

E. HENRIKSON.
GEARING.

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931,761.

Patented Aug. 24, 1909.

Fig. 1.

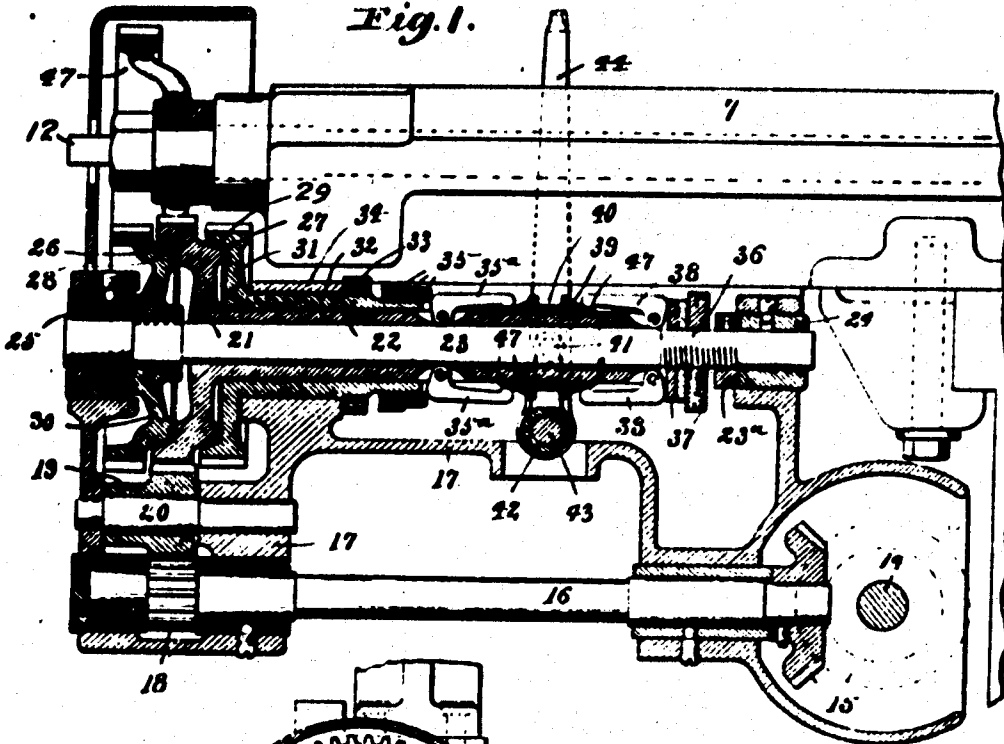
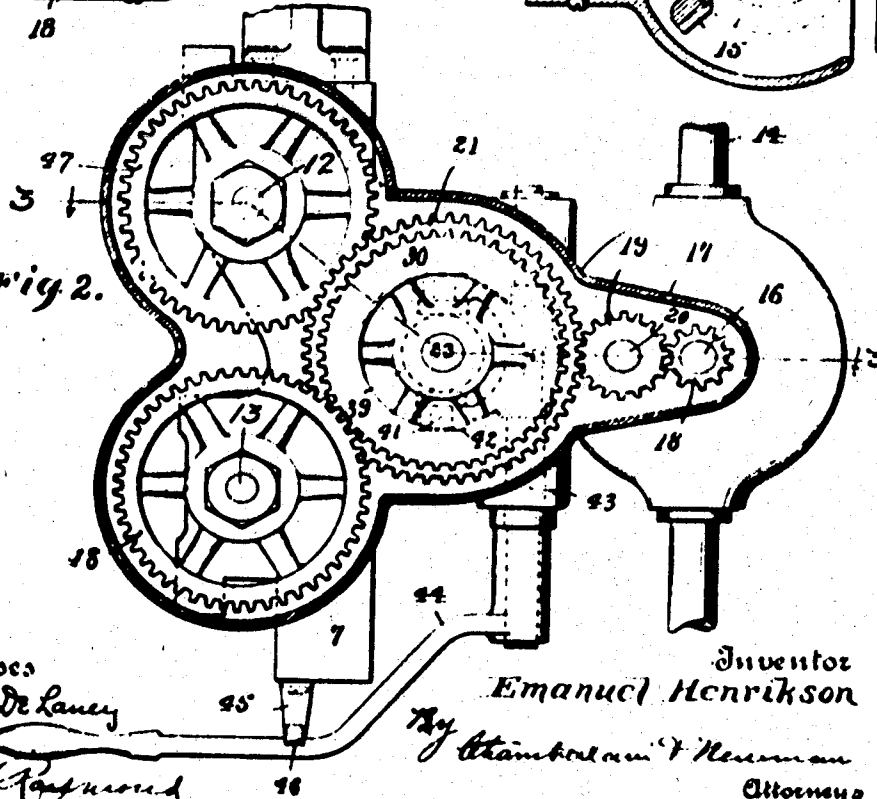


