

J. K. BOLAND.  
HORSE POWER.  
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2 SHEETS-SHEET 1.

996,965.

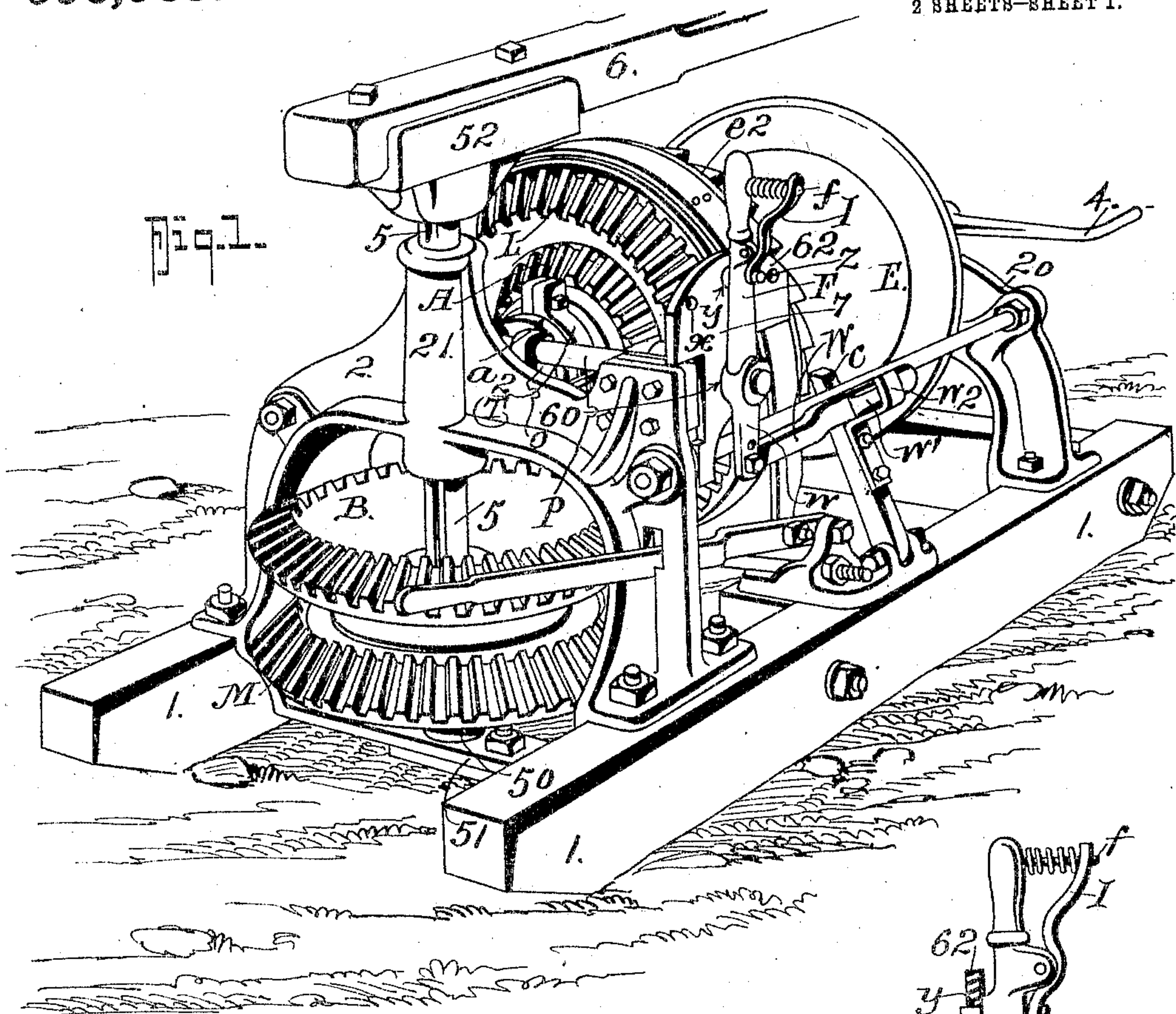
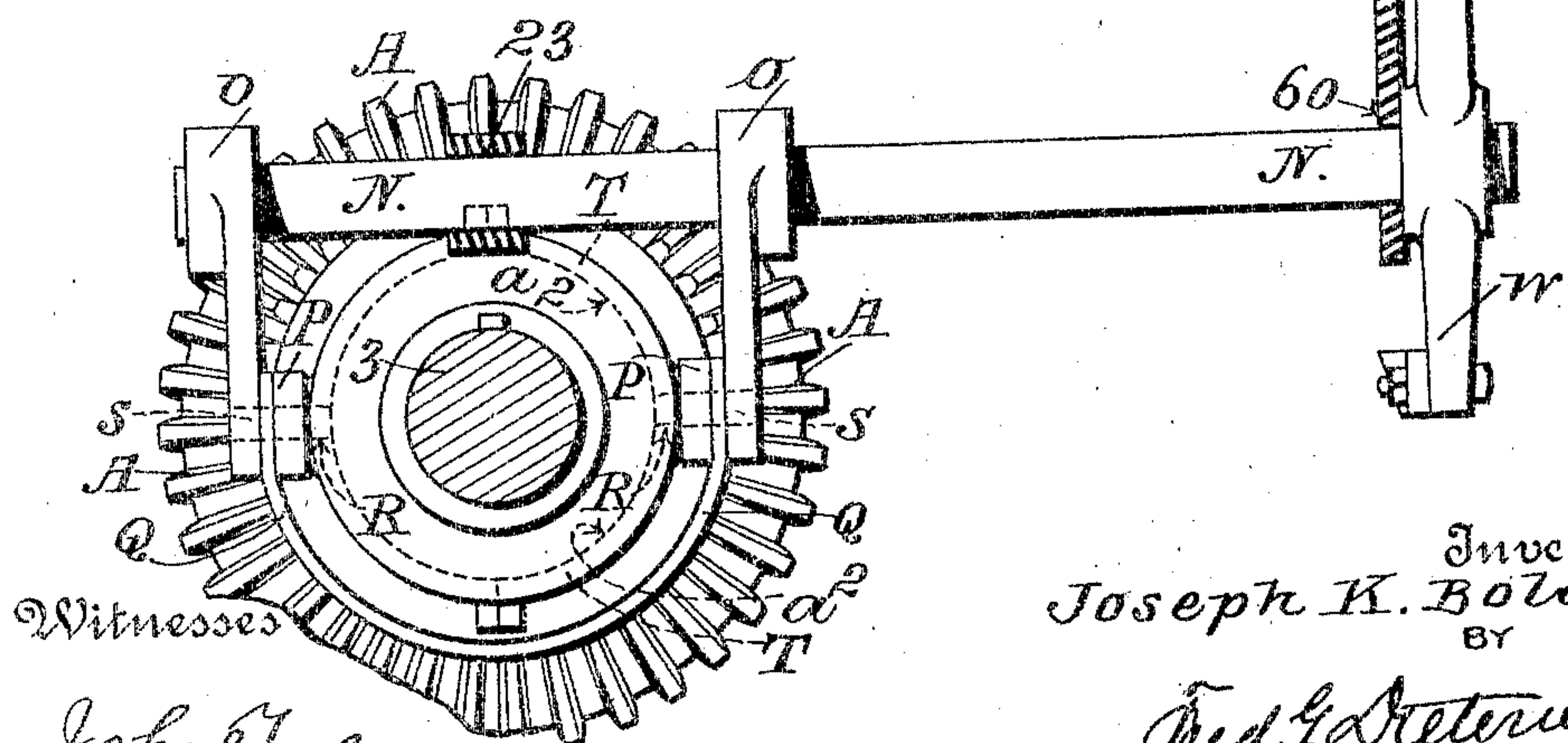


