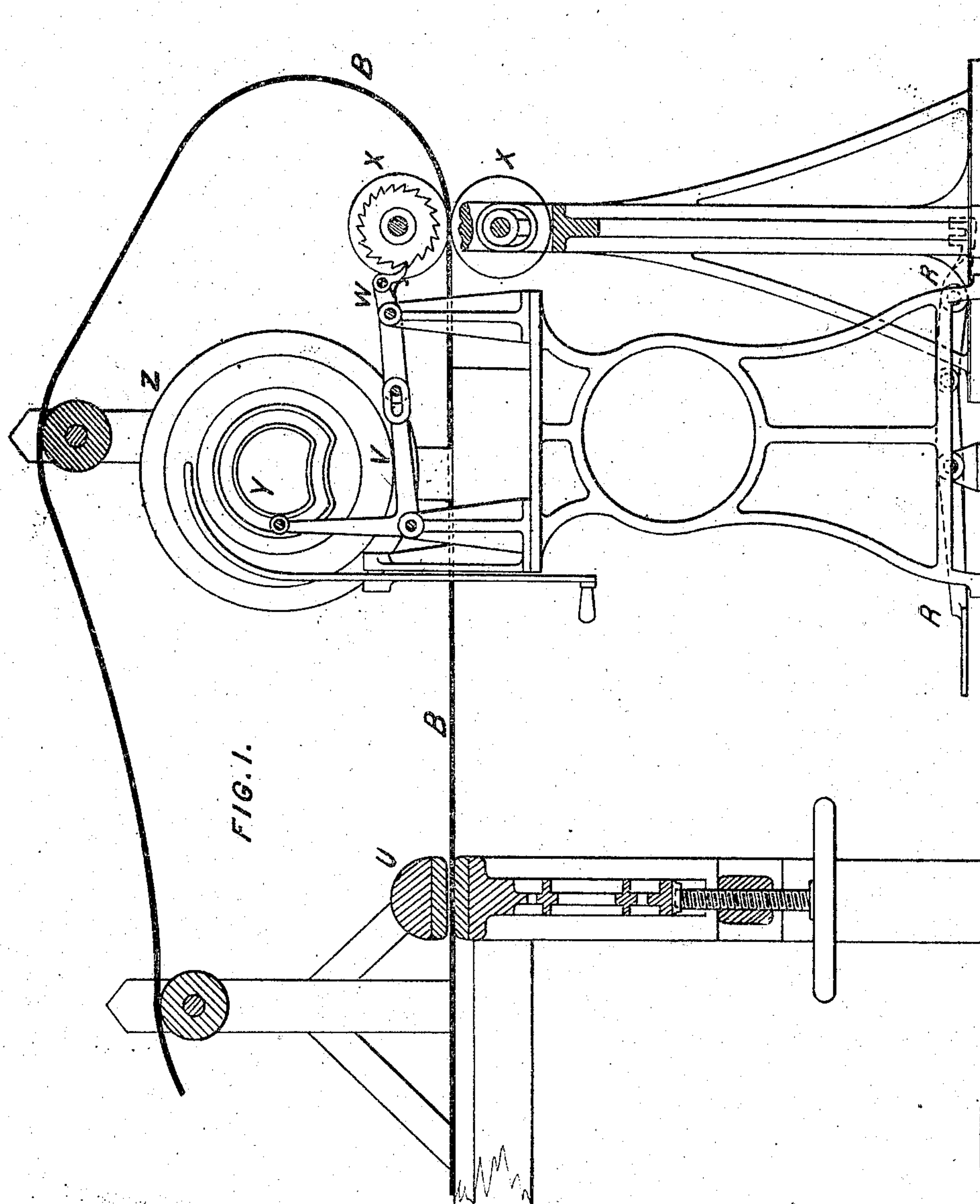


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