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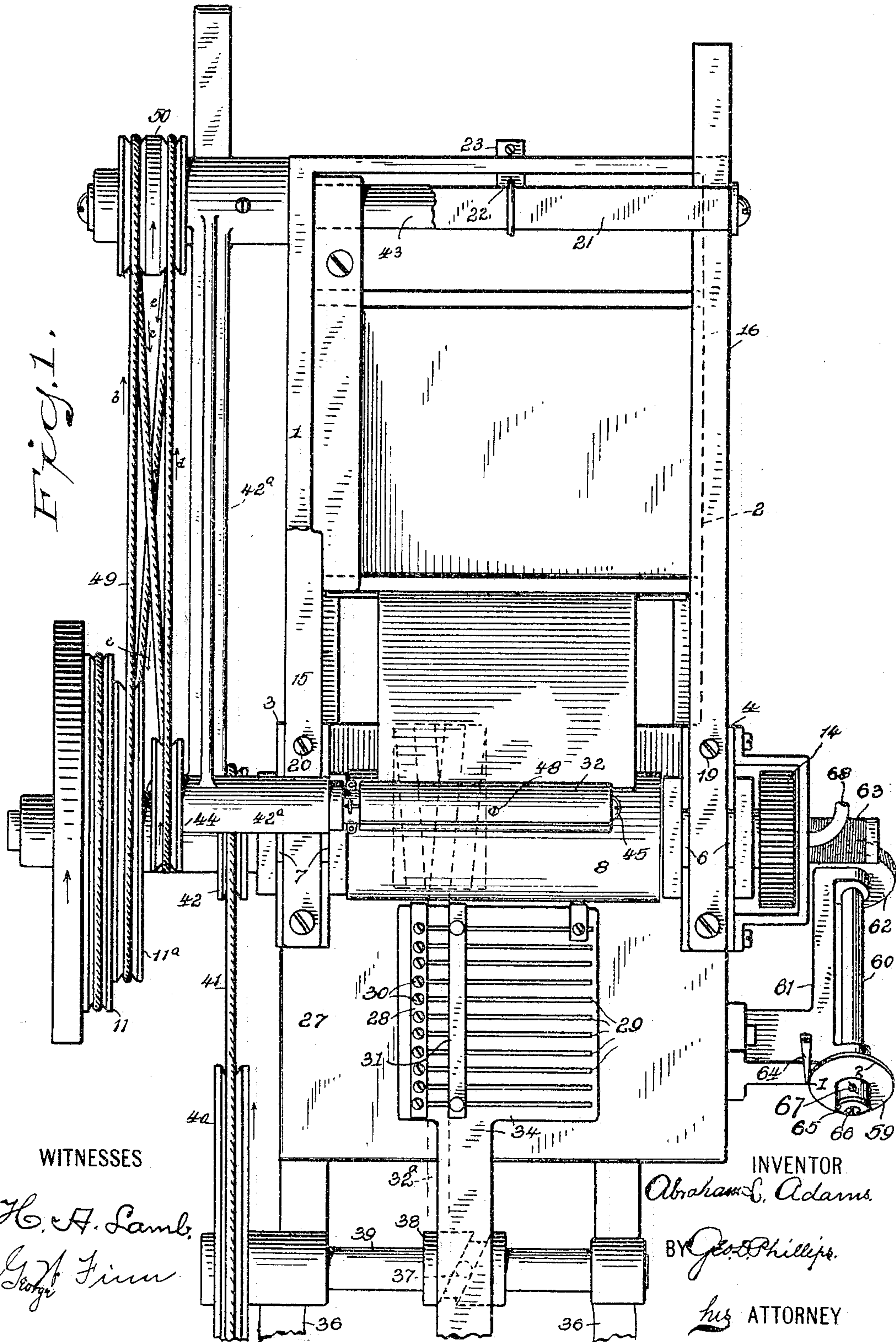
PATENTED FEB. 7, 1905.

A. L. ADAMS.

MACHINE FOR FOLDING AND WINDING CLOTH STRIPS.

APPLICATION FILED APR. 2, 1903.