Fig. 4.



Witnesses

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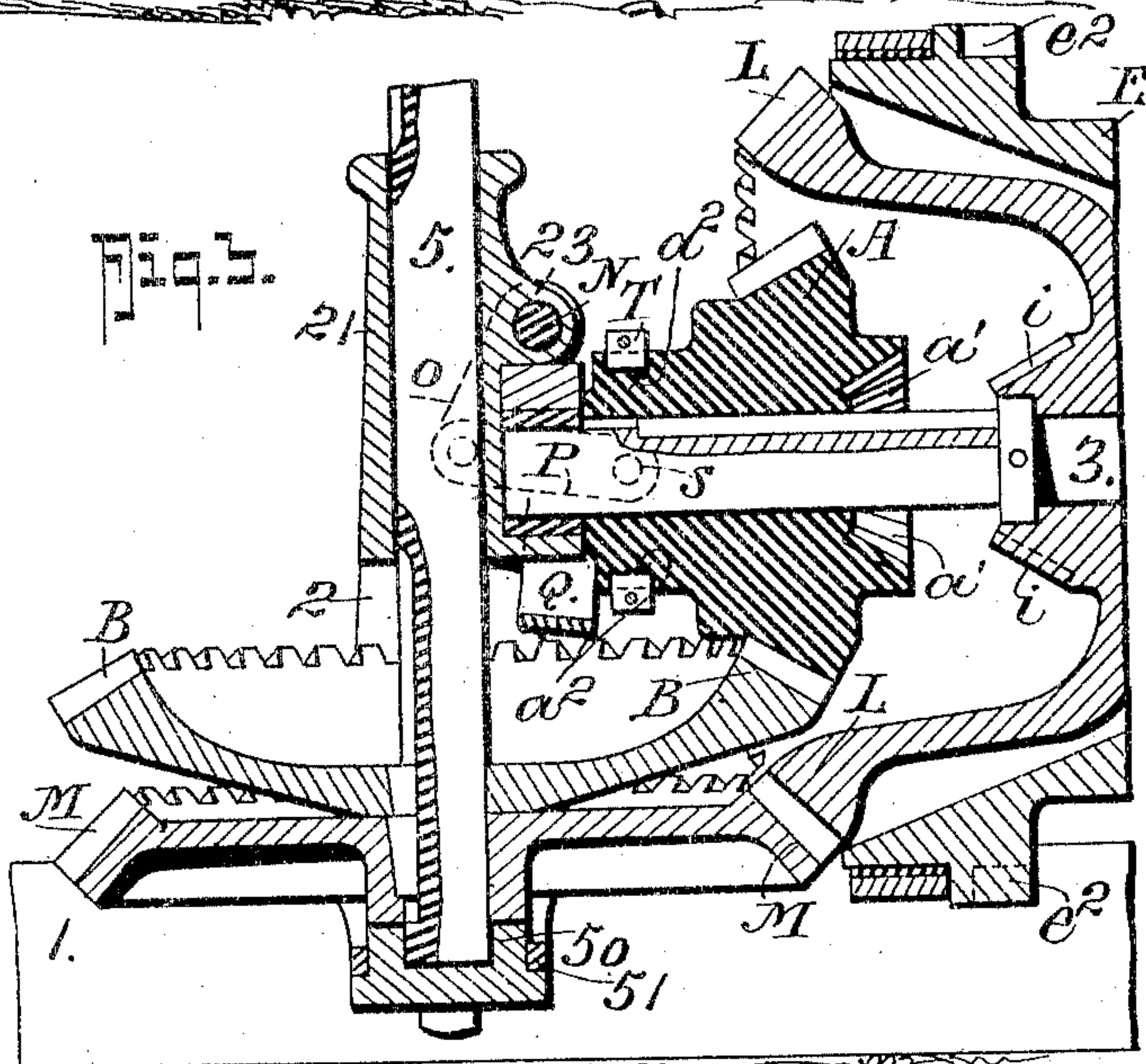
