W. H. BARKWILL.

FRICTIONAL GEARING.

APPLICATION FILED JULY 24, 1914.

1,154,598.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

Fig. 3.

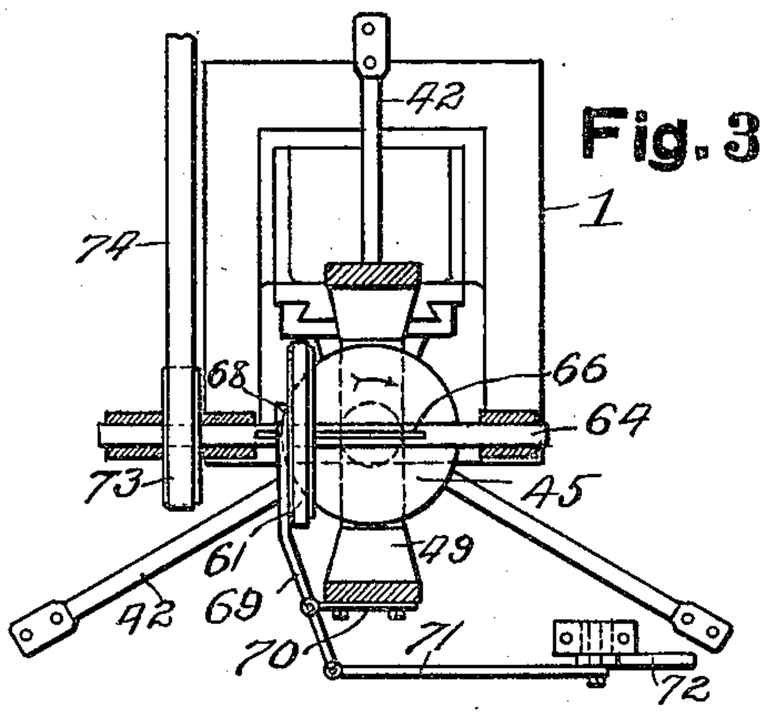

Fig. 1.