3 SHEETS—SHEET 1.



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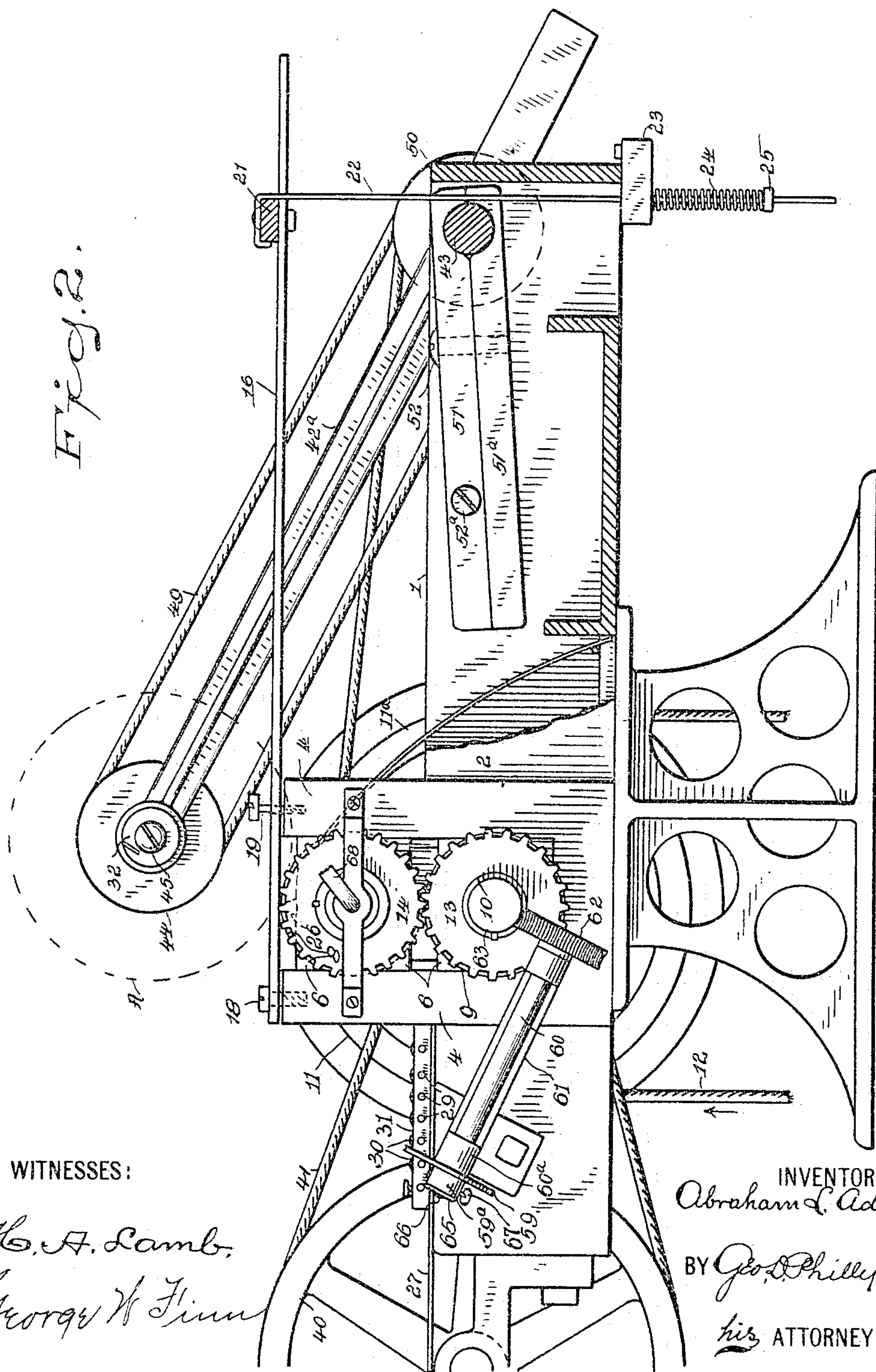
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WITNESSES:

H. A. Lamb,
George W. Finn

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Abraham L. Adams
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his ATTORNEY

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3 SHEETS—SHEET 3.

Fig. 3.