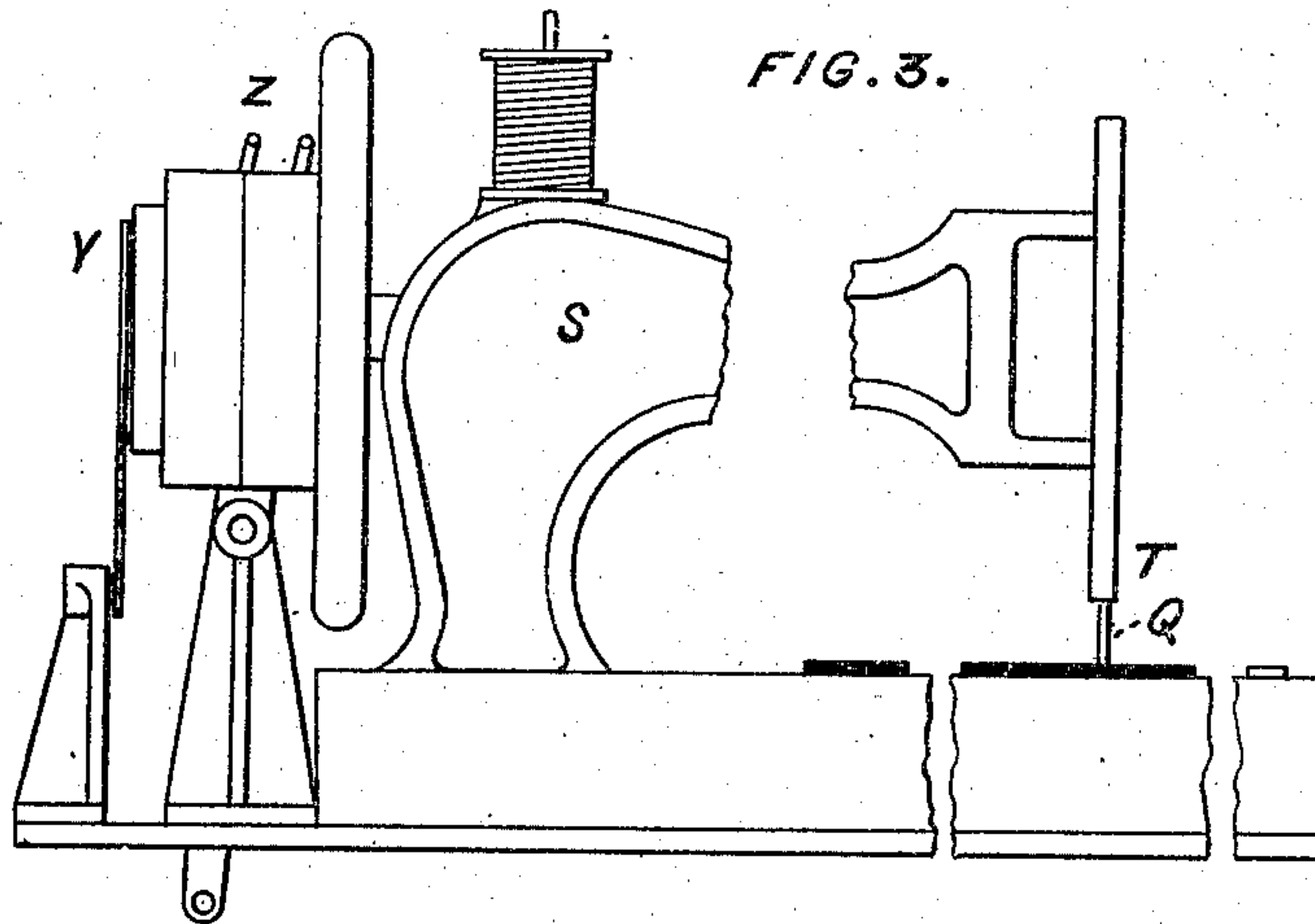
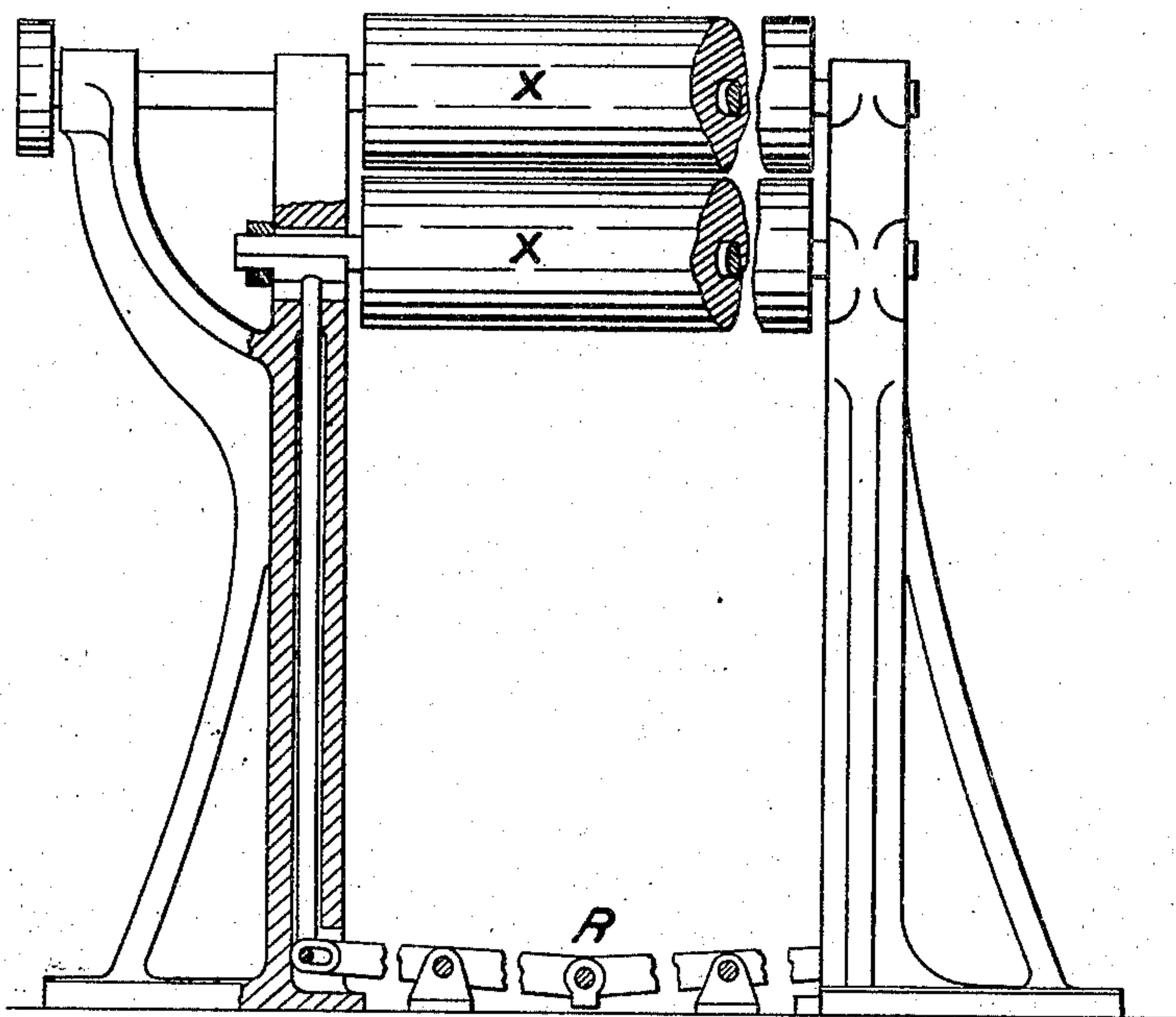


