

No. 827,129.

PATENTED JULY 31, 1906.

S. W. WARDWELL.  
TAKE-UP FOR NARROW WARE LOOMS.

APPLICATION FILED MAR. 3, 1902.

2 SHEETS—SHEET 1.

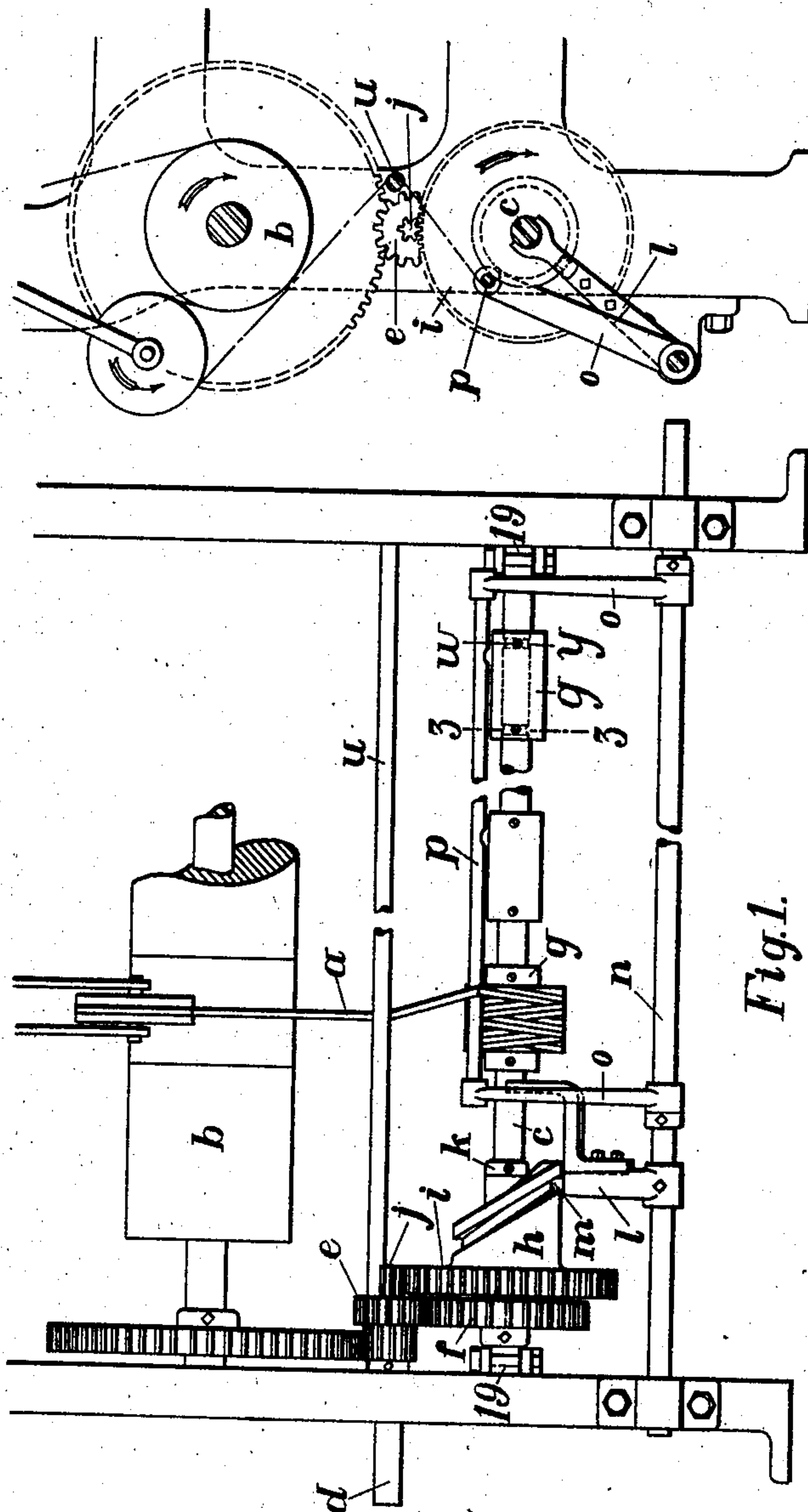


Fig. 1.

Fig. 2.

