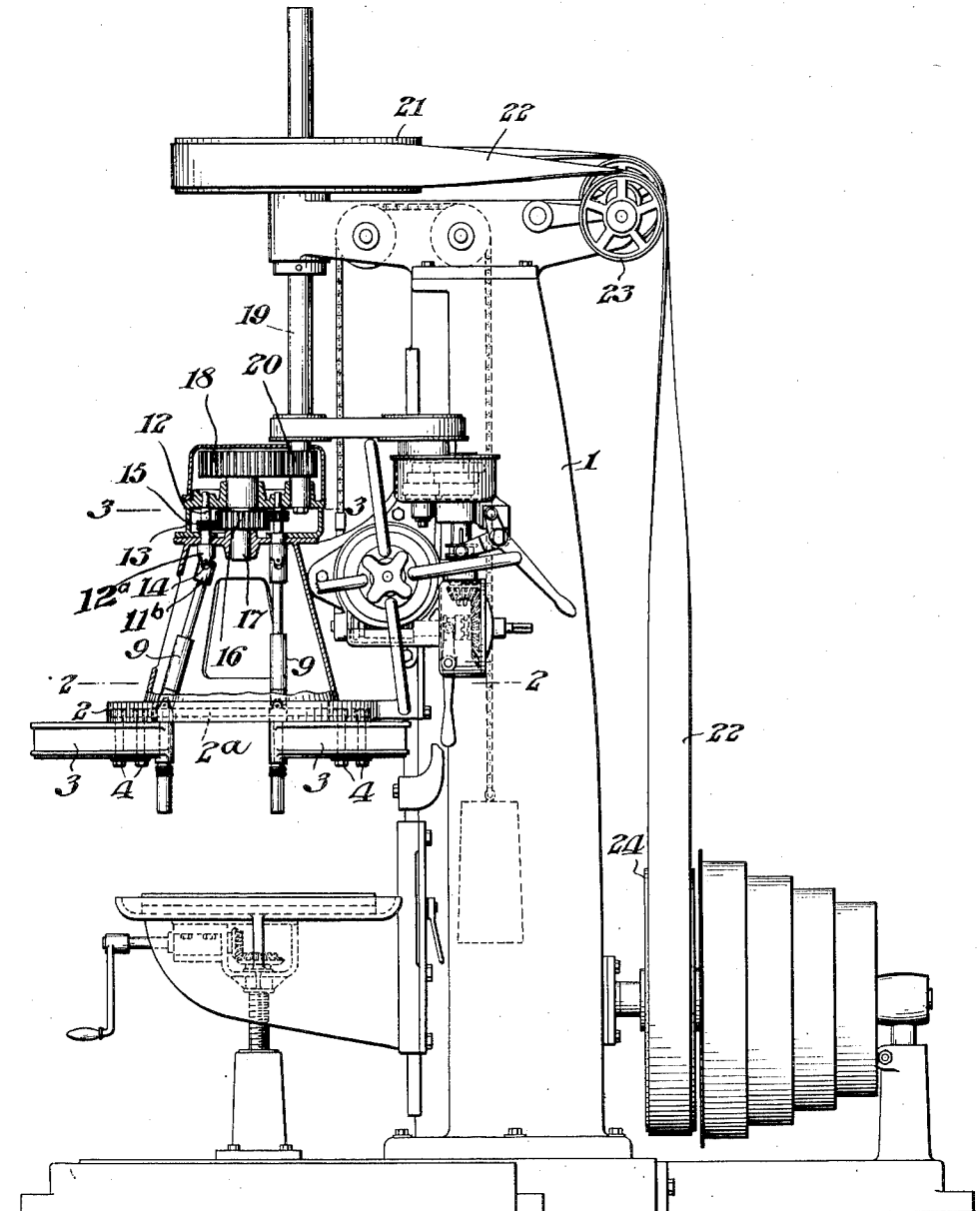


R. F. SCOTT.
 MULTIPLE SPINDLE DRILL.
 APPLICATION FILED AUG. 13, 1913.

1,097,678.