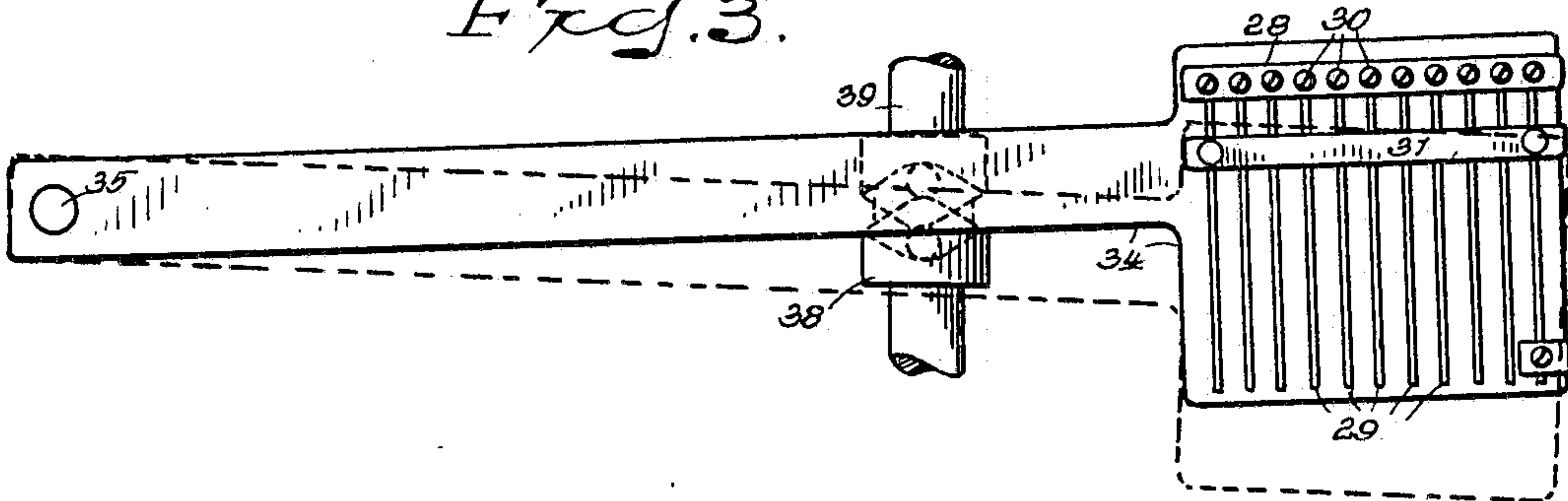


Fig. 4.

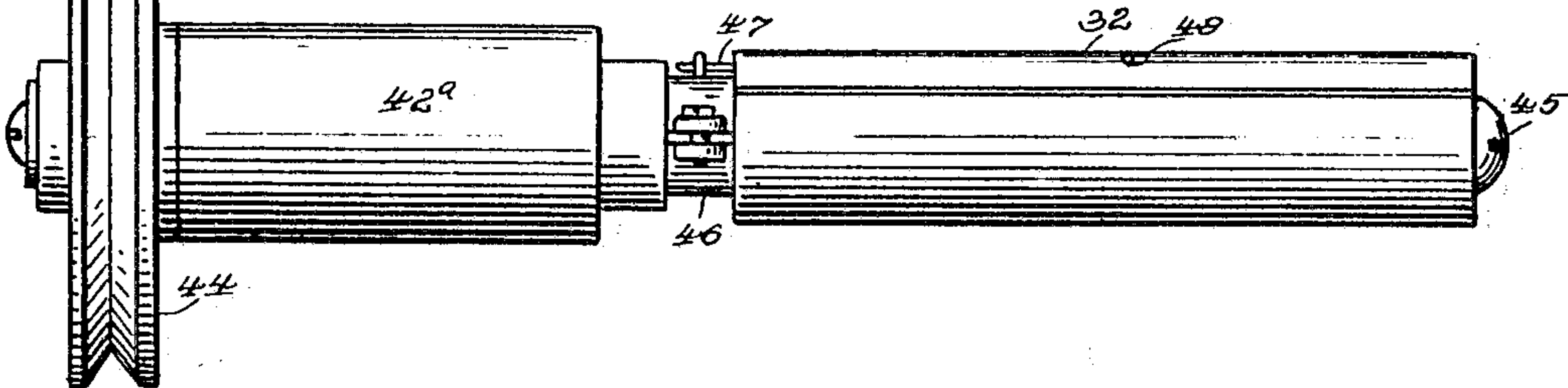


Fig. 5.

