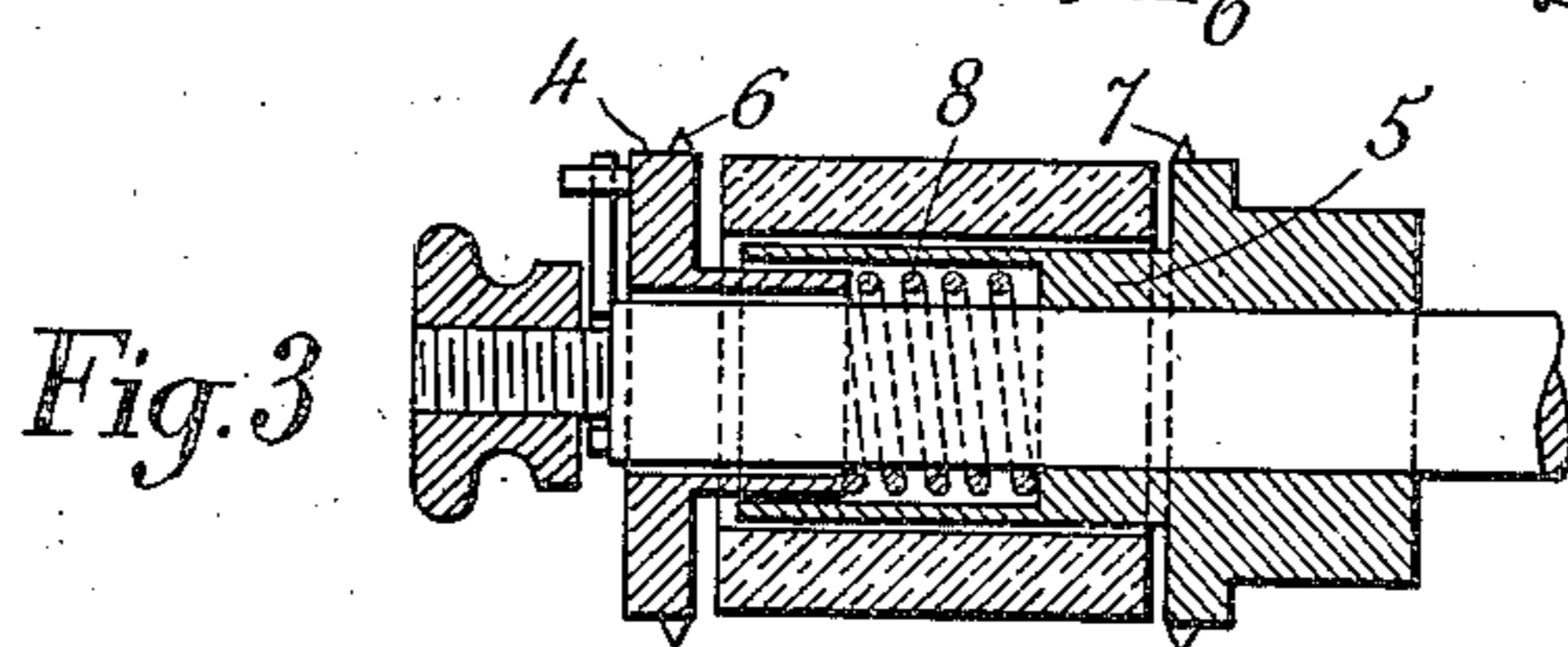
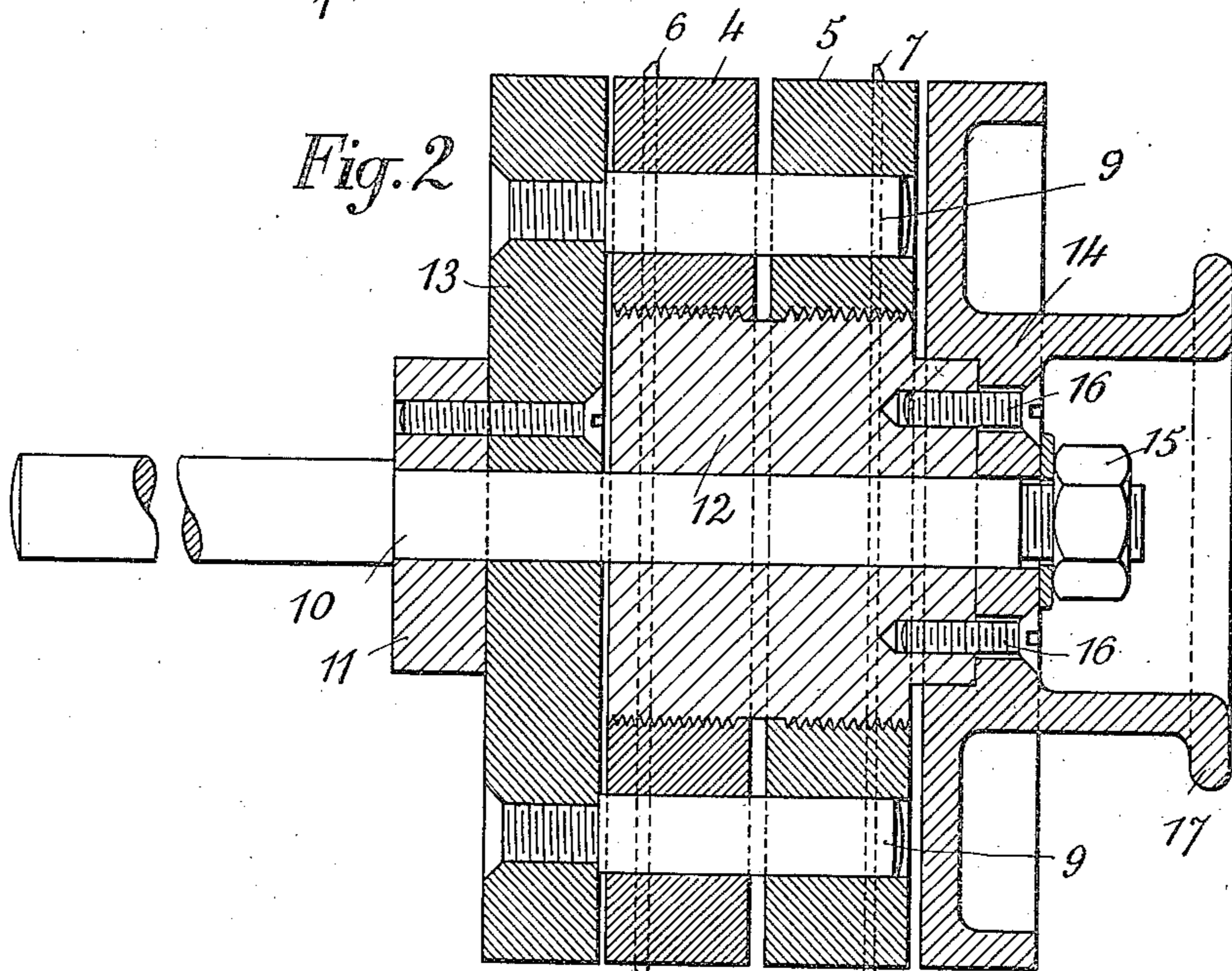