Patented May 26, 1914.

3 SHEETS—SHEET 1.



WITNESSES:

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Geo. H. Quinley

Fig. 1.

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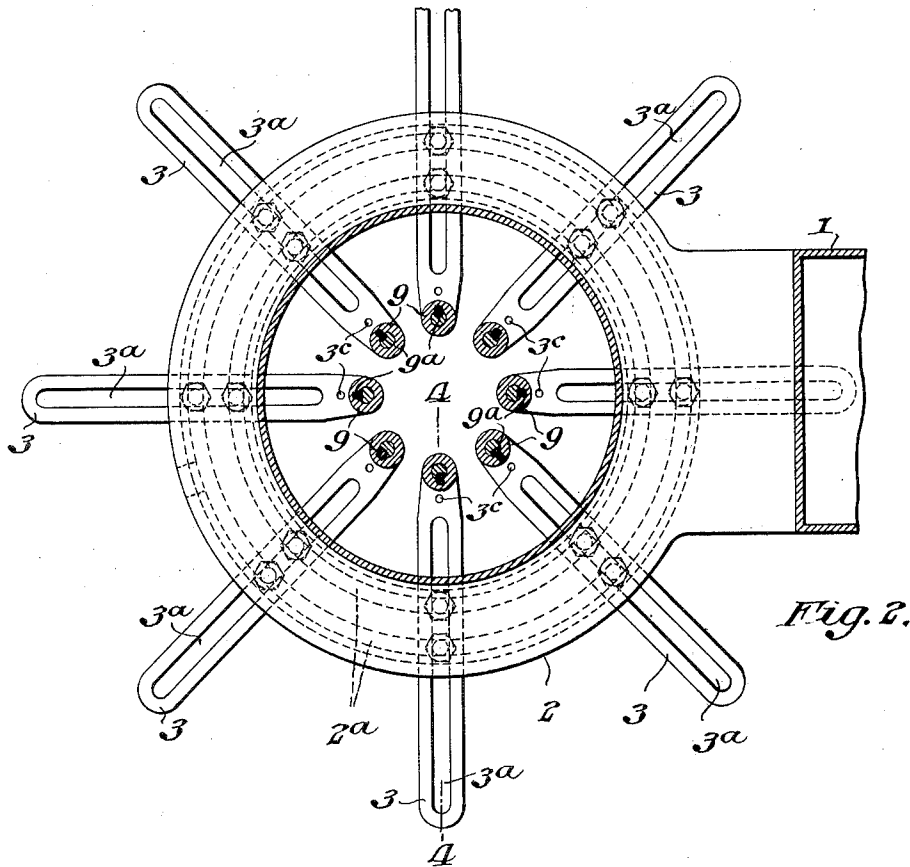


Fig. 2.

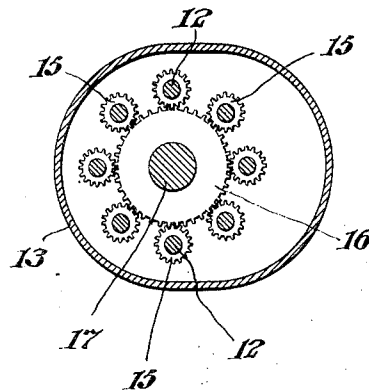


Fig. 3.

