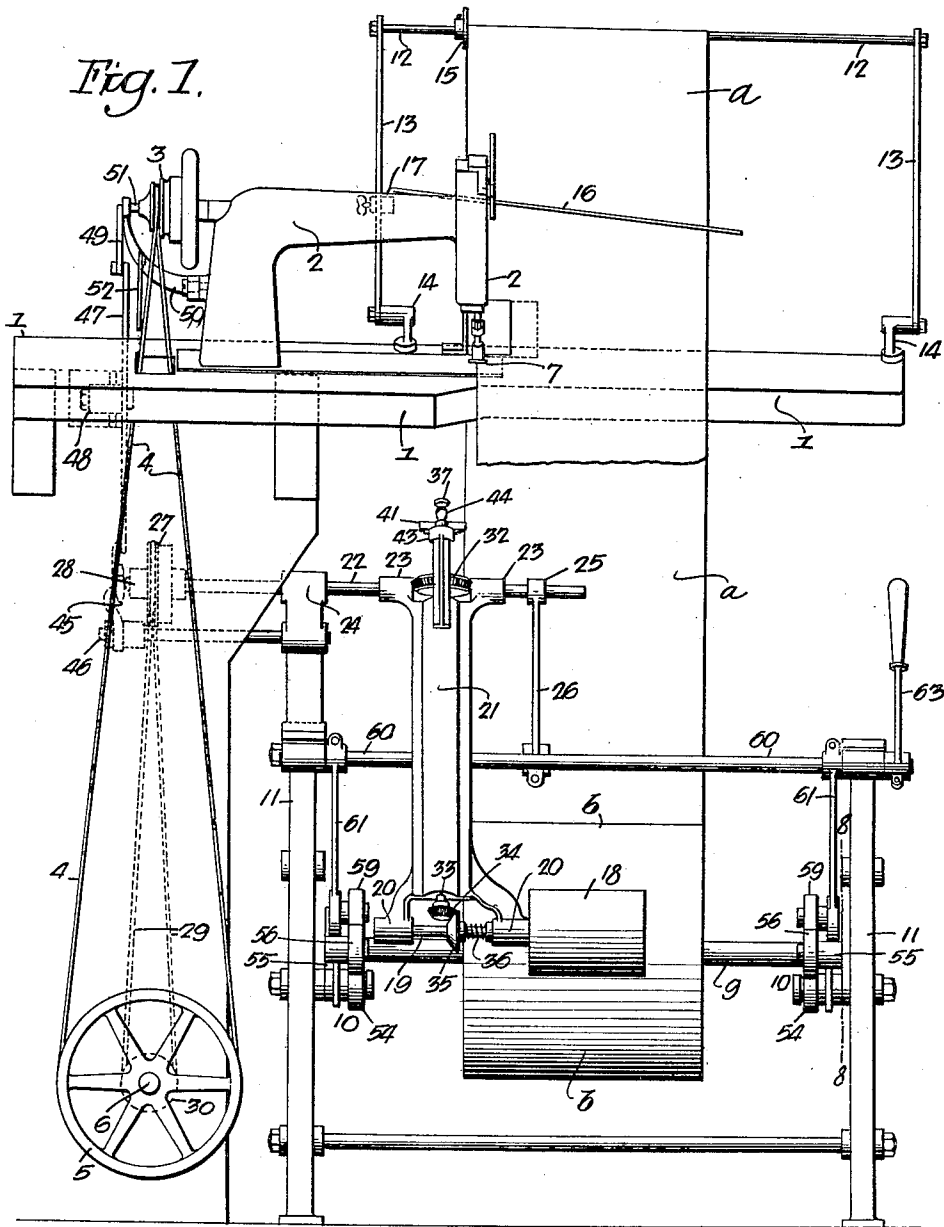


R. LOEB.  
TENSION MECHANISM.  
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1,401,995.

Patented Jan. 3, 1922.  
4 SHEETS—SHEET 1.