Fig. 2.



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GEARING.

931,761.

Specification of Letters Patent.

Patented Aug. 24, 1909.

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To all whom it may concern:

Be it known that I, EMANUEL HENRIKSON, a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful improvements in (bearing, of which the following is a specification.

My invention relates to new and useful improvements in clutch mechanism whereby two shafts may be made to alternately drive separate sets of mechanisms at different speeds, as for instance the head and tool of a boring mill.

Heretofore so called pull gears, have been commonly used on the ends of shafts contained in cross rails of machine tools of this class for changing from one feed to another, which gears are obviously objectionable by reason of the greater amount of time required in applying and removing them besides the labor and bother incident thereto.

It is therefore the object of my present invention to provide improved clutch mechanism, by means of which changes in the feeds of heads of this class can be made, so as to avoid the use of pull gears, and which may be effected by the simple operation of a single lever conveniently located; further to provide means which may be adjusted to pull the heaviest cuts, at the same time act as a safety slip, in case of accidental collisions of the heads or other troubles, thus preventing injury to the machine and work on such occasions, and finally to design the mechanism in a simple and practical manner so as to insure a light running and durable structure.

This feed changing or clutch device is especially applicable and desirable for use in connection with a machine such as is shown in Patent No. 877,403, dated January 22, 1908, but may obviously be used to advantage in connection with other styles of machine tools than that referred to.

Upon the accompanying drawings forming a part of this specification similar characters of reference denote like or corresponding parts throughout the several figures and of which,

Figure 1, shows a sectional plan view, of the end portion of a cross rail of a boring mill with my improved changeable feed driving mechanism connected therewith. Said section being taken on line 3—3 of

Fig. 2, and Fig. 2, shows a sectional end elevation of the changeable feed driving mechanism shown in Fig. 1, the casing inclosing said mechanism being broken away and shown in section.

Referring in detail to the characters of reference marked upon the drawings, 7 indicates a cross rail of a boring mill to which my improved device is shown attached.

12 and 13 represent shafts journaled in the cross rail and upon which driven gears 47 and 48 are mounted.

14 indicates a driven shaft which obviously would be journaled in suitable bearings (not shown) and connected to be driven in either direction and at varying speeds. This shaft is connected by bevel pinions 15 to drive a short cross shaft 16 journaled in a bracket 17 attached to the before mentioned cross rail 7. Upon the outer end of this shaft is mounted a small pinion 18 which connects with and drives an idle gear 19 rotatably mounted upon a stud 20 secured in said bracket 17. This idle gear is further connected with and drives a larger gear 21 having an extended sleeve 22 mounted upon a shaft 23 journaled in bearings 24 and 25 of the before mentioned bracket 17. The said gear 21 is further provided with two annular beveled friction faces 26 and 27 on its outer and inner sides respectively, to engage corresponding friction surfaces 28 and 29 on gears 30 and 31 respectively. The gear 30 is keyed to the before mentioned shaft 23, adjacent to the end bearing 25, and serves to drive said shaft. A collar 23^a is secured to the shaft 23 adjacent to the inner bearing 24 and together with the before mentioned gear 30, serves to prevent longitudinal displacement of said shaft. The gear 31 also contains an extended hub 32 which is fitted to turn upon the surface of the sleeve 22 of the gear 21. The peripheral surface of this hub 32 is provided with a thread to receive a nut 33 that is set up against the end of the bearing 34 of the bracket 17, to hold the gear and hub against longitudinal movement as will be obviously apparent from Fig. 3. Further adjustable nuts 35 are mounted upon a second thread of the reduced end of the hub 32 in a way to form an adjustable shoulder against which levers 35^a of the clutch device operate, as will be later explained. The before mentioned shaft 23 contains a threaded

