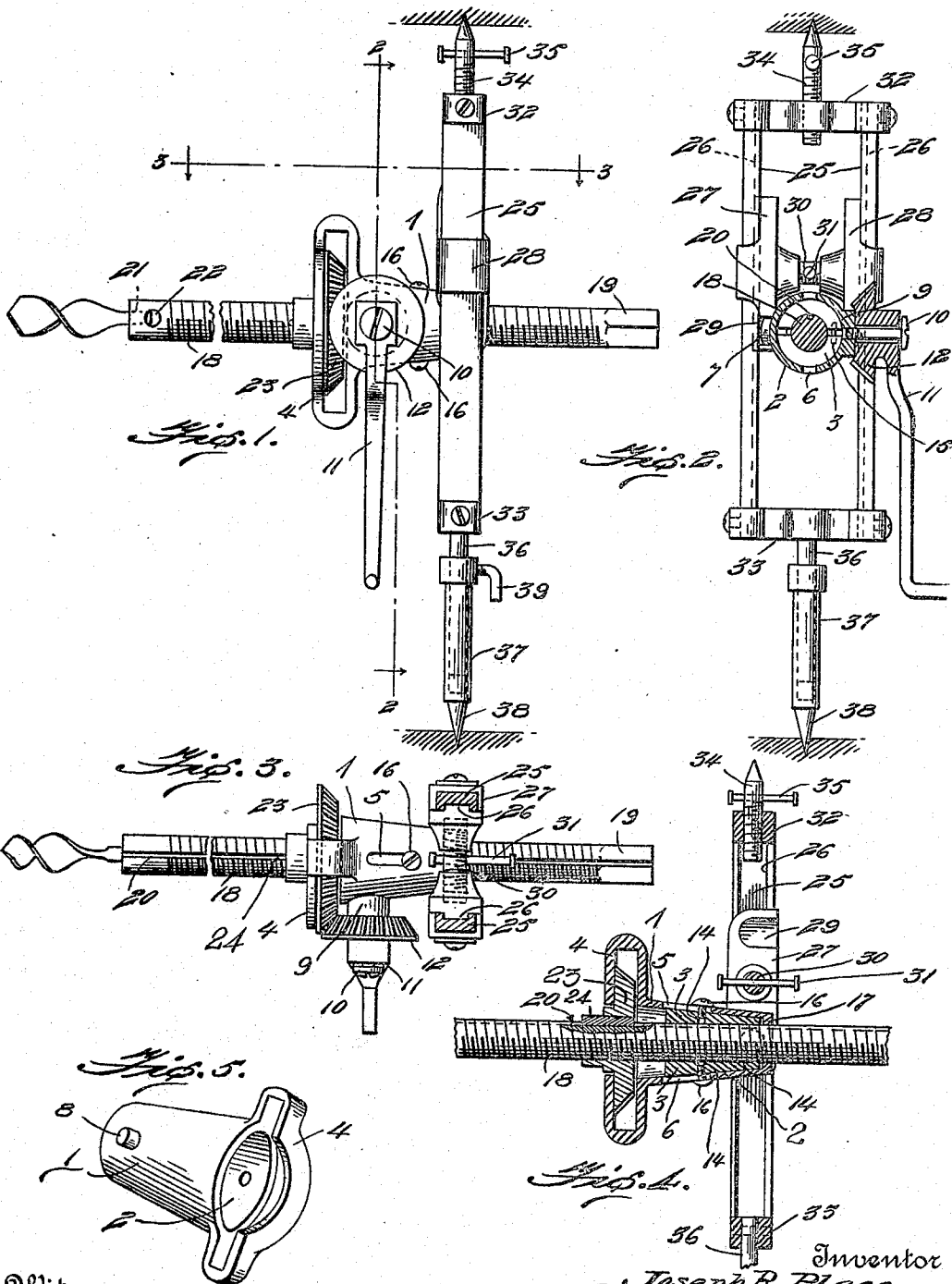


J. R. PLACE.
MINING DRILL.

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UNITED STATES PATENT OFFICE.