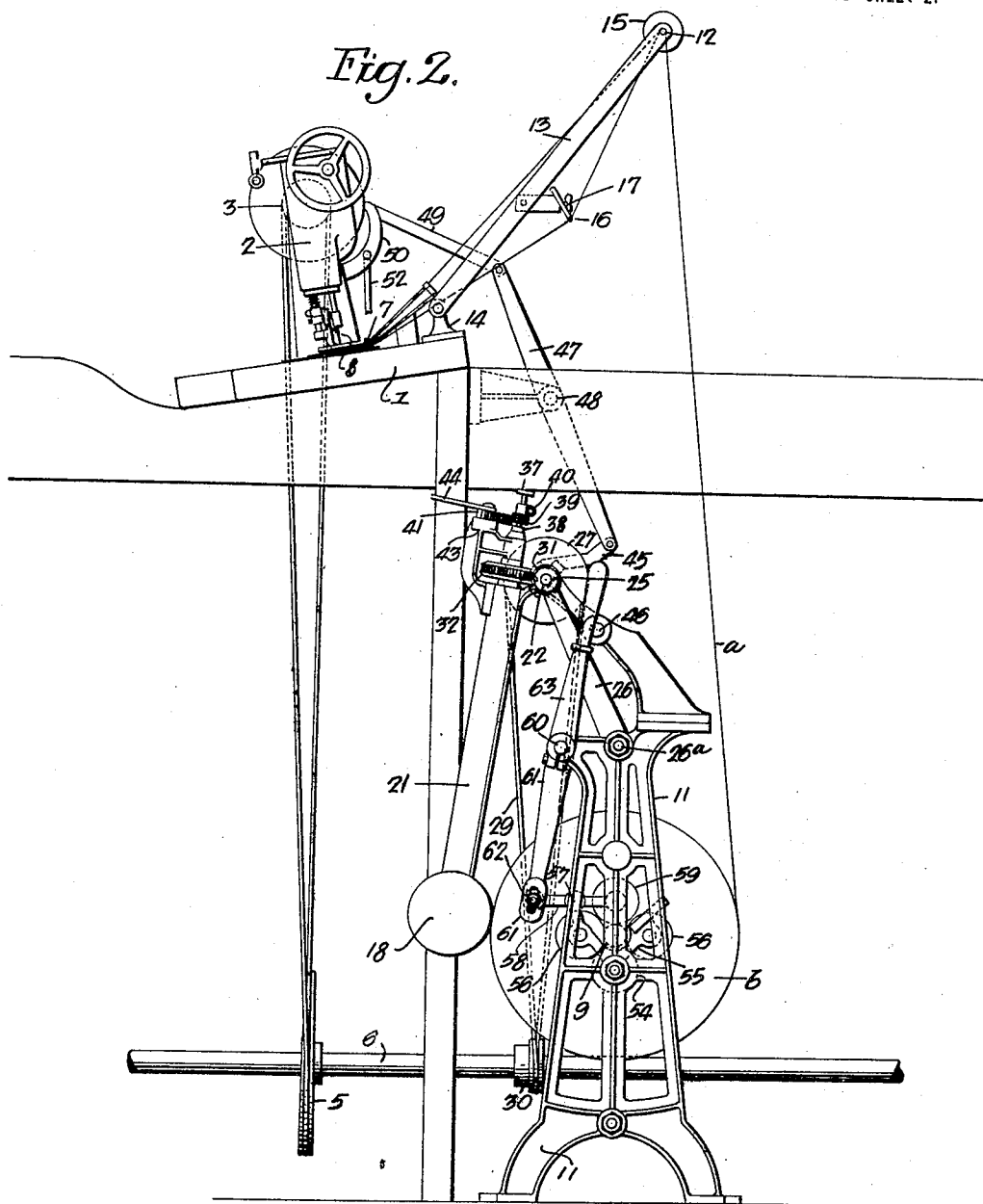
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4 SHEETS—SHEET 2.

Fig. 2.