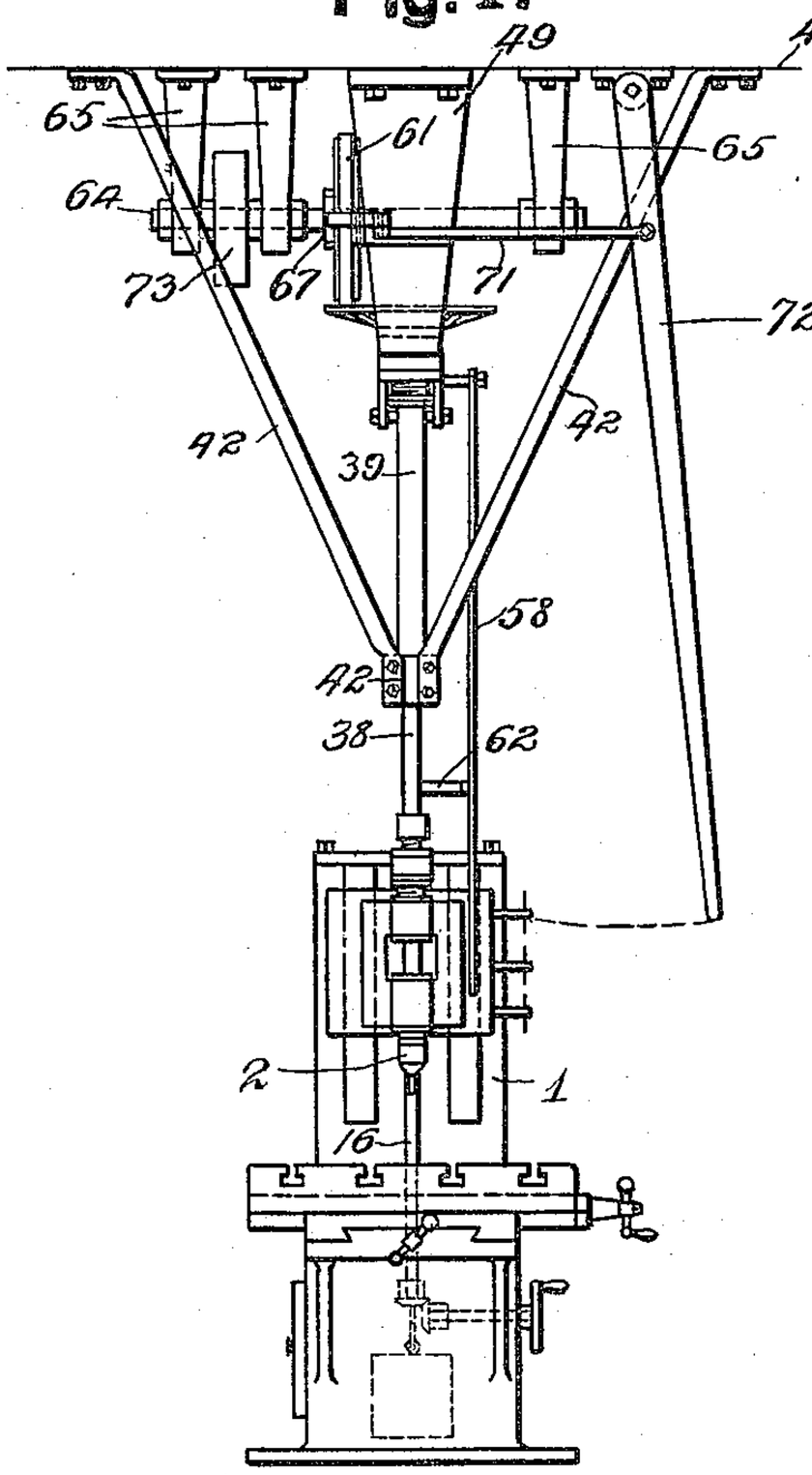

Fig. 2.

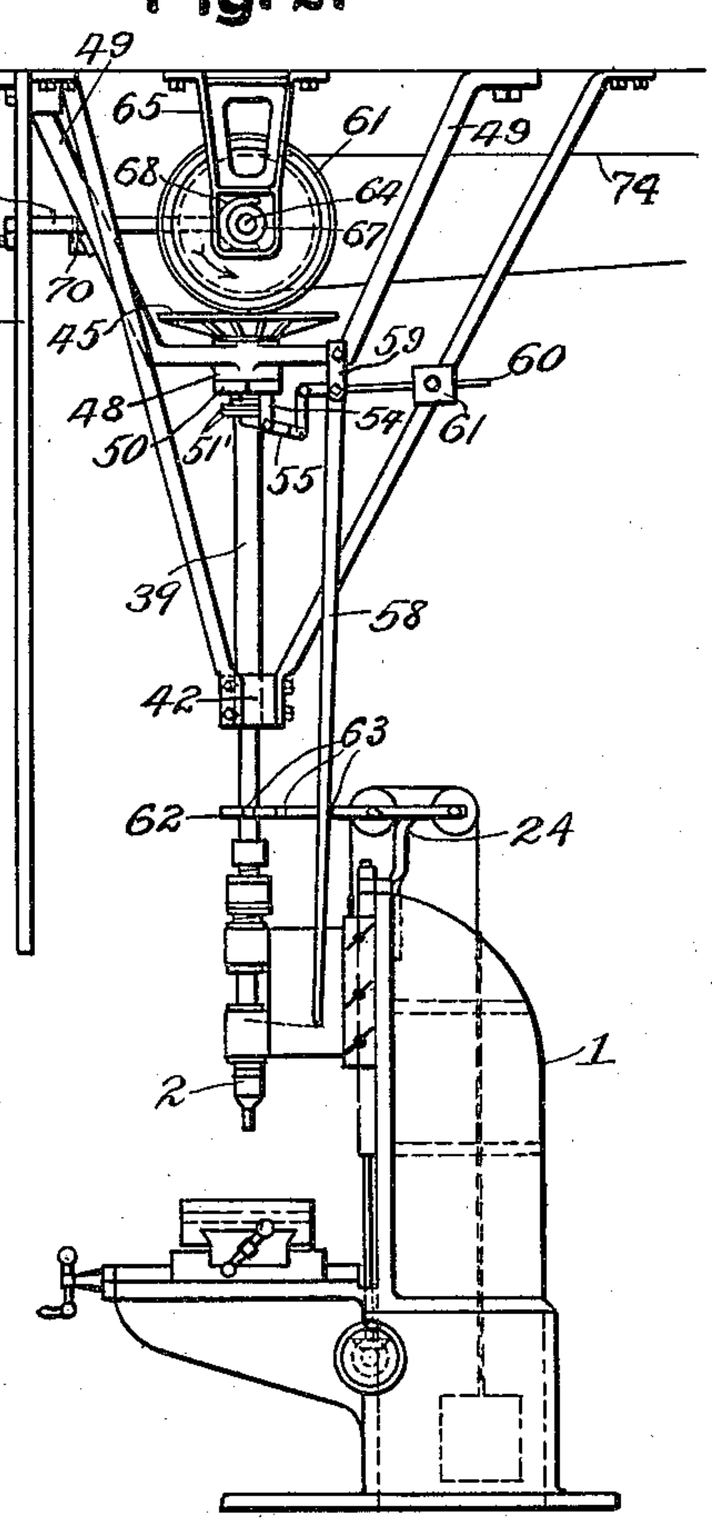

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Fig. 4.

