

1,383,041.

L. F. VERDY.  
MINING DRILL DEVICE.  
APPLICATION FILED MAY 24, 1920.

Patented June 28, 1921.

5 SHEETS—SHEET 1.

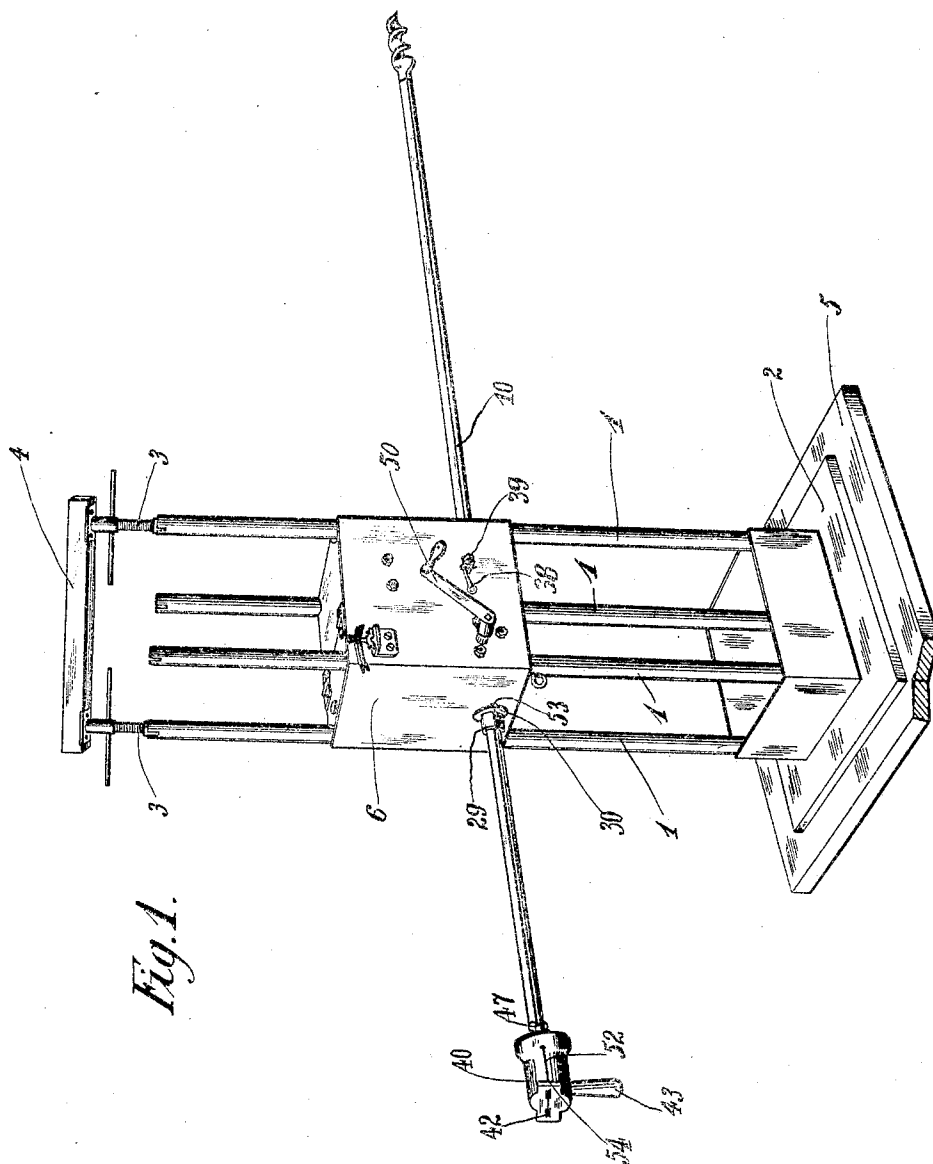


Fig. 1.

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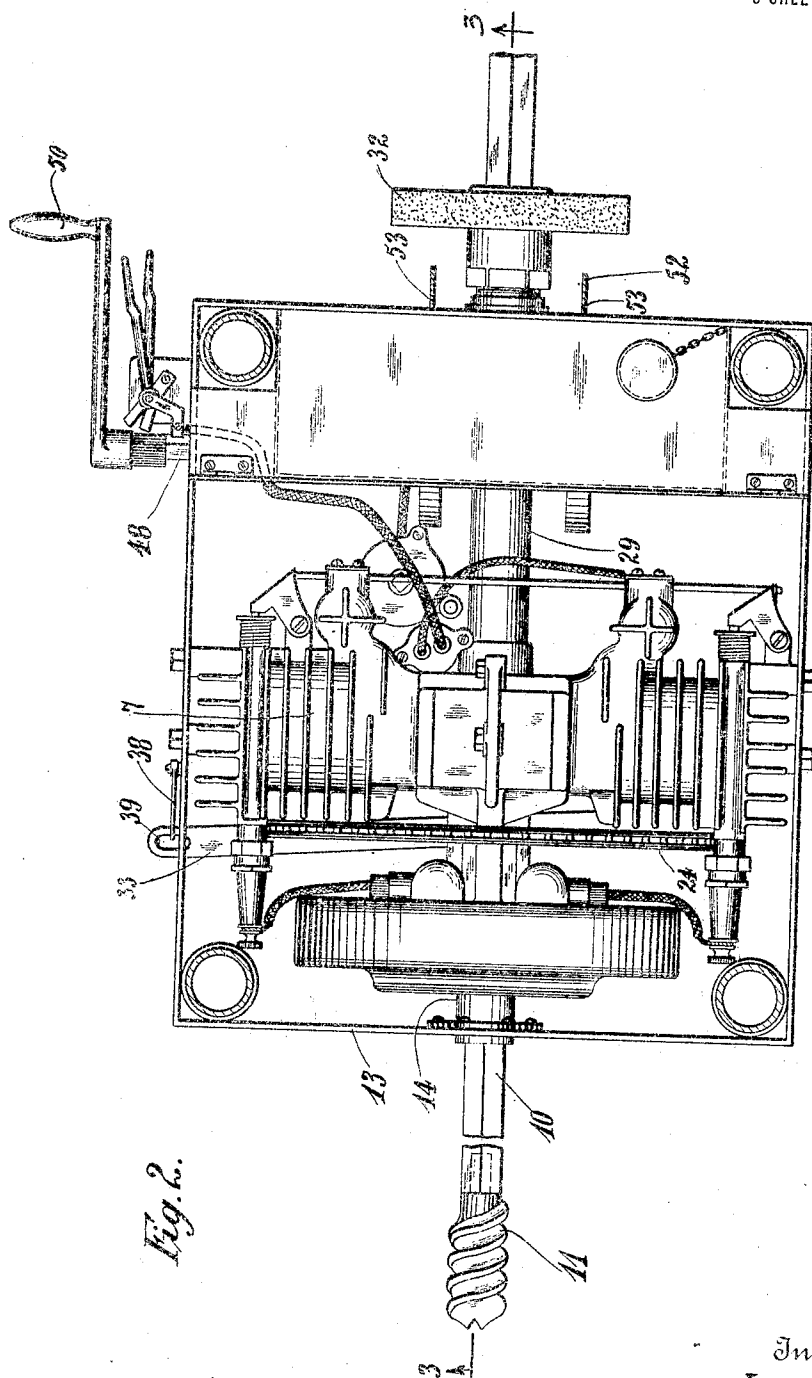


