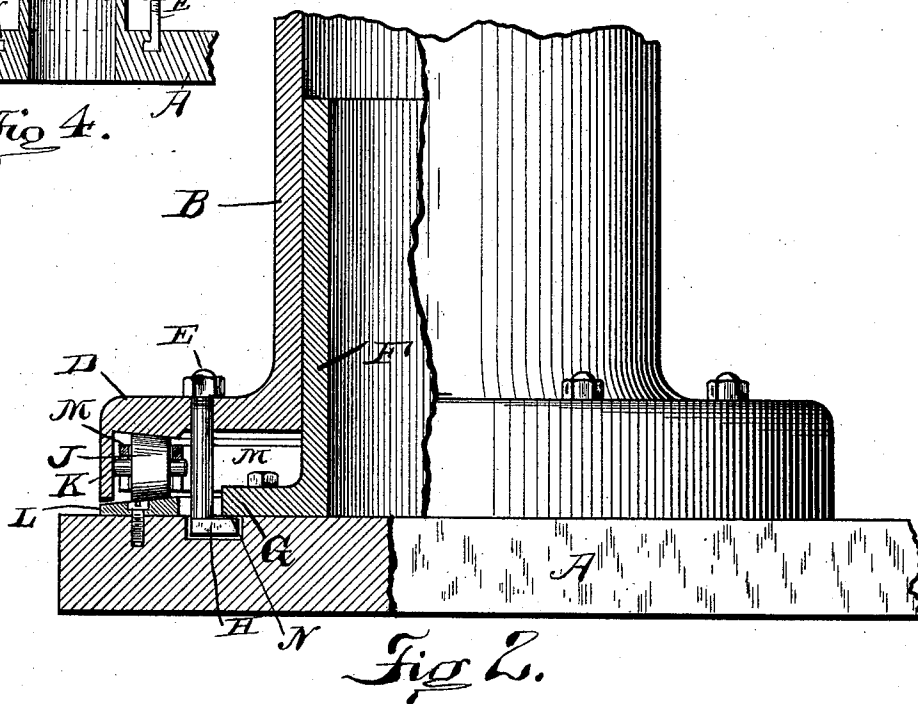
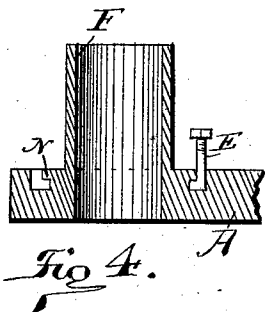
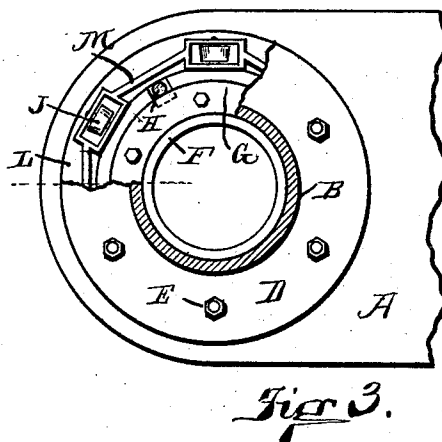
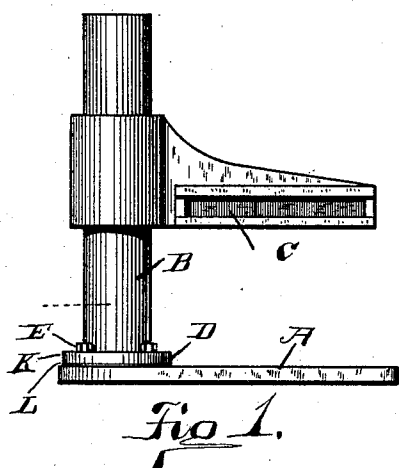


(No Model.)

A. GORDON.
DRILLING MACHINE.

No. 362,618.

Patented May 10, 1887.



Witnesses:
J. W. Snyder
W. A. Seward.

Alexander Gordon
by James W. Sui

Inventor
Attorney

UNITED STATES PATENT OFFICE.

ALEXANDER GORDON, OF HAMILTON, OHIO, ASSIGNOR TO THE NILES TOOL WORKS, OF SAME PLACE.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 362,618, dated May 10, 1887.

Application filed December 21, 1886. Serial No. 222,156. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER GORDON, a subject of the Queen of Great Britain, and a resident of Hamilton, Butler county, Ohio, have
5 invented certain new and useful Improvements in Radial Drilling-Machines, of which the following is a specification.

My invention pertains to improvements in that class of drilling-machines in which the
10 drill is supported by an adjustable radial arm; and it relates to improvements in details of the column or post supporting the radial arm, as will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the arm and arm-support of a radial drilling-machine; Fig. 2, a side elevation, part vertical section, of the lower portion of the same; Fig. 3, a plan of the
20 same, part horizontal section, and with portions broken away to exhibit interior features; and Fig. 4, a vertical section through the stump and a portion of the sole-plate, this view illustrating the stump as being formed integrally with the sole-plate instead of being bolted to it.

