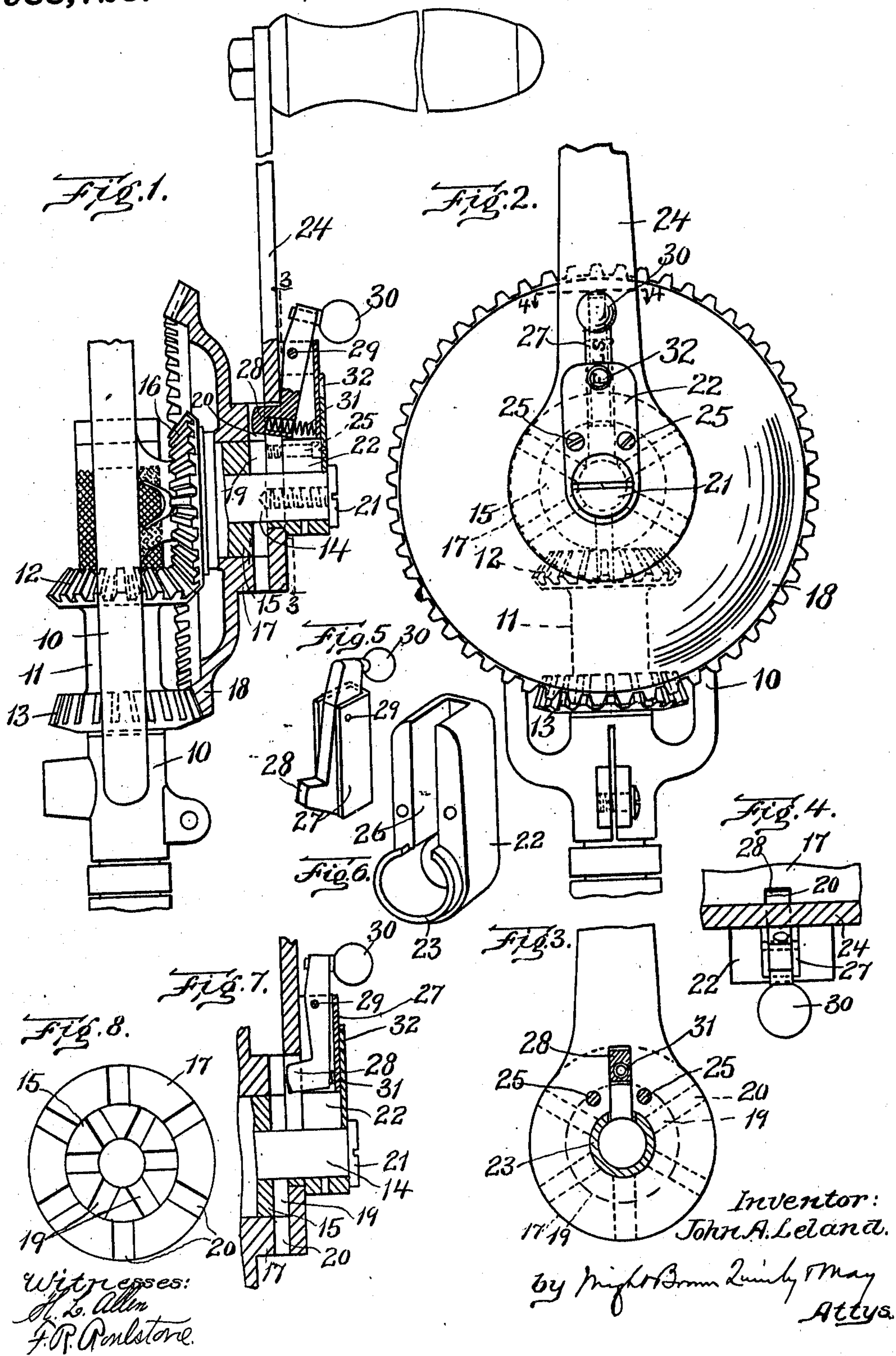


J. A. LELAND.
CHANGE SPEED GEARING.
APPLICATION FILED JULY 13, 1910.

Patented Apr. 4, 1911.

988,723.



UNITED STATES PATENT OFFICE.

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CHANGE-SPEED GEARING.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN A. LELAND, of Montague, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Change-Speed Gearing, of which the following is a specification.

This invention relates to mechanism for changing the speed with which a shaft may be rotated by a prime mover, such as a crank, and has particular reference to that type of such mechanism which employs a sleeve or shaft to which a plurality of bevel gears are connected, said gears being in mesh with an equal number of driving gears, either one of which may be connected to the prime mover, while the other, or others, may run idle.

The object of my present invention is to provide an improved mechanism of the kind explained, in which a single locking device may be quickly shifted so as to connect the prime mover with either one of the driving gears, or to an intermediate position to effect a locking of the driven sleeve or shaft against rotation.

I have illustrated the invention in an embodiment which is especially adapted for breast drills, although I do not limit myself to its use in such tools or devices, but since the driven shaft of a breast drill usually carries a chuck which is rotatively manipulated to grasp or release a drill, it is especially desirable that such shaft shall be fixed while the chuck is being so manipulated.