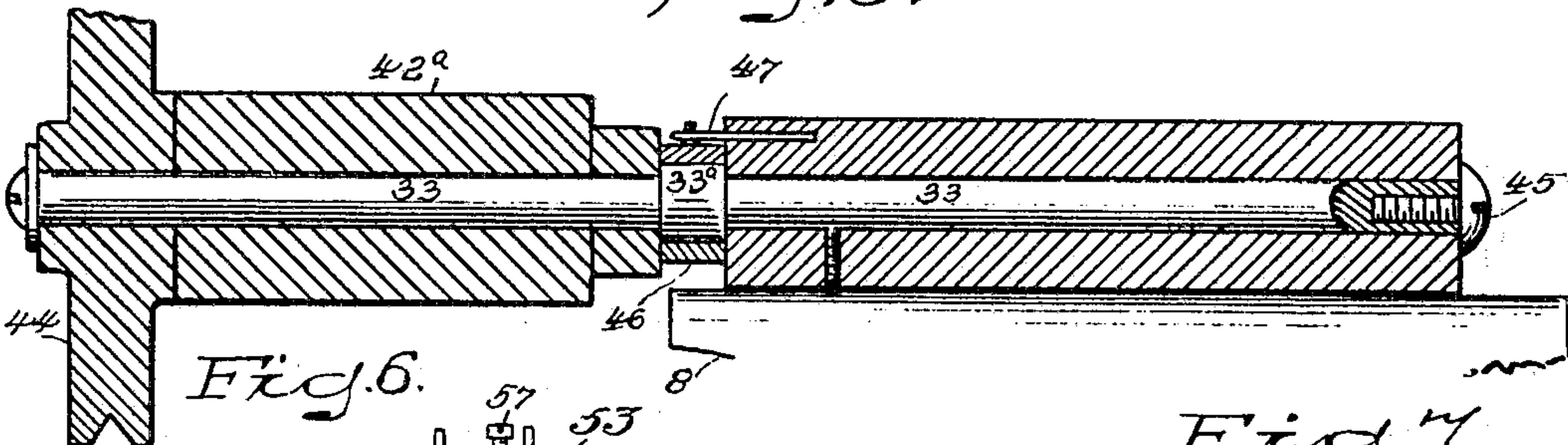


Fig. 6.