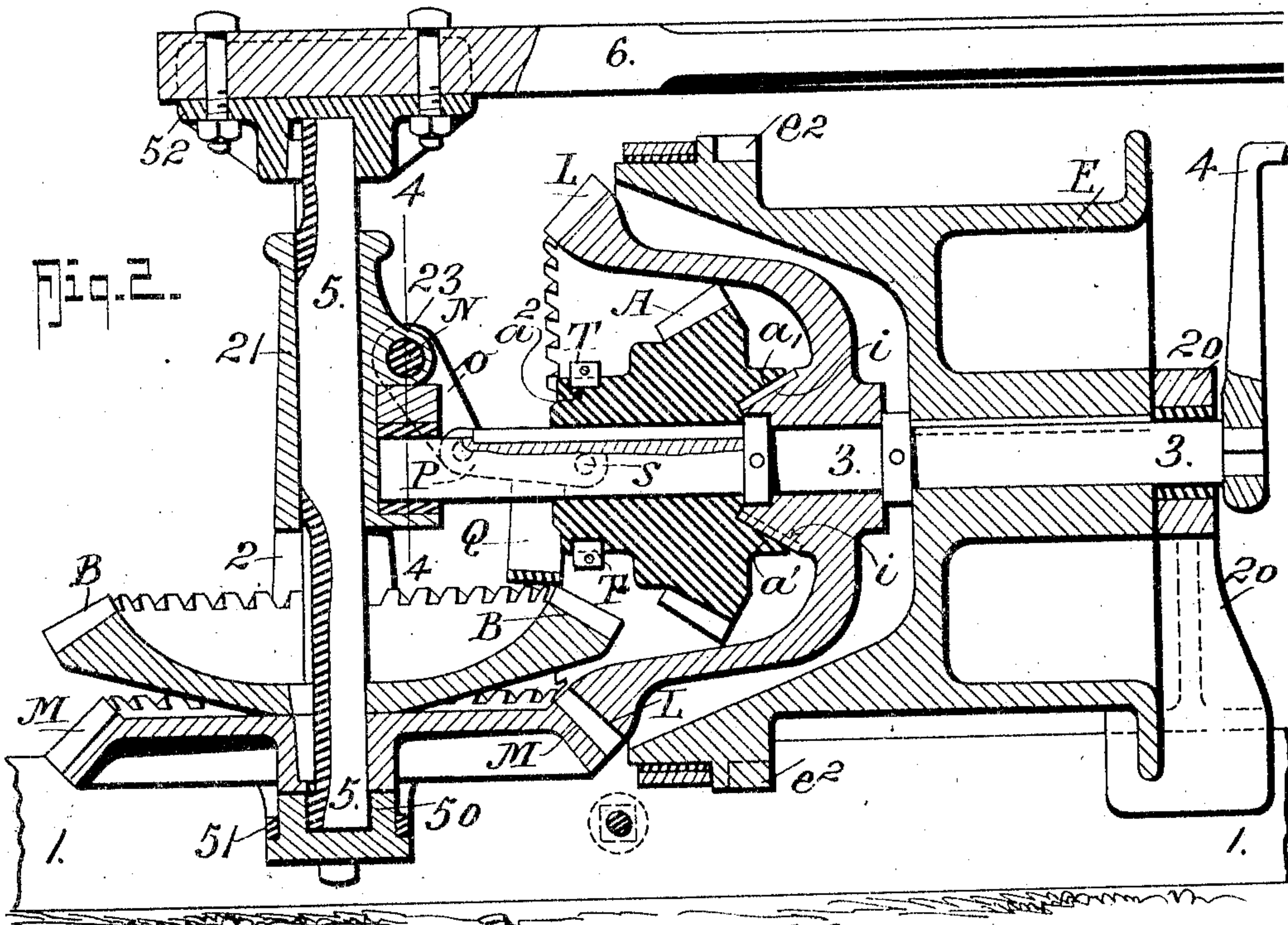
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# UNITED STATES PATENT OFFICE.