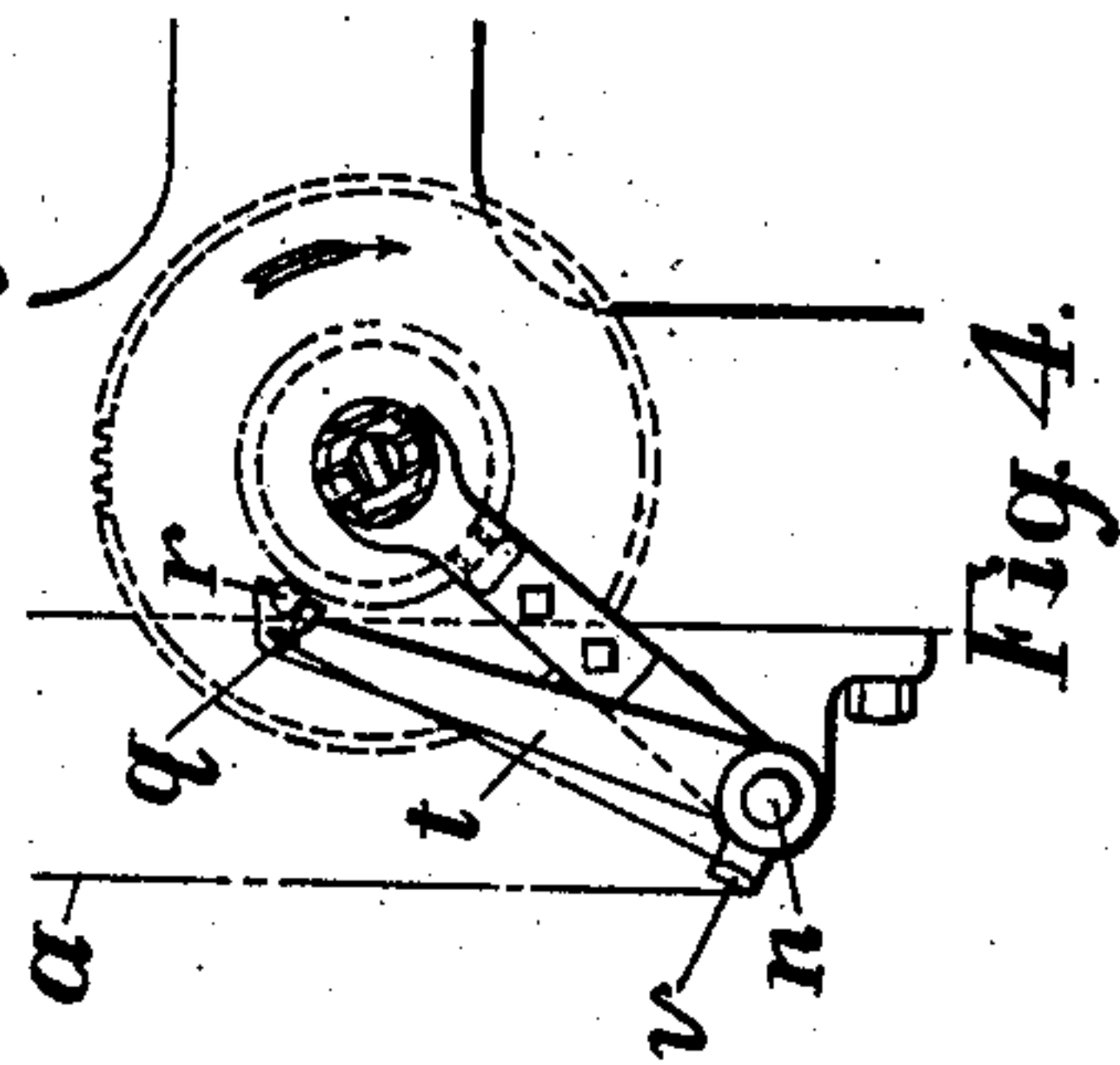


Fig. 4.

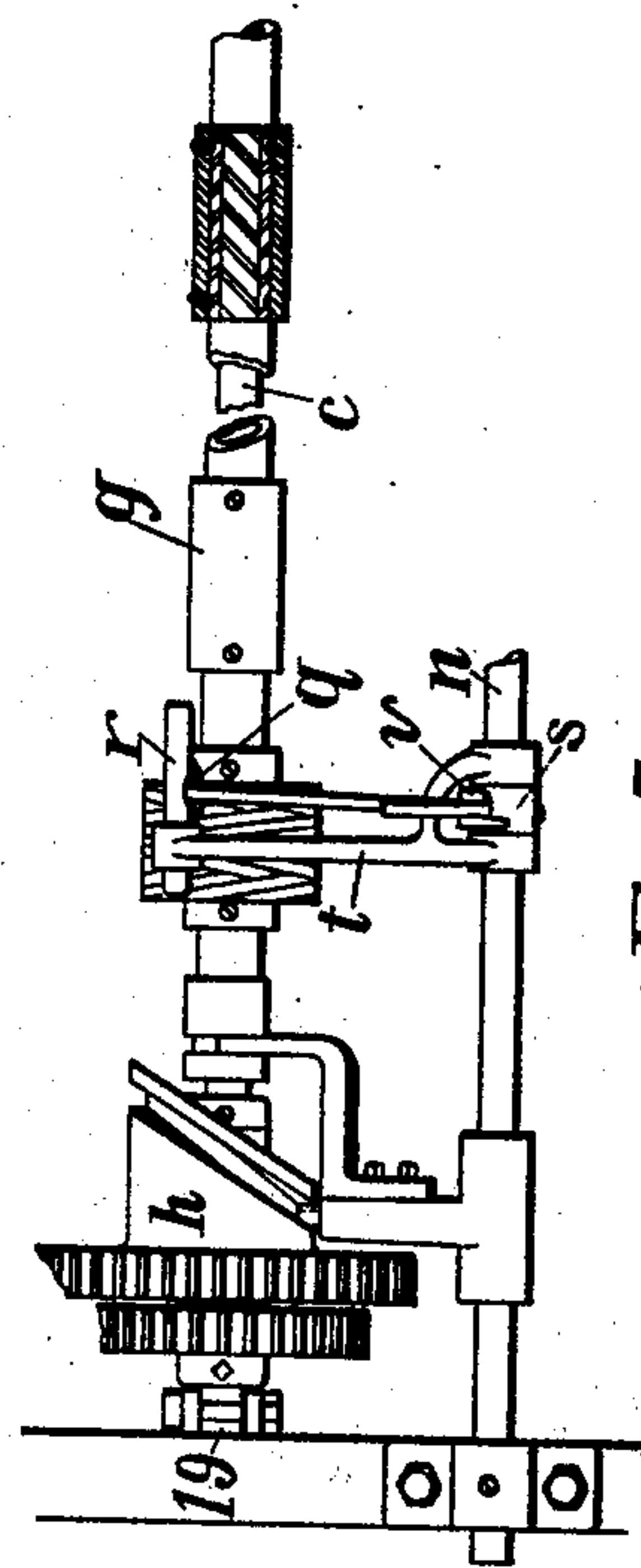


Fig. 3.

