

(No Model.)

2 Sheets—Sheet 1.

A. G. REAMAN.  
HARVEST BINDER.

No. 473,780.

Patented Apr. 26, 1892.

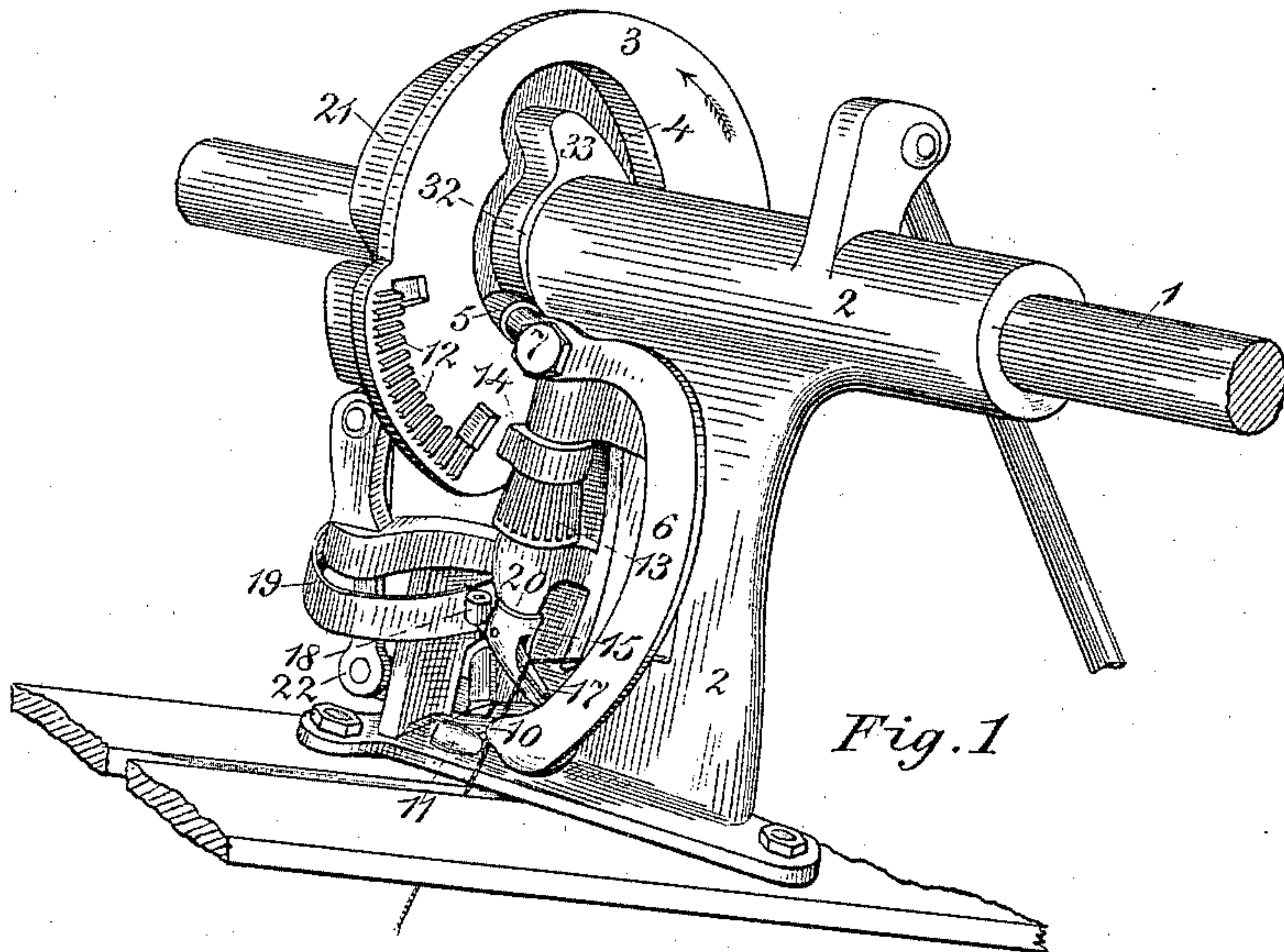


