

No. 776,208.

PATENTED NOV. 29, 1904.

J. W. & S. S. TILLOTSON & A. STUBBS.

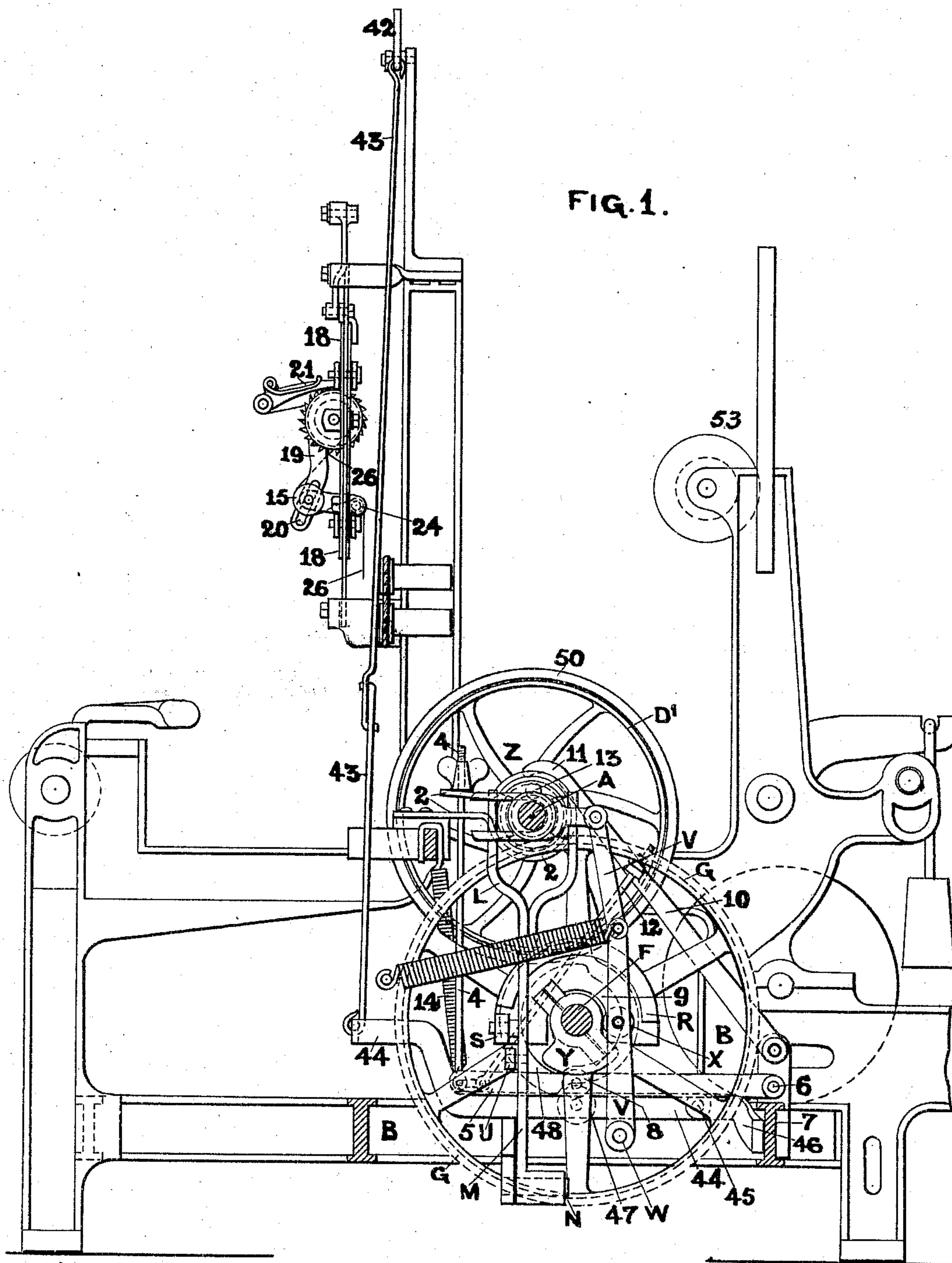
LOOM FOR WEAVING CARPETS.

APPLICATION FILED SEPT. 25, 1903.

NO MODEL.

8 SHEETS—SHEET 1.

**FIG. 1.**



WITNESSES

Abner Reed  
Herbert Wilcock

# INVENTORS

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Samuel Sheard Tillotson  
Arthur Stubbs

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3 SHEETS—SHEET 2.

FIG. 2.

