No. 676,233. Patented June 11, 1901.

T. HUMPAGE & H. I. JACQUES.

TOOTHED GEARING.

(Application filed Dec. 30, 1897.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1

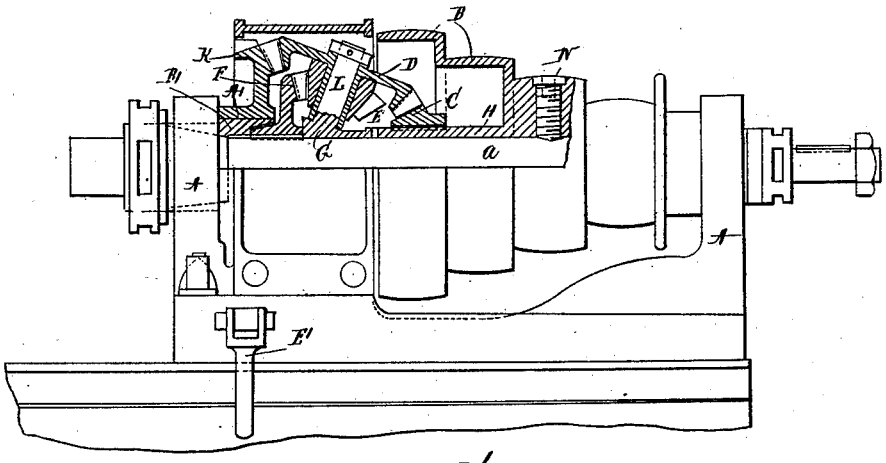

FIG. 2.

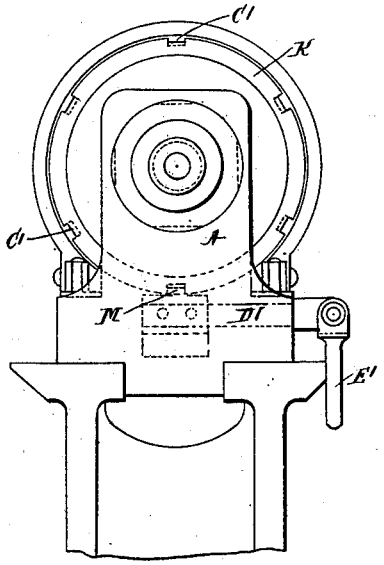

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Fig. 3.

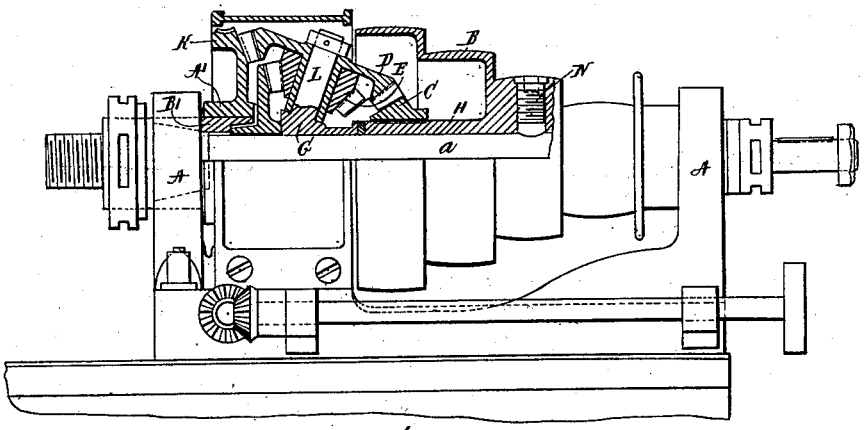
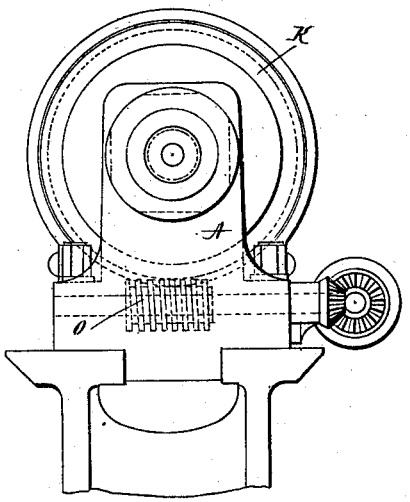


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS HUMPAGE AND HERBERT INNES JACQUES, OF BRISTOL, ENGLAND.

TOOTHED GEARING.

SPECIFICATION forming part of Letters Patent No. 676,233, dated June 11, 1901.

Application filed December 30, 1897. Serial No. 664,505. (No model.)

To all whom it may concern:

Be it known that we, THOMAS HUMPAGE and HERBERT INNES JACQUES, subjects of the Queen of Great Britain, residing at Bristol, in the county of Bristol, England, have invented certain new and useful Improvements in Toothed Gearings, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to toothed gearings for lathe head-stocks, drilling-machines, and similar mechanism; and the object thereof is to provide an improved gearing of this class which is simple in construction and operation and also strong and durable, while being comparatively inexpensive, and not liable to get out of order and frequently need repair.