Fig. 1

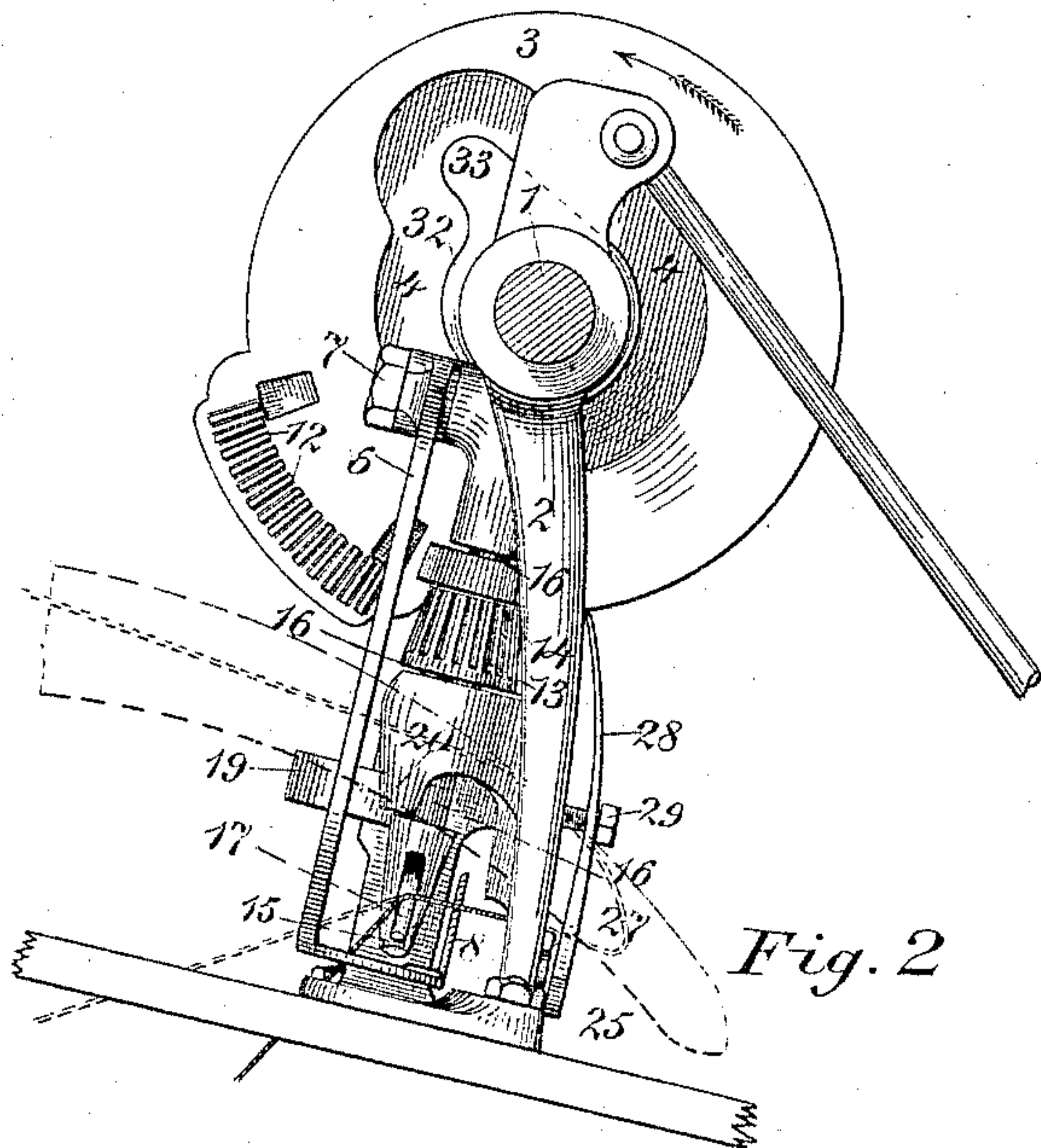


Fig. 2

Witnesses

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*Per W. J. Graham*  
*Atty.*