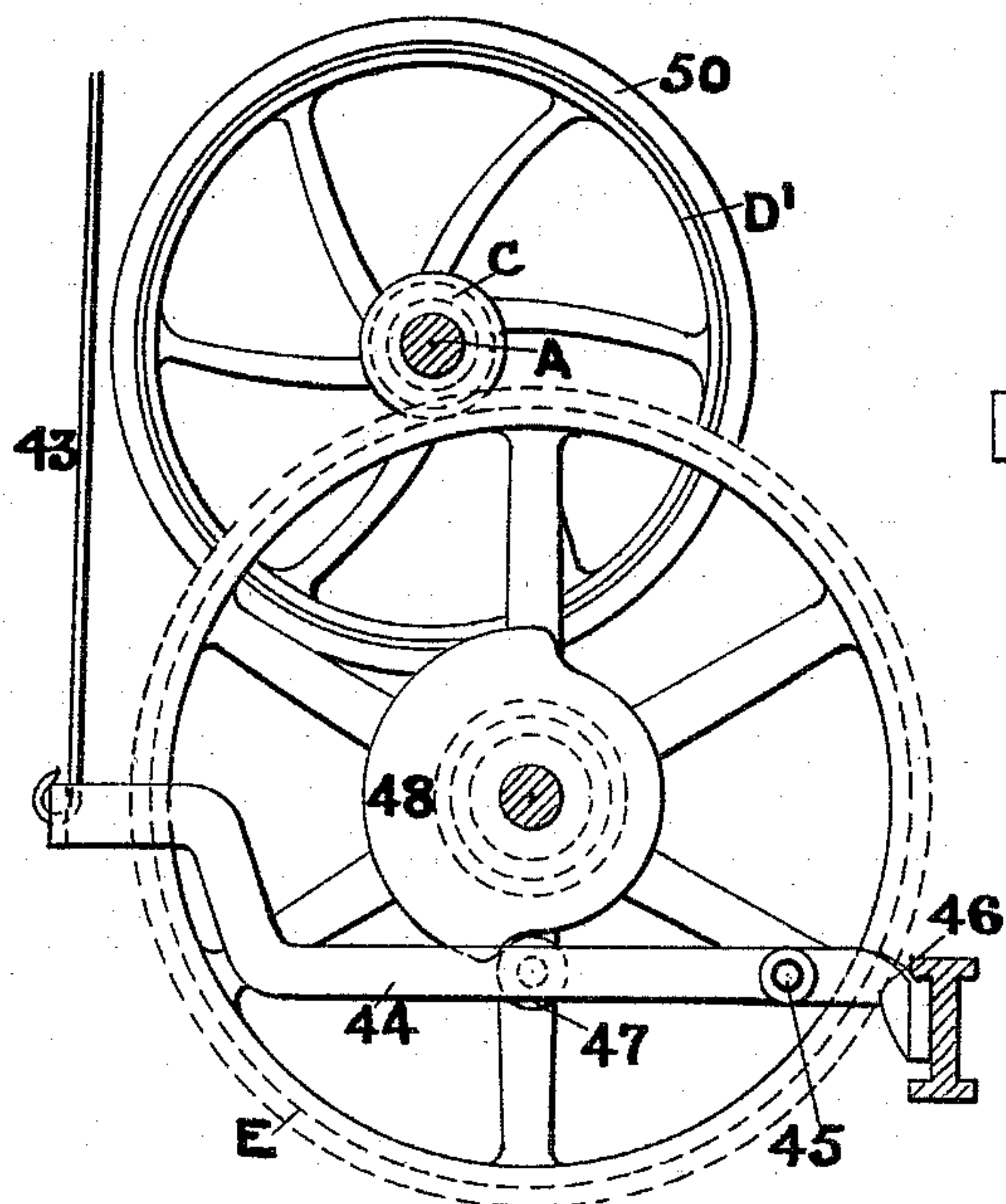


FIG. 3.

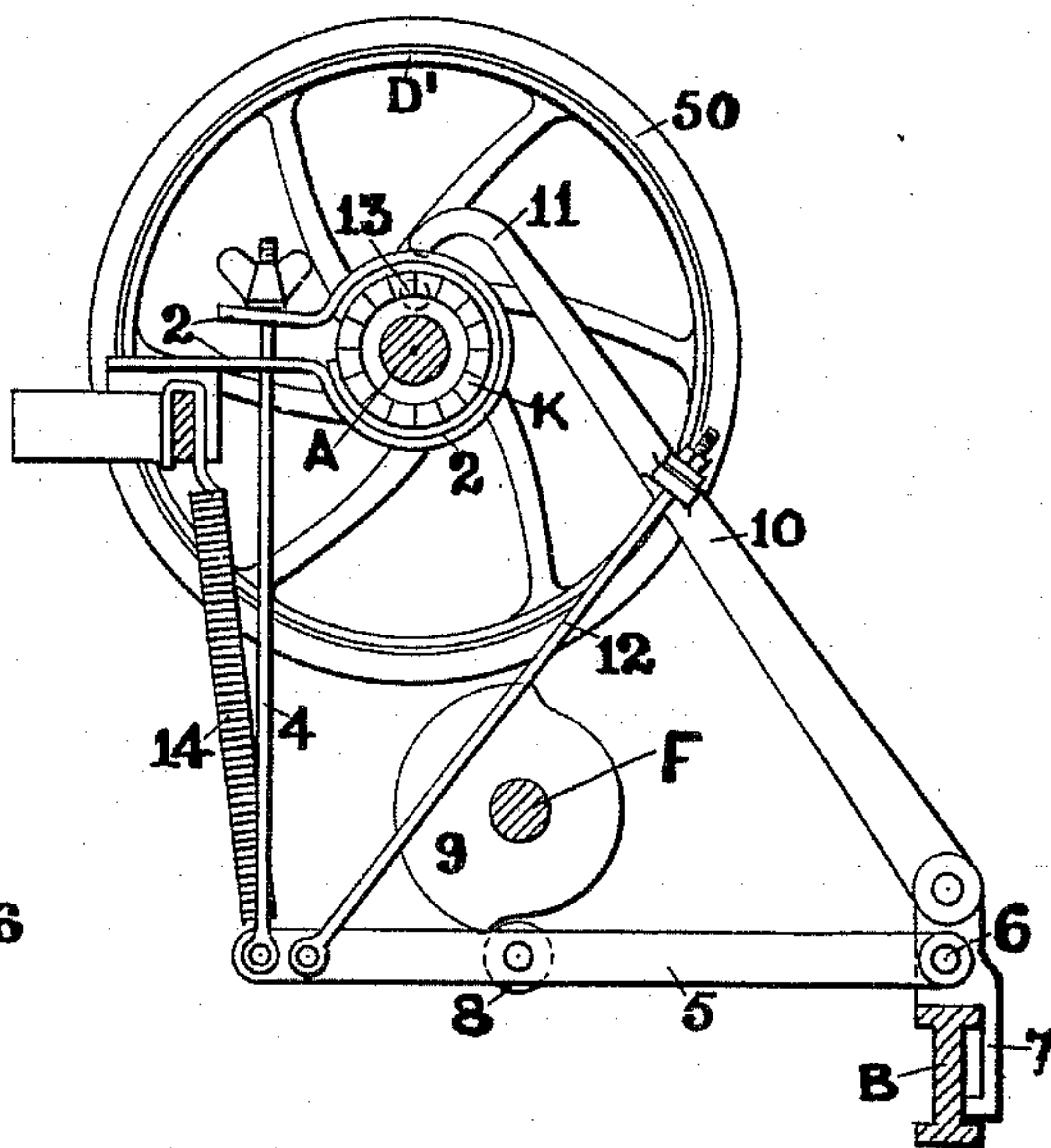


FIG. 4.