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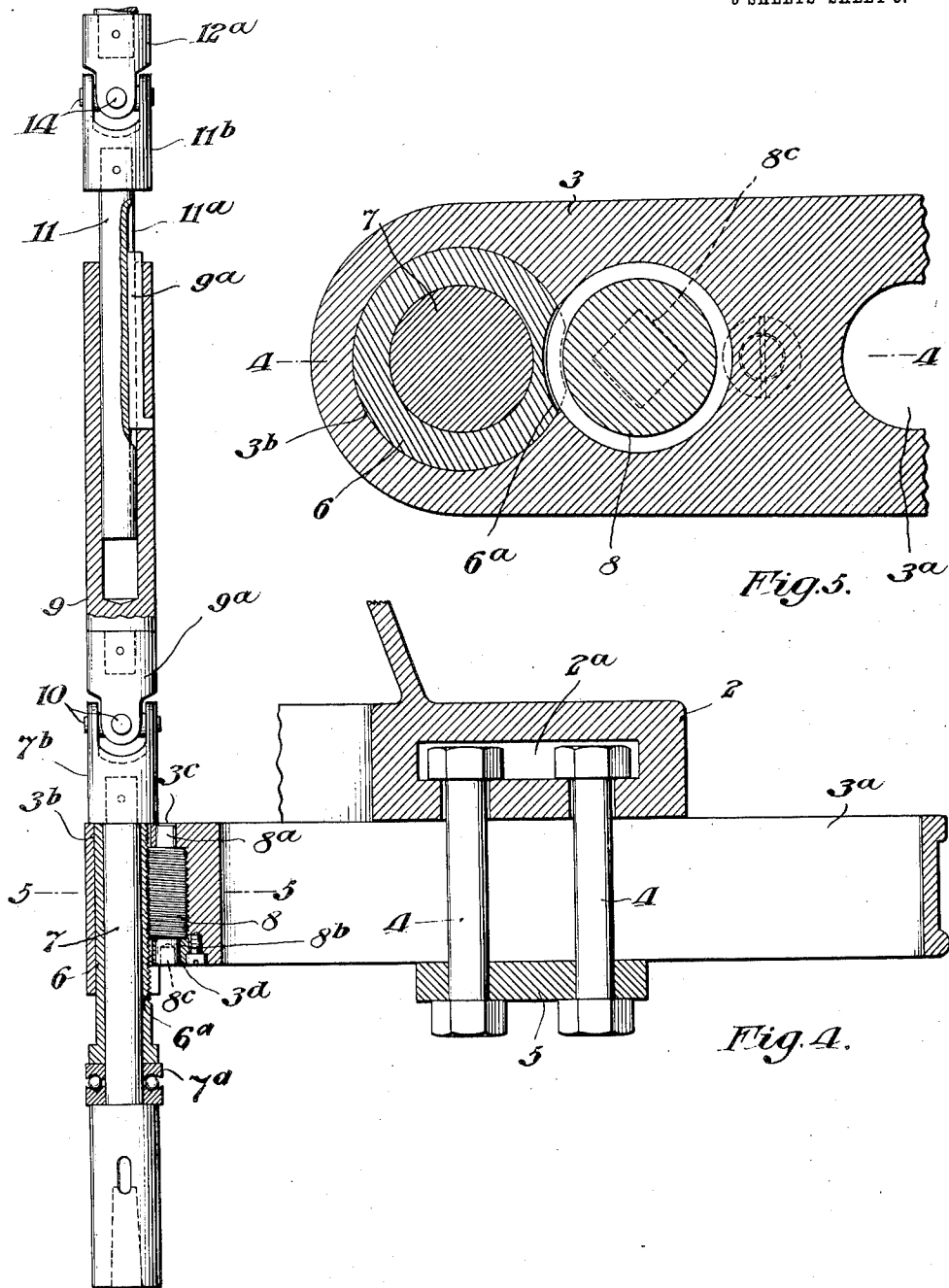
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3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

ROBERT F. SCOTT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO EDWIN HARRINGTON, SON & COMPANY, INC., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MULTIPLE-SPINDLE DRILL.

1,097,678.

Specification of Letters Patent.

Patented May 26, 1914.

Application filed August 13, 1913. Serial No. 784,469.

To all whom it may concern:

Be it known that I, ROBERT F. SCOTT, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain Improvements in Multiple-Spindle Drills, of which the following is a specification.

