Dec. 8, 1931. G. J. THOMAS 1,835,539

DRILLING MACHINE

Filed June 26, 1926 2 Sheets-Sheet 1

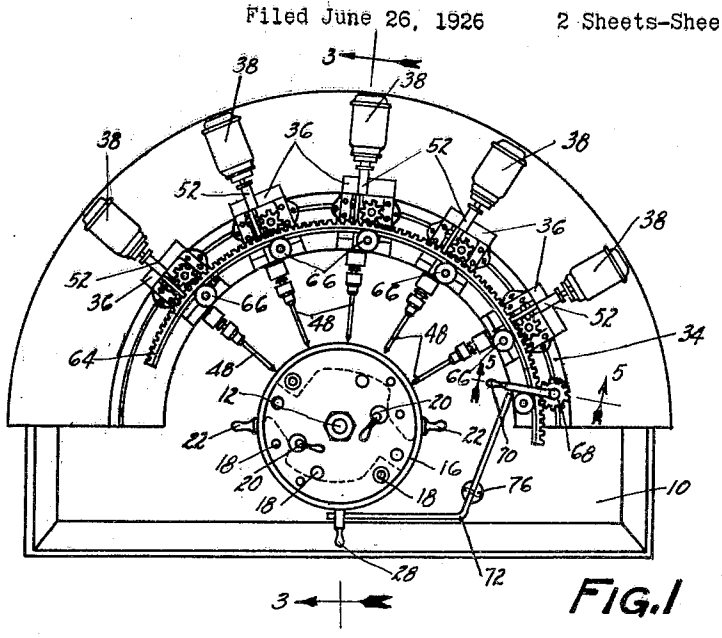


FIG. 1

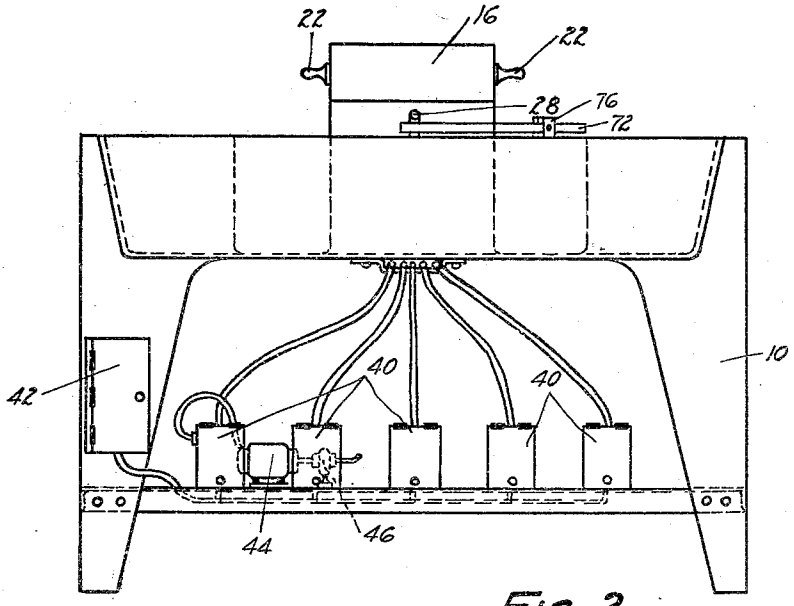


FIG. 2

INVENTOR
GEORGE J. THOMAS
BY
Jno. W. Wenks
ATTORNEY

Dec. 8, 1931. G. J. THOMAS 1,835,539

DRILLING MACHINE

Filed June 26, 1926 2 Sheets-Sheet 2

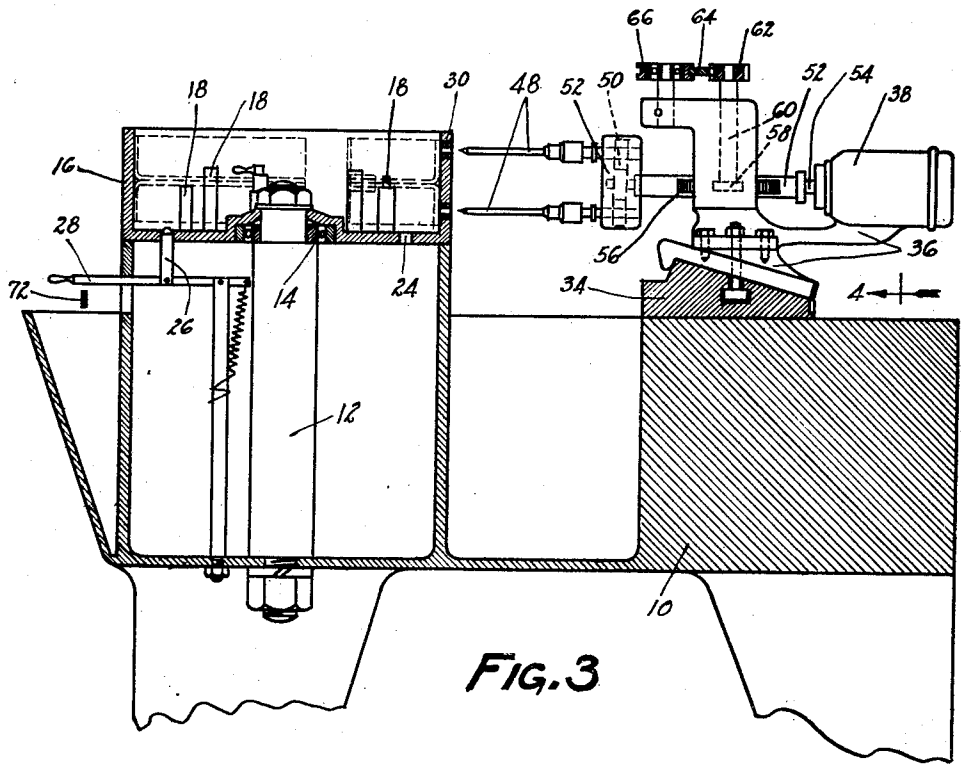


FIG. 3

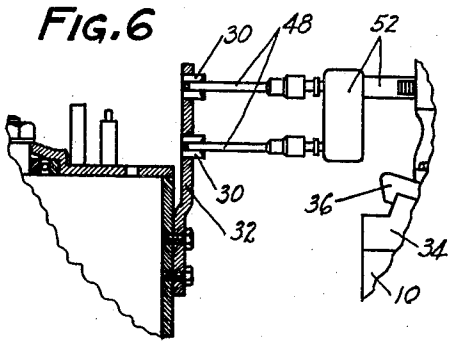


FIG. 6

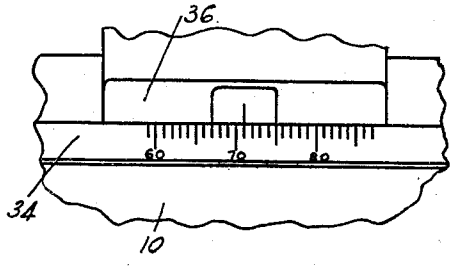


FIG. 4

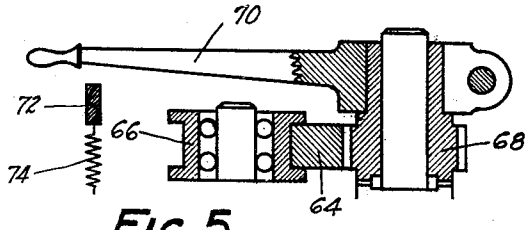


FIG. 5

INVENTOR
GEORGE J. THOMAS
BY
ATTORNEY

Patented Dec. 8, 1931 1,835,539

UNITED STATES PATENT OFFICE

GEORGE JOSEPH THOMAS, OF SOUTH BEND, INDIANA, ASSIGNOR TO BENDIX BRAKE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

DRILLING MACHINE

Application filed June 26, 1926. Serial No. 118,662.

This invention relates to drilling machines, and is illustrated as embodied in a turret machine for simultaneously drilling in a brake shoe all of the holes for the lining-attaching rivets.

An object of the invention is to arrange the machine so that the operator may drill all of these holes in one shoe while he is removing a drilled shoe from and inserting an undrilled shoe in the opposite side of the turret, by arranging the drilling units radially about the side of the turret opposite the operator. Preferably the units are individually motor-driven and are inter-connected by gearing or the like so that all the drills may be advanced and retracted in unison.