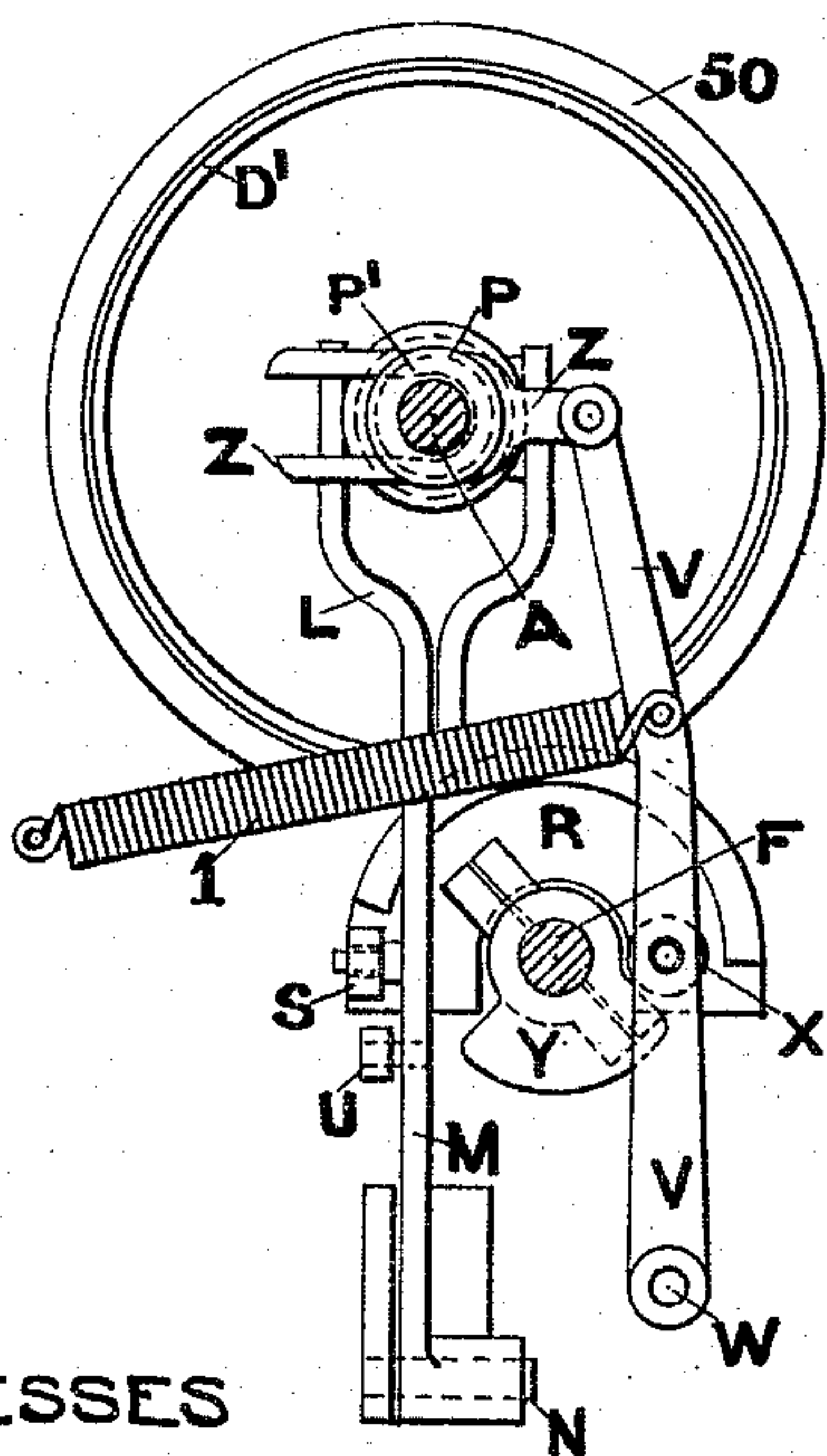
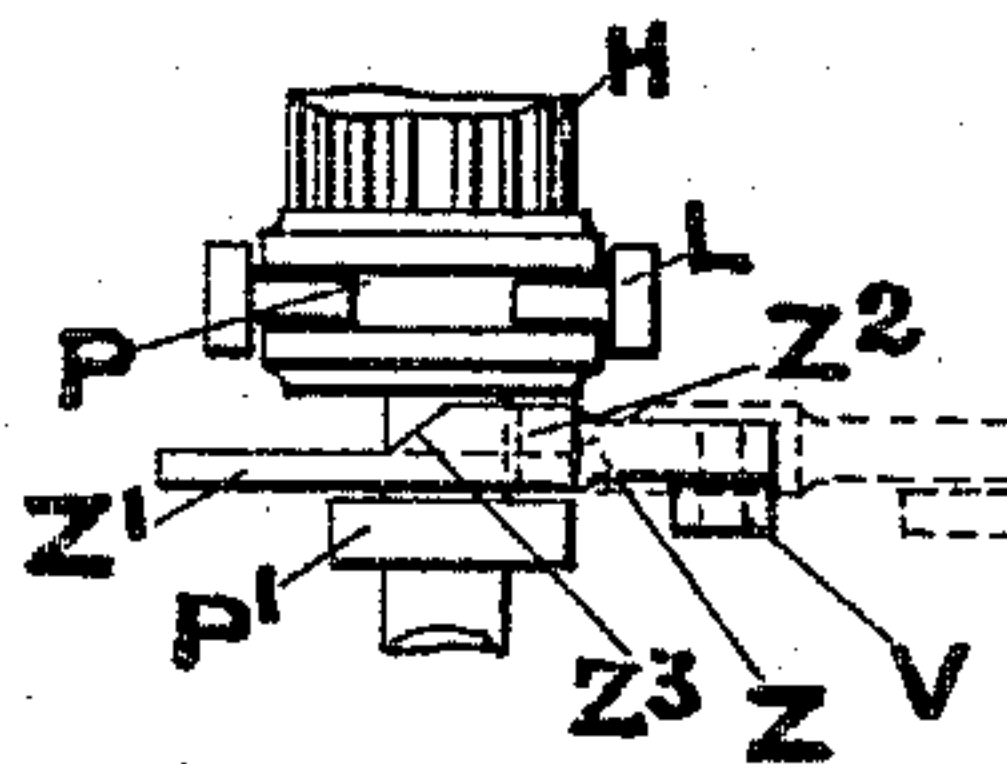


FIG. 5.



