

Sept. 15, 1925.

1,554,060

J. T. WRIGHT

SPINDLE ADJUSTING MECHANISM FOR DRILLING MACHINES

Filed Feb. 21, 1924

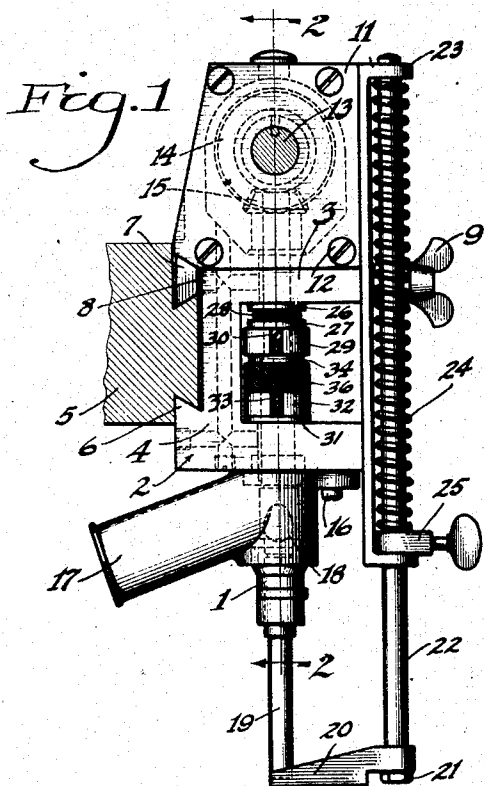
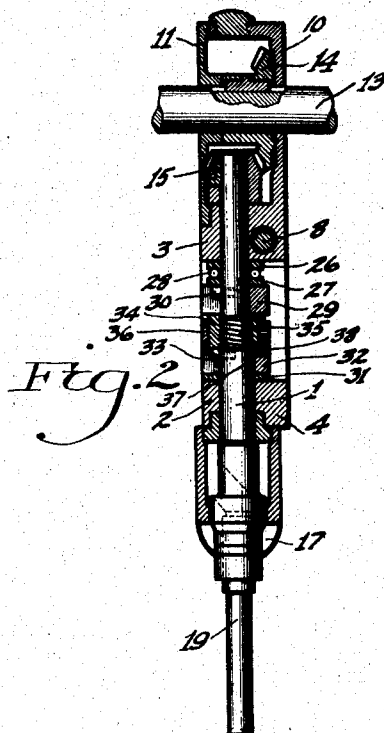
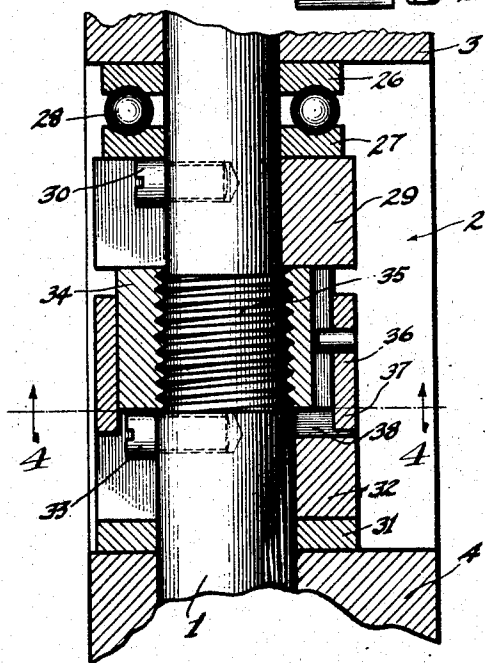
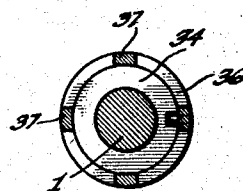


Fig. 3

Fig. 4

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UNITED STATES PATENT OFFICE.

JOSEPH T. WRIGHT, OF CINCINNATI, OHIO, ASSIGNOR TO THE J. T. WRIGHT COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

SPINDLE-ADJUSTING MECHANISM FOR DRILLING MACHINES.

Application filed February 21, 1924. Serial No. 694,207.

To all whom it may concern:

Be it known that I, JOSEPH T. WRIGHT, a citizen of the United States, and residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Spindle-Adjusting Mechanism for Drilling Machines, of which the following specification is a full disclosure.

My invention relates to drilling machines and is particularly directed to a mechanism for adjustably setting the drill spindle, and specifically to a type of drilling machine as disclosed in prior application filed by me August 24, 1922, Serial No. 584,142 patented May 6, 1924, #1,493,457.

The object of my invention is the provision of an improved means for micrometrically translating for adjustably positioning the drill spindle and locking the same in its adjusted position, which setting cannot be disturbed by any vertical thrusts upon the rotative drill spindle.

Other objects and certain advantages will be disclosed in a description of the drawings forming a part of this application, and in said drawings:

Figure 1 is a side elevation.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a detail view of the spindle adjusting and locking mechanism.

Figure 4 is a section taken on line 4—4 of Figure 3.

I contemplate the use of my invention upon a drilling unit of such size and dimensions that a plurality of these drilling units may be mounted upon a rail and driven by a power shaft parallel to said rail. The work is fed to the drilling units by a movable table (not shown). The drilling unit comprises a spindle 1 journaled in a frame 2. This frame provides two spaced bearings 3 and 4. The frame is attached to the rail 5 by a dove-tail connection. One dove-tail element 6 on the frame is fixed. The second dove-tail element 7 as a gib is secured in position by a rod 8 loosely traversing said frame and having a winged nut 9 upon its opposite end. Thus the unit may be moved upon the rail and clamped thereto at any desired point by tightening the winged nut 9. The frame 2 is provided with a casing portion 10 above the bearing 3 provided with a removable cover plate 11 which is secured by a plurality of bolts 12.