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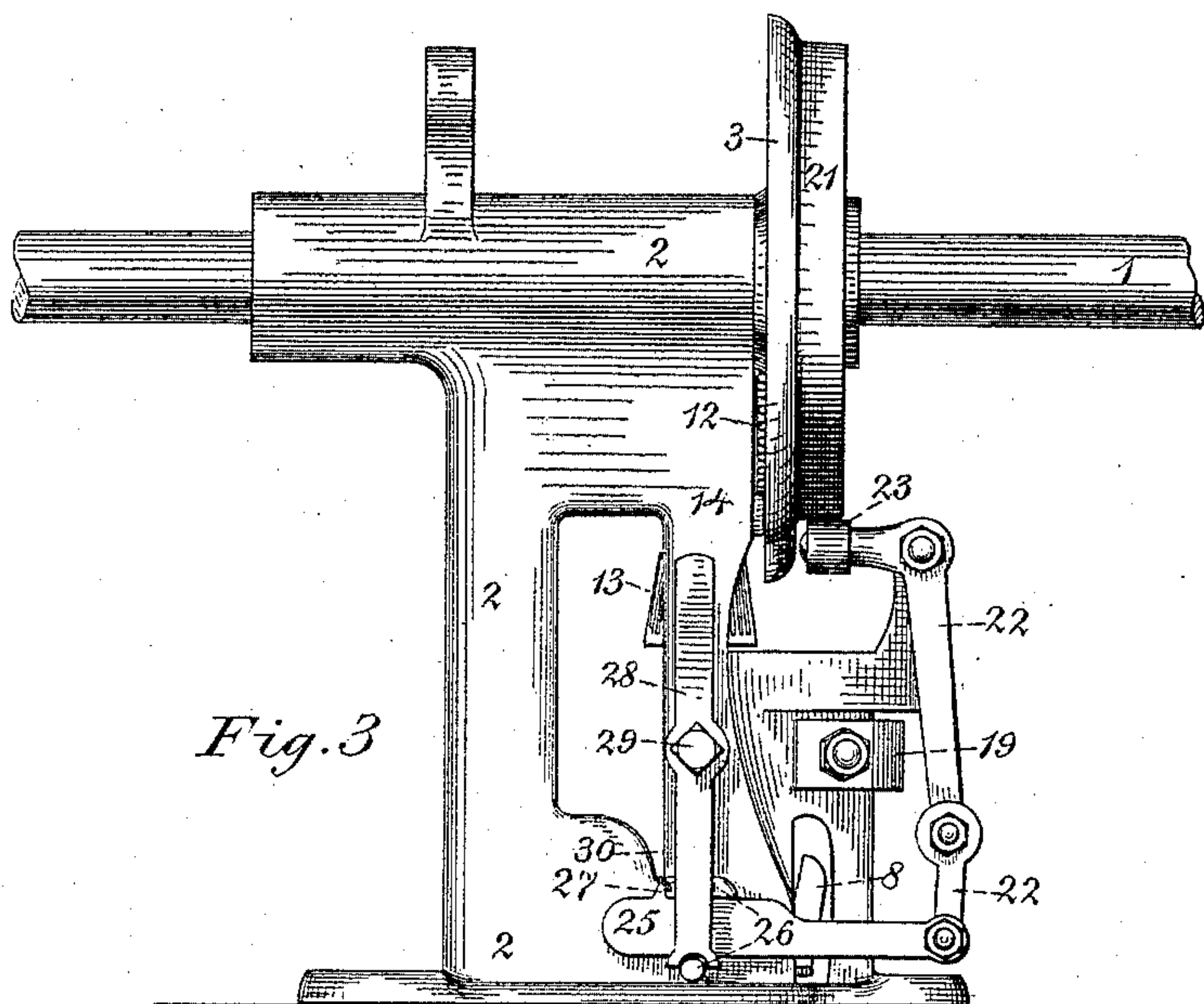