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3 SHEETS—SHEET 3.

FIG. 6.

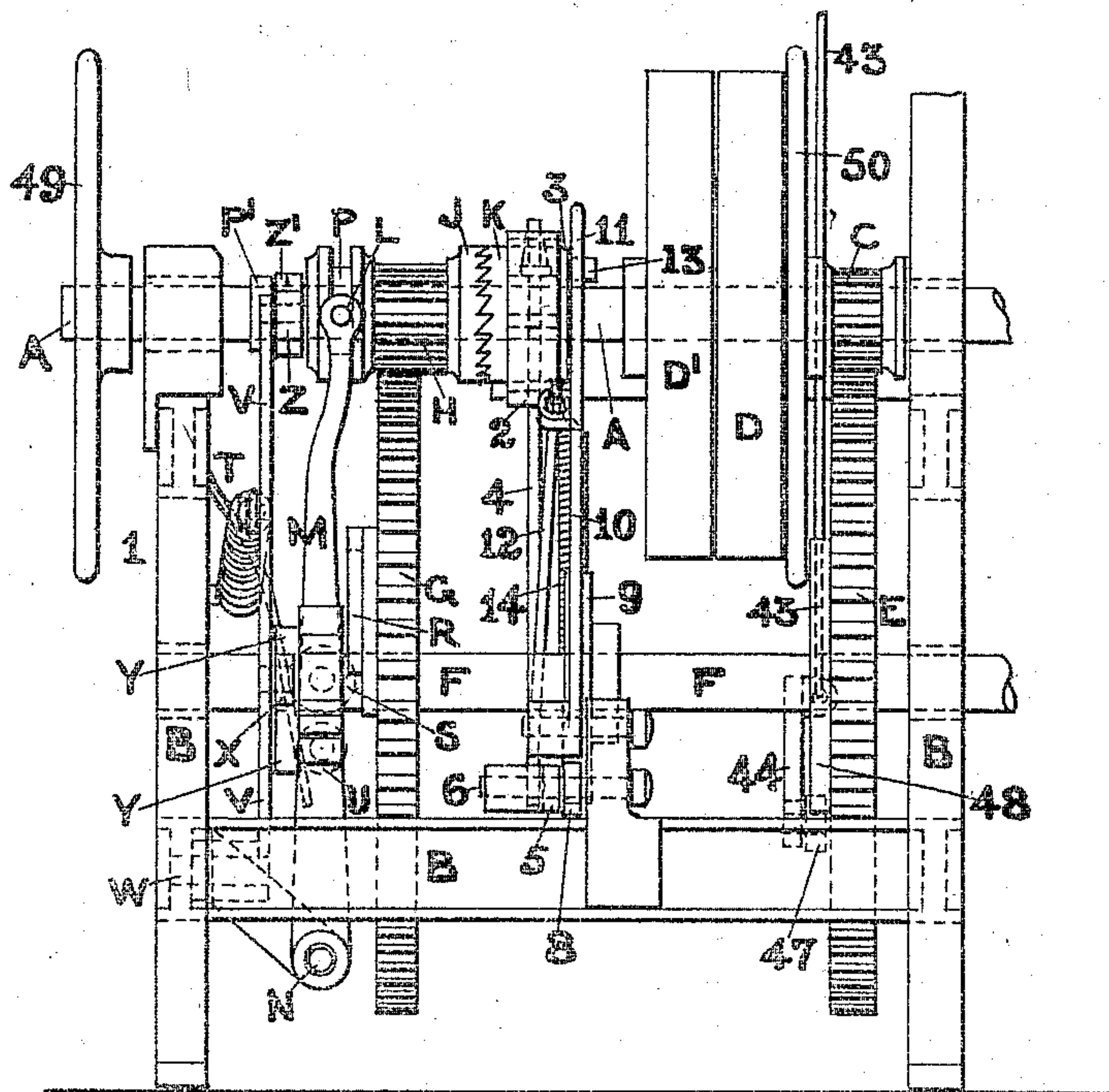


FIG. 7.