WITNESSES

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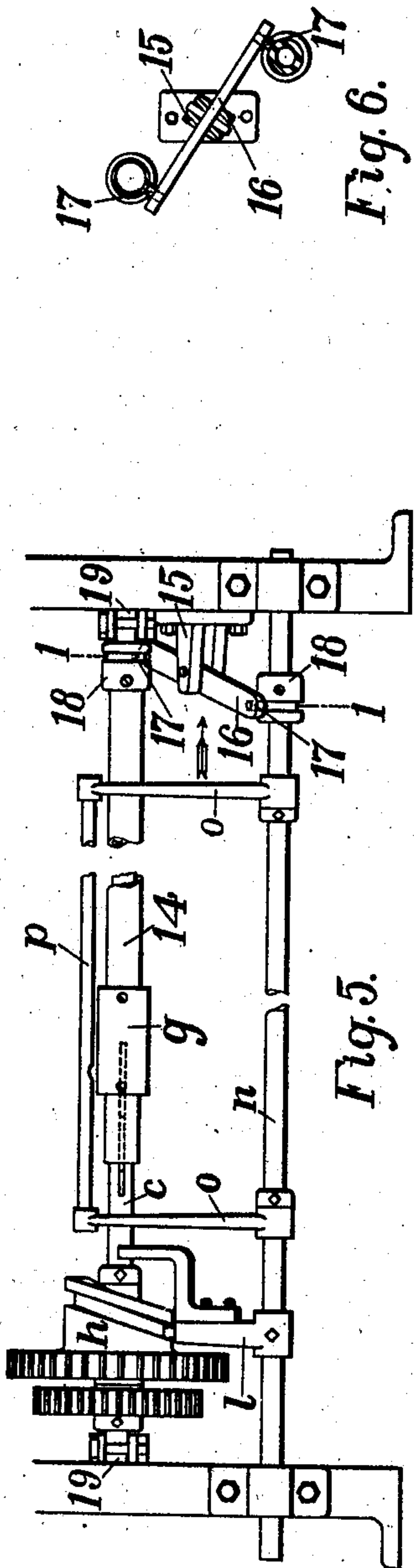


Fig. 5.

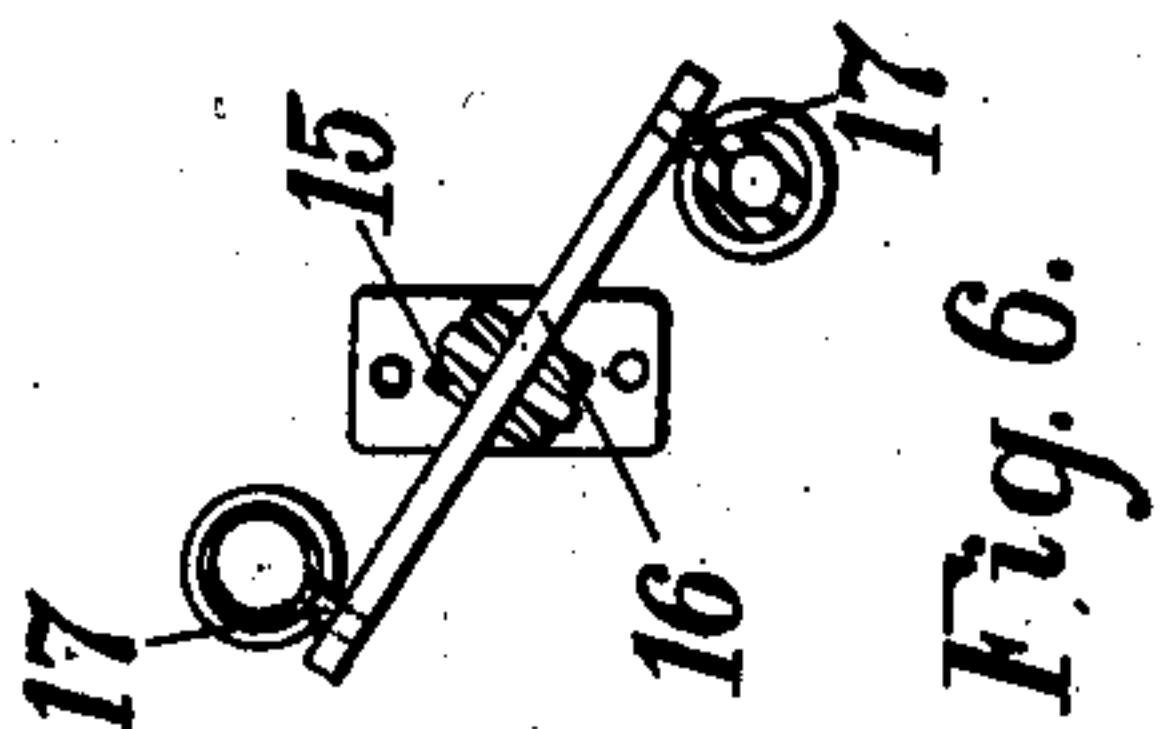


Fig. 6.