FIG. 2.



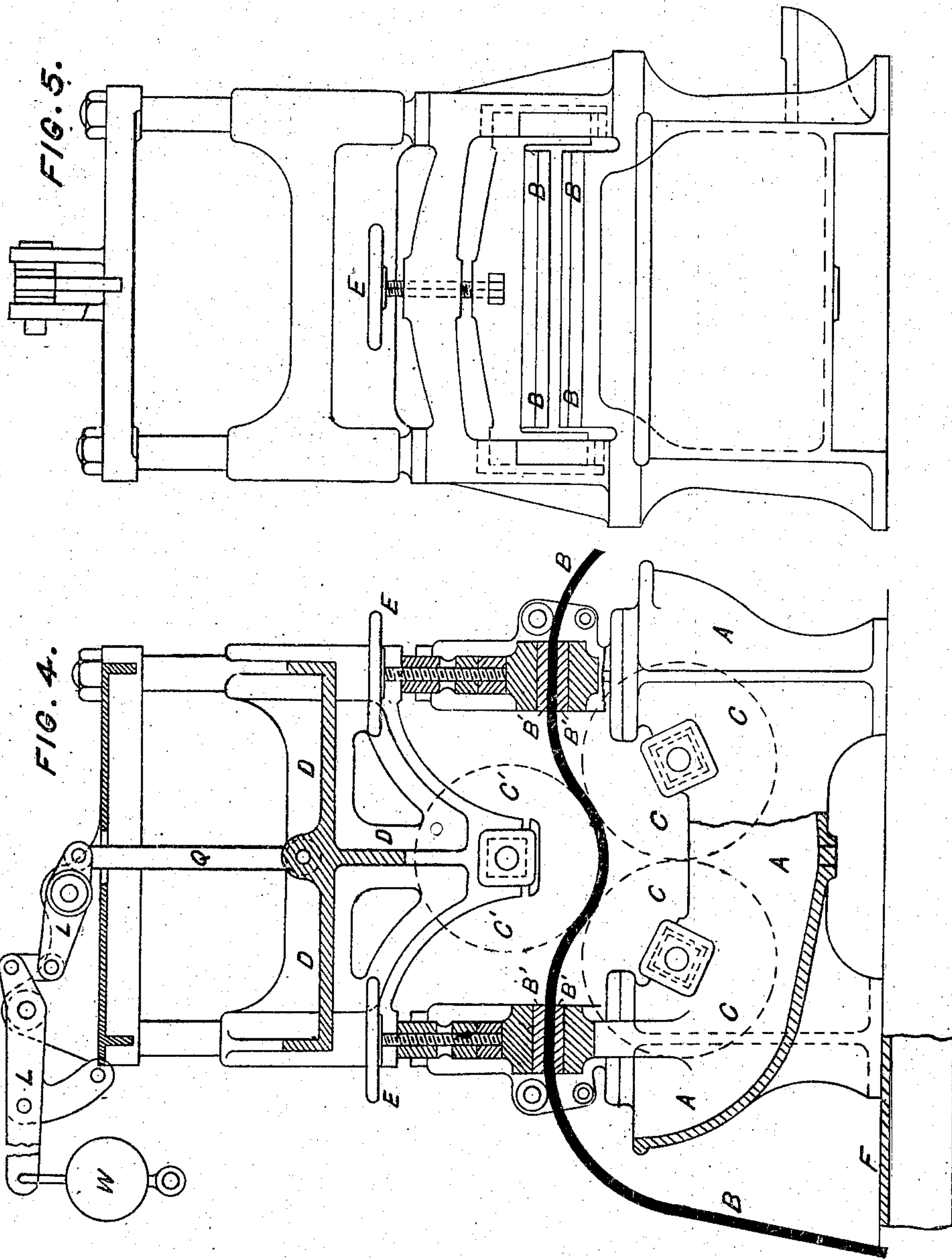