Passing through this casing portion is a power shaft 13. Splined to said power shaft is a bevel gear 14. In mesh with the bevel gear 14 is another bevel gear 15 which is splined to the spindle 1.

Attached to the frame just below the bearing 4, by a bolt 16 is a cutting discharge spout 17. The spindle 1 is provided with a passage 18 connecting the interior of said discharge spout 17 with the interior of the hollow drill 19 which is mounted in the end of the spindle 1.

A yoked pressure foot 20 spans said drill and is attached by a bolt 21 to a pressure foot rod 22. The pressure foot rod is mounted in a bracket 23 which is secured to the frame 2 on the side opposed to the rail. Coiled about that portion of the pressure foot rod within the bracket is a compression spring 24. The tension of this spring can be regulated by means of collar 25 adjustably secured to the pressure foot rod.

Between the bearings 3 and 4 is located my means of micrometrically adjusting a spindle and locking the same in adjusted position. The adjustment is accomplished by providing the spindle with a threaded portion having a nut engaged thereon held against axial motion by being confined between the bearings 3 and 4. Rotating the nut therefore translates the spindle. The lock is accomplished by a lock collar concentric about and splined to the nut, one end of the collar having a toothed engagement with a split collar rotatively secured to the spindle. When the lock collar is moved so that the teeth are clear of engagement with the split collar the adjustment nut can be rotated and the spindle translated. By moving the lock collar back into toothed engagement with the split collar the lock is accomplished. The collar is also adapted to move by gravity into coupling with the split collar when released by the operator.

Adjacent bearing 3 is an end thrust bearing comprising washers 26, 27, between which are a plurality of balls 28. Adjacent this end thrust bearing is a split collar 29 rotatably secured to the spindle 1 by a screw 30. Thus the split collar 29 is splined to the spindle to rotate therewith but is free to be moved upon the spindle axially. Adjacent the bearing 4 is a washer 31 and ad-

5 jacent said washer 31 is another split collar 32 splined to the spindle 1 by means of a screw 33. Between said split collars is an adjustment nut 34 threaded upon a screw-thread portion 35 of the spindle.

10 This adjustment nut 34 is held secure from axial motion by means of the split collar 29 and the end thrust bearing disposed between it and bearing 3 and by the split collar 32 and washer 31 disposed between it and bearing 4. In order to keep said adjustment nut from being rotated independently of the spindle except for purposes of adjustment, I provide a lock clutch non-frictional in its nature. Splined to said adjustment nut is a knurled lock collar 36, provided at one end with teeth 37 which fit into notches 38 in one of the split collars, in this case 32. By moving said knurled lock collar axially until the teeth 37 are clear of the notches 38 and rotating said adjustment collar the spindle can be micrometrically translated and adjusted to compensate for tool wear. I provide four teeth and notches so that every 90° the adjustment collar can be seated and a lock between the adjustment nut and the split collar which rotates with the spindle is thereby accomplished.

Having described my invention, I claim:
30 1. A drill head, a spindle having a threaded portion rotatively and translatively journaled in said head, an adjustment nut held securely against axial motion engaging said threaded portion of the spindle for translating the same, and a lock collar about said adjustment nut normally securing said nut rotatively with the spindle but disengageable for spindle adjustment.

40 2. A drill head, a spindle having a threaded portion rotatively and translatively journaled in said head, an adjustment nut held securely against axial motion engaging said threaded portion of the spindle for translating the same, and a lock collar splined to the adjustment nut normally having toothed engagement with an element rotatively connected with the spindle but disengageable therefrom for spindle adjustment.

3. A drill head providing spaced bearings, a spindle rotatively and translatively mounted in said bearings, said spindle having a threaded portion between said bearings, an adjustment nut about said threaded portion, split collars on either side of said adjustment nut, an end thrust bearing between one of said split collars and one bearing, said split collars and end thrust bearing holding the adjustment nut from axial motion, a lock collar splined to said adjustment nut providing non-frictional engagement with one of said split collars.

4. A drill head providing spaced bearings, a spindle rotatively and translatively journaled in said bearings, said spindle having a threaded portion between said bearings, an adjustment nut about said threaded portion secured against axial motion between said bearings, a collar splined to said spindle adjacent said adjustment nut, and a lock collar splined to said adjustment nut engageable with said collar splined to the spindle.

5. A drill head providing spaced bearings, a spindle rotatively and translatively journaled in said bearings, said spindle having a threaded portion between said bearings, an adjustment nut about said threaded portion secured against axial motion between said bearings, a collar splined to said spindle adjacent said adjustment nut, a lock collar splined to said adjustment nut, and teeth providing engagement between said lock collar and said collar rotating with the spindle.

6. A drill head, a spindle relatively rotatably and translatably disposed in said head having a portion thereof threaded, an adjustment nut engaged upon the threaded portion of said spindle for translating said spindle, a collar adjacent one side of said nut and splined to said spindle, and a movable collar splined to said nut, having a toothed connection with said first collar connecting said parts.

In witness whereof, I hereunto subscribe my name.

JOSEPH T. WRIGHT.