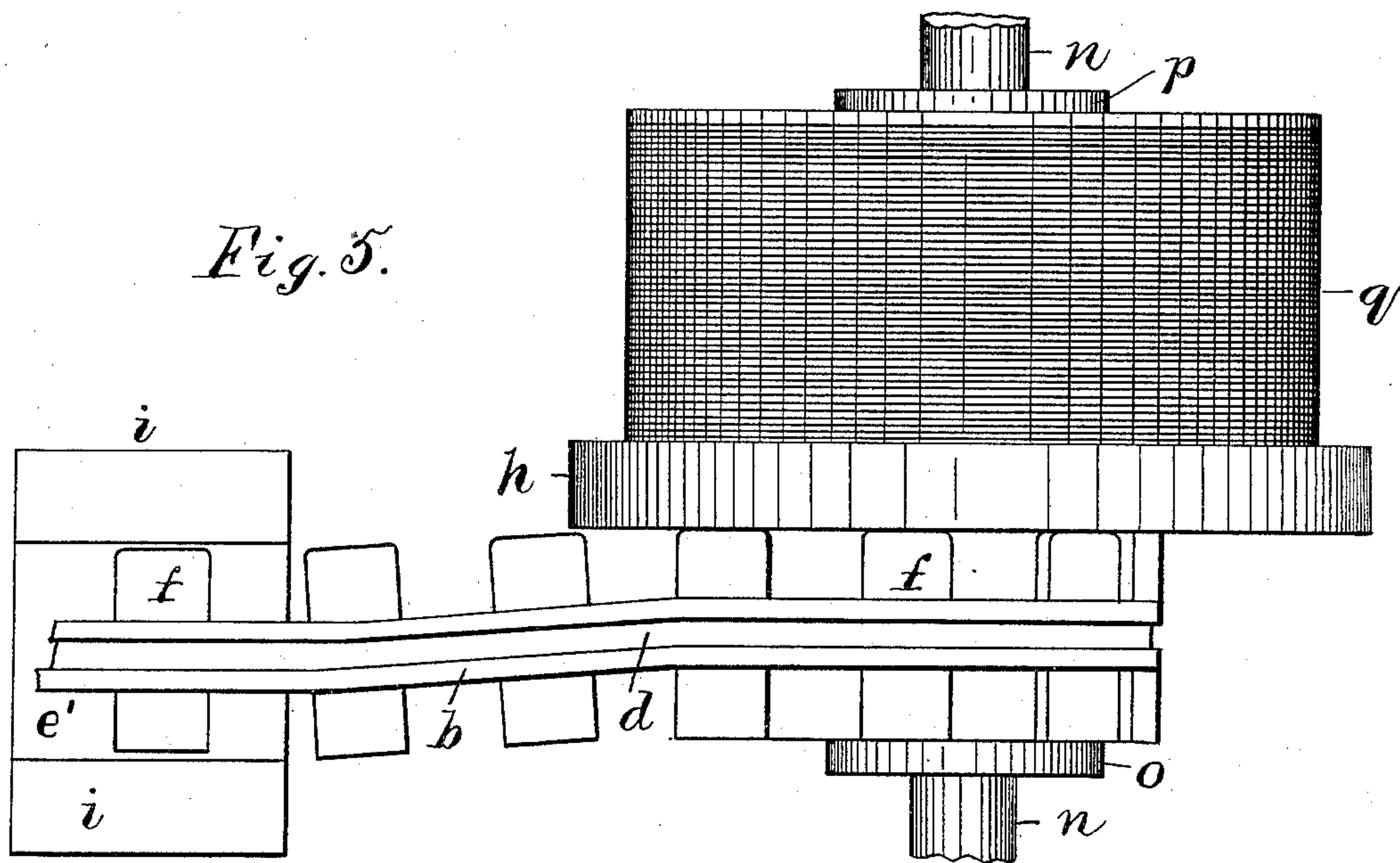
Inventor.
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Inventor.
H. Force, per
Crane Miller, atty.

UNITED STATES PATENT OFFICE.

HERMAN FORCE, OF LODI, NEW JERSEY.

APPARATUS FOR WINDING AND STRETCHING FABRICS.