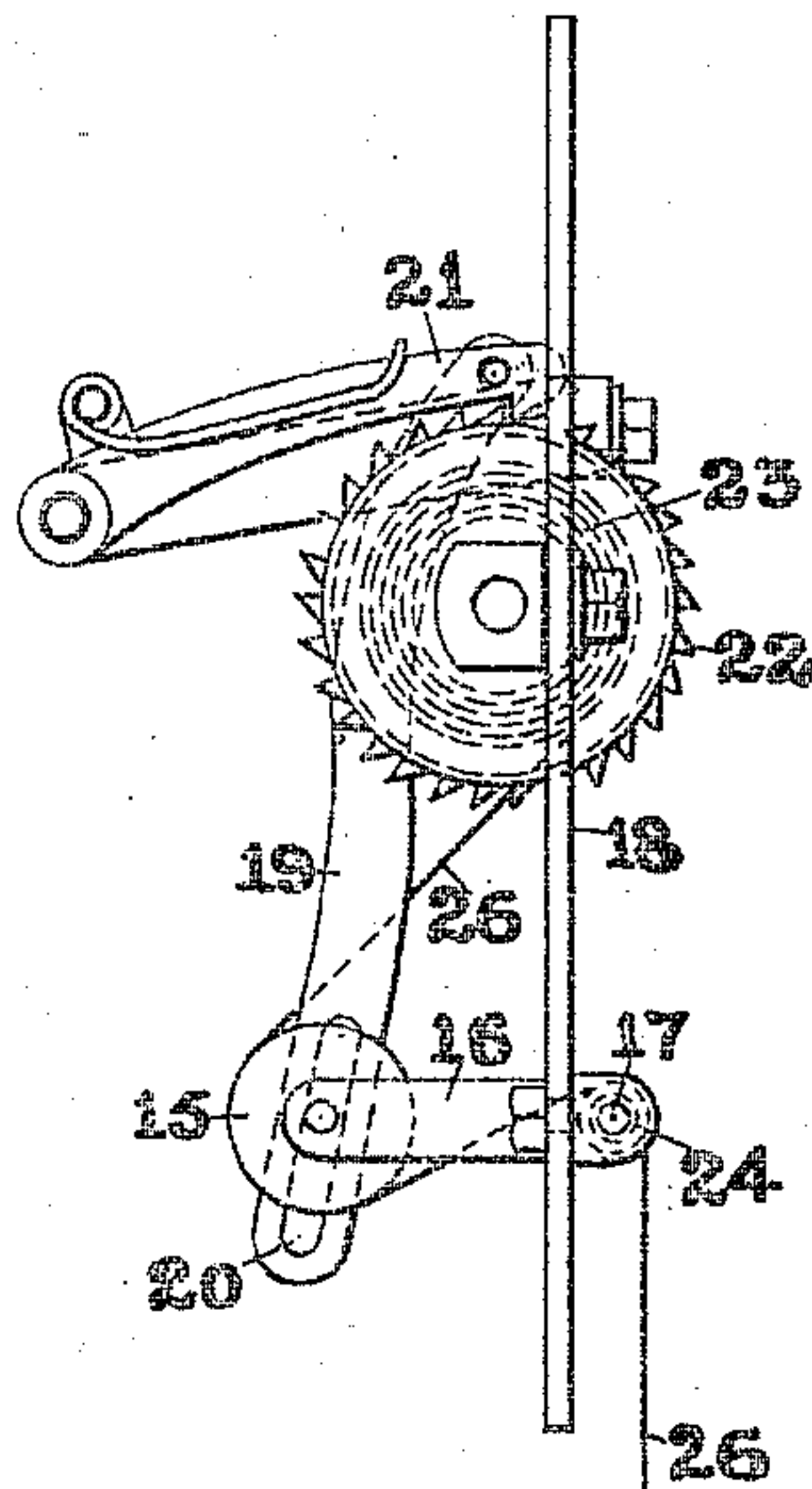


FIG. 8.