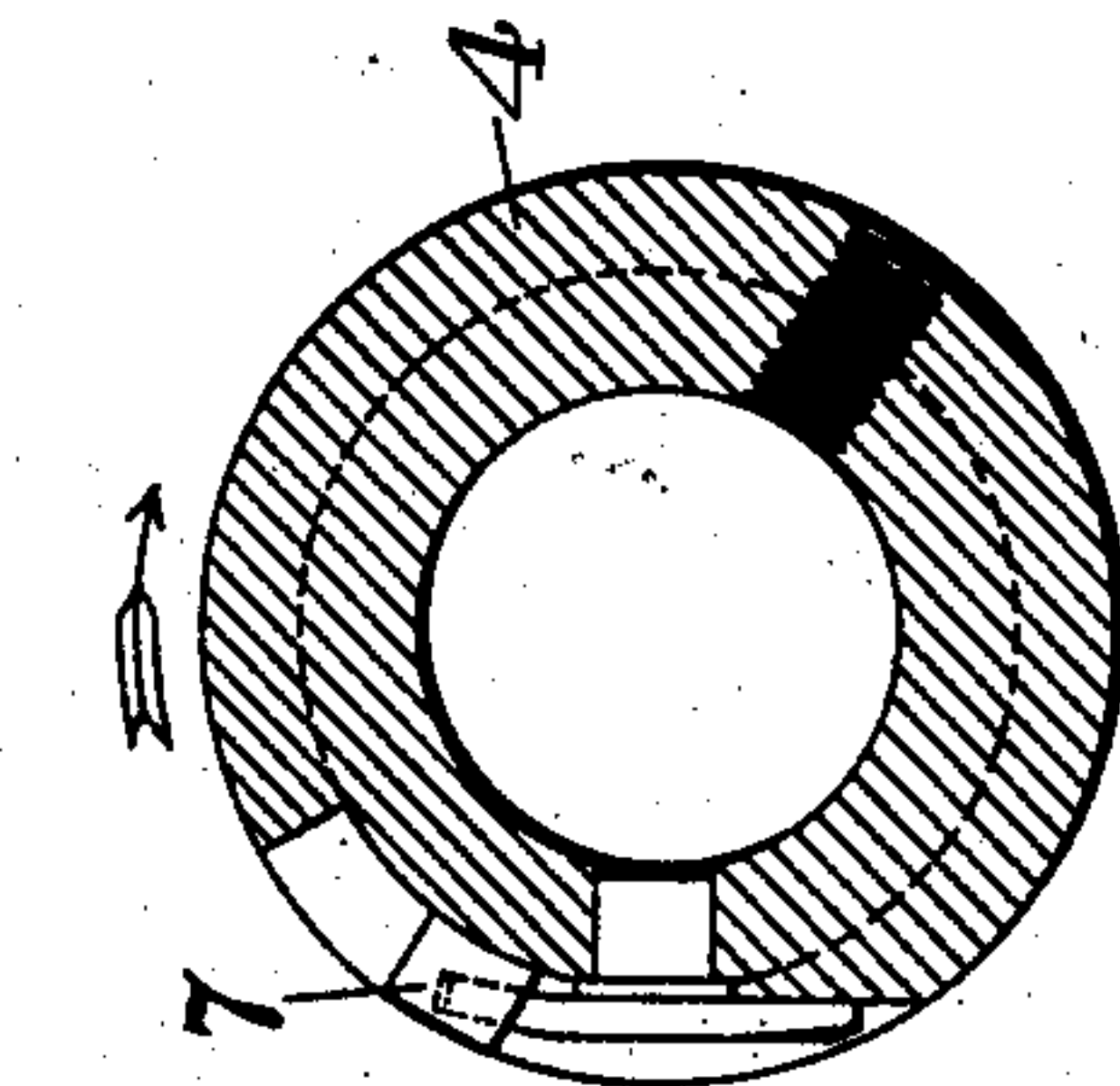


Fig. 10.

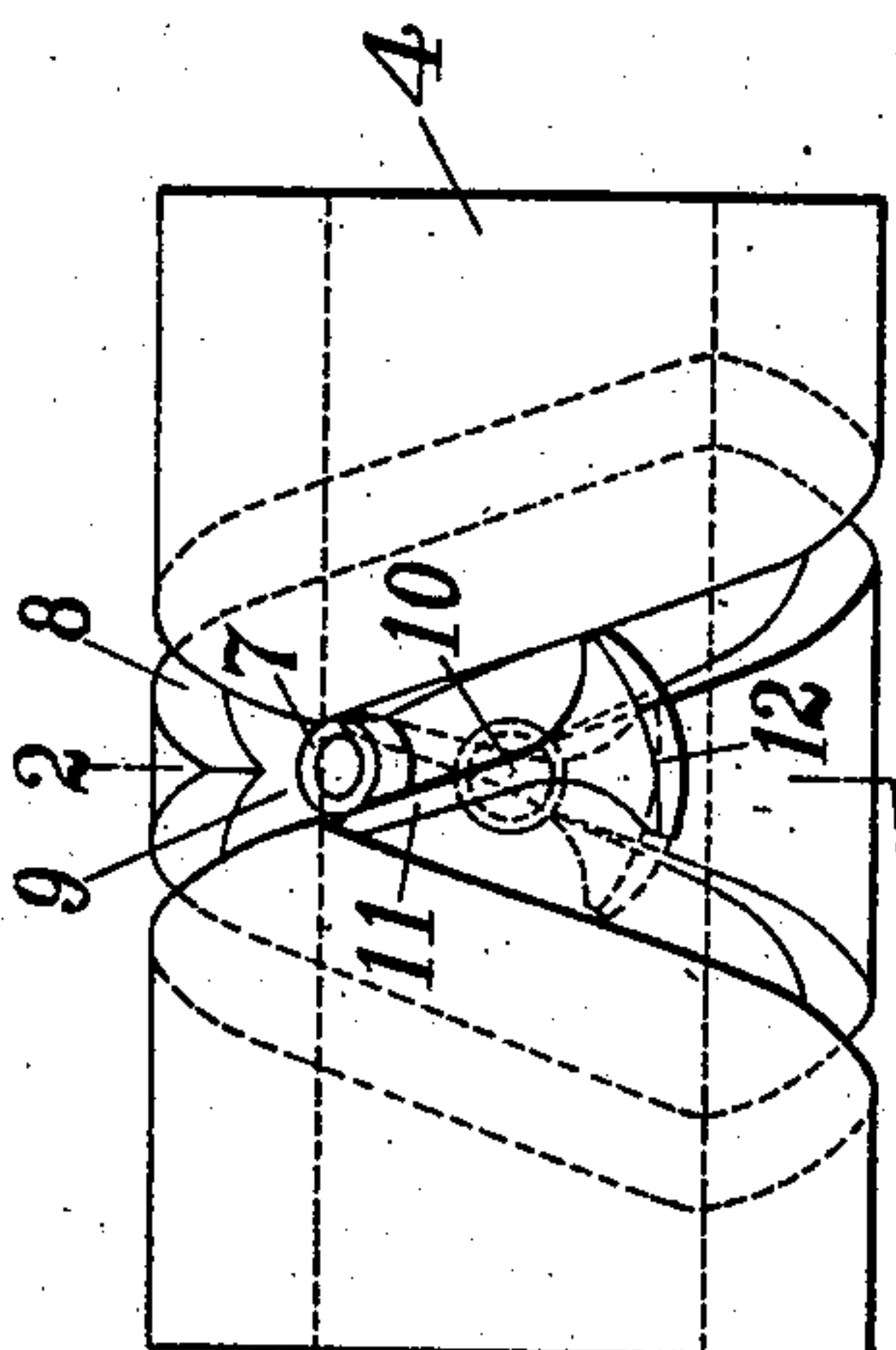


Fig. 9.