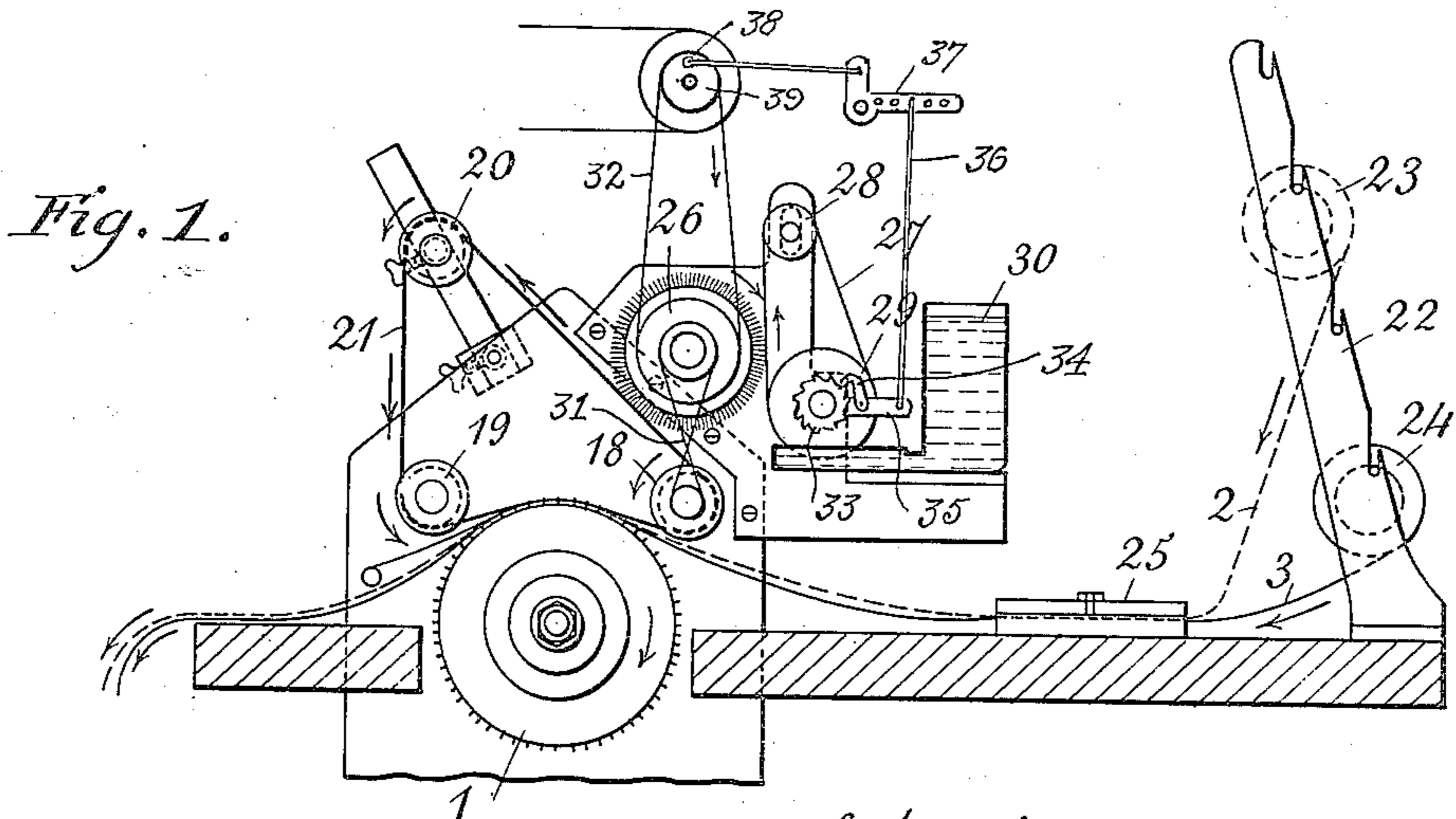