To these ends the invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the accompanying drawings,—Figure 1 is a side elevation, partly in section, of sufficient parts of a breast drill embodiment to illustrate my invention. Fig. 2 is a view from the right of Fig. 1. Fig. 3 represents a section on line 3—3 of Fig. 1. Fig. 4 represents a section on line 4—4 of Fig. 2. Fig. 5 is a perspective detail of the latch and its housing. Fig. 6 is a perspective detail of the crank block, showing the slide-way for the latch housing. Fig. 7 is a view similar to a portion of Fig. 1, but showing the latch disengaged as when a change of speed is to

be effected. Fig. 8 is a face view of the radially notched gear hubs.

Similar reference characters indicate the same or similar parts in all of the views.

A portion of the frame of the tool is indicated at 10, in bearings of which is mounted a shaft or sleeve 11 having two bevel gears 12 and 13 fixed to or integral with it. Said frame also carries a stud 14, on which is mounted the hub 15 of a bevel gear 16, the latter meshing with gear 12. Mounted on the hub 15 is the hub 17 of a larger bevel gear 18 which is in mesh with gear 13. The end faces of the hubs 15 and 17 are flush and are formed with radial notches 19 and 20, respectively.

Rotatably mounted on the end of the stud 14, and held thereon by a screw 21, is an elongated block 22, having a circular flange 23, the inner edge of which bears against hub 15. On the flange 23 is mounted a crank 24, to which the block 22 is secured, as by screws 25. The block 22 is recessed as at 26, the flange 23 being cut away in continuation of said recess. A latch housing 27 is mounted to slide in the recess 26 and has a latch 28 pivotally mounted in it, as at 29, and has a small handle or knob 30. The latch end is normally projected, as indicated in Figs. 1 and 5, by means of a spring of any suitable form and location. In the drawings, I have illustrated a coil spring 31, mounted in one end in a recess in the back of the latch and bearing at its other end against the inner wall of the housing. The crank 24 is formed with an elongated opening, or slot, of sufficient length to permit the latch tip or lug to slide as the housing 27 is shifted along the guide-way 26, the end of the latch which carries the knob always extending beyond the end of said block. If the radial notches 19, 20, should happen to be in alinement, the housing and latch would be shifted radially, without oscillating the latch on its pivot. The quickest way, however, to effect a change of speed is to press the knob 30 inward, which withdraws the latch tip 28 from the notch with which it was engaged, and then slide the housing and latch toward or from the axis of the crank, as the requirement may be, and then release the knob. If then the latch tip bears on a

hub face between two notches, as soon as the crank is rotated to operate the tool, the latch tip is snapped into the first notch encountered by it, due to the spring 31. If that is one of the notches 20, the speed imparted to the shaft or sleeve 11 will be rapid, if one of the notches 19, the speed will be slow, and if in an intermediate position, the gearing will be locked, because the latch tip will engage portions of both inner and outer notches, so that neither hub can rotate idly.

As best shown in Fig. 7, the edge of the latch tip is curved, or slightly cam-shaped, so that when released, after being slid along, and then the crank operated, said tip will certainly engage one notch sufficiently to rotate it until the tip reaches and drops into a notch of the other hub.

To indicate the position which the latch should occupy to attain a given result, the outer face of the housing 27 is provided with such symbols as "F", "L", "S", either one of which can be seen through a hole 32 in block 22, according to whether the speed is fast, the gearing locked, or the speed slow.

I claim—

1. In change speed gearing, a plurality of gears having concentrically mounted hubs provided with recesses in their ends, and a rotary operating member having a radially adjustable locking device movable also in a direction transverse to its direction of adjustment to engage either of said recesses, a spring being mounted to hold the locking device when adjusted.

2. In change speed gearing, a plurality of gears having concentrically mounted hubs provided with radial notches in their end faces, a rotary operating member adjacent said notched ends, and a pivotally and slidably mounted locking device carried

by said operating member and adapted to engage either of said notches, or to simultaneously engage notches of two hubs.

3. In change speed gearing, a plurality of gears having concentrically mounted hubs provided with radial notches in their end faces, a crank having a slide adjustable toward and from its axis, and a locking device movably connected to said slide and adapted to engage and disengage a notch in a direction transverse to its direction of sliding adjustment.

4. In a change speed gearing, a plurality of gears having concentrically mounted hubs provided with radial notches in their end faces, a crank having a slide adjustable toward and from its axis, and a spring latch pivotally connected to the slide.

5. In change speed gearing, a plurality of gears having concentrically mounted hubs provided with radial notches in their end faces, a crank having a recessed block, a housing slidably mounted in the recess of the block, and a spring latch pivotally mounted in said housing.

6. In change speed gearing, a plurality of gears having concentrically mounted hubs provided with radial notches in their end faces, a crank having a recessed block, a housing slidably mounted in the recess of the block, and a spring latch pivotally mounted in said housing, said block having an opening, and the housing having indicating symbols singly visible through said opening.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN A. LELAND.

Witnesses:

LIZZIE B. STRACHAN,
KATHERINE E. NICHOLS.