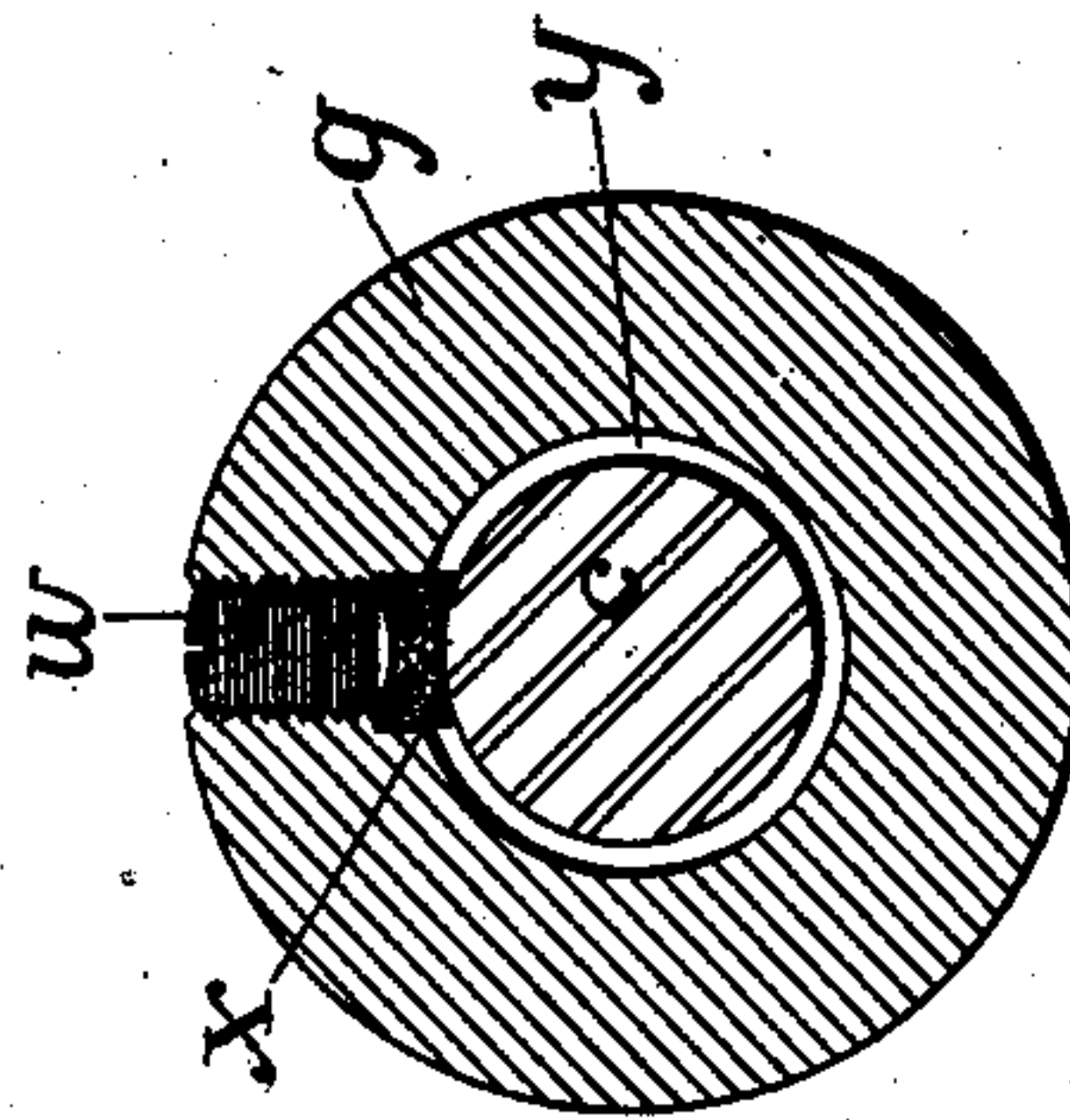


Fig. 11.