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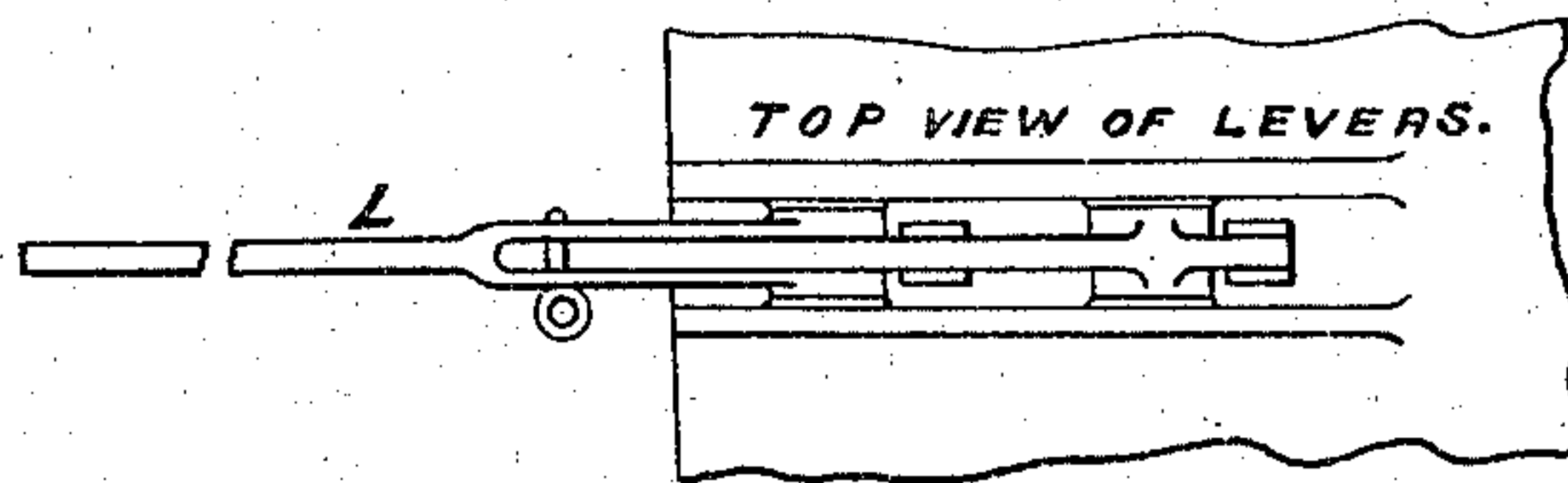
