

No. 709,524.

Patented Sept. 23, 1902.

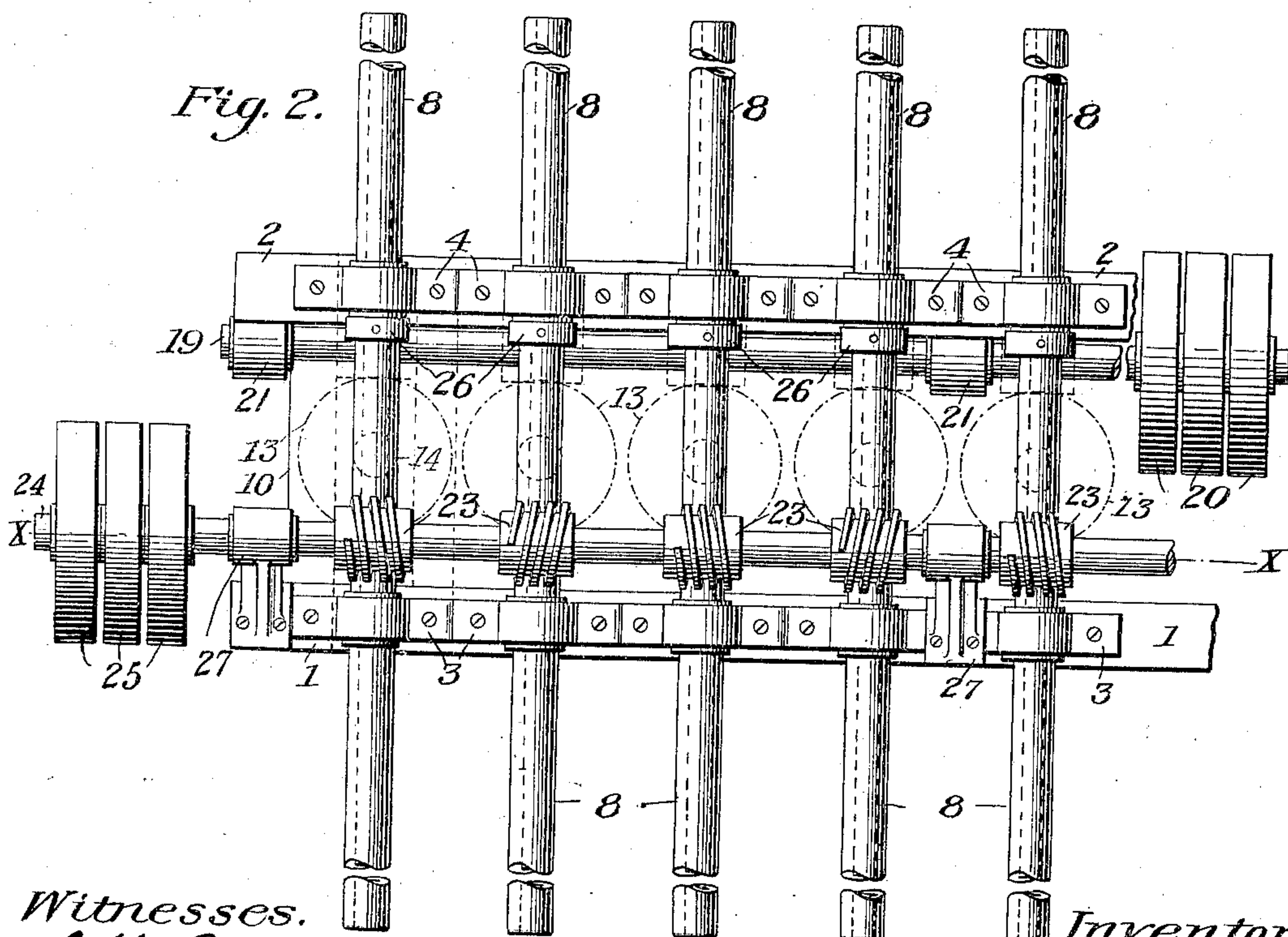
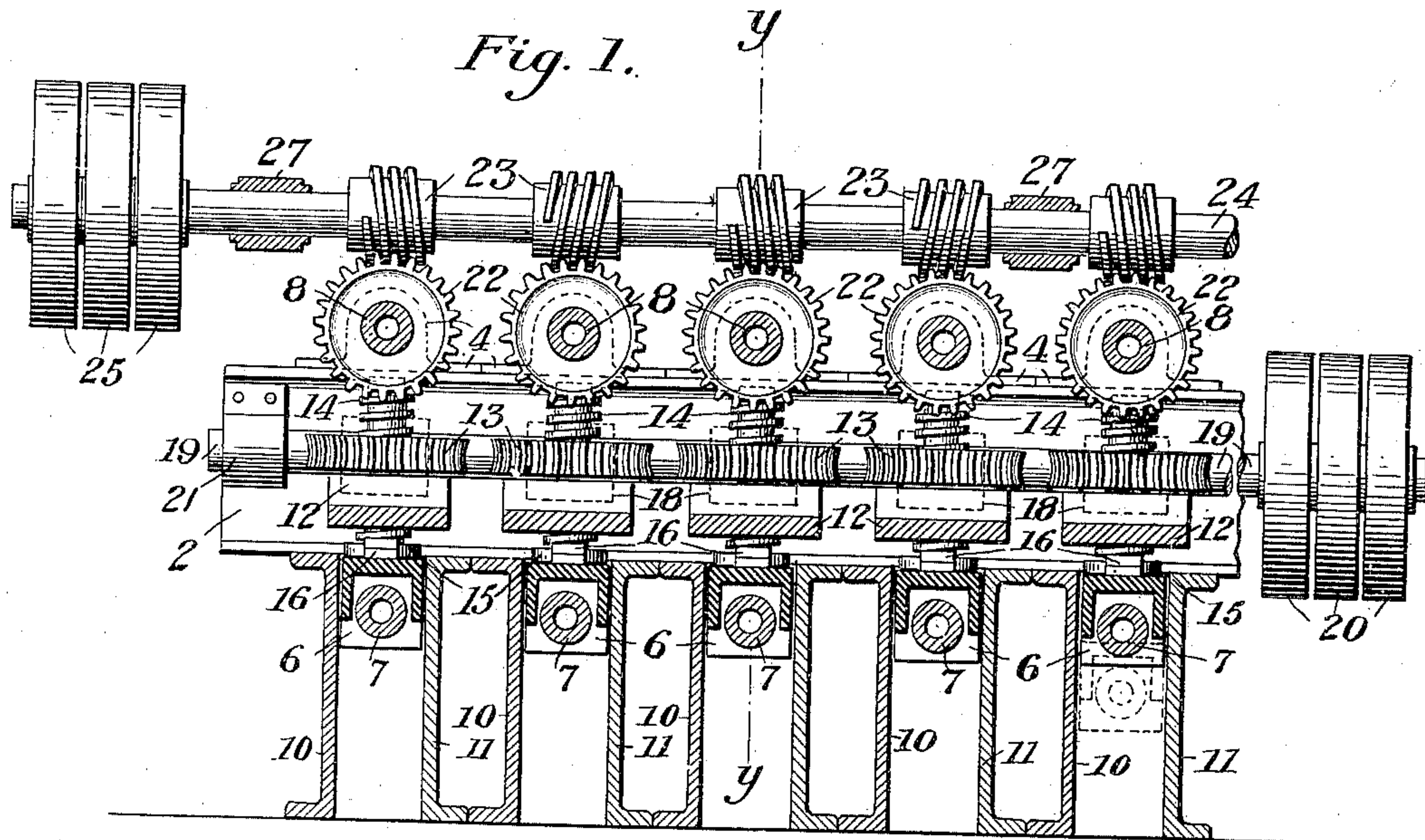
C. STUART.