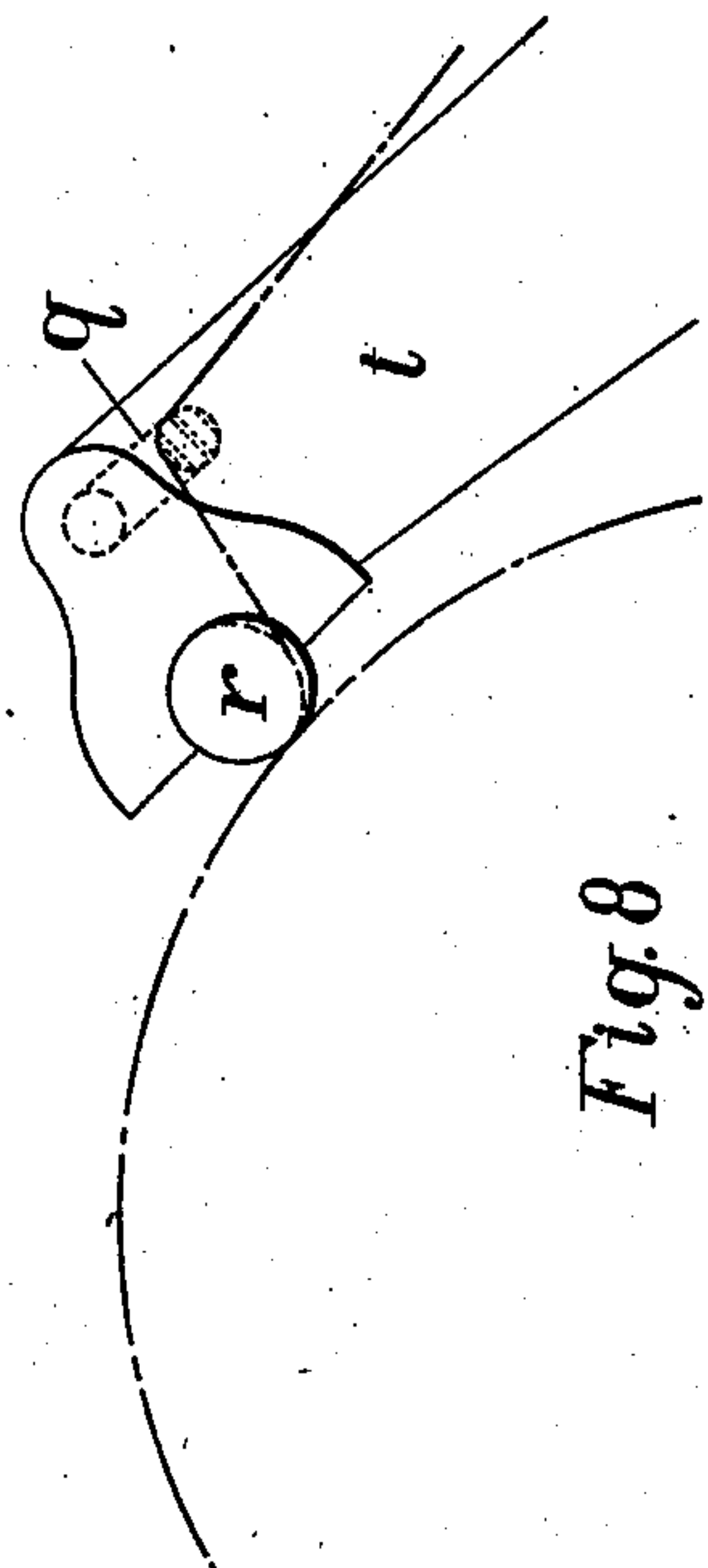


Fig. 8.

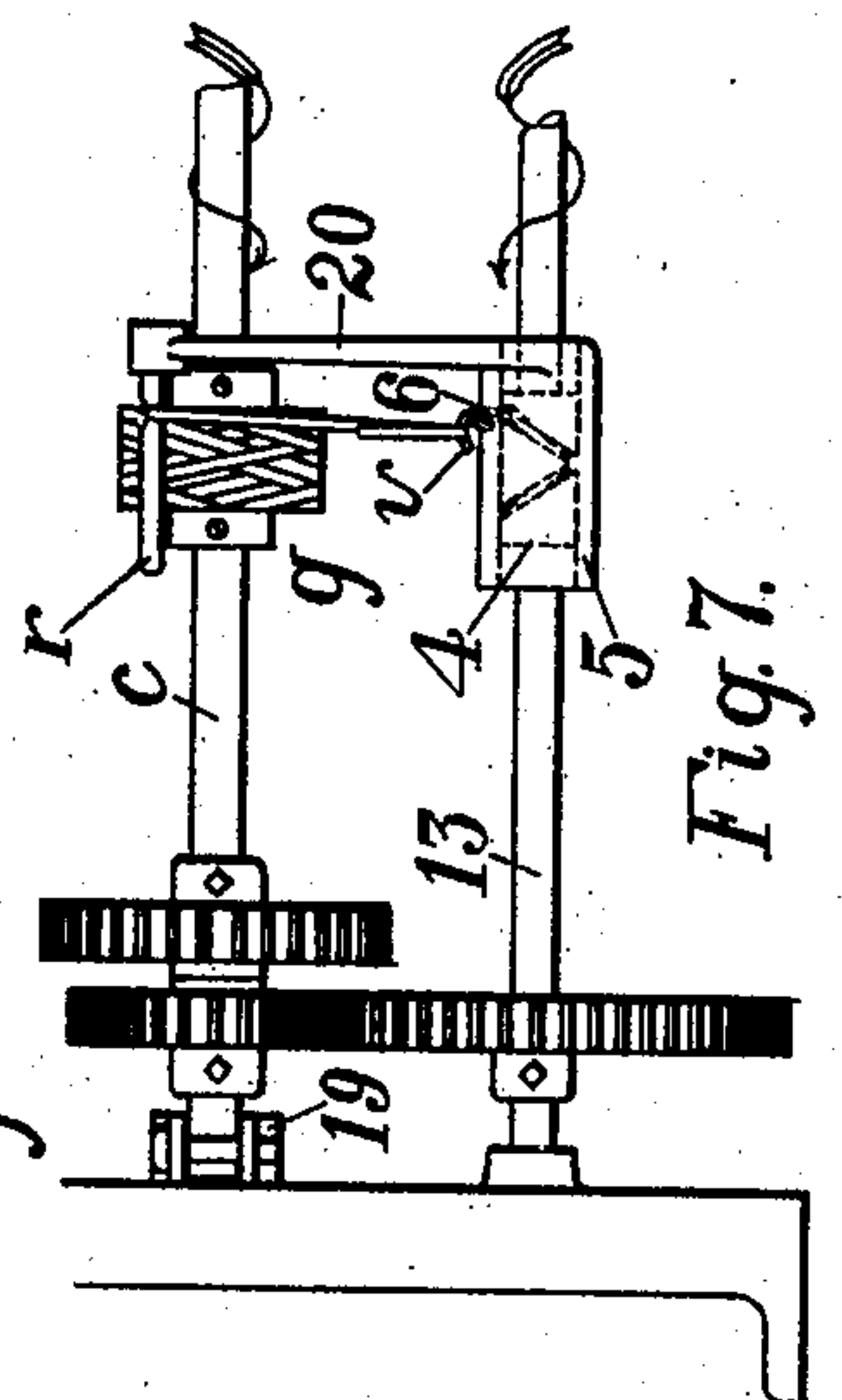


Fig. 7.

WITNESSES

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# UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, OF PROVIDENCE, RHODE ISLAND.

## TAKE-UP FOR NARROW-WARE LOOMS.

No. 827,129.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed March 3, 1902. Serial No. 96,532.

*To all whom it may concern:*

Be it known that I, SIMON W. WARDWELL, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Take-Up for Narrow-Ware Looms, of which the following is a specification.

My invention relates to take-up devices for "narrow-ware" looms—looms for weaving ribbon, tape, and similar narrow fabrics.

The purpose of my invention is to provide means whereby during the weaving and in conjunction therewith tape, ribbon, and similar narrow fabrics shall be wound, preferably in helical coils, to form a self-sustaining package of greater length than the width of the fabric, thereby overcoming the entanglement and loss of time which occurs where the tape is wound in unstable flat coils.