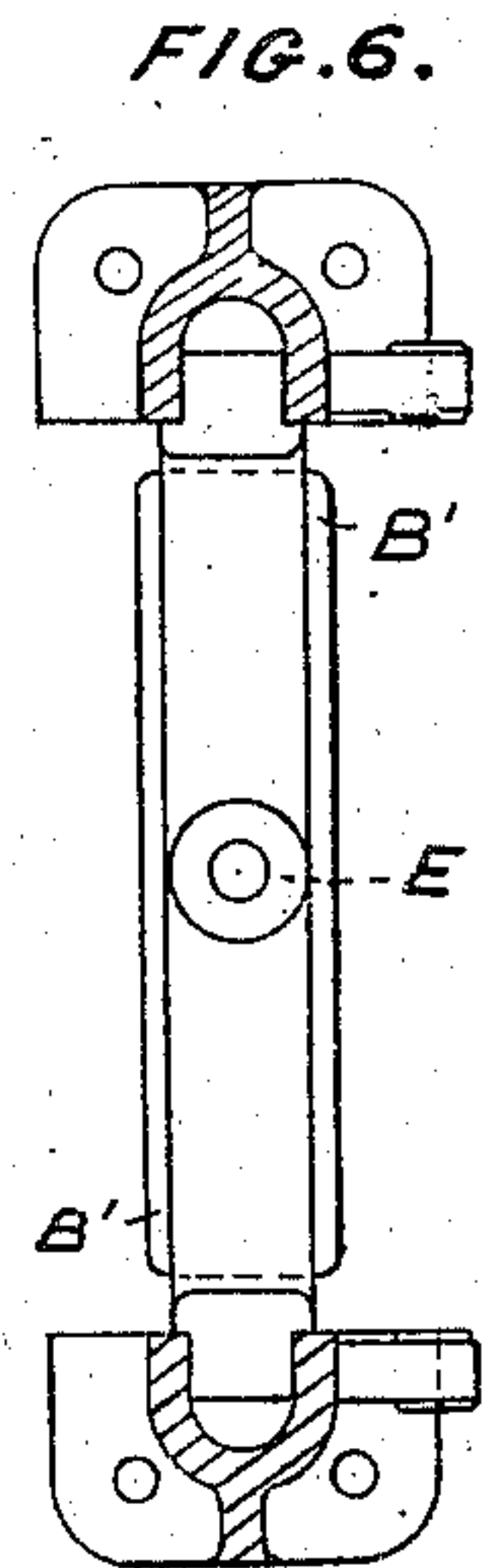
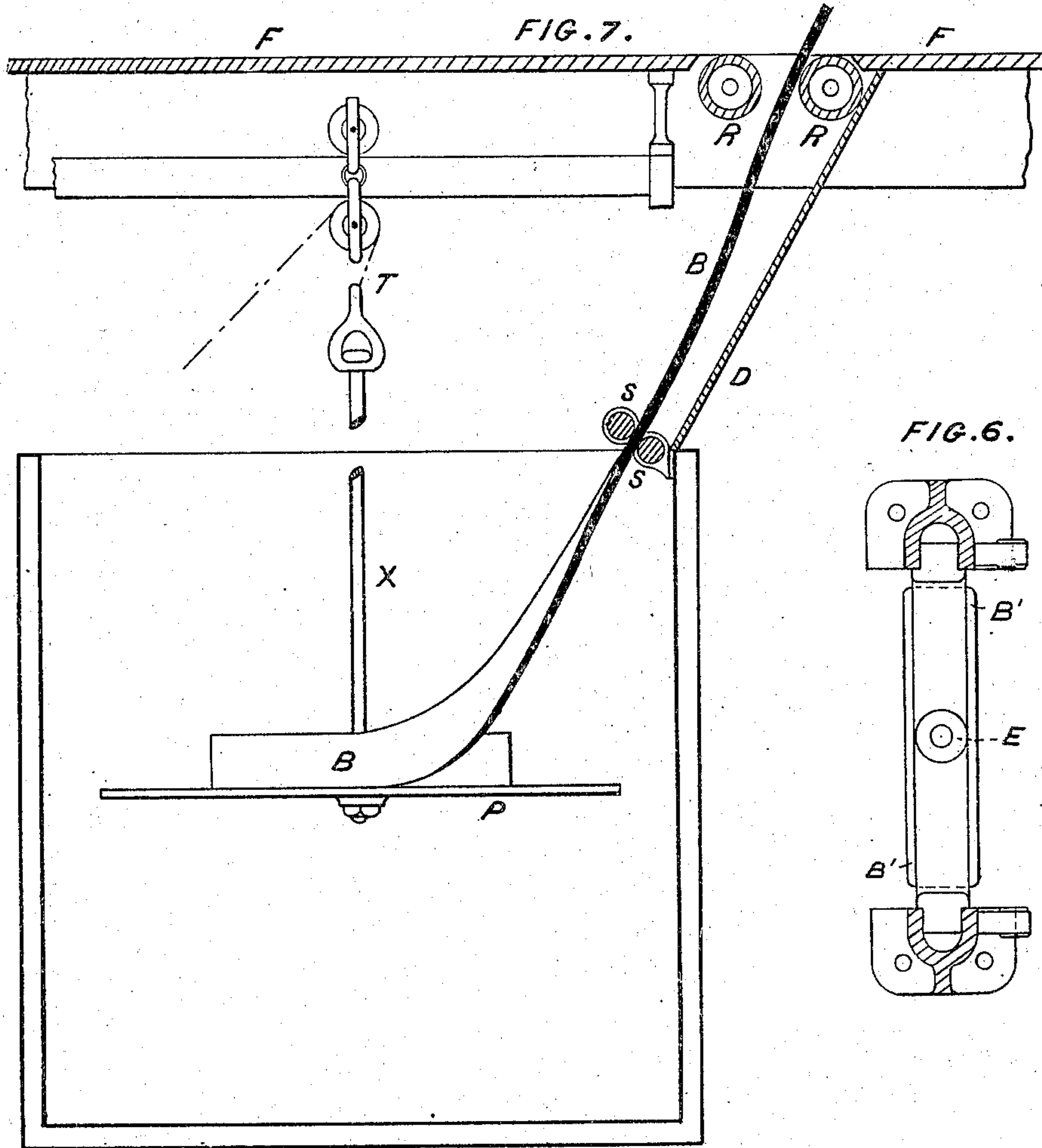