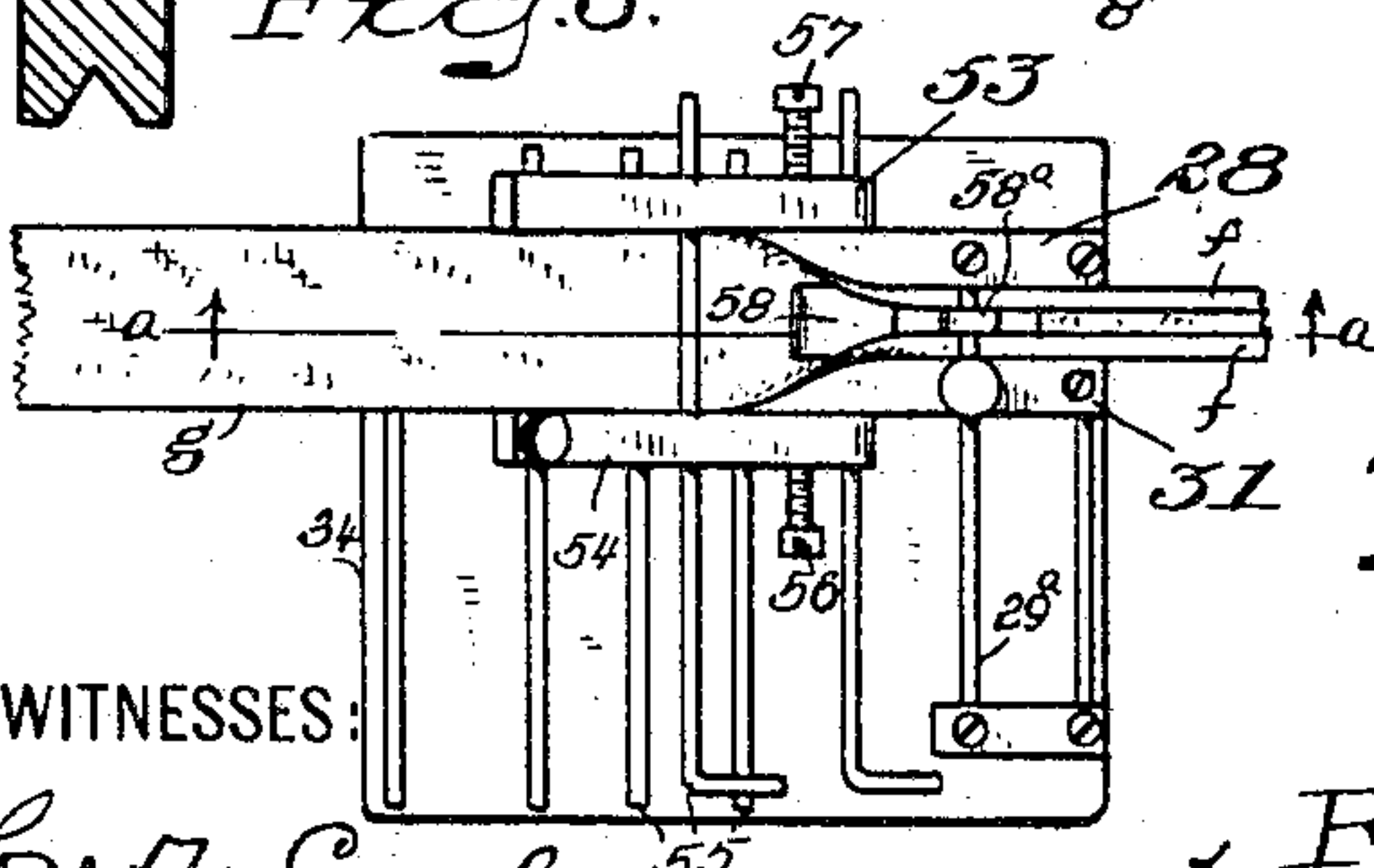
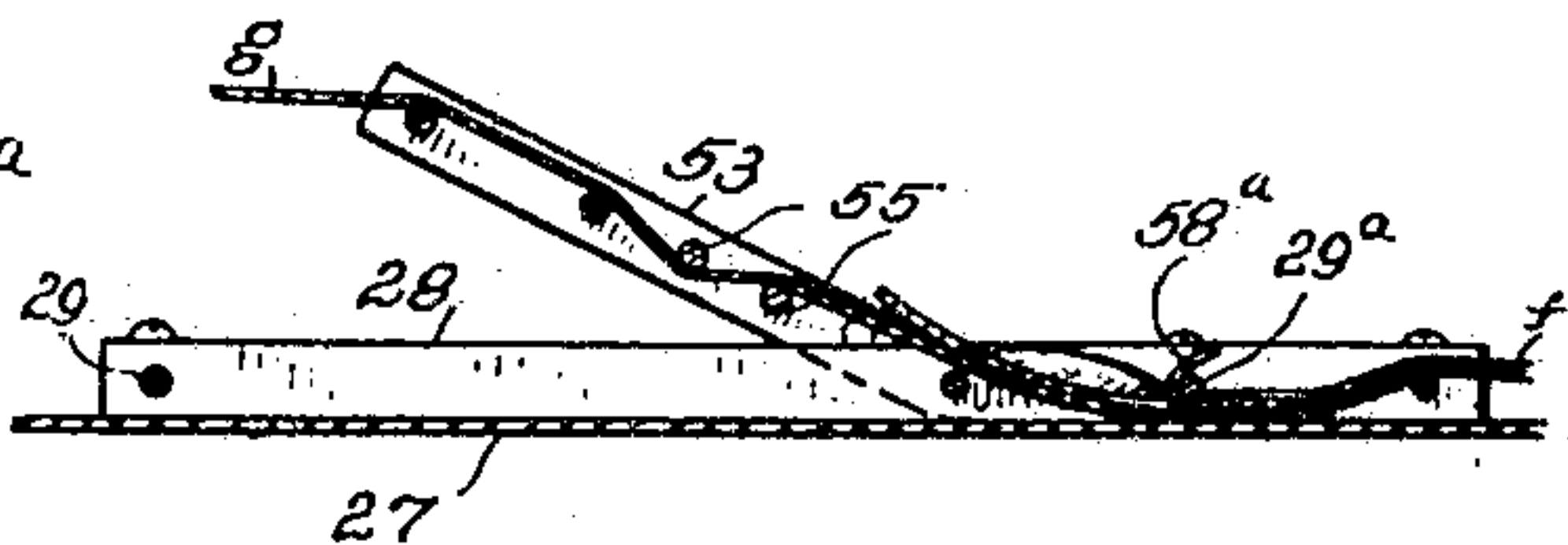


Fig. 7.

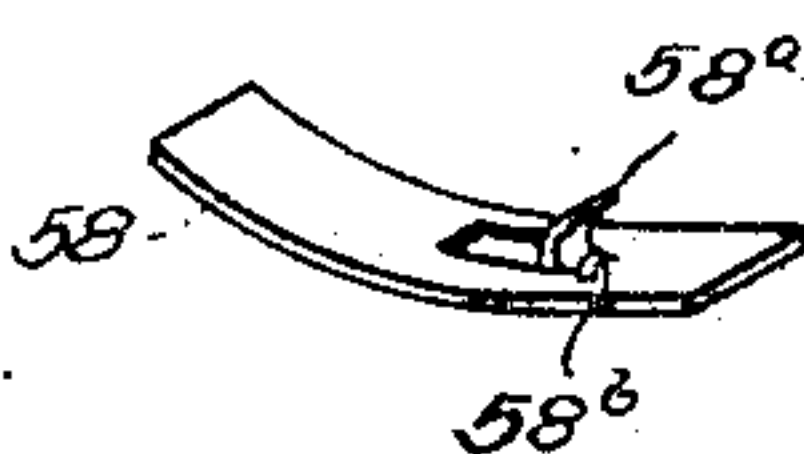


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Fig. 8.