For convenience I shall in the following specification and claims refer to narrow fabric of whatever description as "tape."

The accompanying drawings, forming part of this specification, represent, respectively, Figure 1, a side view of a portion of a loom with my device attached, showing a single guiding-rod reciprocated longitudinally of a plurality of spools or holders; Fig. 2, an end view of the same; Fig. 3, a modification of the device in which the spools are reciprocated all from one cam; Fig. 4, an end view of the same; Fig. 5, a means for reciprocating both the guide and the spools; Fig. 6, a section on the line 1 1, Fig. 5, looking in the direction indicated by the arrow; Fig. 7, means for reciprocating each guide from a separate individual cam; Fig. 8, an enlarged view of the guide *r*, showing the manner of its operation; Fig. 9, an enlarged longitudinal elevation of the cam shown in Fig. 7 for driving the tape-guide; Fig. 10, a section of the same on line 2 2, Fig. 9; Fig. 11, an enlarged sectional view of the spool or holder *g*, taken on line 3 3, Fig. 1.

The essence of my invention is the winding of tape on a loom in conjunction with the weaving in coils, preferably helical coils, to form self-sustaining packages of greater axial length than the width of the tape. This may be accomplished by various devices, the following specification indicating one form of structure and certain modifications thereof.

In Fig. 1 the tape *a* is drawn from the weaving by the sand-roll *b* and delivered to be wound to the winding-shaft *c*, which is

driven at a constant rotative speed from the shaft *d* by gears *e* and *f*, from which shaft the sand-roll *b* is also driven by appropriate connections. The spools or holders *g*, which support the tape-packages, are so mounted on the shaft *c* that, while driven by the shaft, they may slip rotatively thereon to accommodate the surface speed of the package to the uniform linear speed with which the tape is delivered from the weaving. One method of effecting this is shown in detail in Fig. 11, in which the screw *w* serves to press the washer *x*, of leather or other appropriate material, into frictional engagement with the shaft *c*. Peripheral grooves *y* are provided in the shaft *c* to retain the spools longitudinally. The slipping of the washer *x* on the shaft *c* allows the rotation of the holder to be gradually retarded as the package increases in diameter, for the purpose indicated. The groove into which the washer *x* is forced is so rounded that when the screw *w* is loosened the holder *g* may be readily shifted longitudinally of the shaft, to be removed therefrom for the removal of the completed tape-packages. This expedient is, however, old in the art and no novelty is claimed for it.

Mounted on the winding-shaft *c* is the cam *h*, also driven from the shaft *d* through the gear *i*, which meshes with the pinion *j*. The cam *h*, mounted loosely on the winding-shaft *c* and held in place longitudinally by the collar *k*, is thus rotated independently of the shaft and through an arm *l* and a pin or roll *m*, mounted thereon and engaging the groove of the cam, reciprocates the rod *n*, which is mounted in appropriate bearings—as, for instance, in the brackets shown. The roll *m* is maintained in engagement with the cam by the forked extremity of the arm *l*, which straddles the shaft *c*, as shown in Fig. 2.

Mounted on the rod *n* are arms *o*, in which is mounted the tape-guide, which may be a rod *p* of sufficient length to bear on a plurality of packages. The rod is formed with shallow grooves or channels to receive the tape and control its disposition as it is deposited on the packages. To effectually control the disposition of the tape, the latter must pass between the guide and the surface of the package, and the guide must be pressed against the said surface to deposit the tape in the position it is to occupy. This latter is accomplished, as shown in Fig. 2, by leading the tape around a rod or guide *u*, so positioned



as to cause the tape in passing over the guide *p* to maintain the latter in contact with the package.

The operation of my device is as follows:

5 The shaft *d*, actuated from the driving devices of the loom, drives in conjunction the sand-roll *b* and the winding-shaft *c* and through the cam *h* reciprocates the thread-guide *p*. The tape drawn from the weaving  
10 by the sand-roll *b* is delivered thereby at a uniform linear rate to the reciprocating guide, which deposits it on the package in helical coils that cross and recross each other, forming a substantial self-sustaining package  
15 of greater axial length than the width of the tape, the uniform rate of delivery of the tape causing the spools to rotate with gradually-retarded speed because of the gradually-increasing diameter of the packages wound  
20 upon them.

It is obvious that in order to adapt my invention to various types and structures of looms modifications must be made in the character and relation of the parts constituting my invention. It is also obvious that  
25 my invention may be embodied in various forms of structure, and some of these different embodiments and modifications are herewith illustrated and described.

30 The guides instead of being formed in one long rod, as shown in Fig. 1, may be short individual rods *r*, one for each package, and each mounted in its own individual arm *t*, as shown in Fig. 3. The lower end of the arm *t*  
35 is forked, and between its branches is located the collar *s*, whereby the arm is restrained from longitudinal movement on its rod *n*.

The guides may be reciprocated independently of each other, as shown in Fig. 7, by  
40 providing for each guide a cam 4, to which is fitted a sleeve 5, adapted to slide thereon and supporting the guide-arm 20. The cam 4 has formed in its periphery a continuous helical groove 8, extending the length of the cam  
45 in one revolution and back again, crossing itself centrally thereon. The sleeve 5 carries a stud or pin 6, extending into the groove or track of the cam, forming a journal or bearing for the roll 7. (More plainly shown in Figs.

