No. 842,977 PATENTED FEB. 5, 1907

C. RIDDERHOF.

DRILLING MACHINE.

APPLICATION FILED APR. 13, 1906.

2 SHEETS—SHEET 1.

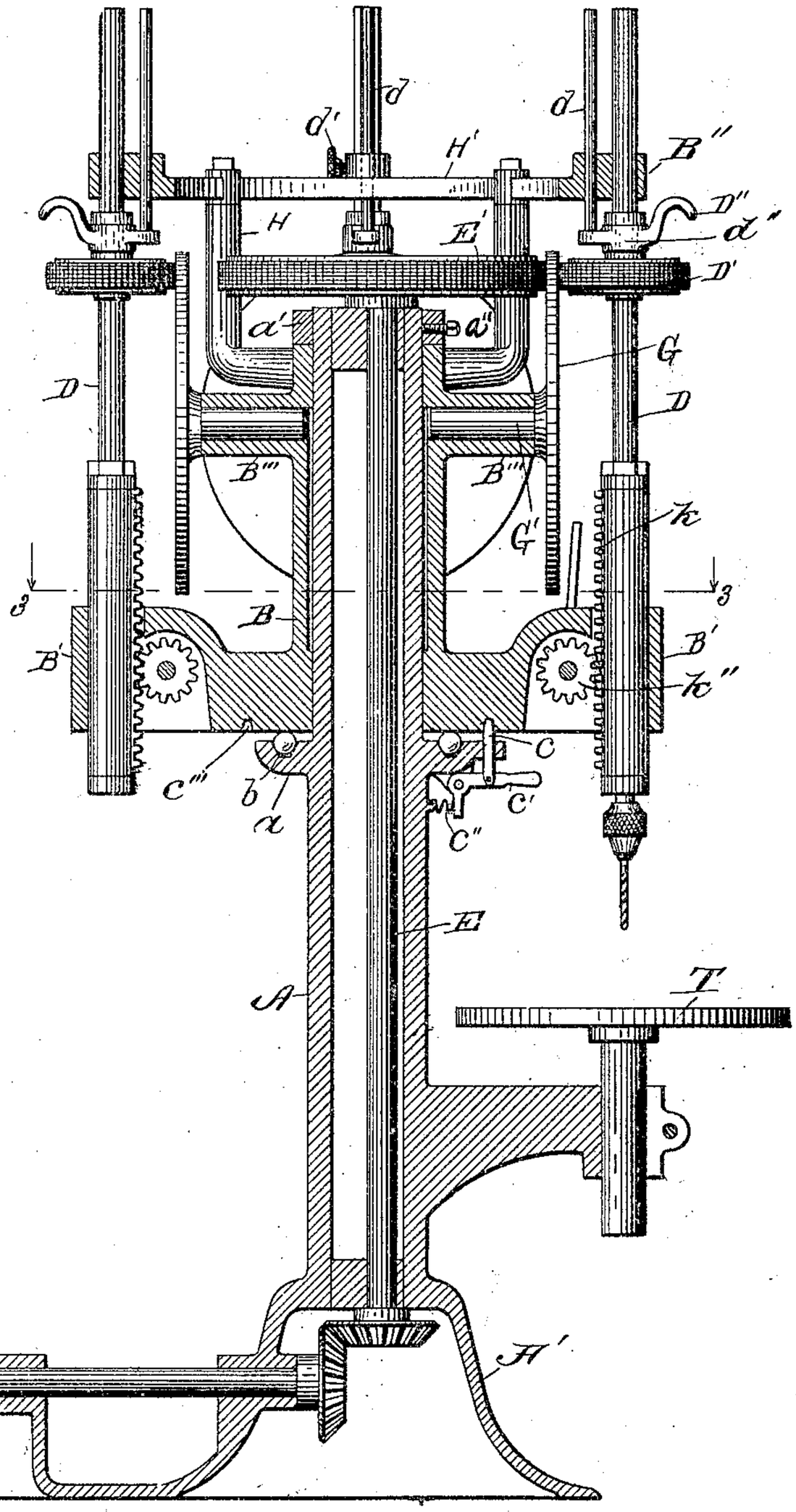

Fig. 1

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2 SHEETS—SHEET 2

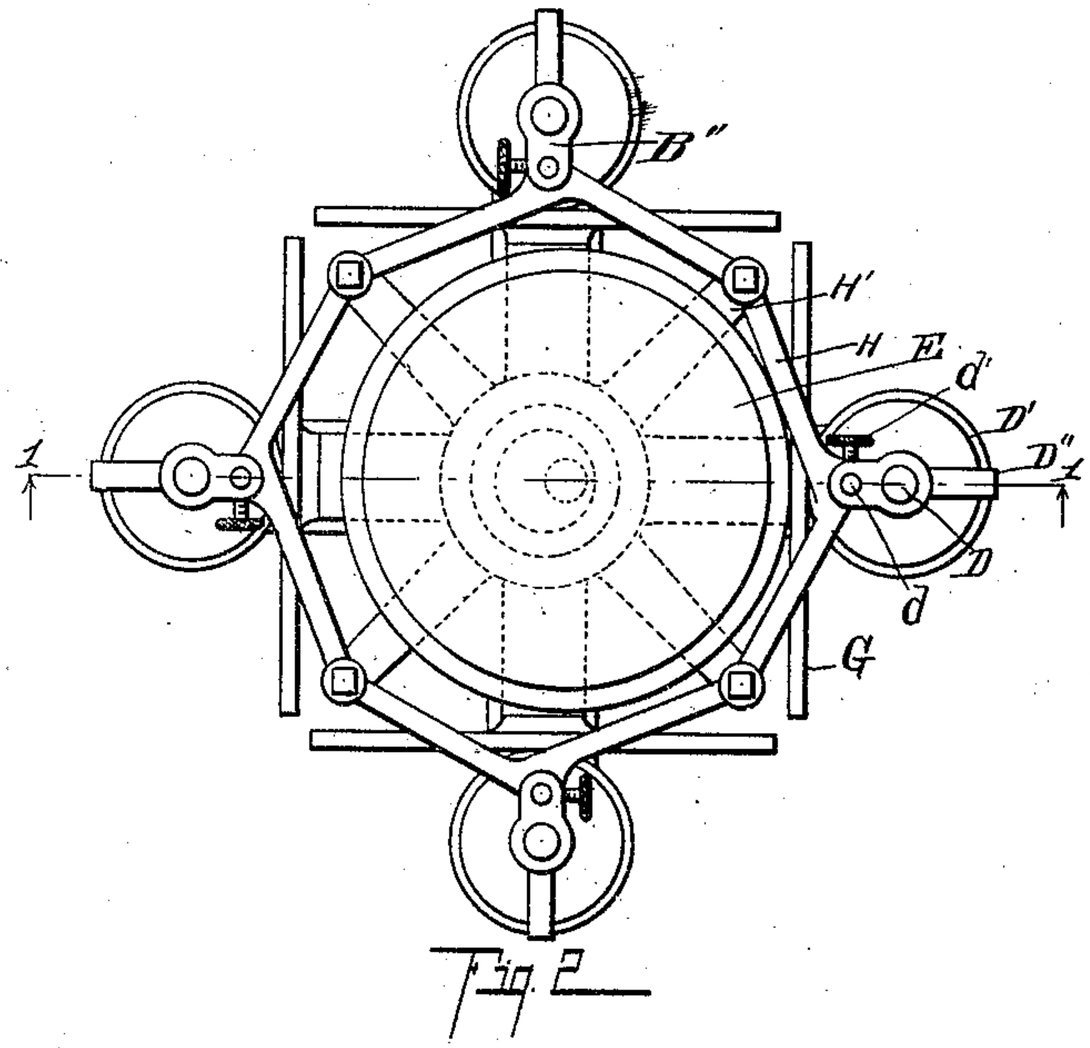

Fig. 2

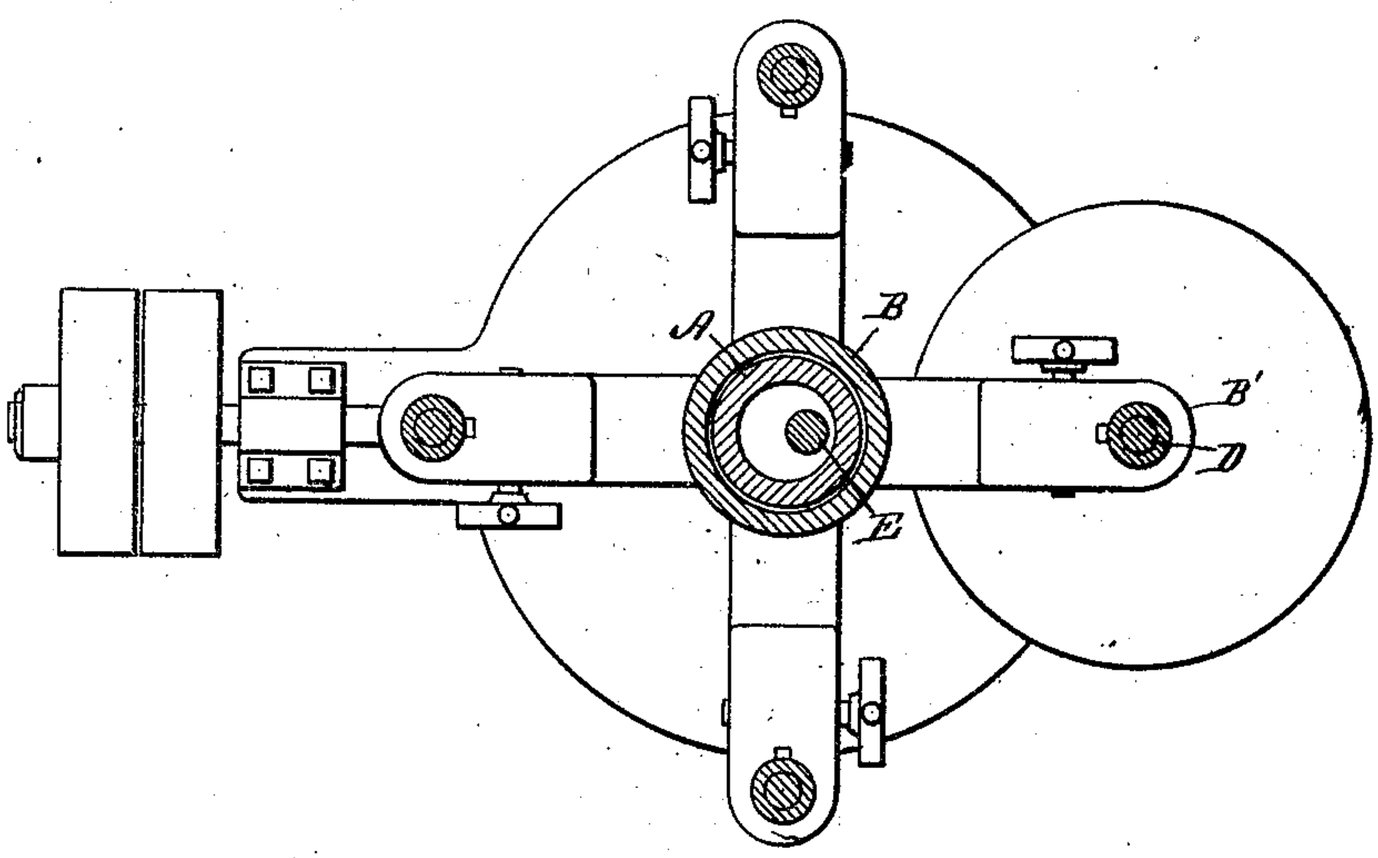

Fig. 3

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UNITED STATES PATENT OFFICE.

CORNEIL RIDDERHOF, OF GRAND RAPIDS, MICHIGAN.

DRILLING-MACHINE.

No. 842,977. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed April 13, 1906. Serial No. 311,603.

To all whom it may concern:

Be it known that I, CORNEIL RIDDERHOF, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification.

This invention relates to improvements in drilling-machines.

The objects of this invention are, first to provide an improved drilling-machine having a plurality of spindles, any one of which may readily be brought into position for use; second, to provide an improved drilling-machine having a plurality of spindles in which only the spindle in working position is driven; third, to provide an improved drilling-machine having a plurality of spindles in which the speed of the spindles can be independently adjusted; fourth, to provide an improved drilling machine which is very convenient to use and one which is simple and durable in structure.