The invention is the same as that for which Letters Patent were granted in Great Britain November 14, 1892, No. 20,542, and is an improvement on the form of construction shown and described in a prior English patent granted to Thomas Humpage, one of the applicants herein, on November 9, 1887, No. 15,289, and said invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a sectional side view of our improved gearing; Fig. 2, an end view thereof; Fig. 3, a view similar to Fig. 1, showing a modification; Fig. 4, an end view thereof.

In the drawings forming part of this specification the separate parts of our improvement are designated by the same letters of reference in each of the views, and in the practice of our invention we provide a frame A of any desired form or construction, in which is mounted a mandrel or shaft *a*, to which is keyed the wheel F. One end of the frame is provided with a casing or housing within which the gearing is located. The frame at that end is provided with a bushing B′, which projects into the housing a short distance. If desired, the inner end of the bushing may be slightly undercut for the reception of a portion of the hub of the wheel F. The cone-pulley B is free to revolve on this mandrel *a* and has fixed to its inside boss H the small pinion C. An armed cross-head G is also free to revolve on the mandrel *a* and carries the gear-wheels D and E, which are fixed together and are free to revolve as one on the arm L. A wheel K, provided with a boss A′, constitutes a fulcrum-wheel when held against rotation, and said wheel is free to revolve on the bushing B′, and its movement is controlled by the several means hereinafter described.

The pinion C gears with the wheel D, which latter also gears with K, and the wheel E gears with F. The outer circumference of the wheel K is provided with slots or notches C′, and the spindle D′, which is fitted in the head-stock casting, is provided with a lug or projection M of such a form that a half-turn of the handle E′ engages or disengages it with or from the notches C′.

In working with the gearing in action the lug M is engaged with one of the notches C′, which prevents the wheel K from rotating. The action of the gearing is then as follows: The wheel C revolving with the cone-pulley B causes the wheels D and E to revolve on L at the same time as the wheel D is in gear with K, which does not revolve, said wheel D receiving a motion, together with E, around the axis of the mandrel *a*. This compound motion of D and E causes the wheel E to drive the wheel F, and consequently the mandrel *a*, in a predetermined ratio of speed, according to the number of teeth in the several wheels. When the lathe is required to run without the gearing, the handle E′ is turned to disengage the lug M and leave the wheel K free to revolve and the set-screw N tightened so as to lock the cone-pulley to the mandrel. The cone-pulley and gearing then turn together as a whole without the gearing coming into action.

We also sometimes, as shown in Figs. 3 and 4, form the outer circumference of the wheel K into a worm-gear and fix a worm O in suitable bearings gearing with the same. When the worm is stationary, the wheel K is under the same conditions as when held by the handle E′, previously described; but if the worm is rotated in either direction by a train of gear-wheels or other suitable means a variable ratio of speed is imparted to the gearing, and we also obtain a similar result by forming the outer circumference of the wheel K into an ordinary spur-wheel and using a pinion in place of the worm previously described.

Having fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a gearing, the combination, with a frame, one end of which is provided with an inwardly-projecting bushing, of a gear-wheel mounted so as to be adapted to turn on said bushing, a shaft journaled in the frame, a gear-wheel rigidly secured thereto adjacent to said bushing, a cross-head and a cone-pulley loosely mounted on the shaft, the pulley being provided with means for locking it to the shaft, and with a pinion, two beveled gear-wheels on the cross-head in engagement with said gear-wheels and pinion, respectively, and means for controlling the movement of the gear-wheel on the bushing.

2. In a gearing, the combination with a frame, one end of which is provided with a housing and with an inwardly-projecting bushing, of a gear-wheel mounted so as to be adapted to turn on the bushing and within the housing, a shaft journaled in the frame, a gear-wheel rigidly secured to the shaft adjacent to the bushing, a cross-head and a pulley loosely mounted on the shaft, the larger end of the pulley lying adjacent to the housing and the smaller end being provided with a set-screw for securing it to the shaft, a pinion on the hub of the pulley, two beveled gear-wheels on the cross-head in engagement with said gear-wheels and pinion, respectively, and means for controlling the movement of the gear-wheel on the bushing.

3. In a gearing, the combination with a frame, of a shaft journaled therein, a bushing, a gear-wheel provided with recesses and mounted so as to turn on the bushing, a cross-head and a pulley mounted to turn on the shaft, a pinion carried by the pulley, a beveled gear-wheel on the cross-head in engagement with the recessed gear-wheel and with the pulley-pinion, a second beveled gear-wheel on the cross-head secured to the first, a gear-wheel secured to the shaft and engaging with the latter, and a spindle in the frame, the inner end of which is provided with a lug for entering one of the recesses in the gear-wheel, and the outer end provided with means for rotating it and locking it in its desired position.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of the subscribing witnesses, this 30th day of November, 1897.

THOMAS HUMPAGE.
HERBERT INNES JACQUES.

Witnesses:
MAYO THOMAS EDWARD,
GILBERT JOHN WHITE.