50 9 and 10.) When the cam is rotated within the sleeve 5, the latter being held from rotation by the guide *r* on the arm 20 bearing on the package is caused to reciprocate by the roll 7, following the track or groove 8. To  
55 prevent the roll from being diverted from its proper course at the crossing 9 of the groove, a switch 10 is provided. The switch is in the form of a wedge pivoted intermediate its extremities, the latter comprising a tongue 11  
60 and head 12. The cam 4 rotates in the direction indicated by the arrow, Fig. 10. The pressure on the roll is from that side of the groove to which the tongue of the switch is swung, as shown by full lines in Fig. 9, and  
65 the roll is guided by said tongue at the cross-

ing-point 9 of the groove. As here shown, the spreading-head of the switch extends across the portion of the groove with which the roll is engaged, and after passing the  
70 crossing-point the roll makes contact with said head and swings the switch on its pivot into the position indicated by the dotted lines. After the roll has accomplished the  
75 full extent of its traverse in one direction it returns in the opposite direction, is guided through the crossing-point of the groove by the tongue of the switch, and again engages the head of the latter to set the switch in the  
80 position indicated by the full lines. The shaft 13, on which the cams 4 are mounted, is rotated from the shaft *c* through suitable gear connections, the direction of rotation  
85 being toward the latter and tending to maintain the guides against the packages. Again, both guide and package may be reciprocated in conjunction, as illustrated in Fig. 5, in  
90 which the spools or holders are shown mounted on a sleeve 14, keyed to the winding-shaft *c*, but free to slide thereon. The lower shaft *n* is reciprocated from the cam *h*, as previously described, and carries the arms *o*, supporting the guiding-rod *p*. Fastened to the  
95 opposite end of the loom-frame from that adjacent the cam *h* is a bracket 15, in which is fulcrumed a lever 16. At either end of the lever 16 are fastened the pins 17, adapted to  
100 engage grooves in the collars 18, secured on the shaft *n* and the sleeve 14. By this means the motion of the shaft *n* is transmitted to the sleeve 14, so that both the guide and the  
105 spool are reciprocated. Their movement is in opposite directions, and hence the length of traverse of the tape is equal to the traverse of the guide plus that of the spool. It is  
110 therefore only necessary to employ a cam with half the length of throw that is employed when either the spool or the guide is reciprocated singly to secure a package of the same  
115 length.

Different provisions must be made for conducting the tape to the winding, depending  
120 on the structure of the loom and the relation of the parts. Figs. 3 and 4 show the tape conducted down from the sand-roll and under a guide *v*, over a second guide *q*, which is  
125 more clearly illustrated in Fig. 8, and thence under the main guide *r* to the package. In this instance the pressure of the tape on the guide *q* maintains the guide *r* against the  
130 package. As shown in Fig. 7, the spool or holder *g* rotates in the opposite direction from that shown in Fig. 4 and the tape is passed directly from the guide *v* over the  
135 guide *r*, dispensing with the guide *q*.

In order that the winding-shaft may be readily disconnected to remove the spools or  
140 holders *g*, the brackets 19 are formed with one side of the bearings open, the shaft being retained therein by pins or other suitable devices. In the form of device illustrated in  
145



Fig. 5 after the shaft has been disconnected it is necessary to remove the collar 18 on the sleeve 14 to free the spools or holders from the latter.

Without limiting myself to the precise character, arrangement, or relation of the parts hereinbefore described, I claim as my invention—

1. In a loom for weaving narrow-ware fabrics, the combination with the winding-shaft, of a fabric take-up comprising a package-holder and means for rotating the same, a traverse means, and means whereby the fabric is laid in cross-spirals upon the holder, substantially as set forth.

2. The combination with a narrow-ware loom having means for uniformly delivering woven tape, of a holder, a shaft supporting the same, guide, means for driving the holder-shaft to take up the tape, as delivered from the weaving devices, and means for varying the relation of the holder and guide to deposit the tape in crossed coils to form a package of greater axial length than the width of the tape.

3. A take-up for looms to wind the tape in openly-coiled helices to form a package of greater axial length than the width of the tape, comprising a spool on which the tape is wound, a shaft supporting the spool and means for uniformly driving the same, a guide to deposit the tape on the spool, means for delivering the tape at a uniform speed to the guide, and devices to cause a relative reciprocal movement of the spool and the guide.

4. The combination with the winding-shaft of a narrow-ware loom, of a series of rotatable package-holders, means for rotating the same at the speed at which the fabrics are delivered from the loom, a series of connected guides, and means for operating the guides to lay the fabric on each holder in crossed coils.

5. In a winding device for narrow-ware looms, the combination with a rotating shaft and means for uniformly driving the same, of a spool carried thereby, means for delivering the tape at a uniform speed to the guide, and means for depositing the tape thereon in crossed helices to form a package of greater axial length than the width of the tape.

6. In a take-up or winding device for narrow-ware looms, the combination with a rotating shaft, of a spool carried thereby, devices for rotating the spool at a gradually-decreasing speed while the speed of the shaft remains uniform, and means for guiding the

tape to deposit it on the spool in helical coils to form a package having a greater axial length than the width of the tape.

7. The combination with the winding-shaft of a loom, of a spool carried thereby, devices for driving said spool from the shaft at a gradually-decreasing speed, and means for guiding the tape to deposit it on said spool in helical coils to form a package of greater axial length than the width of the tape.

8. In a take-up or winding device for narrow-ware looms, the combination with a guide, of a winding-shaft, a spool mounted on the shaft, intermediate friction devices whereby the spool may rotate at a speed different from that of the shaft, and means for reciprocating the guide opposite the tube.

9. In a take-up device for narrow-ware looms, the combination with a reciprocating guide of a winding-shaft, spools mounted on the shaft, and intermediate friction means whereby the spool may rotate at a gradually-retarded speed.

10. The combination in a winding or take-up device for narrow-ware looms, with a winding-shaft and spools so mounted thereon as to permit their rotation at a speed different from that of the shaft, of a series of connected reciprocating guides to deposit the tape on the spools in helical coils.

11. The combination in a winding-machine, of a package-holder and frictional means for rotating the same, to accommodate its speed to the speed of the delivery of the material, means for delivering the material positively to the holder at a uniform lineal speed, a guide for the material, and means for reciprocating it opposite the holder while in contact with the package.

12. The combination with a narrow-ware loom, of a holder for a package, a guide for the material to be wound, means for positively delivering the material at a uniform speed to the guide, a shaft and means for rotating it at a uniform speed, frictional means for rotating the holder from the shaft, and means for reciprocating the guide to deposit the material in crossed helices on the holder, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL.

Witnesses:

JOSHUA B. HALE,  
THOMAS M. CHILDS.