Another important feature of the invention relates to arranging the units for angular adjustment, with respect to the turret, preferably independently of each other, to facilitate drilling brake shoes of different sizes.

The above and other objects and features of the invention, including various novel combinations of parts and desirable particular constructions, will be apparent from the following description of one illustrative embodiment shown in the accompanying drawings, in which:

Figure 1 is a top plan view of the machine;

Figure 2 is a front elevation, but with the drilling units omitted;

Figure 3 is a vertical section through the upper part of the machine on the line 3—3 of Figure 1;

Figure 4 is a detail elevation, looking in the direction of the arrow "4" in Figure 3, showing part of the back of one drilling unit and its mounting;

Figure 5 is a detail section on the line 5—5 of Figure 1, showing part of the drill-advancing and retracting means; and

Figure 6 is a section corresponding to part of Figure 3, but showing a modified construction.

The novel drilling machine comprises generally a suitable base 10, of any desired form, having a vertical post 12 with an anti-friction bearing 14 at its top rotatably supporting any one of several turrets or fixtures 16 of different diameters for holding brake shoes of different sizes with their centers of curvature in the turret axis, i. e. in the axis of post 12. Each turret has suitable pins 18 and eccentrics or the like 20 for holding the shoes (shown in dotted lines) detachably but firmly clamped in position.