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UNITED STATES PATENT OFFICE.

ABRAHAM L. ADAMS, OF BRIDGEPORT, CONNECTICUT.

MACHINE FOR FOLDING AND WINDING CLOTH STRIPS.

SPECIFICATION forming part of Letters Patent No. 781,927, dated February 7, 1905.

Application filed April 2, 1903. Serial No. 150,796.

To all whom it may concern:

Be it known that I, ABRAHAM L. ADAMS, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Folding and Winding Cloth Strips, of which the following is a specification.

My invention relates to an improvement in a machine for folding and winding plain strips of cloth or strips of cloth having a great variety of folds.

It is also especially adapted for winding bias strips or strips cut from cloth on the bias. To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a plan view of the machine, broken view of the vibrating tension-guide and folder, broken view of the bed extension, vibrating tension-frame and its driving-pulley, broken view of the gas-supply pipe for the upper ironing-roll, one of the tension-levers for said roll, and broken view of the lever cross-bar. Fig. 2 is a side elevation, partly in section, of the machine, also showing a spool in dotted position on its arbor. Fig. 3 is an enlarged detail plan view of the vibrating guide and broken view of the cam-shaft from which it vibrates. Fig. 4 is an enlarged detail view of the winding-arbor and sleeve adapted to be secured to said arbor or run independent, also a portion of the oscillating arbor-carrying arm in which said arbor is journaled. Fig. 5 is an enlarged detail view of the arbor, partly in section, sectional view of its sleeve, friction-clamp, arbor-bearing, arbor-driving pulley, and broken view of the upper ironing-roll. Fig. 6 is an enlarged upper detail view of the combined tension-guide, folder, and folder-tongue, showing also a broken strip of cloth partially folded. Fig. 7 is a sectional view of the device shown at Fig. 6 on lines *a a*, also broken sectional view of the table. Fig. 8 is an enlarged detail view in perspective of the folder-tongue.

Its construction and operation are as follows:

1 and 2 are the side frames of the machine. 3 and 4 are standards carrying the boxes 6 and 7, in which the ironing-rolls 8 and 9 are journaled.

10 is the driving-shaft; 11, the driving-pulley; 12, the driving-belt. The lower ironing-roll is mounted on said driving-shaft, and said shaft also carries the pinion 13 to register with the pinion 14 of the upper ironing-roll.

As the strips are narrow pieces of cloth of various lengths stitched together, the seams would not readily pass between the ironing-rolls if said rolls were in a fixed position. To accommodate for these seams, the boxes of the upper ironing-roll are permitted to vibrate up and down in their standards as follows: 15 and 16 are levers having one end loosely connected to the screws 17 and 18, while said levers are allowed to vibrate vertically on the screws 19 and 20. 21 is a cross-piece connecting said levers, and 22 is a vertical rod having a hook at its upper end to embrace said cross-piece from which said rod is suspended, this hook, combined with the block 23, engaging the under side of the machine-bed. Spring 24 and collar 25 form a spring-clamp to exert a varying pressure on the upper boxes of the upper ironing-roll. These boxes have the narrow fulcrum projections 26, one of which is shown at Fig. 2, for the levers 15 and 16 to bear against.

27, Fig. 1, is the table, and on this is supported the tension-guide and folder shown at Fig. 1. This device consists of the stationary side bar 28, with the tension-wires 29 projecting laterally therefrom and secured thereto by means of the screws 30. 31 is an adjustable bar adapted to be moved along said wires and secured thereto, and between these bars 28 and 31 either plain or folded strips are guided. If the strips are to be spooled plain, these bars are set a distance apart to represent the exact width of the strips. If the strips are to be folded—that is, have their edges turned over—they are fed through wider than the distance between said bars. The strips pass from the tension-guide into the bite of the ironing-rolls and from there are spooled on the sleeve 32, (see also Fig. 5.)

mounted on the arbor 33, presently to be more fully described. In forming narrow strips into spools of large diameter it is very difficult to keep the spool from falling apart during the operation of winding or after its removal from the spooling-arbor. Therefore to spool the narrow strips 32^a I make the spool wider than the width of the strip by winding back and forth, as shown by dotted lines at Fig. 1. This is accomplished by simply vibrating the frame 34, which carries the tension-guide. The opposite end of this frame (see also Fig. 3) has the hole 35 therein adapted to embrace a pin (not shown) in the extension 36, Fig. 1, of the machine. 37 is a pin projecting from the under side of this frame to engage with the grooved cam 38 for vibrating said frame. This cam is mounted on the shaft 39, carrying the pulley 40, whose belt 41 connects with the pulley 42 on the driving-shaft 10, from which said cam-shaft 39 receives its motion.