SPECIFICATION forming part of Letters Patent No. 461,954, dated October 27, 1891.

Application filed December 26, 1890. Serial No. 375,771. (No model.)

To all whom it may concern:

Be it known that I, HERMAN FORCE, a citizen of the United States, residing at Lodi, Bergen county, New Jersey, have invented certain new and useful Improvements in Apparatus for Winding and Stretching Fabrics, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to facilitate the drying of cloth when coated with daub or varnish in the process of manufacturing enameled, painted, or printed goods. Such goods are usually hung in a drying-room in numerous vertical folds, with the moist surfaces carefully separated to prevent injury or adhesion until thoroughly dried. In the manufacture of enameled cloth the goods when thus dried shrink fully ten per cent. in width, and one object of my present invention is to hold the goods under tension during the drying operation to prevent such shrinkage, while another object is to dry the goods upon reels, so as to occupy less space in the drying-room than heretofore.

In carrying out my invention I employ two traveling belts, to which I clamp the edges of the web of fabric. The belts are provided with numerous iron armatures and are wound upon a reel having magnetic flanges, by which construction the belts are attracted to the flanges of the reel when wound thereon, and the cloth is stretched between the flanges in a spiral roll. The thickness of the belts separates the several spiral coils of the fabric, so that the separate layers of cloth are prevented from sagging into contact with one another and the moist surfaces are kept from injury.

In one form of my invention I provide means for separating the magnetic flanges forcibly after the cloth is wholly wound upon the reel to stretch and hold the cloth rigidly during the entire drying operation.

My invention may be carried out by any means adapted to effect these results, a practicable device being shown in the annexed drawings, in which—

Figure 1 is a section of a magnetic reel mounted upon a shaft and connected with stretching apparatus. Fig. 2 is a portion of

one of the belts in plan. Fig. 3 is a section of one of the belts on line *xx* in Fig. 2, with one edge of the cloth locked thereto. Fig. 4 is an edge view of the parts shown in Fig. 2. Fig. 5 is a plan of one of the magnetic flanges with a portion of the belt wound thereon and a guide for the belt in plan. Fig. 6 is a cross-section of two of the belts with both edges of the cloth clamped thereto and an elevation of the belt-guides. Fig. 7 is an elevation of the parts shown in Fig. 5, with the belt-guide omitted; and Fig. 8 is a perspective view of one of the armature-blocks.

The belt shown in the drawings consists in a leather band *a*, having narrow bands *b* secured upon its face at the two edges by rows of stitching *c*, leaving a groove *d* in the middle. Armature-blocks *f* are formed with notches *e* to admit the belt transversely, and are secured at intervals to the belt by rivets *g*. The magnetic flanges *h* are mounted upon a shaft *m*, one of them being secured rigidly, as by pin *s*, and the other fitted to a feather *n*, so as to move longitudinally. Each flange is provided with a hub *o*, upon which the belt is wound, and with a magnet-core *p*, surrounded by a coil of wire *q*.

In Fig. 1 a reel of small dimensions is shown, but in practice the flanges and magnet-cores would be made to operate a reel from three to five feet in diameter, so as to hold several hundred yards of cloth.

In Fig. 5 one of the magnetic flanges is shown with a portion of the belt wound thereon and the end of the belt extended through a guide *i*, which is formed with a channel *e'* to lead the blocks *f* toward the hub *o* at a little distance from the inner face of the flange.

In practice two such guides, as shown in Fig. 6, would be mounted adjacent to the two flanges like the single guide shown in Fig. 5, and the chains would be unwound from a drum and delivered to the magnetic reel through such guides. The cloth *k* from a daub-mill, varnishing-machine, or printing-rolls would be led toward the reel with its edges resting upon the bands *b*, as shown in Fig. 6, and operators would be stationed at opposite edges of the cloth *k* to guide the same and to apply the locking device to the

edge of the cloth. Such locking device consists in a rectangular strip l , of india-rubber fabric, which is delivered from a reel overhead to the operator adjacent to the guides.