Each turret has handles 22 by which it may be turned by the operator, or suitable power turret-driving mechanism controlled by a half-revolution clutch may be provided. Each turret has holes 24 which are 180° apart, and one or the other of which receives a spring-held locking pawl 26 operated by a handle 28, which handle would also control the clutch if power turret-driving mechanism is provided. The turrets in the form shown in Figures 1 and 3 are provided with guides or bushings 30 for the drills, whereas in the modification of Figure 6 the bushings are on a stationary part 32.

About the side of the machine opposite the operator there is arranged and suitably secured a saddle 34 in the arc of a circle having its center in the turret axis, and upon this saddle are adjustably clamped a plurality of drilling units.

As best appears in Figure 3, the saddle has a circularly curved T-slot for the unit clamps carried by the bases 36 of the drilling units, so that the units may be individually angularly adjusted about the turret axis.

Preferably each unit includes its own motor 38 fixedly mounted on its base 36, each motor having its own fuse box, etc., 40, but all being controlled by a single switch 42, which switch also controls an auxiliary motor 44 driving a pump 46 which circulates the usual drill-lubricating fluid which is flooded over the shoe being drilled. Each unit is shown as including two drills 48 parallel to each other and both of which are arranged radially of the turret, the drills being geared together at 50, and the drills and the gearing 50 being mounted on a horizontal slide 52 carried by the upper part of the base 36. The upper drill may, as disclosed in Figure 6, be connected directly to the armature of its motor 38 by a telescopic or longitudinally extensible slide 52. I prefer,

however, the construction disclosed in Figure 3 in which the slide is shown connected to a central driving pinion in the gear tram 50.

Slides 52 have on their sides gear teeth or racks 56 meshing with pinions 58 on vertical shafts 60 journalled in the bases 36 and having driving pinions 62 at their upper ends. Pinions 62 for the various units all mesh with a large segmental gear or rack 64 supported by grooved rollers 66 and operated to retract and advance all the drills in unison by a pinion 68 having a handle 70 by which it may be turned. If preferred suitable power mechanism synchronized with turret driving mechanism may be provided for pinion 68, or the handle 70 may be connected to a foot pedal.

In operation, the handle 70 is rocked by one hand to drill one shoe, while a drilled shoe is being removed and an undrilled one placed in the turret by the other hand, or if preferred there may be two operators, one to load the shoes and the other to turn the turret and operate the drills.

I prefer to provide interlocking means preventing the advancing of the drills unless the turret is held positioned by the locking pawl 26. In the arrangement illustrated, a lever 72 is urged by a spring 74 (Figure 5) out of alinement with handle 70, but with its other end just below handle 28, so that movement of handle 28 to withdraw pawl 26 will sling lever 72 about its fulcrum 76 to lie in the path of handle 70, thus preventing forward movement of the drills. Also, if handle 70 is swung in a direction to advance the drills, thus bringing it above lever 72, handle 28 cannot be operated to withdraw pawl 26.

While one illustrative machine has been described in detail, it is not my intention to limit the scope of the invention to that particular machine, or otherwise than by the terms of the appended claims.

I claim:

1. A machine comprising, in combination, a rotatable turret arranged to hold a plurality of arcuate brake shoes with their centers of curvature in the axis of the turret, a plurality of drilling units arranged angularly spaced about said axis and each including a plurality of drills arranged radially with respect to the axis and an individual motor driving said plurality of drills, and means for simultanenously advancing and retracting the individually motor-driven drills of the several units, each unit including a pair of geared-together drills both arranged radially of the turret axis, together with interlocking means preventing advancing movement of the drills and rotation of the turret at the same time.

2. A machine comprising, in combination, a rotatable turret arranged to hold a plurality of arcuate brake shoes with their centers of curvature in the axis of the turret, a plurality of drilling units including radially-extending drills arranged angularly spaced about said axis and each including an individual drill-driving motor, and means for simultaneously advancing and retracting the individually motor-driven drills of the several units, together with interlocking means preventing advancing movement of the drills and rotation of the turret at the same time.

3. In a drilling machine, a rotatable turret arranged to hold a plurality of arcuate brake shoes with their centers of curvature in the axis of the turret, a plurality of L-shaped drilling units arranged angularly spaced about said axis and each including a plurality of drills arranged radially with respect to the axis and connected to individual motors driving said plurality of drills, and means for simultaneously advancing and retracting the individually motor-driven drills of the several units, said means comprising a rack geared to a pinioned shaft, the latter geared to the connection between the drills and their motor.

In testimony whereof, I have hereunto signed my name.

GEORGE JOSEPH THOMAS.