In the drawings, A indicates a sole-plate of a radial drilling-machine; B, a column rising therefrom; C, a radial arm supported by the column and adapted to support in the usual
30 manner the housing of the drill-spindle; D, a rigid flange at the foot of the column; E, bolts with their lower ends engaging a downwardly-facing shoulder at the foot of the stump on which the column turns, the bolts passing up through the flange D, above which flange the bolts are
35 provided with nuts; F, a stump rigidly secured to the sole-plate and engaging within the lower end of the column, and serving as a fixed bearing upon which the column revolves, such
40 stump being concentric with the slot engaged by the lower ends of the bolts E; G, a circular flange at the foot of the stump, serving as the means by which the stump is bolted to the sole-plate, and also as the means by which a
45 downwardly-facing shoulder is provided upon the sole-plate to receive the upward strains of the bolts E, such shoulder becoming practically a rigid feature of the sole-plate to be engaged by the bolts; H, the heads of the bolts
50 engaging under such shoulder; J, an annular

series of rollers, preferably conical, disposed between the flange D and the sole-plate, and preferably disposed outside the circle of the bolts E; K, a circular curtain reaching downwardly from the periphery of the flange D; L,
55 a circular track disposed below the circle of rollers, such track forming, preferably, a slight upward annular projection from the sole-plate, such track being illustrated as formed separately from the sole-plate and secured thereto
60 by screws, the upper outer surfaces of the track being as near as possible to the lower edge of the curtain K without making actual contact; M, a spider-ring having bearings engaging the journals of the rollers J, the outer journals of
65 the rollers projecting beyond the spider-ring into contact with the inner wall of the curtain K; and N, the downwardly-facing shoulder, with which the sole-plate is provided, to be engaged by the bolts E.

When the bolts E are loosened, the column
70 may be freely revolved, the stump forming a fixed axis of revolution and the rollers serving as vertical supports for the column, and also as a means for reducing friction at the base
75 of the column. The spider-ring maintains the spacing of the rollers. When the bolts B are tightened, the rolls are firmly pinched between the flange and the track upon the sole-plate and the column becomes firmly fixed. The
80 circle of bolts E being located within the circle of rollers, prevents canting strains upon the flange and column in case the bolts upon one side are tightened less than the others or are left loose, thus permitting, in fact, a single
85 bolt of the series to exert a pinching strain upon all of the rolls. The contact of the outer journals of the rollers with the inner wall of the curtain prevents the outward displacement of the rolls and prevents frictional contact between the outer faces of the rolls and the inner
90 faces of the roll-bearings in the spider-ring. The upward projection of the track L from the sole-plate forms a peripheral shoulder upon the sole-plate, which serves to a great extent in
95 preventing chips from moving inward on the sole-plate, so as to get into the path of the rollers. The curtain K serves in inclosing the rollers, in furnishing outward-thrust bearings for the roll-journals, in stiffening the flange D,
100

and in forming a practically-tight closure at its foot to prevent the admission of dust to the roller-path.

I claim as my invention—

5 1. In a radial drilling-machine, the combination, substantially as set forth, of a sole-plate provided with a downwardly-facing shoulder, a column attached thereto and provided with an outwardly-projecting flange, a circular series of rolls disposed between said flange and sole-plate, and a series of bolts engaging said shoulder and column-flange and serving to pinch said rolls between the flange and sole-plate.

15 2. In a radial drilling-machine, the combination, substantially as set forth, of a sole-plate provided with a downwardly-facing shoulder, a column attached thereto and provided with an outwardly-projecting flange, a circular series of rollers disposed between said flange and sole-plate, and a circular series of bolts disposed within the circle of rollers and engaging said shoulder and column-flange and serving to pinch the rollers between the sole-plate and flange.

25 3. In a radial drilling-machine, the combination, substantially as set forth, of a sole-plate provided with a downwardly-facing shoulder and bearing a circular roller-track, a circular series of rollers, a column resting its base upon said rollers, bolts engaging said shoulder and

column and adapted to serve for pinching the rollers between the sole-plate and column, and a curtain attached to the base of the column and encircling the series of rollers and projecting downward into close proximity to the roller-track of the sole-plate. 35

4. In a radial drilling-machine, the combination, substantially as set forth, of a sole-plate provided with a downwardly-facing shoulder, a circular roll-track projecting upwardly therefrom, a circular series of rolls, a column attached to the sole-plate and resting its base upon said rolls, and bolts engaging said shoulder and column and serving to pinch the rolls. 45

5. In a radial drilling-machine, the combination, substantially as set forth, of a sole-plate provided with a downwardly-facing shoulder, a column attached thereto, a series of rollers arranged between the base of the column and the sole-plate, bolts engaging said shoulder and column and serving to pinch the rolls, a spider-ring furnishing bearings for the roll-journals, and a curtain attached to the base of the column exterior to the circle of rolls and having its inner wall in contact with the outer ends of the outer journals of the rolls. 55

ALEXANDER GORDON.

Witnesses:

W. A. SEWARD,
J. W. SEE.