E. A. IVATTS.
MACHINE FOR COLORING KINEMATOGRAPHIC FILMS.
APPLICATION FILED OCT. 3, 1908.

923,432.

Patented June 1, 1909.



Witnesses

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MACHINE FOR COLORING KINEMATOGRAPHIC FILMS.

No. 923,432.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed October 3, 1908. Serial No. 456,094.

To all whom it may concern:

Be it known that I, ERNEST ALBERT IVATTS, engineer, a citizen of Great Britain, residing at Paris, in the Department of the Seine and Republic of France, have invented certain new and useful Improvements in Machines for Coloring Kinematographic Films, of which the following is a specification.

The object of the present invention is a machine for coloring kinematographic films by means of stencil bands, that is to say by means of bands cut out according to certain shapes, limiting the parts to be colored of the film.

This invention is characterized by: (1) a continuous movement of the principal parts permitting of obtaining increased production; (2) an arrangement for continuously actuating the film to be colored and its stencil band, consisting of a toothed cylinder constructed so as to permit of an automatic or other adjustment of the two sets of teeth which engage in the perforation of the films for the purpose of obtaining the lateral adjustment of these bands; (3) a coloring arrangement consisting of an endless band carrying the coloring material and moving continuously above the film to be colored and its stencil but in an opposite direction to these latter during their passage on the actuating cylinder; (4) a holding-back of the films and principally of the stencil which is generally shorter than the film itself and permitting the sliding of the stencil above the film in an opposite direction to that in which the film and stencil are being moved for the purpose of maintaining the longitudinal adjustment of these two bands on each other; (5) the material or nature of the endless band effecting the coloring consisting of a ribbon in velvet or other like pile fabric; (6) the inking arrangement of the endless band effecting the coloring consisting of a circular brush rotating in the direction in which this band is moved but at a higher speed for the purpose of straightening up the surface of the velvet which has been pressed down when passing above the film; (7) the feeding of the coloring material to the above mentioned circular brush by an endless band plunging into a bath maintained at a constant level, the movement of this band being adjustable according to the inking to be given; (8) the

possibility of employing this machine by substituting suitable liquids for the colors, for producing what is known in the industry of printing on tissues or papers as discharge prints or reserve prints.