The spooling-arbor 33 is journaled in the free end of the vibrating arbor-carrying arm 42^a, which arm is secured to the rocking shaft 43 at the rear of the machine. 44 is the friction driving-pulley for said arbor. The sleeve 32 is located on said arbor between the shouldered portion 33^a of said arbor and the retaining-screw 45 in the end thereof. This sleeve is adapted to run freely and independently on said arbor or with more or less friction by means of the friction-clamp 46, with which said sleeve is connected by means of the driving-pin 47 or to be connected directly to the arbor by means of the set-screw 48.

What is meant by "bias strips" is strips cut from a piece of cloth in diagonal lines. Consequently these strips stretch easily and by stretching are narrowed more or less proportional to the distance they are pulled out or stretched. This is made more apparent when plain bias strips, not having the edges folded over, cut from very thin and delicate fabric are spooled, as the slightest friction or pull on the strip will distort it. In winding strips of this character there is more or less tension applied to the arbor by the friction-clamp 46 in proportion to the delicate nature of the strip. In winding strips not cut on a bias there must be a greater pull, so that a spool can be wound tight and at the same time true and even. To do this, the set-screw 48 is used to secure the sleeve 32 firmly to the arbor. Therefore by means of this sleeve mounted on the arbor, which can either be run loose or under more or less tension to suit the fabric or be secured firmly to the arbor, all kinds of fabric from the most delicate bias strip to the strongest unbiased fabric can be wound.

When the sleeve is running free on the arbor, such sleeve is rotated by the contact of the spool with the upper ironing-roll; but

when the sleeve is secured to the arbor said arbor and sleeve are rotated by the pulley 44. However, all spools are in contact with this upper ironing-roll, and in the case of an unbiased strip, as before mentioned, there should be a pull sufficient to wind the spool tight and even; but as the spool A increases in size the circumferential travel of the spool will exceed that of the arbor, and then the tension or pull would be so great as to break the strip were it not for the fact that the pulley 44 is frictionally connected to the arbor and will therefore slip and relieve the strain on the strip.

I also show a novel and simple way of communicating power from the reduced cone 11^a of the driving-pulley to the pulley 44 of the winding-arbor by means of the single endless belt 49, which will always exert the same tension or driving effect on the arbor-pulley in whatever position it may occupy in its travel through the arc of a circle described by the oscillation of the arbor-carrying arm 42^a. This belt (see Fig. 1) passes around the cone-pulley 11^a and over the outer groove of the double pulley 50 on shaft 43 in the direction of arrow *b*, thence in the direction of arrow *c* over the friction driving-pulley 44, thence over the inner groove of the pulley 50 in the direction of arrow *d*, and from thence back to the cone-pulley 11^a, as shown by arrow *e*. This arrangement of the single belt will, as before mentioned, always be taut no matter in what part of the circular arc the pulley 44 may be located. Without such an arrangement the arbor-pulley would have to be driven by a separate belt.

To prevent any undue vibration of the arm 42^a as it is raised by the contact of the rapidly-increasing diameter of the spool in its contact with the upper ironing-roll, which vibration would result in an imperfectly-wound spool, I employ a tension device for the shaft 43, which consists of the two pieces 51 and 51^a, clamped together by means of the screw 52. In the meeting faces of these clamps and at one end thereof is provided grooves to embrace said shaft to effect the necessary friction through the medium of the screw 52, while the screw 52^a anchors the clamp to the side frame of the machine.

At Figs. 6 and 7 is shown a fold-controller to be used in connection with the tension-guide and folder shown at Fig. 1. This fold-controller consists of the side bars 53 and 54, whose forward ends are pivotally supported on one of the tension-wires 29. This controller also carries the tension-wires 55. The side bars 28 and 31, as previously mentioned, determine the width of the fold, while the controller will operate either to maintain a uniformity in the folds—that is, to make the width of the folds or turned-over edges of the strips exactly alike, or to vary this by making