5 The strip is pressed by the operator upon the cloth over the groove d in the belt, forcing the cloth down into the groove, as shown in Figs. 3 and 6. A portion of one of the strips is shown at l in Fig. 7, where a small roll l'

10 is shown to hold the strip into the groove d while the cloth is carried by the belts to the magnetic reel. As the belts approach this reel the armature-blocks f are attracted laterally by the flanges h , and the belt is thus

15 deflected laterally, as shown in Fig. 5, which tends to stretch the web of cloth in a straight line between the two belts, as shown in Fig. 6. The blocks f slip in contact with the flanges h as the belts are wound in a spiral coil upon

20 one another, as shown in Fig. 7, the successive coils of the belt serving to hold the locking-strips l securely in place, and thus preventing the edges of the cloth from pulling out of the groove d under the tension imposed

25 in drying. The dry side of the cloth is placed next to the groove d and the wet side is only defaced where the locking-strip is pressed into it and along its edge over each of the belts formed of the parts a and b .

30 In Figs. 1 and 6 the blocks appear to be flush with the top of the narrow bands c , but in practice the leather would be made to project a little above the bands c , so that the cloth would only be pressed against the subsequent coil of the belt by the width of such

35 bands.

The operation of reeling the cloth would be carried on continuously until the entire length of the cloth was wound upon the magnetic reel

40 with an equal length of the belts, and the ends of the belts would then be fastened in a suitable manner. The spiral coil of cloth is then preferably stretched by moving one of the flanges upon the shaft m , the magnetic attraction of

45 the flanges for the blocks f stretching the cloth when one flange is moved. Means for moving one flange is shown in Fig. 1, where the magnetic core is shown extended outside the coil q and provided with a collar t , to which

50 a clamping-tongs r is applied to draw the flange longitudinally by means of a screw u and rotary nut v . The shaft is shown mounted in bearings z upon posts c' ; but any suitable framing may be used to support the reel

55 in a drying-room, or the reel may be mounted upon a portable carriage to be transported into a drying-room after the cloth is wound thereon. The magnetic current is maintained in the coils q during the drying operation to

60 hold the cloth stretched, and the cloth is thus not only held from sagging to deface its surface, but is preserved materially from the shrinkage which usually occurs during the

drying of the coating. A considerable saving is thus effected in the width of the cloth, 65 while a drying-room of the same capacity may be enabled to contain a greater quantity of cloth at the same time, and the cloth itself may be reeled with greater rapidity than heretofore. The current required to energize 70 the magnets would be conducted to the coils q by any suitable means, so that the magnetic flanges could be rotated without breaking the electrical connections.

It is obvious that the coils of wire q may 75 be held stationary around the magnet-cores p and produce the same effect in magnetizing the cores and attached flanges, and a bracket p' is shown in dotted lines attached to one of the posts in Fig. 1, to indicate a means of 80 holding the magnetic coils stationary, if desired. Means are, however, well known for conducting an electric current to a revolving coil.

The details of construction are entirely im- 85 material to my invention, and the means for locking the cloth and applying the magnetic tension to the same may therefore be varied at pleasure.

Having thus set forth my invention, what 90 I claim is—

1. In an apparatus for winding fabrics, the combination, with two belts and means for clamping the edges of the fabric thereto, of armatures attached to the belts, and a reel 95 provided with magnetic flanges to attract the armatures, substantially as set forth.

2. In an apparatus for winding fabrics, the combination, with two belts and means for clamping the edges of the fabrics thereto, of 100 armatures attached to the belts, a reel provided with magnetic flanges to attract the armatures, and means for moving one of the flanges away from the other to stretch the cloth when reeled. 105

3. An apparatus for winding fabrics consisting in a shaft having two flanges provided with magnet-cores, and having magnet-coils applied to such cores, and one of the flanges being movable upon the shaft, as set forth. 110

4. In an apparatus for winding fabrics, the combination, with a shaft provided with two magnetic flanges, of two belts consisting each in the leather bands a and b , combined to form a groove d , as set forth, armature-blocks f , se- 115 cured to the bands at intervals, and a locking-strip l , adapted to hold the cloth in the groove d , the whole arranged and operated substantially as set forth.

In testimony whereof I have hereunto set 120 my hand in the presence of two subscribing witnesses.

HERMAN FORCE.

Witnesses:

THOS. S. CRANE,
HENRY J. MILLER.