According to the drawing accompanying this description: Figure 1 shows in side elevation a diagrammatic view of the coloring machine. Fig. 2 shows a transverse section of the actuating cylinder with adjustable teeth. Fig. 3 shows a transverse section of the actuating cylinder, the teeth of which can be automatically adjusted.

According to this invention the machine consists of a solid frame on which are mounted the mechanism for actuating the band or film to be colored and its stencil as well as the arrangement for coloring.

1.—The mechanism for actuating these bands consists of a cylinder 1 rotated around its axle and actuating and adjusting in position the stencil 2 and the film 3 to be colored, arranged on each other, this being effected by means of two parallel sets of teeth engaging in the perforation of the films. This cylinder 1 is divided perpendicularly through the middle into two parts 4 and 5 but turning as a single piece. The two sets of teeth 6 and 7 of the cylinder are arranged respectively each on one of the two parts. They can thus be adjusted laterally although they are rotated uniformly together. The teeth of each set correspond, and are arranged two by two on generating straight lines on the surface of the cylinder; the distance separating them is absolutely constant and identical. The distance separating these two sets of teeth may be adjusted either automatically as shown for example in Fig. 3 in which a spring 8 constantly tends to separate the two halves 4 and 5 of the cylinder, while the tension of the two films 2—3 engaged in the teeth 6—7 limits this separation of the two sets of teeth by counterbalancing the action of the spring 8, or the lateral adjustment of the sets of teeth may be effected by hand, as shown for example in Fig. 2 in which the sets of teeth (6—7) are cut on the two parts 4—5, which turn uniformly together by means of the pin 9. These two parts 4 and 5 are provided with a screw thread at the interior, a right hand thread for the one part and a left hand thread for the other part, and are screwed on to another part 12 provided with two iden-

tical screw threads, and turning loosely on a shaft 10 provided with a shoulder 11. Two pieces 13—14 arranged at either side serve, the one 13 for rotating the two parts 4—5, the other 14 is provided with a thumb stud 17 and serves for adjusting the distance separating the two parts 4—5 and consequently also the sets of teeth 6—7. The bolt 15 serves for locking the whole system, and screws 16 rigidly connect up the two parts 14 and 12; in order to regulate the distance separating the two parts 4—5 it suffices to unscrew the nut of the bolt 15 and turn the stud 17 of the part 14 in one direction or the other until the screw thread of the part 12 acting on the parts 4 and 5 have brought the two sets of teeth 6—7 into the required position. It is easy to be seen that with this arrangement the lateral adjustment of the images printed on the film and the corresponding openings in the stencil will now only depend for their adjustment on the perforations which is easily effected. Theoretically, for an exact adjustment, it is absolutely necessary that the lateral distance between the perforations of the two bands, film and stencil, should be exactly the same, but in practice there is a certain amount of variation permitted.

2.—The arrangement for coloring consists of three rollers 18, 19, 20, on which revolves an endless band 21 effecting the coloring; at the lower portion, between the two rollers 18 and 19 this band presses against the cylinder 1, on which are situated the film 3 to be colored and the stencil 2. A support 22 arranged at the front of the machine carries two spools 23 and 24 the one 23 containing the stencil 2 and the other 24 the film 3 to be colored. The film and stencil first pass through a guide 25 and then engage with the tooth cylinder 1. The endless band is rotated in an opposite direction to that of the film by means of the driving rollers 18 and 19. The roller 20 serves as stretcher and by regulating its position also permits of centering the band 21 on the films. This band 21 serves as vehicle for the color. It is continuously moistened by a circular brush 26 so as to continuously replace the coloring material taken up by the film during its passage over the cylinder 1. Its nature should be such that it is capable of coloring the film through the cut-out openings of the stencil and consequently, as it were, to a greater or less extent embrace the openings of the stencil. For this purpose one may, for example, use a ribbon in velvet or other like pile fabric.