portion 36 upon which are mounted adjustable nuts 37 to form a shoulder against which the levers 38 operate in somewhat the same manner as the before mentioned levers 33 act against the collars 35.

Upon the sleeve 22 is slidably mounted a collar 39 having an annular groove 40 for the engagement of pins 41 of the yoke 42. This yoke is connected to a rocker shaft 43 journaled in bearings of the bracket 17, and contains upon its lower end an operating handle 44 by means of which said yoke 42 and the collar 39 are shifted with respect to the before mentioned sleeve 22 for the purpose of shifting the intermediate gear 21 longitudinally.

To the underside of the cross rail is attached a spring 45 which is extended down in the path of the operating handle 44 and contains a shouldered portion 46 to receive and hold the said lever in either of its adjusted positions. In longitudinal pockets in the surface of the before mentioned sleeve 22 is pivoted the before mentioned pairs of L shaped levers 35 and 38, which have shouldered portions that bear against the collars 35 and 37 respectively. The collars 35 are connected through the sleeve 32 with the gear 31, while the collars 37 are connected through the shaft 23 with the gear 30. The inner or free ends of said levers bear upon the annular beveled end portions 47 of the collar 39, which collar is subject to a longitudinal movement by the operation of the handle, and impart radial movements to the free ends of the arms, for the purpose of engaging the frictions of the gears 21, with the respective frictions of the companion gears arranged upon either side. In this respect it will be noted that if the lever is shifted to the right, the collar 39 would be likewise moved upon the sleeve 22 in a way to force the free ends of the levers 38 outward, throwing their shoulders against the collar 37 in a way to slide said sleeve 22 and its gear over to engage the friction of the outer gear 30 and if said handle was shifted in the opposite direction, the friction of the inner gear 31, would be engaged in a way to drive that gear by the intermediate gear. The gears 30 and 31 are directly connected with the gears 47 and 48 respectively upon the outer ends of the shafts 42 and 43, thus completing the connection for operating the same. By this mechanism it will be seen

that the power can very readily and conveniently be shifted from one shaft to the other, and by reason of the friction drive and the adjustable collars before mentioned the device can be set to carry almost any load desired, and to insure a slip, so called, in case of accident.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. The combination with a pair of shafts for driving separate sets of mechanism of a gear upon each of said shafts, a bracket, a clutch shaft journaled in the bracket, a clutch faced gear mounted upon the clutch shaft and connected to operate the gear on one of the before mentioned mechanism shafts, a double faced clutch gear also mounted upon the shaft with means for driving the same and having an extended sleeve, a beveled faced clutch gear mounted upon said sleeve and connected with the gear on the second mechanism shaft, a collar mounted upon said sleeve, a pivoted handle and connections for shifting the intermediate clutch gear and its sleeve to engage and disengage either of the adjoining clutch members.

2. The combination with two shafts for alternately operating two separate sets of mechanism, of gears upon both the said shafts, a bracket, a clutch shaft journaled in the bracket, a clutch faced gear mounted upon said shaft and connected to drive one of the mechanism shafts, an intermediate double faced gear having an extended sleeve journaled upon said clutch shaft, means for driving the double faced clutch gear, an inner beveled faced gear mounted upon the sleeve of the intermediate gear, collars mounted upon both the hub of said inner gear and the before mentioned shaft, levers pivoted in the sleeve of the intermediate gear and adapted to operate against the collars before mentioned, and means to operate said levers against said collars in a way to shift the sleeve and intermediate clutch gear to engage either of the adjoining clutch gears.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 26th day of June, A. D., 1906.

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Witnesses:

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