

UNITED STATES PATENT OFFICE.

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GEARING.

944,635.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHESTER L. ROBBINS, citizen of the United States, residing at East Thompson, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Gearing, of which the following is a specification.

The present invention relates to an improved form of gearing which is especially adaptable for changing the speed of the disk used for moving a saw mill carriage, whereby a slow speed and a quick reverse of the carriage may be had.

The object of the invention is the provision of changeable speed gearing of this character which can be readily applied to saw mill or other machinery which is strong and durable in its construction and which enables the quick change from a low speed to a high speed, or vice versa, as may be desired.

The invention has for a further object the provision of a system of gearing wherein a plurality of wheels are alternately thrown into engagement with a disk and a friction wheel is adjustably engaged against a main disk to produce different speeds and a reverse speed, all of the above movements being controlled from one hand-lever.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a side elevation of the gearing embodying the invention, portions being broken away and shown in section. Fig. 2 is a top plan view of the same, portions being broken away and shown in section, and Fig. 3 is a detailed elevation of the operating lever and mechanism directly connected therewith.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawing by the same reference characters.

Referring to the drawings the numeral 1 designates a shaft which is provided with a rigidly mounted wheel 2 formed with an inner beveled portion 2^a and an outer beveled portion 2^b. Arranged at right angles to the shaft 1 is a counter shaft 3, which is suitably journaled in the bearing 3^a disposed upon a frame 3^b and which has a friction disk 4 applied thereto. Secured to the counter shaft

3 is a beveled gear wheel 5 which is adapted to frictionally engage the outer beveled portion 2^b of the wheel 2. A second beveled gear wheel 6 is also mounted upon the inner end of the counter shaft 3 and has a feather and spline connection therewith so that while it can slide longitudinally upon the shaft 3 it must always rotate therewith. This second gear wheel 6 is designed to frictionally engage the inner beveled portion 2^a of the wheel 2 and to give a slow speed to the counter shaft 3, the high speed being obtained by the counter shaft 3 when the first mentioned beveled gear wheel 5 is in operative position and engages the beveled portion 2^b.

A pair of collars 7 are loose upon the counter shaft 3 between the two beveled gear wheels 5 and 6 and these collars have openings considerably larger than the counter shaft 3 so that they can move laterally thereon to a limited extent. The opposite sides of each of the collars are formed with the spaced ears 8, the same being disposed upwardly and downwardly respectively, and the two collars are loosely connected at one side between the ears 8 by a lever 9 and at the opposite side between the opposite ears 8 by the short arm of a bell-crank lever 10. The middle portion of the lever 9 and also the middle portion of the short arm of the crank lever 10 are pivoted to the frame 3^b through the medium of a brace arm 11, and it will be obvious that by suitably manipulating the lever 10 the members may be given a parallelogrammatic movement and the collars 7 moved toward or away from each other as desired. When the collars 7 are forced apart in this manner, the beveled gear wheel 6 engages the inner beveled portion 2^a of the wheel 2 and the counter shaft 3 is driven at a slow speed, the gear wheel 5 being forced away from the outer beveled portion 2^b of the wheel 2 and the end thrust of the counter shaft 3 serving to hold the gear wheel 6 in operative position. In a reverse manner when the lever 10 has been manipulated to draw the collars 7 toward each other, the gear wheel 5 is forced against the outer beveled portion 2^b of the wheel 2 by the end thrust of the counter shaft 3 so as to cause the counter shaft 3 to be driven at a high speed, the gear wheel 6 being permitted to fall away from the inner beveled portion 2^a of the wheel 2.

The long arm of the lever 10 operates with-

in a keeper 12 secured to the frame supporting the gearing, the said keeper being formed of spaced bars connected by a pair of screws 13 which serve as stops to limit the movement of the lever 10 and also constitute a means for drawing the two sides of the keeper together and holding them in a frictional engagement with the lever 10. In this manner the lever is held against accidental movement, but when force is applied thereto can be readily swung to either limit of its movement as desired.

Disposed across the side beams 14 of the frame 3^b is a transverse shaft 15 mounted in journal boxes 16 which are disposed upon the upper faces of the beams 14 slightly forward of the friction disk 4. The shaft 15 is provided with a friction wheel 17 which is keyed thereto to admit of the longitudinal sliding of the wheel 17 upon the shaft 15, the wheel 17 being provided with a sleeve 18 loosely fitted about the shaft 15 and provided with a peripheral groove adjacent its outer end for the reception of a split collar 19 by means of which the sleeve 18 is moved longitudinally upon the shaft 15.

Disposed about the collar 19 is a bracket comprising a pair of side bars 20 which are longitudinally slotted as at 21 (shown in Fig. 3) for the reception of studs 22 which are extended oppositely and outwardly from the collar 19, the side bars 20 being terminated at their opposite extremities in integrally formed sockets 23 within which are inserted the upper and lower handle sections 24 and 25 respectively. The section 25 extends downwardly from the socket 23 and is loosely engaged through the lower end of a yoke 26 which is pivotally depended from lugs 27 projected downwardly against the inner faces of the beams 14 from the journal boxes 16. The section 25 is provided at its lower end with a laterally projecting abutment 28 of convex formation which coöperates with a convex foot 29 for impinging the forward end of a rod 30 therebetween to cause the movement of the rod 30 upon the manipulation of the hand-lever sections 24 and 25. The rod 30 is pivotally engaged at its rear extremity with the long arm of the bell-crank lever 10 through which the same is operated. The foot 29 is carried upon the lower ends of side members 31 which engage oppositely against the rod 30 and which are extended upwardly and connected to a reach rod 32 passing upwardly and engaged upon a bell-crank lever 33 positioned adjacent the handle 34 and operated by a spring 35 interposed between the same. It is thus obvious that when the hand-lever is swung laterally the sleeve 18 will be carried longitudinally upon the shaft 15 and the friction wheel 17 will assume various positions against the disk 4 to impart various speeds to the counter shaft 3. The hand-lever may also be operated for-

wardly or rearwardly to actuate the rod 30 to swing the bell-crank lever 10 and to thereby separate and draw together the collars 7 and throw the gears 5 and 6 into and out of operation.