Fig. 3

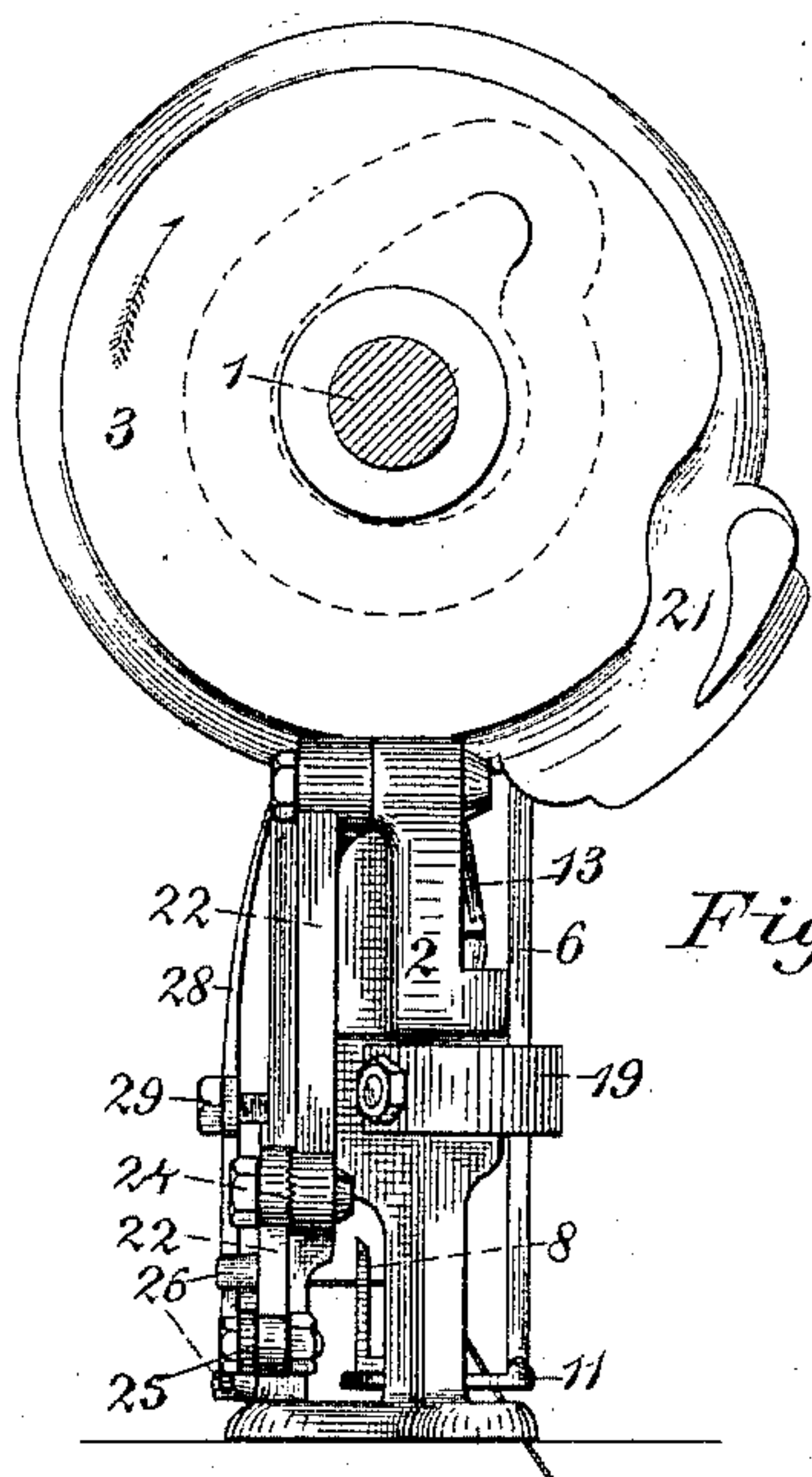


Fig. 4

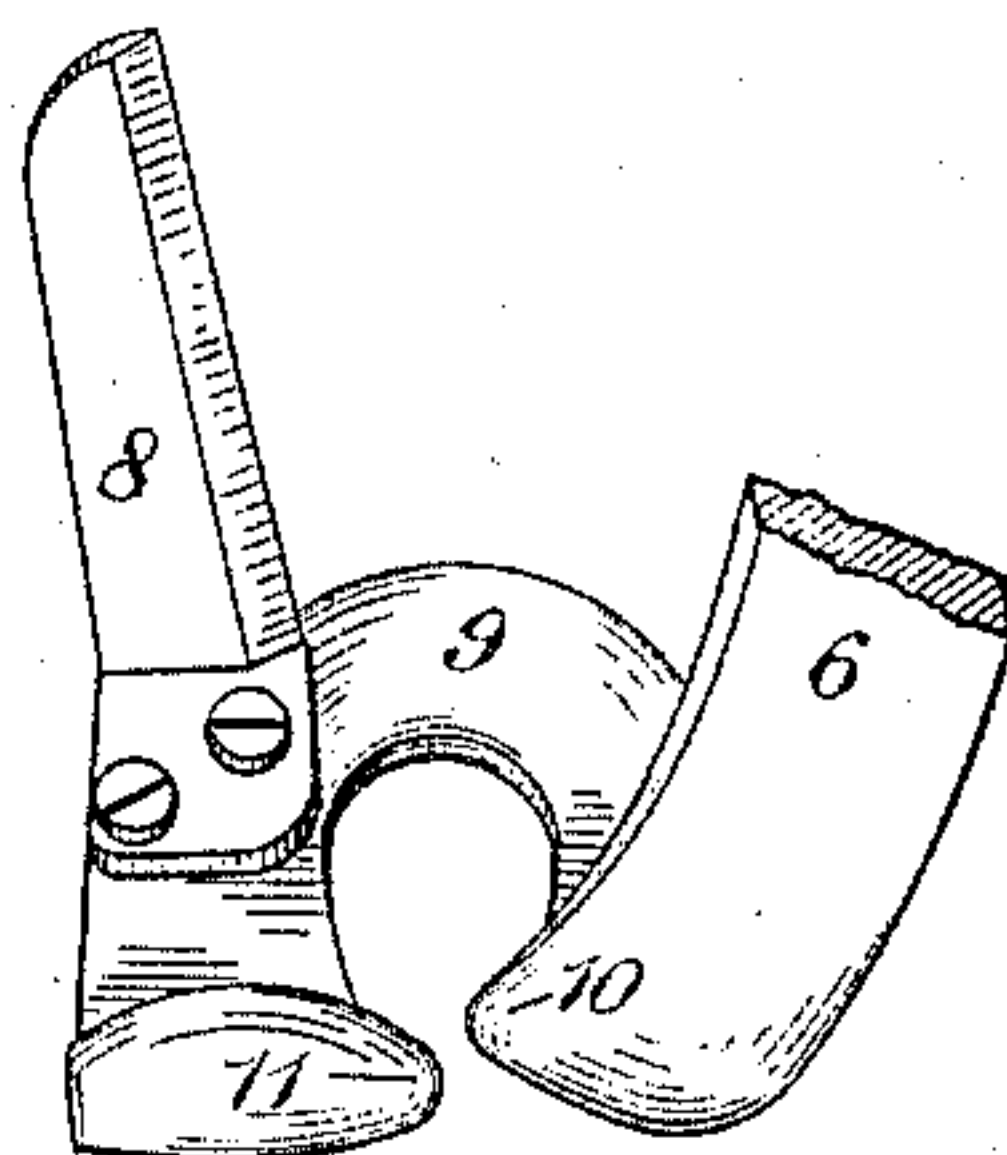


Fig. 5

Witnesses

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# UNITED STATES PATENT OFFICE.

ABRAM G. REAMAN, OF RINGWOOD, ASSIGNOR TO MERCER BROS. & CO.,  
OF ALLISTON, CANADA.

## HARVEST-BINDER.

SPECIFICATION forming part of Letters Patent No. 473,780, dated April 26, 1892.

Application filed December 31, 1890. Serial No. 376,424. (No model.)

*To all whom it may concern:*

Be it known that I, ABRAM G. REAMAN, a subject of the Queen of Great Britain, residing at Ringwood, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Harvesters, of which the following is a specification.

My invention relates particularly to improvements in the knotter mechanism of harvesters; and the objects of my invention are, first, the saving of the twine employed in binding the grain by providing for the gradual release of the end of the twine as the knot is being tied, instead of cutting it off and dropping it, and, second, the increase of the durability of the knife by it only being required to cut the single strand of the twine instead of the double to sever the sheaf when tied, thereby reducing the constant attention in sharpening said knife and the power required to operate the same in severing the twine.