Further objects and objects relating to structural details will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of a structure embodying the features of my invention, taken on a line corresponding to line 1 1 of Fig. 2, certain parts, as wheels and shafts, being shown in full lines. Fig. 2 is a plan of the structure appearing in Fig. 1. Fig. 3 is a horizontal section taken on a line corresponding to line 3 3 of Fig. 1.

In the drawings the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the column or standard A is mounted upon a suitable frame or base A'. The standard A is preferably hollow, and the driving-shaft E is arranged therethrough. A turret or head B is revolubly mounted on the upper end of the standard A, the standard being provided with a flange-like bearing *a*, adapted to receive the bearing-balls *b* for the turret. The turret is held upon its bearings on the standard by the collar *a'*, the collar being preferably retained by a set-screw, as *a''*. (See Fig. 1.) This forms a structure which is very convenient to manufacture and one which can be readily assembled, so that if desired it may be shipped in the knockdown or disassembled condition.

The turret is provided with outwardly-projecting arms B' B'', by which the drill-spindles D are carried. The arms B'' project outward from the ring-like frame H', which is carried by the upwardly-projecting arms H. As the turret is revolved the drill-spindles are brought successively over the work-table T, which may be in the usual or any desired form. The drill spindles or holders are provided with racks *k*, with which the adjusting-pinions *k''* are arranged to mesh. By this means the spindles are fed to or from the work.

On each of the drill-spindles D is arranged a wheel D'. The wheels D' are splined to the spindles and are adjustably secured in position by means of the rods *d*, which are connected thereto and are arranged through suitable holes provided therefor in the arms B''. The rods *d* are adjustably secured to the arms B'' by means of the set-screws *d'*. The rods *d* are connected to the wheels D' by means of the collars *d''*, which are arranged on the hubs thereof. For convenience in adjusting the wheels D' handles D'' are provided. These handles project from the collars *d''*.

Arranged in contact with the wheels D' are idler-disks G. These disks are carried by the journals G', which are arranged in the horizontal projecting bearings B''' on the turret. On the upper end of the driving-shaft E is a friction driving-wheel E'. The shaft E is arranged eccentrically of the turret, so that as the turret is revolved the idler-disks G are brought successively into engagement therewith. The parts are so arranged that this takes place when one of the drill-spindles is over the center of the work-table. By this arrangement the drill-spindles may be brought successively into position, in which position they are properly connected to the driving-shaft.

When it is desired to vary the speed of any of the drill-spindles, it may be accomplished by adjusting the spindle-wheels D′ to and from the center of the idler-disks G. The means by which this is accomplished have been described.

The shaft E may be driven by any suitable connection. In the structure illustrated I have shown the same connected to the horizontal shaft F, on which are pulleys F′. By this arrangement of the parts the machine may be equipped with a number of drills of varying sizes, and they may be brought successively into position for use by the operator without his changing his position or adjusting the work.

For retaining the turret-head in its adjustable position I preferably provide a latch-pin *c*, adapted to engage suitable holes *c*‴. The pin *c* is carried by the latch-lever *c*′, which is held in its engaging position by the coiled spring *c*″. By arranging the driving-wheel E′ eccentrically of the turret the spindles are brought into driving connection therewith as the turret-head is revolved, so that the drill-spindles are driven only when they are in operative position.

This of course reduces the wear on the parts and the vibration of the machine, the power required for operation, &c.

While I have illustrated and described my improved drilling-machine in detail in the form preferred by me on account of structural economy and convenience in use, I am aware that it is capable of very great variation in structural details without departing from my invention.

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

1. In a drilling-machine, the combination of a revolvable turret; a horizontally-arranged friction driving-wheel arranged eccentrically of said turret; a plurality of vertically-arranged idler-disks carried by said turret arranged to successively engage said driving-wheel as said turret is revolved; a plurality of vertically-arranged spindles carried by said turret; and horizontally-arranged friction-wheels adjustably arranged on said spindles arranged in engagement with said idler-disks, for the purpose specified.

2. In a drilling-machine, the combination of a revolvable turret; a driving-wheel arranged eccentrically of said turret; a plurality of idler-disks carried by said turret arranged to successively engage said driving-wheel as said turret is revolved; a plurality of spindles carried by said turret; wheels adjustably arranged on said spindles arranged in engagement with said idler-disks, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

CORNELL RIDDERHOF. [L. S.]

Witnesses:
FREDERICK MELSON,
JAMES K. DIAMOND.