PROCESS OF INTENSIFYING THE LUSTER OF SILK.

(Application filed July 10, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

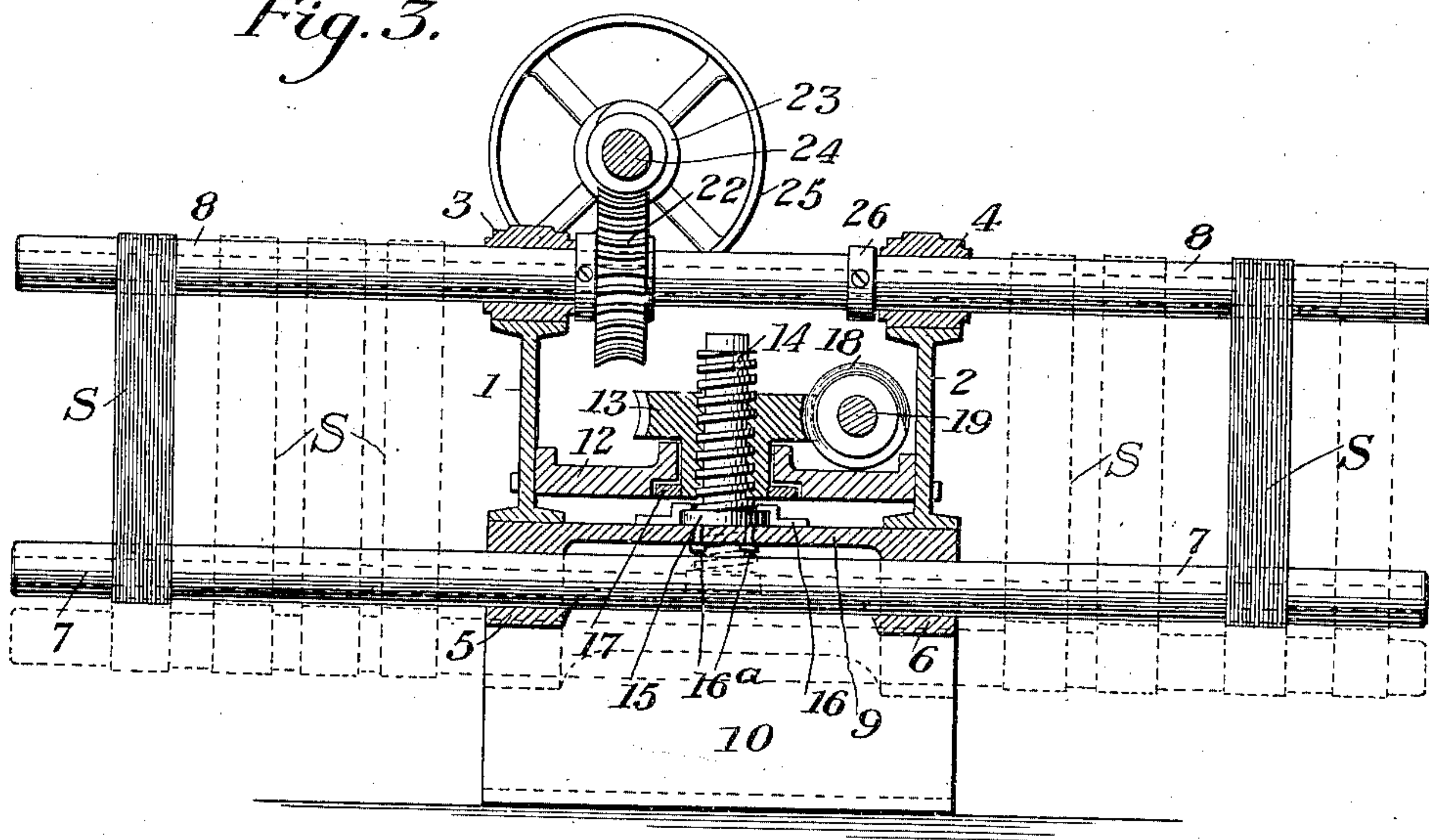
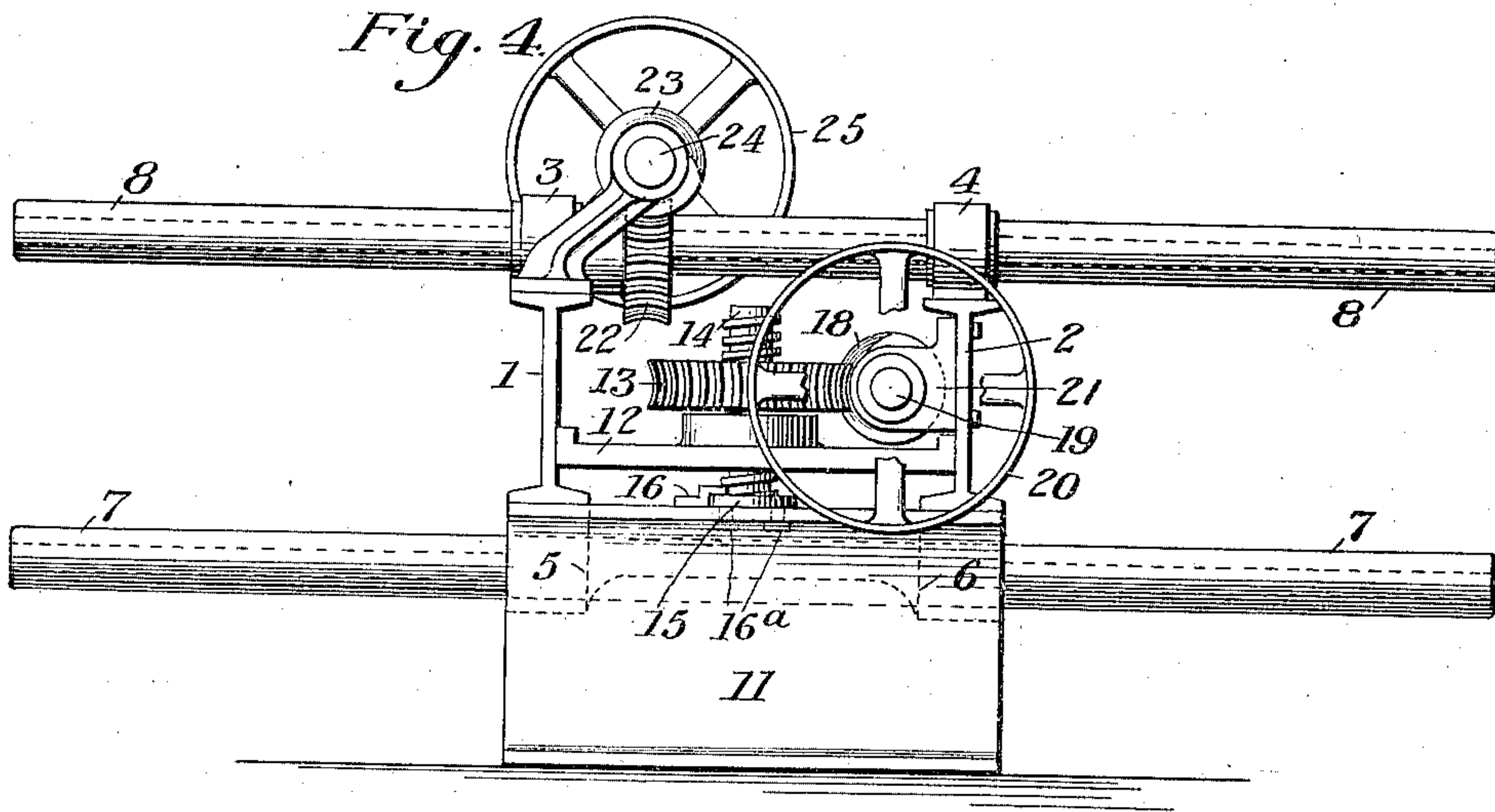