The endless band 21 is moved (as by the belt 31) in an opposite direction to that of the film and stencil, principally for the purpose of producing as it were, a methodical use of the color which it contains and consequently a progressive coloring of the film:

this movement in an inverse direction has also the advantage of longitudinally adjusting the film and the stencil on each other. As a matter of fact, the friction of the band 21 on the film and stencil holds these latter back in an opposite direction to that in which they are moving, the perforations of the film and stencil are thus continuously held pressed on the teeth of the cylinder 1 and always from the same side, thus producing a longitudinal adjustment of these perforations as exactly as possible; furthermore, the stencil, the perforations of which are always nearer to each other than those of the corresponding film as it is older, should consequently slide with regard to this film in an opposite direction to that in which they are moved for the purpose of maintaining its longitudinal adjustment. This sliding movement will be facilitated by the holding back resulting from the direct friction of the band 21 on the stencil.

The circular brush 26 effecting the inking of the endless band 21 is so rotated (as by the belt 32) that it rubs against the band 21 in the same direction as that in which the latter is rotated, but at a slightly higher speed for the purpose of redressing the surface of the velvet which has been pressed down when passing over the cylinder 1. This brush 26 is inked by another endless band 27 consisting for example of a wire gauze held by two rollers 28 and 29 and plunging into a bath maintained at a constant level by a reservoir 30. This band 27 can be rotated by means of a driving roller 29 which latter may be operated intermittently by a mechanism of levers and ratchet wheels rotating this roller 29 periodically through a distance which can be adjusted as required. The mechanism shown in the drawing comprises a ratchet wheel 33 on the shaft of the roller 29, engaged by a pawl 34 pivoted on a lever 35 which is oscillated by a pitman 36 attached to a bell crank lever 37 which is rocked by a crank pin 38 on the pulley 39 which drives the belt 32. A series of holes in the bell crank lever permits the stroke of the lever 35 to be varied by shifting the point of attachment of the pitman to the bell crank lever.

Having now particularly described and ascertained the nature of my invention, I declare that what I claim is:

1. Means for coloring kinematograph films, comprising a stencil strip containing perforations similar to those in the film, a toothed drum for moving said stencil and film together by engaging said perforations, and a color-applying belt moving in the opposite direction to that of the stencil and film and exerting a backward drag on the stencil to keep it always in register with the film.

2. Means for coloring kinematograph films,

comprising a stencil strip moving in unison with the film, a color-applying belt moving in the opposite direction and means for redressing the surface of said belt.

5 3. Means for coloring kinematograph films, comprising a stencil strip moving in unison with the film, a color-applying belt moving in the opposite direction and means for redressing the surface of said belt, said means
10 comprising a color-distributing brush moving in the same direction as the belt but at a slightly higher speed.

4. Means for coloring kinematograph films, comprising a stencil strip moving in unison
15 with the film, a color-applying belt moving in the opposite direction, a color-distributing brush moving with said belt but at a higher speed, a color-supplying band in contact with said brush, and means for moving said
20 band intermittingly.

5. Means for coloring kinematograph films, comprising a stencil strip moving in unison with the film, a color-applying belt moving in the opposite direction, a color-distributing
25 brush moving with said belt but at a higher speed, a color-supplying band in contact with said brush, means for moving said band intermittingly, and means for varying

the speed of movement of said color-supplying band.

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6. In a machine for coloring kinematograph films, a drum for actuating the film and its stencil, consisting of a hub having right and left hand screw threads, two
35 toothed wheels meshing with said screw threads, and means for turning said hub in order to axially separate or approach said wheels.

7. In a machine for coloring kinematograph films, a drum for actuating the film
40 and its stencil, consisting of a hub having right and left hand screw threads, two toothed wheels meshing with said screw threads, means for turning the hub in order to vary the relative distance between said
45 wheels, a shaft on which said hub is loosely mounted, and a driving element secured to said shaft and engaging with both of said wheels.

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

ERNEST ALBERT IVATTS.

Witnesses:

HENRY DANBY,
LUCIAN CRESPIEN.