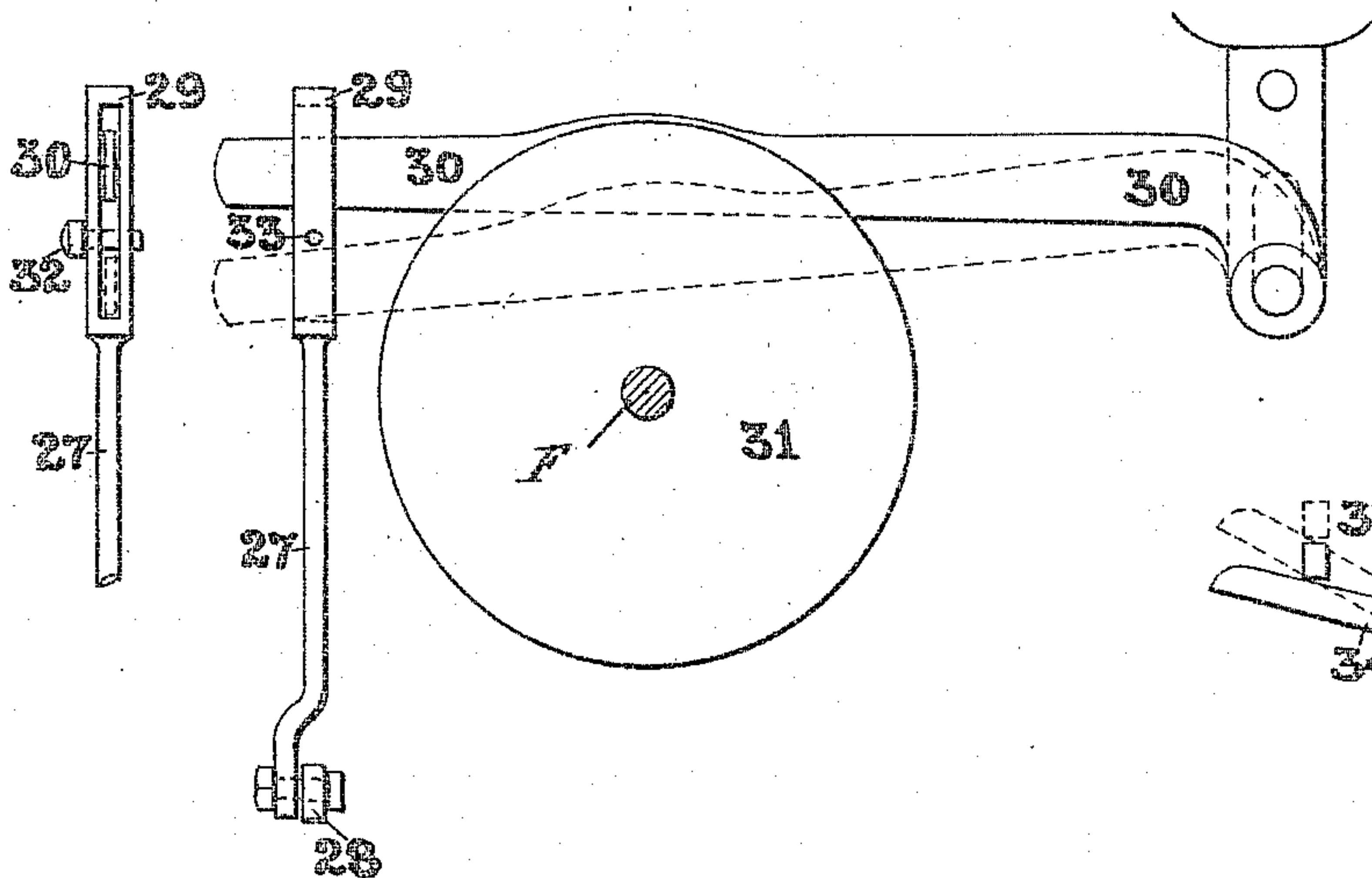
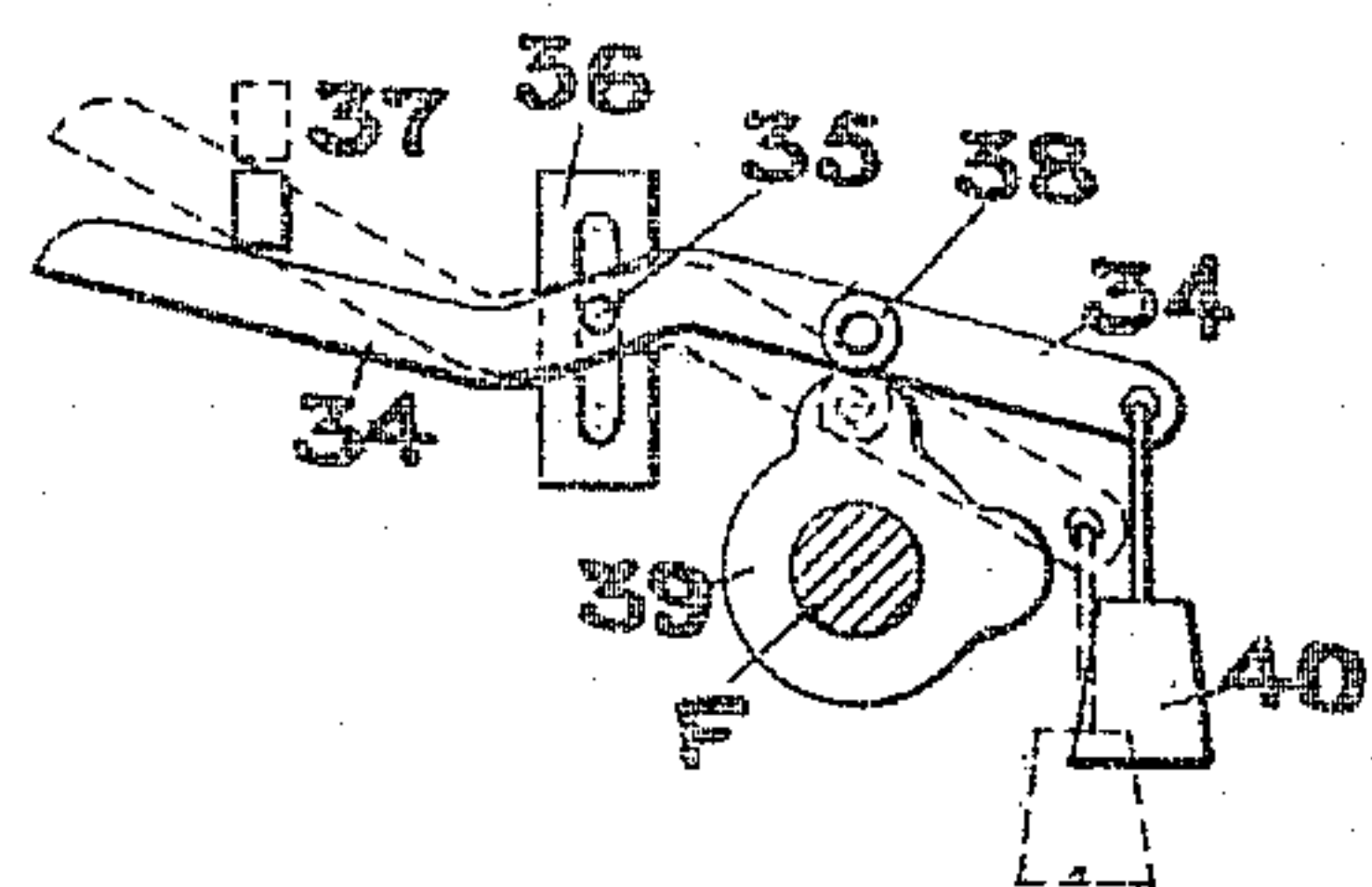


FIG. 9.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN WILLIAM TILLOTSON, SAMUEL SHEARD TILLOTSON, AND ARTHUR STUBBS, OF HALIFAX, ENGLAND.

## LOOM FOR WEAVING CARPETS.

SPECIFICATION forming part of Letters Patent No. 776,208, dated November 29, 1904.

Application filed September 25, 1903. Serial No. 174,659. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN WILLIAM TILLOTSON, SAMUEL SHEARD TILLOTSON, and ARTHUR STUBBS, subjects of the King of Great Britain, and residents of Halifax, in the county of York, England, have invented new and useful Improvements in Looms for Weaving Axminster, Chenille, and Like Carpets, of which the following is a specification.

The object of this invention is to greatly simplify the working parts of looms for weaving Axminster, chenille, and like carpets, make the operation of such loom more uniform by reducing the wear and tear of same, increase the speed, and produce a better quality and a greater quantity of carpet.

Hitherto in Axminster and the like looms the beat up of the loom has been effected by cams upon the bottom shaft. These cams work so slow that their effect upon the connecting mechanism between the bottom shaft and the lay of the loom is such as to put great strain upon the loom generally and the wheels in particular, frequently stripping or breaking the teeth of same. Further, the noses or lifts of the said cams become worn, and so have a correspondingly-deteriorating effect upon the working of the loom.

Our improvements consist in beating up the lay of the loom by mechanism placed at one side of the loom convenient of access and operating a crank-shaft, which crank-shaft now occupies a position hitherto taken up by the straight shaft carrying the picking-wheel. In this manner we drive the lay of the loom direct, thereby taking the strain off the intermediate parts. We dispense with the cams hitherto employed for this purpose, reduce the wear and tear, and enable the loom to run lighter and with greater speed. Also we dispense with the friction-ropes hitherto employed in connection with the catcher-warp, as such ropes are subjected to and affected by atmospheric influences, often stretching or contracting with a varying effect upon the warps, and provide efficient means, insuring a uniform tension upon the said warp when binding in the fur without in any way retarding such warp. We also employ special mechanism

for operating the float warp-beam heald when felling the rugs or carpets, in order to stitch the float-warp in with the other warps. Further, we use particular means for determining the time of picking in manner that as one picking-wheel is set to pick the other misses. Also we actuate the selvage-needle apart from the needle-frame.