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HORSE-POWER.

996,965.

Specification of Letters Patent.

Patented July 4, 1911.

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*To all whom it may concern:*

Be it known that I, JOSEPH K. BOLAND, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Horse-Power, of which the following is a specification.

My invention relates to horse power mechanisms and it primarily has for its object to provide an improved construction of machine of the type stated, in which the parts are designed for a quick and convenient adjustment to produce duplex motion, whereby light loads may be hoisted quickly and heavy loads slowly, and in which a simple, easily operated and improved means is included for instantly making the change from a quick to slow motion, and whereby the slack rope can be readily taken up by turning the drum by hand power.

My invention consists in the peculiar construction and novel combination of parts, that constitute my improved horse power mechanism, all of which will hereinafter be fully explained, specifically pointed out in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1, is a perspective view, the shifting lever devices being shown at a midway position to allow the hoisting drum to run idle and ready to slack. Fig. 2, is a longitudinal section of the same, the parts being adjusted for slow speed. Fig. 3, is a partial longitudinal section, and shows the parts arranged for imparting a high speed to the drum. Fig. 4, is a transverse section on the line 4—4 on Fig. 2, parts being omitted, and the lever in its midway position.

In the practical arrangement, my horse power mechanism is mounted upon a pair of longitudinal base beams 1—1 made fast in any suitable manner, and the said mechanism includes the front and a rear yoke like standard 2—20 having bearing boxes on their inner sides to receive the drum shaft 3, upon which the hoisting drum E is mounted and the rear end of the shaft 3 is extended to receive a crank lever 4 for turning the drum by hand when it runs loose, for taking up the slack rope. The front standard 2 has a central tubular bearing 21 for the driving shaft 5 the lower end of which has a stepped bearing 50 in a cross beam 51 of the framing, and the upper end carries the socket casting 52 for receiving the turning beam or pole 6 as is clearly shown in Fig. 1.

M and B designate a pair of miter gears fixedly held on the lower end of the power shaft 5, the upper one B of which is utilized when the parts are adjusted for a fast speed and the lower one M is used when the parts are set for a slow speed.

A is a beveled pinion keyed on the drum shaft and slidable thereon for being moved into or out of mesh with the upper or fast gear B, in a manner presently explained. Gear A has a clutch face  $a'$  for engaging a clutch hub  $i$  on the large miter gear L loosely mounted on the drum shaft and normally held in mesh with the lower or slow gear M on the power transmitting shaft 5. It should be stated that the drum, its shaft and the gear A turn together when the said gear is in mesh with the gear B and when so adjusted a fast speed is transmitted to the drum, and when the gear A is shifted out of mesh with gear B and beyond its midway or idle position, it clutches with gear L and through said gear and gear M slow motion is imparted to the bevel gear, the shaft and the drum.

7 designates a bearing plate that projects vertically from one end of the front standard 2 and is disposed at right angles thereto. Mounted in a hub bearing 60 on the plate 7 and a bearing 23 on the back of the front standard 2 is a rock shaft N that is located above and extends across the drum shaft as is best shown in Fig. 4, by reference to which it will be seen the shaft carries a pair of pendent crank members O—O, each of which pivotally joins with a link P in parallelism with the drum shaft and whose free ends have stub pivots S—S for fitting in the seats R on the split ring or yoke T that encircles the grooved neck  $a^2$  of the bevel gear A. To prevent the yoke T from turning with the gear A and jamming, I join the two cranks O by a semi-circular strap Q. It should be here stated that the use of the strap Q or its equivalent is essential since without joining the two cranks O—O there is always danger of the said two cranks twisting out of alinement and an irregular application or shifting of the yoke T. By using the member Q, a positive and uniform shifting of the yoke and with it the gear A is effected and with little or no danger of the yoke binding on the hub of the gear A. Shaft N at its outer end carries a third pendent crank member  $w$ , which may be, and



preferably is, integral with the rocking lever F fixedly held on the outer end of shaft N and which swings over a keeper head 62 on the bearing plate 7, formed with three apertures or sockets  $x-y-z$  and the lever carries a spring latch pin  $f$  that slips into either of the said sockets as the lever is shifted thereover.

I designates a spring-finger latch connected to the pin  $f$  for pulling the pin out of the sockets  $x-y-z$  when it is desired to shift the lever.

W designates a pusher arm pivotally joined to the crank  $u$  and having a cam end  $w'$  that rides through box  $w^2$  and engages a dog  $c$  for holding it out of contact with the ratchet rim  $e^2$  on the drum, see Fig. 1.

By reason of the peculiar construction and arrangement of the parts, shown and described, it will be readily understood that when the lever F is at the midway position shown in Fig. 1 the gear A is out of mesh with gear B and as gear L now runs loose, the drum will be at the loose or idle position and can be readily turned by hand to take up the slack rope. When high speed is desired, lever F is shifted over to the right to cause the latch pin to engage notch  $z$  which shifts gear A and holds it in mesh with the gear B and in consequence fast speed is imparted to the drum. By shifting the lever F to the left to the limit, the gear A will be moved out of gear with member B and will become clutched with slow gear L driven from the power gear M.

Heretofore in horse power mechanisms of the general character shown, the pawl or dog that engages the ratchet on the drum is either thrown back by hand or by some special tripping device, when the drum runs loose. In my construction when the bevel gear is shifted to the midway position so the drum with the bevel gear runs loose, the pawl or dog is automatically swung back and held out of engagement with the ratchet (see Fig. 1) by the cam member  $w$  that is coupled to the pendent end of the lever F, it being obvious that since the lever is held locked to its midway position, the means for holding the pawl free of the ratchet on the drum is also held locked to the said free position.

What I claim is:—

1. In a horse power, a drum, a driving shaft, a drum shaft, power transmission gearing between said driving shaft and said drum shaft, said power transmission gearing including a shiftable gear, a ratchet and pawl device for holding said drum from movement in one direction, means for shifting said shiftable gear, and means controlled by said shifting means for releasing said pawl.