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# UNITED STATES PATENT OFFICE.

MAURICE GANDY, OF LIVERPOOL, GREAT BRITAIN.

## COTTON BELTING AND PROCESS OF MANUFACTURE.

SPECIFICATION forming part of Letters Patent No. 228,186, dated June 1, 1880.

Application filed September 10, 1879. Patented in England May 9, 1877.

*To all whom it may concern:*

Be it known that I, MAURICE GANDY, of Liverpool, in the county of Lancaster, in that part of the United Kingdom of Great Britain and Ireland called England, have invented an improved belt or band for driving machinery and an improved mechanical process of manufacturing the same, of which the following is a description in such full, clear, and exact terms as to enable any one skilled in the arts or science to which it appertains to make and use the same, reference being had to the accompanying drawings, making a part of this specification, by which there is illustrated certain machinery used in the practice of my invention, and in which—

Figure 1 is a cross-section of the sewing-machine referred to as used in my improved process. Fig. 2 is a front elevation of the rollers shown at Fig. 1. Fig. 3 is a front elevation of a part of the sewing-machine. Fig. 4 is a cross-section of the pressing-machine further referred to as used in my improved process. Fig. 5 is a front elevation of the same; Fig. 6, a detached part thereof; and Fig. 7, an adjunct, the use and relation of which will be hereinafter described.

My invention consists, first, of an improved cotton belt; second, of an improved mechanical process of making a cotton belt.