In the drawings, Figure 1 is a side elevation of an Axminster loom with our improvements applied. Fig. 2 is a side elevation of cam, lever, and part of connecting-rod for actuating selvage-needle. Fig. 3 is a side elevation of mechanism for braking crank-shaft and preventing the latter from overrunning itself. Fig. 4 is a side elevation of mechanism for throwing clutch out of gear and stopping the going part of loom. Fig. 5 is a plan of a section of crank-shaft, showing means for holding clutch in gear in order to beat up the lay of the loom. Fig. 6 is a front view of mechanism shown at Figs. 2, 3, and 4 in position at one end of loom and convenient of access. Fig. 7 is a side elevation of our tension mechanism for catcher-warp. Fig. 8 is a side elevation of cam for operating float-beam heald and lever with our improvements applied. Fig. 9 is a side elevation of cam and lever for determining the time of picking and putting in and out of action of the picking-motion.

In constructing our improved looms in place of the ordinary straight shaft carrying the picking-wheel we substitute a crank-shaft A, connected by connecting-rod (not shown) with the going part of the loom in the ordinary way and operated by mechanism placed at one end of the loom and convenient of access. This mechanism is mounted within a suitable framework B at one end of the loom and consists of a pinion C upon the boss of a driving-pulley D, driven by belt from any convenient driving-shaft. This pulley D is loose upon the crank-shaft A. D' is another loose pulley. The pinion C gears with a gear-wheel E upon the bottom shaft F. A second and similar gear-wheel G, also upon the bottom shaft F, gears with a second pinion H, fast or cast upon the boss of a sliding clutch J, also loose upon the shaft A. The clutch J



engages at intervals—that is, when the lay is in operation—with a clutch-box K, fast upon the aforesaid shaft A.

During the operation of the aforesaid mechanism the loom is putting in a suitable number of picks of ordinary weft. This occurs after the pick or shoot of chenille weft or fur and between the next or following shoot of fur in order to bind in the said fur and form the groundwork of the fabric. When the required number of picks have been given or put in, the lay of the loom is stopped and the fur mechanism put into operation, so as to put in another shoot of fur. This stoppage is brought about by the clutch J being thrown out of gear with the clutch-box K by means of a fork L upon one end of a pivoted lever M, pivoted upon a stud N, supported by a bracket attached to the framework B. This fork L works within a neck P in the boss of the sliding clutch J and operates to move or slide the said clutch J along the shaft A in and out of gear with the clutch-box K. The fork L and lever M in order to disengage the clutch J, as aforesaid, are acted upon by a tappet or cam R, fast upon the boss of the wheel G. Such tappet engages with an anti-friction bowl or runner S, mounted upon the lever M. A suitable strong blade-spring T buffers against a second bowl U upon the lever M and assists in keeping the said bowl S in contact with the face of the tappet R and in returning the clutch J when released by the said tappet. The pinion H is of sufficient width to allow of this movement of the clutch J, yet remain in gear with the wheel G. In order, however, to permit of the fork L disengaging the clutch and afterward to retain the said clutch in gear, we employ a further lever V, pivoted upon a stud W on the framework B. This lever V also carries an anti-friction-bowl X, which is acted upon by a cam Y, fast upon the shaft F. This cam is so timed, however, as to move the lever V slightly in advance of the lever M. A second fork or stop Z (see Fig. 5) is mounted upon the lever V and slides upon the shaft A at right angles to same between the neck P and a fast collar P'. This fork or stop Z is of greater width at its base than at its extremity, the lesser, Z', being connected with the greater, Z<sup>2</sup>, by an incline Z<sup>3</sup>. As the cam Y, acting slightly in advance of the tappet R, strikes the bowl X the lever V withdraws the fork Z, as shown in dotted lines at Fig. 5. Immediately this takes place the clutch J is disengaged by the action of the lever M and moved along the shaft A until it comes in contact with the narrow portion Z' of fork Z out of gear with the clutch-box. When the clutch is reversed, the tappet R releases the lever M slightly in advance or simultaneous with the release of the lever V, and a strong spring 1, acting on the said lever V, returns the fork Z, bringing the part Z<sup>2</sup> into the space between the side of the neck P

and the collar P' for holding or retaining the clutch in gear. Further, it is absolutely necessary, however, that each time the lay or going part knocks off or is put into action the clutch should engage with the clutch-box at the self and same place or position as heretofore, and to prevent the same varying or the shaft A from overrunning we provide upon the clutch-box K a suitable brake 2, which encircles the hub 3 of such box K and is operated to grip the same at the proper time by means of a connecting-rod 4, attached at its other end to a pivoted lever 5, pivoted at 6 upon a bracket 7, supported by the loom-frame B. The lever 5 also carries a bowl 8, operated upon at intervals by a cam 9 on the bottom shaft. As an auxiliary to this brake 2 we employ a further lever 10, pivoted upon the loom-frame and having a curved end 11. This end is brought into contact with and immediately behind a stud 13, projecting from the hub 3 and horizontal with the shaft A by means of a connecting-rod 12, attached to same and the lever 5. Thus the action of the brake and lever 10 are simultaneous. The curved end as it drops behind the stud 13 prevents further movement of the shaft A in that direction, while the brake prevents further movement in any direction until it is again released. A strong spring 14, attached to lever 5 and an arm bolted to the loom-frame, acts to return the said levers when released by the cam 9.