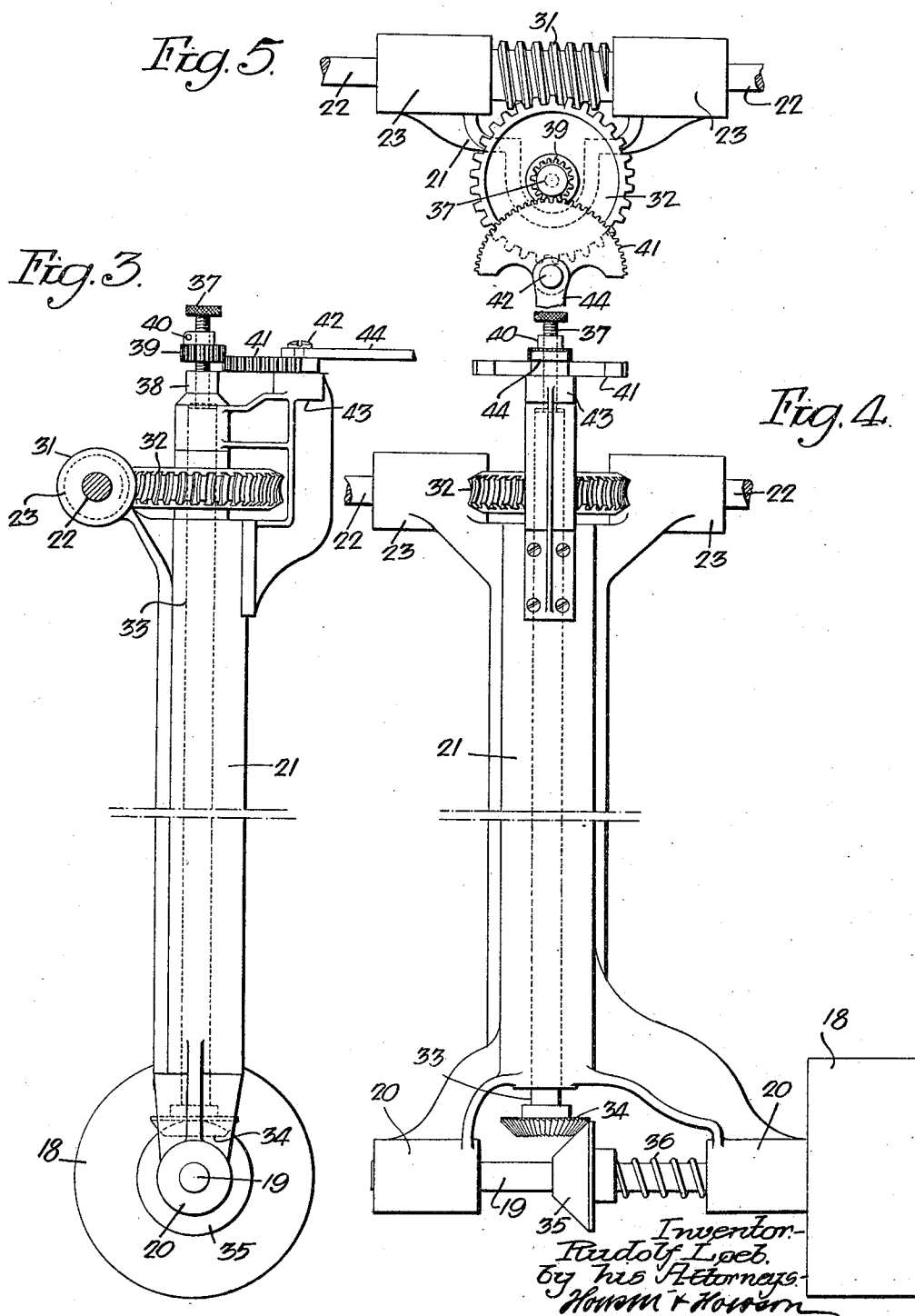


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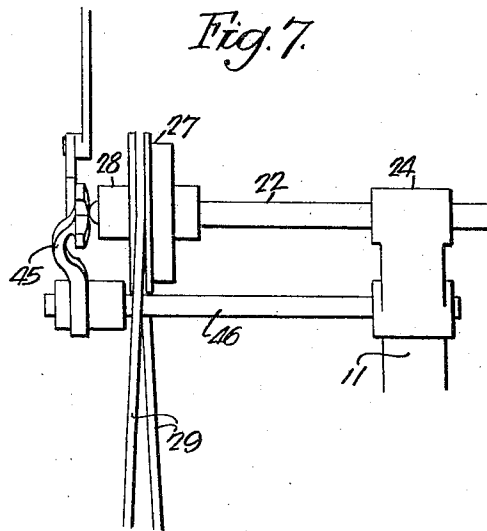
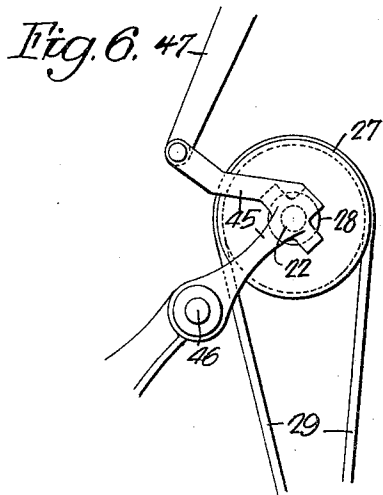
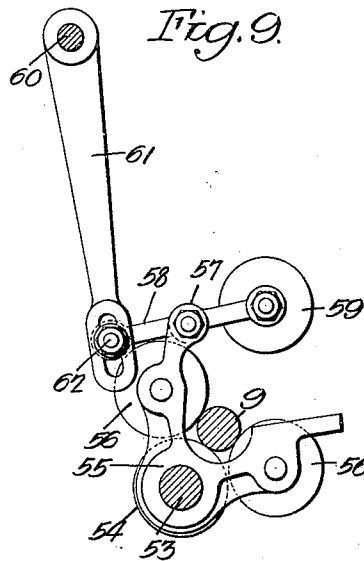
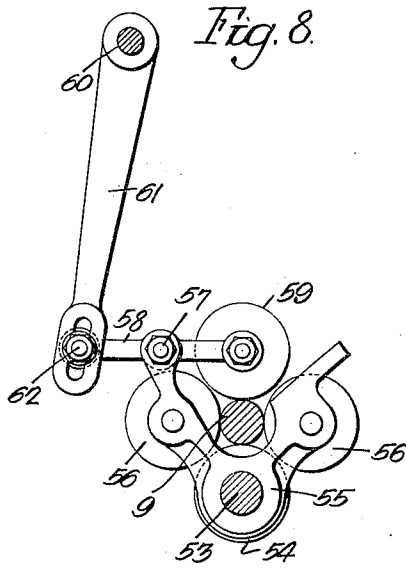
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4 SHEETS—SHEET 3.



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Patented Jan. 3, 1922.  
4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

RUDOLF LOEB, OF JENKINTOWN, PENNSYLVANIA.

## TENSION MECHANISM.

1,401,995.

Specification of Letters Patent.

Patented Jan. 3, 1922.

Application filed January 23, 1920. Serial No. 353,470.

*To all whom it may concern:*

Be it known that I, RUDOLF LOEB, a citizen of the United States, residing in Jenkintown, Montgomery County, Pennsylvania, have invented certain Improvements in Tension Mechanisms, of which the following is a specification.

One object of my invention is to provide means for properly feeding fabric from a roll to a sewing machine so that there will be proper tension on the fabric.

A further object of the invention is to provide means for adjusting the tension mechanism.

A still further object is to provide means for carrying the spindle on which the roll of fabric is wound.

My invention is especially adapted for use in connection with sewing machines for hemstitching the edges of handkerchiefs and other articles.