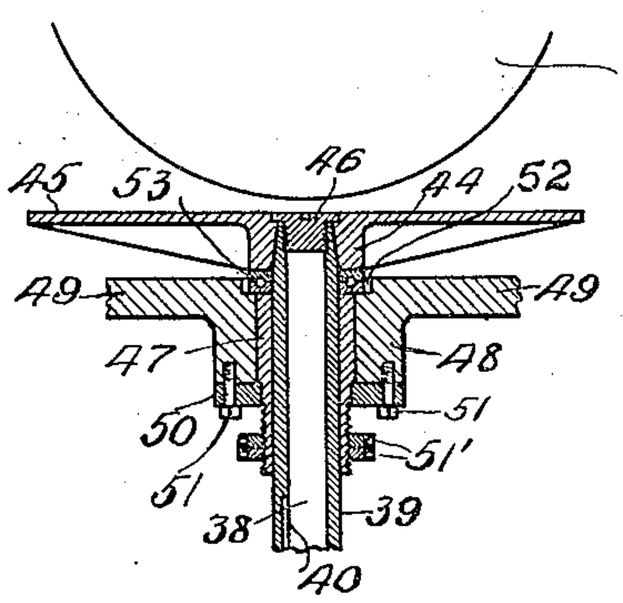
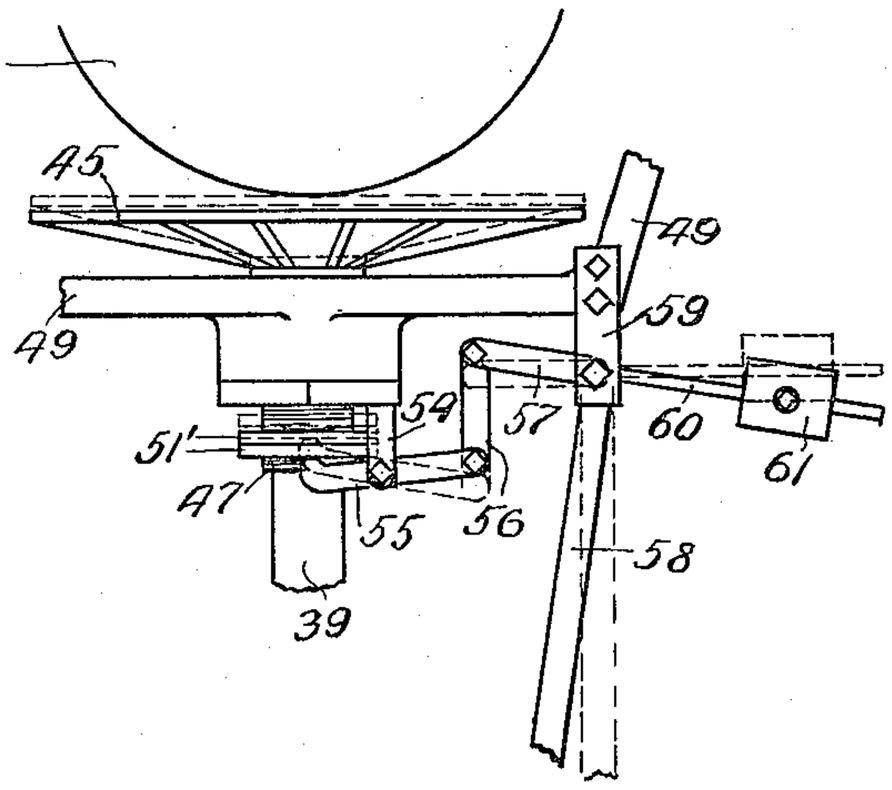


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FRICTIONAL GEARING.

1,154,598. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed July 24, 1914. Serial No. 852,833.

To all whom it may concern:

Be it known that I, WILLIAM H. BARKWILL, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Frictional Gearing, of which the following is a specification.

This invention relates to frictional gearing.

One object of the invention is in a feasible and thoroughly practical manner to obtain any desired speed for operating machines such as milling machines or the like and to transmit, with the least amount of lost motion, the required power.

A further object is to dispense with all toothed gearing in transmitting speed and power from a drive shaft to a milling tool or the like, whereby a smooth and positive drive of the latter may be obtained, thus to insure a grade of finished work that shall be of the highest character.