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES STUART, OF PATERSON, NEW JERSEY.

PROCESS OF INTENSIFYING THE LUSTER OF SILK.

SPECIFICATION forming part of Letters Patent No. 709,524, dated September 23, 1902.

Application filed July 10, 1902. Serial No. 115,100. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES STUART, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Processes of Intensifying the Luster of Silk, of which the following is a specification, reference being had therein to the accompanying drawings.

My process is illustrated in said drawings, in which—

Figure 1 is a sectional view through the line *xx* in Fig. 2, which shows a machine on which the skeins of damp silk are suspended, stretched, and revolved while being maintained in said stretched condition and being subjected to a dry air of a temperature of about 120° Fahrenheit. Fig. 2 is a plan view of said machine. Fig. 3 is a sectional view through the line *yy* of Fig. 1, and Fig. 4 is an end view of the machine.

The skeins of damp silk are spread out on and around a pair of rollers 7 and 8, which are preferably hollow metallic rollers nickel-plated. Both of said rollers are adapted to turn in their respective bearings; but the upper roller 8 is mounted in bearings 3 and 4, which are secured to the upper part of the I-shaped beams 1 and 2, while the lower roller 7 is mounted in bearings or journals 5 and 6. In the downwardly-projecting portions of the inverted-U-shaped bridge 9, which is adapted to slide vertically between the legs 10 and 11, which in sets of two form a guide for the combined bearings 5 and 6 and the lower roller 7 when the silk is being stretched or slackened preparatory to the removal thereof from the rollers after being dried. The bearings 5 and 6 of the lower roller 7 are raised or lowered by means of the screw 14, which passes through the worm gear-wheel 13. The screw 14 has a head 15, which is secured, by means of screw 16^a, to the bridge 9, and when the worm gear-wheel 13 is rotated by means of the worm 18 on the driving-shaft 19 the screw 14 is raised or lowered, and with it the bridge 9 and the bearings 5 and 6, according to the direction in which the worm gear-wheel 13 is turned. The worm gear-wheel 13 is provided at its lower end with a lock-nut 17, which prevents it from rising, but permits it to turn in the support 12, which is secured to

the I-shaped beams 1 and 2. In addition to the head 15 on the lower end of the screw 14 being secured by the screw 16^a it is secured also by means of clamps 16 on the upper part of the bridge 9. The shaft 19 is driven from a set of pulleys, the two outside pulleys being loosely secured to said driving-shaft 19 and the center one being fastened thereto, one of the outer pulleys being utilized for a straight and the other for a cross belt in order to drive the shaft in either direction. The shaft 19 is mounted in bearings 21 on the machine-frame.