I attain the above objects by means of the mechanism illustrated in the accompanying drawings, in which similar numbers of reference refer to similar parts throughout and correspond to the said numbers employed in this specification.

Figure 1 is a perspective view of my improved knotter for binder-machines. Fig. 2 is an end elevation of the same. Fig. 3 is a side elevation of the opposite side from that shown in Fig. 1. Fig. 4 is an end elevation of the opposite end from that shown in Fig. 2; and Fig. 5 represents a perspective detail view of the knife and lower end of the lever on which it is supported.

I attach my improved knotter to the usual binder-shaft 1, operating above the table and carrying the kicker-arms which throw the sheaf off after being tied.

To the bottom of the frame 2 of my improved knotter I attach the breastboard, against which the sheaf is pressed in the act of being tied, and which breastboard is only shown in Figs. 1 and 2.

On the binder-shaft 1 is secured the cam-wheel 3 to work my knotter. In the inner side of the said cam-wheel 3 is formed a race-way 4, having two particular curves therein

to operate the roller 5, fixed on the end of the shorter arm of a curved lever 6, which is pivoted on the fulcrum-pin 7, secured in the frame 2. On the longer arm of said lever 6 is carried a knife 8, employed to cut the twine. The lower end of said lever 6 is particularly adapted to engage and hold the twine loosely within a loop 9, formed on it, and has two projections 10 and 11, respectively, as shown in Fig. 5. Over the first one the twine slips and is by the lower one guided between the two and into the loop 9 shown, so that any considerable movement of the lever 6 carries the twine with it. On the said cam-wheel 3 is formed a peripheral projection on which a series of teeth forming a toothed sector 12 is carried, the purpose of which is to engage with the teeth of the knotter-pinion 13, and cause the same to revolve one revolution at each engagement, which takes place once in each revolution of the wheel 3, revolving in the direction shown by the arrow. Above the said pinion 13 is formed a rest 14, which is, as shown, a cam of segmental shape having a flat face as the chord of said segment, the ends of said face on the rest 14 engaging adapted recesses in the cam-wheel 3, when the latter causes said pinion 13 to revolve, the purpose of said rest 14 being to hold the knotter-foot 15 in position turned away from said cam-wheel 3 normally. The said knotter-foot 15, rest 14, and pinion 13 are secured on a shaft 16, carried in suitable bearings formed on the frame 2. The knotter-foot 15 is somewhat of the ordinary form now in use, having a jaw 17 pivoted through it, which carries on its rear upper end an anti-friction roller 18, which in revolving comes in contact with a spring 19, secured to the frame 2, as shown. On the lower bearing of the shaft 16 is formed a small cam 20, against which the said roller 18 is caused to revolve by the spring 19 pressing against it to depress the lower end of the lever 17 at the proper time to engage and hold the twine in forming the knot. On the outer side of the said cam-wheel 3 is formed a face-cam 21, which is circular, excepting nearly opposite the sector 12 on the inner and opposite side where an inwardly-curved course is taken for the purpose of operating the cord-holder for



gripping and relaxing the twine, presently to be described. On an adapted support at the end of the frame 2 is pivoted a bell-crank lever 22, having on its shorter arm a roller 23 to operate on said face-cam 21. The longer arm of said lever 22 is formed of two parts, as shown in Figs. 3 and 4, which are secured together by a suitable bolt and provided with radial corrugations 24 on the engaged faces of said parts, so as to provide for the adjustment of the position of the grip 25, jointed to the lower end of the longer arm of the said lever 22. Said grip 25 is merely a plate adapted to operate reciprocally between studs 26, fixed on the frame 2, and it has a hook 27 on the upper edge to engage and hold the twine, as shown. The spring 28, forked over one of the pins 26 at the low end and secured by a set-screw 29 about its center to the frame 2, bears against the said frame at the upper end and on the grip 25 at the lower end of said spring, thereby pressing the grip 25 closely against the frame 2, so as to maintain hold of the twine, which is drawn down into a narrow slit 30, formed in the frame 2 for the purpose of directing the twine to the hook 27, when the twine is brought over by the needle which is shown in dotted lines and which is common to most binder mechanisms. To fully understand my improved knotter, it will be necessary to follow the movements performed by the several parts and to observe the relative positions of the acting or moving parts and the combinations thereof particularly.