In the accompanying drawings:

Fig. 1 is a front view illustrating my improved tension mechanism in connection with a sewing machine having a hemstitching attachment;

Fig. 2 is an end view of the machine;

Fig. 3 is an enlarged end view of the means for driving and adjusting the tension roll;

Fig. 4 is a front elevation of the same;

Fig. 5 is a plan view;

Fig. 6 is an end view of the stop mechanism;

Fig. 7 is a side view of the same;

Fig. 8 is a sectional view on the line 8—8, Fig. 1, illustrating the bearing for the spindle; and

Fig. 9 is a view, similar to Fig. 8, showing the bearing in the open position so that the spindle can be removed.

1 is a table mounted on suitable supports. This table is arranged at a slight incline, in the present instance, as shown. On this table is a sewing machine 2, of any ordinary type used in factories. This machine is power driven, having a pulley 3 around which passes a driving belt 4 from a pulley 5 on a driving shaft 6. 7 is the hemmer attachment, which is located in proper position with respect to the needle 8. In the present instance, the machine is adapted to hem-

stitch one edge of a fabric, but it will be understood that it can be arranged to make a plain hem, or an embroidery stitch on the edge of the fabric, if desired.

The fabric is in the form of a roll cut to the width of a handkerchief, or other article to be stitched. The fabric is indicated at *a* and the roll of fabric is indicated at *b*. The roll of fabric is mounted on a mandrel, or spindle, 9 adapted to bearings 10 carried by a frame 11 of any suitable construction. The fabric may be secured to the spindle by an expanding mandrel, or may be mounted on a spool, which may be attached to the mandrel, if desired. The fabric passes from the roll *b* around a guide rod 12 on a bracket 13 adjustably mounted on bearings 14 secured to the table 1. On the rod 12 is a collar 15, which may be adjusted to any position and secured, after adjustment, so as to bring the edge of the fabric into proper alinement with the sewing machine. 16 is a tension rod adjustably secured at 17 to one of the arms forming the bracket 13. By adjusting this rod 16, the fabric can be brought in proper alinement with the hemmer 7 of the sewing machine.

In order to place proper tension on the fabric, I provide a tension roller 18, which bears upon the roll of fabric. This roller is mounted on a spindle 19 adapted to bearings 20 of a swinging frame 21, which has bearings 23 mounted on a shaft 22, which is mounted in bearings 24 on one of the frames 11 and a bearing 25 mounted on an arm 26 secured to a rod 26<sup>a</sup> extending from one side of the frame to the other. The shaft 22 is a driving shaft and has, in the present instance, a pulley 27 loose on the shaft, which can be connected thereto by a clutch 28 of any suitable type. A driving belt 29 passes around a pulley 27 and around a pulley 30 on the driving shaft 6. Secured to the shaft 22 is a worm 31, which is located between the two bearings 23 of the swinging arm 21 and this worm meshes with a worm wheel 32 splined to the shaft 33 extending through the swinging frame 21. On the lower end of this shaft 33 is a bevel wheel 34 having a roughened surface which meshes with a smooth cone wheel 35 on the shaft 19 carry-

ing the presser roll 18. The cone 35 turns with the shaft 19, but is arranged to slide thereon. Back of the cone is a spring 36, which keeps it in frictional contact with the bevel wheel 34 so that the presser roll 18 is positively driven and is always in contact with the surface of the roll of material, as it is free to swing on the shaft 22 and exerts sufficient pressure on the roll to provide the proper tension for the fabric.

As the presser roll 18 is a driven roll, the cone wheel 34 can be moved vertically so as to increase or diminish the surface speed of the presser roll, as desired. This is accomplished by means of a screw 37, which is adapted to the threaded extension 38 on the upper end of the swinging frame 21 and bears against the end of the shaft 33. The spring 36 on the shaft 19 tends to keep the shaft 33 in contact with the end of the screw so that, on turning the screw, the cone wheel 34 can be moved toward and from the shaft 19, altering the speed of the presser roll, as desired. The screw 37 is turned directly when considerable adjustment is required. I provide a pinion 39, which has a thread adapted to the screw and is secured thereto by a clamp 40. This pinion meshes with the teeth of a segment 41 pivoted at 42 to a bracket 43 of the frame and has a handle 44 by which it can be turned. By this means, the operator can make slight adjustments when it is found that the tension on the fabric should be altered.