one fold wider on one side than on the other, or, if necessary, to throw the fold all on one side. This is done by means of the adjusting-screws 56 and 57, which screws operate in the side bars 53 and 54 of the controller and whose ends bear against the outer faces of the side bars 28 and 31 of the tension-guide. When, therefore, the outer bars 53 and 54 rest against the inner bars 28 and 31, the outer side bars will be equidistant from the center of these inner bars and the folds will be equal; but whenever this relative position is changed the width of the folds will vary. 58 (see also detail view, Fig. 8) is a tongue to lie on the upper surface of the strips between the folds to keep said surface smooth and free from wrinkles. This tongue has the hook portion 58^a, adapted to partially embrace the wire 29^a, and such hook portion is inclined toward the forward travel of the ingoing strip, so as to prevent said tongue being drawn along therewith. To prevent lifting of this tongue by the rapid forward movement of the strip, and thereby cause a friction between the upper surface of the folds and the under surface of the wire 29^a, the projection 58^b is formed on the upper surface of the tongue immediately under the hook 58^a, which projection will strike said wire, and thus prevent such frictional contact.

As the product of this machine is sold to manufacturers, it is necessary to determine the exact number of yards each spool contains or to wind spools containing a certain number of yards each. For this purpose I employ an indicator which consists of the dial 59, mounted on one end of the shaft 60, journaled in the bracket 61. The lower end of this shaft carries the worm-gear 62, registering with the worm 63 on the projecting end of the driving-shaft. The dial 59 is divided into three equal parts which are indicated "1," "2," and "3," the last number not being shown. One revolution of the dial represents thirty-six yards, while one-third of a revolution, or the distance between the indicating numbers "1," "2," &c., by the aid of the pointer 64, will represent twelve yards. It will also be understood that these three subdivisions may be still further subdivided. As the spools are packed in boxes, it is desirable to wind them of such a diameter that they will just enter the boxes, and as some strips will wind a spool of greater diameter and containing a less number of yards than other strips it is absolutely necessary to know just how large to wind a spool to fit the box. In starting, the dial is set with the figure "1" opposite the pointer, as shown in Fig. 1, and a spool is wound that will exactly fit a certain box. Then the distance traveled by the dial is noted, and the rest of the spools necessary to fill the box can easily be run off the machine by the dial moving through the same space. The

dial is held by frictional contact between the washer 65 and screw 66 of the hub 59^a of said dial and the shoulder 60^a of the shaft, so that when a spool is wound of the proper diameter as noted on the dial the thumb-screw 67 is loosened and the dial is returned to the starting-point "1," or the reading on the dial may be noted and the dial will rotate a similar distance for the next spool. Turning the dial back for every spool will cause less confusion.

The gas-pipe 68 carries on its inner end (not shown) within the upper ironing-roll a tip for burning gas to heat said roll.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a machine of the character described, of ironing-rolls, a vibrating arm, an arbor journaled in the free end of said arm, a frictional driving-pulley mounted on said arbor, a cloth-strip-winding sleeve mounted on said arbor and at one side of said pulley, means whereby said sleeve is adapted to run free on said arbor, or be secured rigidly or frictionally thereto, substantially as described and for the purpose set forth.

2. The herein-described improvement in a machine of the character described, comprising an arbor, a sleeve mounted thereon, means whereby said sleeve is adapted to run free on said arbor, or be secured rigidly or frictionally thereto for winding various grades of cloth strips, for the purpose set forth.

3. The combination, in a machine of the character described, of ironing-rolls, a driving-shaft on which one of said rolls is mounted, said shaft carrying double pulleys, a vibrating arm, a shaft to which said arm is rigidly secured, a spool-winding arbor journaled in the free end of said arm, a pulley on said arbor, said arm-shaft carrying a double loose pulley, combined with a single belt to engage with all of said pulleys so that the arbor-pulley will always be under the driving tension of said belt in whatever position the said vibrating arm may be placed, substantially as set forth.

4. In a machine of the character described, the combination with a spooling-arbor adapted to wind spools from cloth strips, of a tension device for said strip, a fold-controller mounted thereon, means substantially as shown for adjusting the lateral position of said fold-controller, for the purpose set forth.

5. In a machine of the character described, the combination with a spooling-arbor adapted to wind spools from cloth strips, of a tension device for said strips, a laterally-adjustable fold-controller mounted thereon, a fold-separator tongue adapted to keep the bottom of the strip smooth, a support for said tongue, means on said tongue to avoid friction between said support and strip, substantially as described.

6. In a machine of the character described,
the combination with a spool-arbor-carrying
arm and a shaft to which said arm is rigidly
secured, of a friction device for said shaft
5 adapted to steady said arm in its vibratory
movements, substantially as described.

Signed at Bridgeport, in the county of Fair-

field and State of Connecticut, this 21st day
of March, A. D. 1903.

ABRAHAM L. ADAMS.

Witnesses:

S. J. CHAFFEE,

G. W. FINN.