When the skeins of silk have been placed around and spread out on the upper and lower rollers (a pair of rollers, the upper and the lower one being capable of accommodating a great many skeins) and the stretching mechanism has been put into operation, forcing the lower roller down until the skeins are stretched to the desired extent, they are left in that position, thereby being prevented from shrinking, and the upper roller 8 is caused to rotate by means of the driving device. (Shown in Fig. 1.) Power being communicated to the driving-shaft 24, a rotary motion is communicated through the worm 23 to the worm gear-wheels 22, which are secured each to its respective upper roller 8. Each upper roller 8 is thereby caused to turn in its bearings, and owing to the stretched condition of the silk around the two rollers—the upper one, 8, and the lower one, 7—both are caused to turn in the same direction, thereby giving to the skein or skeins of silk a continued revolution around the rollers and in the same direction in which the rollers are turning, so that during the successive revolutions of the silk every portion of the skein is brought in contact with the smooth heated surface of the rollers. The silk is therefore stretched while damp, maintained in a stretched condition, spread out around the rollers, and the rollers being heated and the air being dry and heated to a temperature of about 120° Fahrenheit the silk is also calendered while drying and passing around the heated rollers in the dry air of the heating room or chamber.

The object of my invention is to give to silk fiber and the fabric into which it is woven a glossiness or permanent luster of great bril-

liancy; and it consists in taking the skeins of silk fiber as they come from the hydro-extractor after being dyed, stretching them while damp, maintaining them in a stretched condition, and causing the skeins to be rotated or turned gradually while so stretched and in subjecting the silk while so damp, stretched, and gradually turning to a drying heat of a temperature of about 120° Fahrenheit until completely dry. By this process the silk is prevented from shrinking while drying and the silk being kept in motion every portion of the skein of silk during the revolution of the skein is acted upon and a uniformity in the luster is produced throughout the whole skein. After the silk has passed through this process it does not shrink and retains the brilliancy which has been imparted to it by this process and exhibits it in the woven fabric.

In carrying out this invention I use a drying and stretching room in which a silk-stretching machine is erected of the class illustrated in the accompanying drawings, upon which I suspend the damp skeins of fiber as they are taken from the hydro-extractor after dyeing. The skeins are passed around suitable rods, which are capable of holding a plurality of skeins. These rods may be made of metal or other suitable material, and they may be either tubular or solid. Whether the skeins be passed around the said rods in a vertical or in a horizontal position is immaterial. The stretching-machine comprises means for forcing one of the rods which contains the skeins away from the other rod which is fixed, in order to stretch the skeins, a means for maintaining the rods apart to keep the skeins in said stretched condition, and also comprises means which give to said rods a rotary motion, thereby imparting a rotary motion to the stretched skeins of damp silk, so that the skeins are performing during the process a gradual revolution around said rods. These rods having a smooth

surface and being of metal, whether solid or tubular in construction, become heated owing to the temperature of the drying-room, which is about 120° Fahrenheit, and as they revolve the skeins of stretched silk revolve, every portion of the skein being acted upon and passing around said rods during the revolutions of the skein, and the silk is thus calendered, the result being a perfect smoothness, equality, and luster. When the skeins are perfectly dry, the rods are brought together to facilitate the removal of the silk, which is perfectly dry, does not shrink, and is ready for the process of manufacturing.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of intensifying the luster of silk, which consists in taking the skeins directly from the hydro-extractor after dyeing, and, while still damp, stretching them and simultaneously maintaining them in a stretched condition, causing them to be gradually revolved and subjecting them while so stretched and being revolved in a closed chamber to dry air at a temperature of about 120° Fahrenheit, thereby preventing shrinking during the drying, as set forth.

2. The process of intensifying the luster of silk, which consists in taking the skeins, after dyeing, from the hydro-extractor, and, while they are still damp, stretching them and simultaneously maintaining them in a stretched condition, causing them to be gradually revolved and calendered, and subjecting them while so stretched and being revolved and calendered, in a closed chamber, to dry air at a temperature of about 120° Fahrenheit thereby preventing shrinking during the drying, as set forth.

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

CHARLES STUART.

Witnesses:

LOUIS A. PIAGET,
JOHN F. KERR.