In order that the rotation of the presser roll 18 will stop and start with the sewing machine 2, I provide a clutch 28 of any of the ordinary types for locking the pulley 27 to the shaft 22. This clutch is actuated by a beveled arm 45 on a stud 46 projecting from one of the frames 11 of the machine. This arm 45 is attached to one arm of a lever 47, which is pivoted at 48 to a bearing secured to the frame, which supports the table 1. The other arm of the lever 47 is connected by a rod 49 with a lever 50 of the sewing machine, and it is connected by a rod 52 to any suitable treadle mechanism, not shown, so that the moment the machine is stopped by an operator, the rotation of the tension roll 18 is also stopped. In the present instance, I have shown a means for supporting the spindle, or mandrel, 9 on the frames 11.

53 are two studs, one secured to one frame 11 and the other secured to the other frame 11. On these studs is a supporting roller 54 for carrying the ends of the spindle, or mandrel, 9. This roller may have a roller bearing, if desired, so that the mandrel will turn freely thereon.

55 is a frame pivotally mounted on each stud 53 and carries two rollers 56, which are the side supports for the spindle when in position, as shown in Fig. 8. This frame

has an extension 57 to which is pivoted a lever 58 carrying a roller 59, which is the top bearing for the mandrel 9. This lever 58 is actuated by a rock shaft 60 adapted to bearing in the frames 11. The rock shaft 70 has arms 61, which are slotted to receive studs 62 on the arms 58. On this rock shaft is a handle 63 by which the rock shaft can be turned when it is desired to open the bearing, as shown in Fig. 9, so that the mandrel 9 can be removed and another mandrel with a roll of fabric thereon, can be placed in the bearing, after which the bearing is closed, as in Fig. 8.

Thus it will be seen by the above construction that I can provide means for readily mounting a roll of material in the machine. I also provide means for placing tension on the material as it is unrolled and fed to the machine. This tension can be regulated by the operator at will.

This invention is especially applicable for stitching the edges of rolls of fabric from which handkerchiefs are made. This material is first stitched on one edge, rerolled, and again placed in the machine and stitched along the other edge, after which it is cut in desired lengths and the unstitched edges are stitched in another machine.

The character of the stitch may be varied by substituting one style of hemmer 7 for another.

I claim:

1. The combination in a tension device, of a mandrel for carrying a roll of material to be stitched; a swinging frame; a shaft thereon; a presser roller mounted on the shaft; a driving shaft at the point of suspension of the swinging frame; a longitudinal shaft located in the frame; gearing between the driving and the longitudinal shaft; a friction drive between the longitudinal shaft and the shaft on which the presser roller is mounted; and means for varying the rotation of the roller in respect to the driving shaft.

2. The combination in a tension device, of a mandrel on which a roll of material is mounted; a frame carrying a mandrel; a driven shaft; a frame pivotally mounted on the shaft; a longitudinal shaft mounted on the pivoted frame; worm and worm gearing between the two shafts; a bevel wheel on the end of the longitudinal shaft; a transverse shaft on the free end of the pivoted frame; a roller on said shaft; a cone arranged to slide on and turn with said shaft; and a screw for adjusting the longitudinal shaft so as to vary the speed of the presser roll.

3. The combination in a tension device, of a mandrel on which a roll of material is mounted; a frame carrying a mandrel; a driven shaft; a frame pivotally mounted on the shaft; a longitudinal shaft mounted on

the pivoted frame; a worm and worm gear-  
ing between the two shafts; a bevel wheel  
on the end of the longitudinal shaft; a trans-  
verse shaft on the free end of the pivoted  
5 frame; a roller on said shaft; a cone ar-  
ranged to slide on and turn with said shaft;  
a screw for adjusting the longitudinal shaft  
so as to vary the speed of the presser roll;  
a pinion adjustably mounted on the screw;  
and a segment meshing with the pinion and 10  
having an arm by which an operator can  
turn the screw when minor adjustments are  
necessary.

RUDOLF LOEB.