On the completion of the packing of a sheaf beneath the breastboard secured to the knotter-frame 2 the needle is operated to pass up over the sheaf and through the needle-opening in the frame 2, carrying with it the twine and laying it close alongside the end secured by the hook 27. Next the cam-wheel 3 comes into operation against the knotter-pinion 13 and causes the foot 15 to turn round, carrying the double of the twine with it and forming a loop thereon by the operation of the knotter-foot 15 in the usual way, on which means I make no claim of invention. About the same time, it will be observed, the small cam 32 in the raceway 4 will cause the lever 6 to recede from the knotter-foot 15 and allow the twine to slip down over the projection 10 and pass between it and the lower projection 11 into the loop 9, so as to be directed by the lever 6 and held tightly against the said foot 15 when the knot is being formed. Next the cam 21 comes into effect, throwing the arm 24 and the grip 25, so as to release hold of the twine (held secured heretofore by the hook 27) and allow the end of said twine to be taken up in the knot just being tied on the double of the twine. The hook 27, being relieved of the end of the twine, is drawn in the opposite direction by the reverse curve 31 in the face-cam 21 and instantly engages that part of said twine brought over by the needle and secures it before the needle begins to re-

turn to its normal position below the table. The roller 5, it will be noticed, will now occupy the curve between the two cams 32 and 33 in the raceway 4 and will be next caused to throw the lever 6 the full extent of its longer swing as it passes over the cam 33 in said raceway and the knife will pass the foot 15, severing the single twine between the knot and the hook 27. The needle next starts on its return, and the final operation is that the kicker-arms (not shown) remove the sheaf. The needle returns and the new sheaf is packed against the twine held by said grip 25.

Having now described my invention and the operation of the same in binding a sheaf, I will now proceed to define what I claim as my invention, at the same time keeping in sight the fact that knotters having a similar foot 15, cam 20, lever 17, with a roller 18 thereon, and spring 19 have been and are still in use; but

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

1. In the knotter device for harvest-binders, the combination of the spring secured medially to the knotter-frame and guided at its lower end between studs on said knotter-frame, with the grip-plate also guided between said studs and secured against said knotter-frame by said spring, and having a hook on its upper edge to hold the twine, and a shank by which it is operated, substantially as shown and described.

2. In combination, the spring secured medially to the knotter-frame and guided by studs on said frame, the grip-plate having a hook formed on its upper edge to hold the twine secured against the knotter-frame, and having a shank on said grip-plate to connect it to a lever operated by a cam-wheel, so as to reciprocate said grip-plate horizontally, and the studs on the knotter-frame above and below said grip-plate to guide it and said spring, substantially as shown and described.

3. In combination, the clamping-spring secured medially by a set-screw to the knotter-frame to clamp the grip-plate, the grip-plate having a hook on its upper edge to hold the twine, and the studs on the knotter-frame to guide said grip-plate and spring, substantially as shown and described.

4. The combination of the twine-guide formed at the bottom of the needle-opening in the frame of the knotter, with the grip-plate having a hook thereon, the spring secured medially by a set-screw and guided by studs on the said frame of the knotter, the said guide-studs to direct said grip-plate and spring, the bell-crank hinged to said grip-plate, and the cam-wheel having a raceway formed on its periphery to operate said bell-crank, substantially as shown and described.

5. The combination of the cam-wheel having an inwardly-curved raceway formed on a portion of its periphery with the bell-crank vibrated by said raceway, the grip-plate hinged to said bell-crank, and the spring se-



cured medially by a set-screw to bear on said grip-plate, substantially as shown and described.

5 6. The combination of the cam-wheel having an inwardly-curved raceway formed on a portion of its periphery, with the bell-crank vibrated by said raceway, the grip-plate hinged to said bell-crank, the spring secured

medially by a set-screw to bear on said grip-plate, and the studs on said frame to guide said grip-plate and spring, substantially as shown and described.

ABRAM G. REAMAN.

Witnesses.

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