My improvements are comprised in a machine having a plurality of drill spindles revoluble, by flexible shafts of variable length, in radius bars which are longitudinally adjustable relatively to a center and fixed to a supporting ring carried by the machine frame. The spindles are vertically adjustable by means of sleeves in which they are revoluble and which are moved vertically, in the respective radius bars, by threaded cylindrical segments thereon engaged by screws journaled in the respective radius bars.

In the accompanying drawings, Figure 1 is a part sectional elevation of a machine embodying my improvements; Fig. 2 is a broken sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a sectional view taken on the line 4—4 of Figs. 2 and 5; and Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

The machine, as illustrated in the drawings, comprises the frame or housing 1 having fixed thereto the ring 2 for supporting the radius bars 3. Bolts 4 are engaged in the ring channels 2^a, pass through the bars' slots 3^a and engage the clamping plates 5, whereby the bars are fixed to the ring.

Each radius bar 3 has in the inner end thereof, within the ring 2, a vertical bearing 3^b in which is a longitudinally movable sleeve 6 on a drill spindle 7 which is revoluble therein, the spindle being movable vertically by the sleeve through the latter's engagement with the ring 7^a and knuckle 7^b. Each radius bar contains a vertical screw or worm shaft 8 having the journals 8^a and 8^b revoluble in the bearings 3^c and 3^d, the screw engaging a complementary nut section or threaded cylindrical segment 6^a on the sleeve 6 and having the socket 8^c for the engagement of a wrench.

The spindles 7 are revolved in the sleeves

6 by the sleeves 9 having the knuckles 9^a joined to the knuckles 7^b by the connected transversely extending journals 10, forming a gimbal joint. Each sleeve 9 is telescoped on a rod 11 containing a longitudinal groove 11^a in which is engaged a feather 9^a fixed within the sleeve 9, the parts 9 and 11 forming a shaft of variable length. Vertical arbors 12, journaled in a housing 13 which is supported by the ring 2, have thereon knuckles 12^a joined to knuckles 11^b on the shafts 11 by the connected transversely extending journals 14. Pinions 15, fixed on the arbors 12, are driven by a spur wheel 16 fixed on an arbor 17 which is journaled in the housing 13 and has a spur wheel 18 fixed thereon. An arbor 19, journaled in the housings 1 and 13, has fixed thereon a pinion 20 which drives the spur wheel 18, the arbor being driven by its pulley 21 and a belt 22 thereon which passes over the pulleys 23 to the driving pulley 24.

The adjustment of the radius bars 3, the revolution of the spindles 7 in the various positions to which they may be adjusted, and the adjustment of the elevation of the various spindles, are rendered practicable by the adjustability of the length of the respective shafts comprising the parts 9 and 11 and the universal joints by which these shafts are connected with the spindles 7 and the arbors 12, while the revolution of the screws 8 moves the sleeves 6 vertically through the bearings 3^b to adjust the elevation of the spindles with the drills therein, the worm and sleeve holding such spindles in the desired positions.

Having described my invention, I claim: 90

1. The combination of an adjustable radius bar, a sleeve movable longitudinally in said bar, said sleeve having an exterior threaded segment, a screw journaled in said bar, said screw engaging said segment, and a drill spindle journaled in said sleeve, said spindle being connected with said sleeve so as to be movable longitudinally thereby.

2. The combination of an adjustable member having a bearing, a sleeve with a threaded cylindrical segment movable longitudinally in said bearing, a worm journaled in said member in engagement with said segment, a drill spindle journaled in and mov-

able longitudinally by said sleeve, an arbor,
a sectional shaft of variable length, a uni-
versal joint connecting a section of said
shaft with said spindle, and a universal
5 joint connecting a second section of said
shaft with said arbor.

In testimony whereof I have hereunto set

my hand this fifth day of August, 1913, in
the presence of the subscribing witnesses.

ROBERT F. SCOTT.

Witnesses:

JOS. G. DENNY, Jr.,

GEO. A. CUNNEY.