The mechanism is so timed that when the given number of picks of ordinary weft have taken place the cam Y operates on the lever V, withdrawing the fork Z. This is followed immediately by the clutch J being disengaged from the clutch-box K by the lever M and tappet R. Simultaneous with the action of the lever M the brake 2 and lever 10 come into operation to stop the shaft A, prevent overrunning, and hold said shaft in such a position as to enable the clutch to reengage with the clutch-box in the exact position it occupied before disengagement. The aforesaid cycle of events take place automatically and at the proper time and are repeated each time the lay is stopped or put in action. Also in connection with the catcher-warp for binding in the fur (see Fig. 7) in place of the ropes and weights we preferably employ a suitable tension bar or roller 15, supported in brackets or bearings 16, pivoted at 17 upon the needle-frame 18. At one end of the tension-bar we place a lever 19, having a slot 20 at one end and connected at the other end with the pawl 21 and ratchet-wheel 22 upon the catcher warp-beam 23. A second roller or tube 24, loose upon shaft or studs 17, is also mounted upon or supported by the needle-frame 18. The catcher-warp 26 passes from the beam 23 under the tension-roller 15 and over the roller 24 down to the rug or carpet being woven. In this manner the tension-roller 15 rests



evenly and entirely upon the warp-threads and gives the necessary uniform tension to same when binding in the fur. The slot 20 allows the said roller to adjust itself automatically as the tension on the warp varies.

The float-beam 53 is shown in Fig. 1; but the float-beam heald is not shown, as it does not form a part of the present invention and is of any approved construction.

For operating the float-beam heald when felling the rugs or carpets when finished (see Fig. 8) in order to stitch the float-warp in with the other warp-threads we preferably form the lever or connecting-link 27 (upon or connected with the treadle 28) with a slotted or looped end 29. Within this loop 29 works the horizontal lever 30, operated by the ordinary tappet 31. This loop or slot is of such a length that when the float-beam heald is required to remain up the action of the cam or tappet 31 and lever 30 has no effect upon same. However, in order that the said lever 30 may have effect we place a suitable cotter or pin 32 through a corresponding hole 33 in the loop 29 immediately above the lever 30 when the latter is at the bottom of its movement, so that when such lever rises it acts to lift the lever or connecting-rod 27 and operate the treadle 28 and heald as often as desired. Immediately the pin or cotter is withdrawn the lever or link is inoperative and the heald remains up.

In clearing up the fur we preferably have two beats up instead of one. This is obtained by providing the cam actuating this mechanism with a second or additional insertion.

For determining the time of picking in a more effective and positive manner we preferably mount the picking-wheels upon the crank-shaft in the usual way—that is, as one is set to pick the other misses—and to simplify the mechanism of the picking motion we employ (see Fig. 9) a bent lever 34, pivoted at 35 and adjustable upon a suitable bracket 36, attached to the loom-frame. One end of this lever engages with the picking-tongue 37 on the picking-shaft, so as to raise it clear of the picking-hammer on the picking-wheel, (not shown,) when not required to pick, to the position shown in dotted lines. The lever 34 carries an antifriction-bowl 38, which is operated upon at intervals by a cam 39 on the bottom shaft F. The action of this cam raises this end of the lever and lowers the picking-tongue into position at the proper time for the hammer to strike the same and operate the picking-motion. A suitable weight 40 raises, by means of the lever 34, the aforesaid tongue clear of the picking-hammer upon the release of the said lever by the cam. This mechanism is employed and operates at each side of the loom alternately, as aforesaid. We also prefer in our loom to operate the selvage-needles apart from the needle-frame

carrying the catcher-warps, so that such needles may remain down or act independently of the needle-frame in order to form a better and more permanent selvage than hitherto. This we accomplish by placing such needles in the needle-frame 18. The selvage-needles are actuated by an L lever or bar 42. We attach to this bar or lever a suitable connecting rod or wire 43, connected at its bottom end with a lever 44, (see Fig. 2,) pivoted at 45 upon a bracket 46, supported by the loom-frame. This lever 44 carries a bowl 47, which is acted upon by a cam 48. The action of this cam upon the lever, connecting-rod, and arms is such as to raise or lower the selvage-needles, the latter remaining up or down, according to the speed and formation of the cam for the purposes aforesaid. In this manner the action of the needle-frame has no effect upon the selvage-needles, being actuated by separate means.

Hand-wheels 49 and 50 are provided when required to turn the loom back or operate the going part by hand or adjust the position of the clutch.

In describing our invention we would have it understood that we lay no claim to operating the lay of the loom by the crank-shaft; but

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a loom, the combination, with the picking-wheel shaft A, and a clutch member K secured thereon; of a toothed pinion H and a clutch member J slidable on the said shaft and operating the clutch member K, a shaft F, a toothed wheel G secured on the shaft F and gearing into the pinion H, a toothed wheel E also secured on the shaft F, a toothed driving-pinion C mounted on the shaft A and gearing into the wheel E, and lever-and-tappet mechanism for actuating the clutch member J at intervals and operated from the shaft F.

2. In a loom, the combination, with a picking-wheel shaft A, and a clutch member K secured thereon; of a toothed pinion H and a clutch member J slidable on the said shaft and operating the clutch member K, a shaft F, a toothed wheel G secured on the shaft F and gearing into the pinion H, a toothed wheel E also secured on the shaft F, a toothed driving-pinion C mounted on the shaft A and gearing into the wheel E, lever-and-tappet mechanism for actuating the clutch member J at intervals and operated from the shaft F, an inclined stop which locks the said clutch members in engagement, and lever-and-tappet mechanism for actuating the said stop at prearranged intervals and also operated from the shaft F.

3. In a loom, the combination, with a picking-wheel shaft A, and a clutch member K secured thereon; of a toothed pinion H and a clutch member J slidable on the said shaft



and operating the clutch member K, a shaft  
F, a toothed wheel G secured on the shaft F  
and gearing into the pinion H, a toothed wheel  
E also secured on the shaft F, a toothed driv-  
5 ing-pinion C mounted on the shaft A and gear-  
ing into the wheel E, lever-and-tappet mech-  
anism for actuating the clutch member J at  
intervals and operated from the shaft F, fric-  
tion-brake mechanism connected to the said  
10 shaft A, and lever-and-tappet mechanism for  
actuating the said brake mechanism when the

said clutch members are disengaged and also  
operated from the shaft F.

In testimony we hereunto affix our signa-  
tures in the presence of two witnesses.

JOHN WILLIAM TILLOTSON.  
SAMUEL SHEARD TILLOTSON.  
ARTHUR STUBBS.

Witnesses:

ABM. REED,  
HERBERT WILCOCK.