A further object is practically to eliminate danger of breakage of a milling tool or the like by securing the coöperation between the driving and the driven gear of the driving train of such character that rotation of the latter gear may instantly be stopped and with it the tool without interfering with the continuous rotation of the former gear.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination and arrangement of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings forming a part of this specification and in which like characters of reference indicate corresponding parts Figure 1 is a view in front elevation of a milling machine constructed in accordance with the present invention, showing the same in use in connection with a milling machine. Fig. 2 is a view in side elevation. Fig. 3 is a top plan view, partly in section. Fig. 4 is a fragmentary detail sectional view, on an enlarged scale, showing the manner of supporting the driven gear or disk, and the means for securing the disk with the sleeve of the tool spindle and Fig. 5 is a view in elevation, on an enlarged scale, displaying the means for shifting the driven disk into and out of engagement with the driving gear.

A frictional gearing in accordance with my invention is here shown as employed for driving the cutting tool of a milling machine designated generally by the numeral 1, the tool 2 of which is suitably connected to the lower end of a spindle 38, the upper portion of which spindle is housed within a sleeve 39.

The lower end of the sleeve 39 is loosely mounted in a bearing carried by the lower end of a V-shaped hanger 42, the upper ends of the arms of which are secured to a suitable overhead support 43. The upper end of the sleeve is cone-shaped and internally threaded and engages with a similarly shaped threaded seat formed in the hub 44 of a metallic friction disk of driven gear 45, a screw 46 threaded into the upper end of the sleeve and having its head countersunk in the disk, serving to clamp the disk and sleeve together. The upper portion of the sleeve is disposed within a bearing 47 loosely mounted in a boss 48 carried by the lower end of a hanger 49, the arms of which are secured to the overhead support 43. The bearing is shouldered externally and threaded at its lower end and is engaged by a split collar 50 that is secured by bolts 51 to the underside of the boss 48. Below the collar 50 and threaded onto the bearing are a pair of nuts 51′, one of which constitutes a lock nut. The upper face of the boss is provided centrally with a socket 52 in which is seated an antifriction bearing 53 that engages with the upper end of the bearing 47, and the under side of the hub 44 of the disk 45. Depending from each side of the collar 50 is a lug 54 to which is pivotally connected a yoke 55, the inner ends of the arms of which are arranged to contact with the under side of one of the nuts 51′. The outer end of the yoke has connected with it one end of a link 56, the other end of which is pivotally connected with an angular arm 57 carried by the upper end of a lever 58 pivoted at its bend to a plate 59 bolted to the hanger 49. The lever has projecting from it a horizontal arm 60 carrying an adjustable weight 61, the function of which is to hold the disk 45 normally out of contact with the friction driving member or gear 61. The lower end of the lever is disposed to traverse a bar 62, secured to a bracket 24 carried on the upper end of the machine 1, and provided with notches 63 by which to hold the disk 45 in

locked engagement with the disk 61, the force of frictional contact between the two disks being thus positively controlled.

The driven disk 61 is mounted to slide upon a shaft 64 journaled in hangers 65, the shaft being provided with a keyway 66 to engage with the spline in the gear. Secured to the shaft at one end is a collar 67 with which is pivotally connected a yoke 68 carried by one end of a bent lever 69 pivoted to a bracket 70 secured to the hanger 49. The other end of the lever is pivotally connected with one end of a link 71, the other end of which is pivoted to a lever 72 having its upper end connected with an overhead support and its lower end disposed convenient to the operator of the machine. By throwing the shifter lever 72, the driving gear can be moved toward and from the center of the disk 45 and thus vary the speed of drive of the latter. The shaft carries a pulley 73 around which passes a belt 74 to a suitable source of power.

It will be seen from the foregoing description that by the peculiar driving mechanism employed, not only can the speed of the milling tool be controlled at will, but danger of breakage is practically eliminated as by throwing the friction lever 58, the operation of the machine can instantly be stopped, thus securing another object sought.

I claim:—

The combination with a frame, of a shaft journaled in said frame, a friction driving gear carried by said shaft, a friction disk having its axis at right angles to said driving gear and provided with a centrally-disposed boss having a frusto-conical opening terminating in a shouldered recess, a hollow spindle having a frusto-conical end fitted in said boss and having its interior extremity threaded, a shouldered screw fitted in the extremity of the spindle and having its shouldered portion lying in the recess, a sleeve slidably mounted in said frame and surrounding the hollow spindle, an anti-friction bearing between the sleeve and boss, and means to reciprocate said sleeve and cause the disk to engage the driving gear.

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

WILLIAM H. BARKWILL.

Witnesses:
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