2. In a horse power, a drum, a driving shaft, a drum shaft, power transmission

gearing between said driving shaft and said drum shaft, said power transmission gearing including a shiftable gear, a ratchet and pawl device for holding said drum from movement in one direction, means for shifting said shiftable gear, means controlled by said shifting means for releasing said pawl, and means for locking said pawl.

3. In a horse power, a drum, a driving shaft, a drum shaft, power transmitting gearing connecting said driving shaft with said drum shaft and including a shiftable gear, means for shifting said gearing, said means comprising a rock shaft, a yoke on the shiftable gear, cranks on said rock shaft connected with said yoke, and another yoke that connects the cranks.

4. In a horse power, the combination with a loosely journaled drum shaft, a drum fixed thereon, a driving shaft, a pair of driving gears mounted on said driving shaft, a driven gear and clutch member loosely mounted on said drum shaft to mesh with one of said driving gears, a shiftable gear and clutch member on said drum shaft to turn therewith, means for shifting said shiftable gear and clutch member into and out of engagement with said driven gear and clutch member and into and out of engagement with the other driving gear, said shifting means comprising a rock shaft, a pair of oppositely disposed crank arms thereon, and a yoke ring on said shiftable gear, said ring having trunnions for engaging said crank arms.

5. In a horse power, the combination with a loosely journaled drum shaft, a drum fixed thereon, a driving shaft, a pair of driving gears mounted on said driving shaft, a driven gear and clutch member loosely mounted on said drum shaft to mesh with one of said driving gears, a shiftable gear and clutch member on said drum shaft to turn therewith, means for shifting said shiftable gear and clutch member into and out of engagement with said driven gear and clutch member and into and out of engagement with the other driving gear, said shifting means comprising a rock shaft, a pair of oppositely disposed crank arms thereon, and a yoke ring on said shiftable gear, said ring having trunnions for engaging said crank arms, and a supplemental member that crosses the drum shaft and joins with the trunnion bearings.

6. In a horse power of the character stated, the combination with the loosely journaled drum shaft, a drum fixedly held thereon, a slow speed driven gear having a clutch face and loosely mounted on said shaft, a pair of driving gears one of which is in mesh with the loose gear on the drum shaft; of a bevel gear slidable on the drum shaft, and keyed thereon, said bevel gear having a clutch face to engage the slow



speed gear and a ratchet and pawl device for the drum; of a means for shifting the bevel gear to engage either the slow speed clutch gear, one of the driving gears or to a midway or free position, and a device controlled by the gear shifting means for holding the pawl out of mesh with the ratchet when the gear is at the midway position.

7. In a horse power of the character stated, the combination with a loosely journaled drum shaft, a drum fixedly held thereon, a slow speed driven gear having a clutch face and loosely mounted on said shaft, a pair of driving gears one of which is in mesh with the loose gear on the drum shaft; of a bevel gear slidable on the drum shaft and keyed thereon, said bevel gear having a clutch face to engage the slow speed gear clutch face, a ratchet and pawl device for the drum, a means for shifting the bevel gear to engage either the slow speed gear clutch face, one of said driving gears, or to a midway or free position, a device controlled by the gear shifting means for holding the pawl out of engagement with the ratchet when the gear is at the midway position, and a locking device for securing the gear shifting means to its several adjusted positions.

8. In a horse power, a loosely mounted drum, a drive mechanism including driving

gears and a driven gear on the drum shaft and a shiftable gear on the drum shaft cooperating with one of said driving gears and with said driven gear for imparting fast or slow motion to the drum, a ratchet and pawl device for the drum, means for shifting the gear to transmit fast or slow speed to the drum, and to a midway or free position, the said means including a rocking lever and a locking device for holding the lever to its rocked position, and means controlled by the rocking lever for releasing and holding the pawl from the drum ratchet at times.

9. In a horse power of the character described, the combination with the drum having a ratchet rim, a pawl for engaging said rim to hold said drum from movement, a driving mechanism for said drum and shiftable devices for operatively connecting and disconnecting said driving mechanism and drum, together with means controlled by said connecting and disconnecting means for holding said pawl out of engagement with said ratchet when said driving mechanism is operatively disconnected from said drum.

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