The belt consists, first, of cotton canvas or duck composed of warp stouter than the weft, both warp and weft being hard-spun and the canvas hard and tight woven; second, of cotton canvas or duck thus made folded and united by longitudinal rows of stitching and stitched under tension; third, of cotton canvas thus made, folded, and stitched, saturated with linseed-oil; fourth, of cotton canvas thus made, folded, stitched, and saturated with linseed-oil, pressed and stretched until it is hard, even, and rigid, by which the belt is rendered insensible to the atmospheric changes and non-elastic.

The method or mechanical process of making the belt consists, first, of folding the canvas upon the line of its warp, either in a machine or by hand, to the thickness desired; second, of stitching it by a suitable machine upon the line of its warp with as many rows of stitching as may be necessary to thoroughly

unite the folds or plies of canvas, the stitching being done while the belt is under tension between a holder and a pair of feed-rollers; third, of pressing the belt in a series of calender-rollers until its surface is flat and even and the several folds or plies of canvas are forced hard upon each other; fourth, of stretching the belt in the operation of pressing it until its tensile elasticity is practically exhausted and the liability of the belt to stretch in use is removed.

In the drawings, Fig. 1 represents a side elevation of a portion of a sewing-machine, nippers, and feeding-rollers, by which the belt B is sewed while under tension. Z are the driving-pulleys of the sewing-machine. (See also Fig. 3.) Y is a disk with a cam-groove, which operates, by means of the bell-crank lever V, the spring-pawl lever W, and thereby feeding and pressing rollers X. The feeding and pressing rollers X intermittently pull the belt B through and from the nippers U, which hold the belt, and the needle Q of the sewing-machine sews the belt while under strain. The feeding-rollers X are driven by a pulley, and are brought into operation by the machinist through the treadle and gear R. (See also Fig. 2.)

In the drawings, Fig. 7 represents a tank containing linseed-oil and set below the floor F, upon which the pressing and stretching machine is located.

By B is shown the belt after it has been folded and stitched. By P is shown a disk secured upon the lower end of a rod, X, to which a tackle, T, is attached, by which the disk P is raised and lowered in the tank. The object of the disk is to carry a coil of the belt suspended in the oil substantially in the manner shown.

The belt, after being sufficiently soaked with the oil, is led up between a pair of rollers, S S, by which the free oil is stripped off it, and thence forward between a pair of friction-rollers, R, and two pairs of nippers, B' B', passing on its way between the calender-rollers C C and C', as illustrated.

Each of the nippers is provided with an adjusting-screw, E, by which the nippers are forced upon the belt and its tension under the rollers is regulated. There are nippers on



each side of the rollers; but those on the delivery side are left open when in operation to allow the belt an unobstructed passage between them.

5 The rollers are arranged to rotate alternately in opposite directions, by which the belt can be pressed and stretched first one way and then the other, first from and then back to the oil-tank, until the oil is thoroughly soaked and  
10 forced into the fabric and every thread in the structure is drawn and pressed to its bearing, the tendency of the belt to stretch being thus developed to its maximum and its surface being brought to a hard and equal plane.

15 The two lower calender-rollers, C C, have their axis supported by stationary bearings in the frame A; but the roller C' is carried by an adjustable frame, which, through the agency of the jointed rod Q and the lever I, is forced  
20 down by a weight, W, upon the bottom rollers, as shown by Fig. 4.

By Fig. 6 is shown a top view of the nippers and a section through the frame by which they are supported.

25 It is not intended to confine the patent of which this is to be the specification to the especial form of machines, apparatus, or mechanical appliances above described, the in-

vention being not of any machine especially, but of the belt and of the mechanical process 30 by which it is produced.

I claim, therefore, and desire to secure by Letters Patent—

1. As an improvement in the mechanical process of manufacturing canvas belts, the fol- 35 lowing steps in succession, viz: first sewing the fabric while under tension to prevent the stitching from breaking when the belt is stretched; then saturating it with oil to make it proof against dampness; then drawing it 40 through stretchers and between rollers, to stretch the belt and force the fabric full of oil and make the belt hard, rigid, and smooth.

2. The improved article of manufacture consisting of a hard, even-surfaced, rigid, imper- 45 vious, non-elastic belt composed of cotton canvas or duck having its warp-thread larger than the weft, both warp and weft being hard-spun, the fabric tight-woven and folded, stitched, and saturated with linseed-oil.

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Witnesses:

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