Having thus described the invention, what is claimed as new is:

1. The combination of a main shaft, a wheel applied to the main shaft and formed with an inner beveled portion and an outer beveled portion, a counter shaft, a beveled gear wheel rigid with the counter shaft, a second beveled gear wheel having a feather and spline connection with the counter shaft, the said gear wheels being adapted to engage the beveled portions of the wheel upon the main shaft, a pair of members loose upon the counter shaft between the beveled gear wheels, and means for moving the members toward or away from each other to operate said second beveled gear.

2. The combination of a main shaft, a wheel applied to the main shaft and formed with an outer beveled portion and an inner beveled portion, a counter shaft, a beveled gear wheel rigid with the counter shaft, a second beveled gear wheel having a feather and spline connection with the counter shaft, the said beveled gear wheels being adapted to engage the beveled portions of the wheel upon the main shaft, a system of members arranged between the beveled gear wheels and loosely connected to each other so as to have a parallelogrammatic movement, and means for operating the said members to operate said second beveled gear.

3. The combination of a main shaft, a wheel applied to the main shaft and formed with an outer beveled portion and an inner beveled portion, a counter shaft, a beveled gear wheel rigid with the counter shaft, a second beveled gear wheel having a feather and spline connection with the counter shaft, the said beveled gear wheels being adapted to engage the beveled portions of the wheel upon the main shaft, a pair of collars loosely receiving the counter shaft and arranged between the beveled gear wheels, levers loosely connecting the collars at opposite sides thereof, and means for imparting a parallelogrammatic movement to the members for moving the collars toward or away from each other so as to throw said second beveled gear into an operative position.

4. The combination of a main shaft, a wheel mounted upon the main shaft and formed with an inner beveled portion and an outer beveled portion, a counter shaft, a beveled gear wheel rigid with the counter shaft, a second beveled gear wheel having a feather and spline connection with the counter shaft, the said beveled gear wheels being adapted to engage the beveled portions of the wheel upon the main shaft, a system of members arranged between the

beveled gear wheels and loosely connected so as to have a parallelogrammatic movement, a lever for moving the said members to throw said second beveled gear into an operative position, a keeper for the lever, and screws applied to the keeper for holding the sides thereof in frictional engagement with the lever.

5. The combination of a main shaft, a wheel mounted upon the main shaft and formed with an outer beveled portion and an inner beveled portion, a counter shaft, a beveled gear wheel rigid with the counter shaft, a second beveled gear wheel having a feather and spline connection with the counter shaft, the said beveled gear wheels being adapted to engage the before mentioned beveled portions of the wheel upon the main shaft, means for forcing the beveled gear wheels apart or permitting them to come together to throw said second beveled gear into an operative position, a lever for actuating the said means, a second lever provided with a pair of cooperating shoes, and a rod connected to the first mentioned lever and adapted to be gripped between the shoes of the second mentioned lever to produce an operative connection between the levers.

6. The combination of a main shaft, a wheel mounted upon the main shaft and formed with an outer beveled portion and an inner beveled portion, a counter shaft, a beveled gear wheel rigid with the counter shaft, a second beveled gear wheel having a feather and spline connection with the counter shaft, a system of members arranged between the two beveled gear wheels and loosely connected so as to have a parallelogrammatic movement, a lever for moving the said members to throw the beveled gear

wheels apart or permit them to come together so as to throw said second gear into an operative position, a second lever, a fixed shoe upon the second lever, a movable shoe upon the second lever, a hand lever upon the second lever, an operative connection between the hand lever and the movable shoe, and a rod connected to the first mentioned lever and adapted to be gripped between the shoes to produce an operative connection between the levers.

7. The combination of a main shaft, a counter shaft, changeable speed gearing between the main shaft and the counter shaft, a lever for controlling the said changeable speed gearing, a friction disk on the counter shaft, a friction wheel engaging the friction disk, a lever for moving the friction wheel toward or away from the center of the friction disk, and an operative connection between the lever and the first mentioned lever.

8. The combination of a main shaft, a counter shaft, changeable speed gearing between the main shaft and the counter shaft, a lever for controlling the changeable speed gearing, a friction disk upon the counter shaft, a wheel frictionally engaging the friction disk, a second lever for moving the said wheel toward or away from the center of the friction disk, a pair of cooperating shoes upon the second lever, and a rod connected to the first mentioned lever and adapted to be gripped between the shoes of the second mentioned lever to produce an operative connection between the levers.

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

CHESTER L. ROBBINS. [L. S.]

Witnesses:

JULIA ROBBINS,

HANNAH T. ROBBINS.