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MINING-DRILL.

936,937.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH R. PLACE, a citizen of the United States, residing at Chicago Heights, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mining-Drills; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object the production of an improved mining drill provided with means for automatically forcing the drilling tool along the path of a bore.

Another object of this invention is the production of a mining drill formed with a threaded feed screw, and provided with a disengageable nut for enabling the ready removal of the threaded feed screw.

Another object of the invention is the production of a mining drill provided with means for adjustably securing the same in operative position against a quantity of mineral to be drilled.

A still further object is the production of a mining drill so constructed that the various parts may be readily assembled into a working machine, and that when assembled may be quickly disassembled for repairing or replacement.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims, and in the drawings, in which—

Figure 1 is a side elevation of my improved mining drill, showing the same in operative position; Fig. 2 is a vertical sectional view thereof, taken on the line 2—2 of Fig. 1; Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a central longitudinal section of Fig. 3; and Fig. 5 is a detail perspective view of a housing.

Corresponding and like parts are referred to in the following description and in all the views of the drawing by similar reference characters.

In the drawings, 1 designates a housing formed with a cone-like body opening, 2, through which a split nut, 3, is adapted to extend. The housing 1 is provided with a half washer, or bearing bracket, 4, which is formed thereon and is formed with vertical slots, 5 and 6, adapted to aline with each other. The housing 1 is also provided with rounded bearing lugs or trunnions, 7 and 8, which extend laterally therefrom, and is further formed with an internally threaded lug, 9, which is adapted to receive a threaded pin, 10, of an operating crank, 11. A bevel gear, 12, is formed on the operating crank, 11 and said gear is adapted to embrace or rotate around the threaded lug 9.

The split nut 3 is adapted to be seated in the cone-shaped opening of the housing 1, and is therefore formed with a cone-like body and is provided with internal threads, 13, screw openings, 14, and a guide pin, 15, is secured to one-half of the nut and is adapted to extend through an opening formed in the opposite half of the nut. When positioned in the housing, the screw openings, 14, of the split nut are adapted to register with the slots 5 and 6 of said housing and the sections of the split nut are movable longitudinally in the housing and guided in their movement by screws, 16, which are arranged to extend through the slots 5 and 6 and be threaded in the openings 14 of the split nut. When forced inwardly in the housing 1, the sections of the split nut are adapted to close together, and as they move in an outward direction in the housing, the sections are adapted to expand or spread apart. The movement of the split nut in the housing 1 may be limited by an internal shoulder, 17, formed in the lower end of said housing.

A threaded feed screw, 18, is adapted to extend through the split nut, 3, and said chuck is formed with a squared end portion, 19, a longitudinal slot, 20, and provided with a bit receiving aperture, 21, across which a transverse aperture, 22, extends. A bevel gear, 23, is mounted on the housing 1 and embraces the feed screw, 18. The bevel gear 23 is formed with smooth bore and provided with a key, 24, arranged to be seated in the

key slot 20, of the feed screw 18. The bevel gear 23 is mounted on the forward end of the housing and is normally engaged by the bevel gear, 12, and when rotated is adapted to revolve the feed screw, 18.

When the split nut 3 is disposed in the housing 1 and forced inwardly therein, and the chuck, 18, extended through the split nut, the rotation of the bevel gear, 23, will give the feed screw, 18, a spiral motion, thereby turning it on its axis and forcing it against the material to be drilled. When it is desired to quickly remove the feed screw from the housing, the screws, 16, are unloosened and the split nut moved outwardly in said housing so that the sections thereof will expand, allowing the chuck to move out of engagement with the internal threads of said split nut.

The drilling mechanism described is adapted to be held in adjustable position against the material to be drilled by a holding tool comprising a plurality of uprights, 25, formed with longitudinal grooves, 26, along which sliding members, 27 and 28, are adapted to move. The sliding members 27 and 28 are formed with end sockets, 29, having oppositely arranged side openings and are adapted to receive the lugs, 7 and 8, of the housing, 1. The sliding members 27 and 28 are formed with body openings through which the uprights, 25, are arranged to extend and are adapted to be forced against the uprights by an expanding screw, 30, having an operating pin, 31. The ends of the uprights, 25, are secured together by cross bars, 32 and 33, said cross bars being mounted upon the ends of the uprights and held in place thereon by screws threaded against said ends. The cross bar 32 is provided with a rotatable screw, 34, having an operating pin, 35, and the cross bar, 33, is provided with a pin, 36, on which is mounted a sleeve, 37. The sleeve, 37, is provided with a point, 38, preferably formed of hard metal, and is adapted to be adjustably positioned on the pin, 36, by an operating screw pin 39, which is adapted to be threaded against the pin 36.

By means of my improved drill, a miner is enabled to accurately position a drilling tool against a quantity of coal or other mineral to be bored or drilled, and needs only to operate the crank 11 to rotate the drilling tool and move the same along the bore formed by the drilling, so that the point of the drilling tool will constantly engage new material. Should there be any necessity for the operator to remove a drill tool which may have become injured, it is only necessary for him to back the feed screw sufficiently to permit the forward movement of the split nut in the housing to clear the threads of the feed screw.

My drilling tool may be positioned at any

angle against the mineral to be drilled by forcing the screw, 30, and the sleeve, 37, against the sides of the pit or timbers, and swinging the housing 1 on the lugs 7 and 8 in the sockets, 29. When screwed against the sides of a pit or timbers, the holding tool may be rotated upon its axis in any direction for enabling the adjustment of the drilling tool or its removal to a different point of operation, and for this purpose, the side openings of sockets 29, face in opposite directions upon the sliding members, 27 and 28. Should any of the gears become mutilated for any reason whatsoever, they may be removed by expanding the split nut and fixing the same in its expanding condition by tightening the screw 16, and removing the screw which connects the crank 11 to the housing, 1. When this is done, the chuck 18 may be removed from engagement with the split nut, and the bevel gear 23 slipped off the housing 1, and thereafter the projection, 4, which is adapted to engage the upper surface of said bevel gear and the bevel gear, 12, may be removed from the threaded lug 9 without any difficulty. A tool is mounted on the chuck, 18, by extending the rounded or squared end of said tool through aperture, 21; and the tool is removed from the chuck, 18, by passing a pointed instrument through the transverse aperture, 22, and forcing said instrument against the end of said tool.

The operation of my improved mining drill will be readily understood from the description, taken in connection with the accompanying drawings, and it is understood that the construction shown in the accompanying drawings may be modified to meet the various needs of mining without departing from the spirit of my invention.

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

1. In a mining drill, a housing formed of bearing lugs and a bearing bracket having a smooth circular opening, said housing having a cone-shaped bore, a cone-shaped split nut, slidably movable in the housing, means slidably extending through the housing and connected to the parts of the split nut, for expanding and contracting the same, a feed screw extending through the nut and housing and means for spirally rotating the feed screw.

2. In a mining drill, a housing formed cone-shaped and provided with means whereby a beveled gear is slidably and removably secured on the housing and placed in operative position thereon, a crank operated beveled gear secured to the housing, the second beveled gear removably secured to the housing and in engagement with the first mentioned beveled gear, a split nut

formed cone-shaped arranged within the housing and means extending through the housing and slidable thereon for extending and contracting the split nut, a feed screw
b keyed to the removable beveled gear and bearing lugs formed on the housing.

In testimony whereof I have hereunto set

my hand in presence of two subscribing witnesses.

JOSEPH R. PLACE.

Witnesses:

CATHERINE E. PLACE,
ABE. SOLOMON.