Fig. 2.

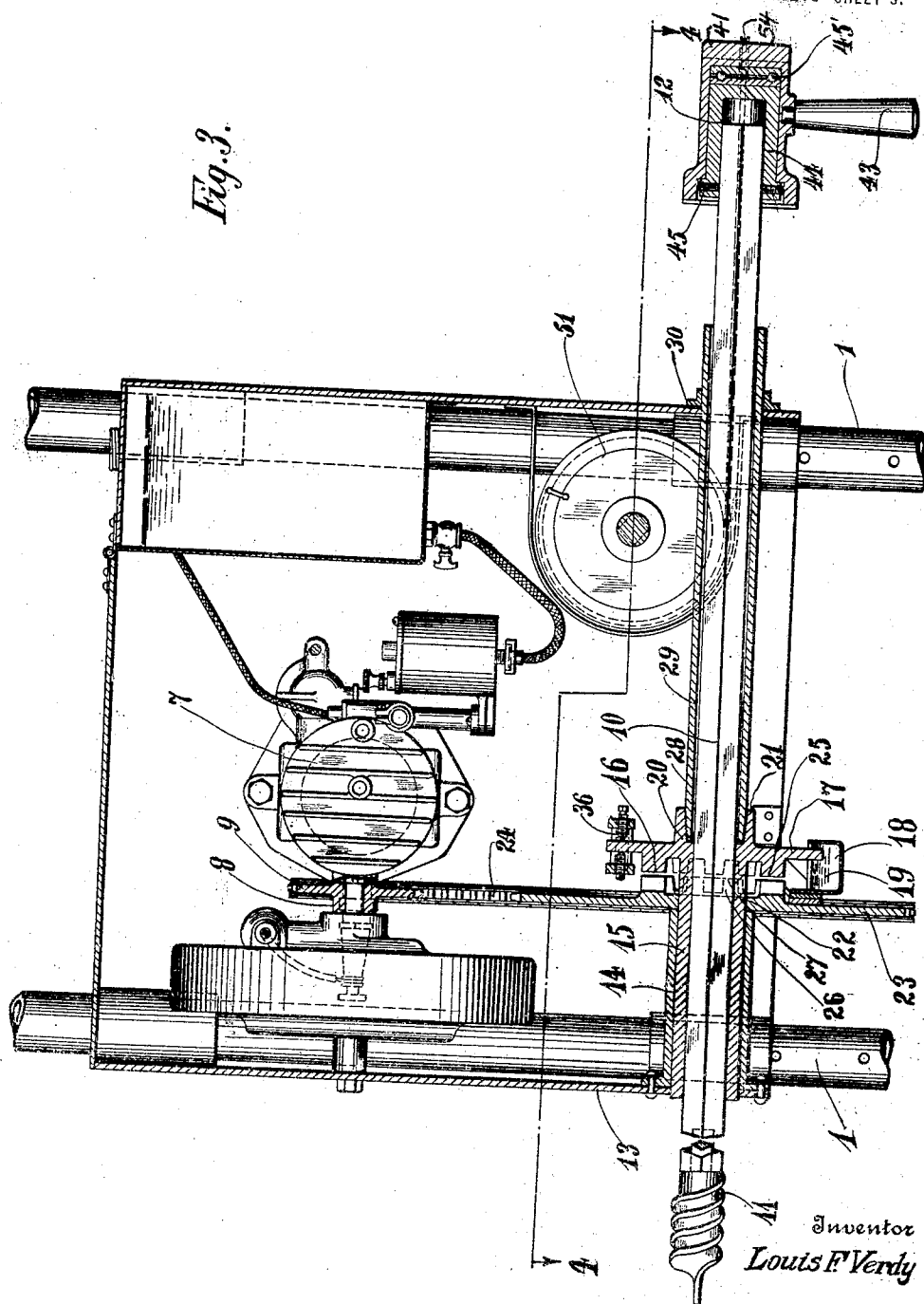
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5 SHEETS—SHEET 3.

Fig. 3.



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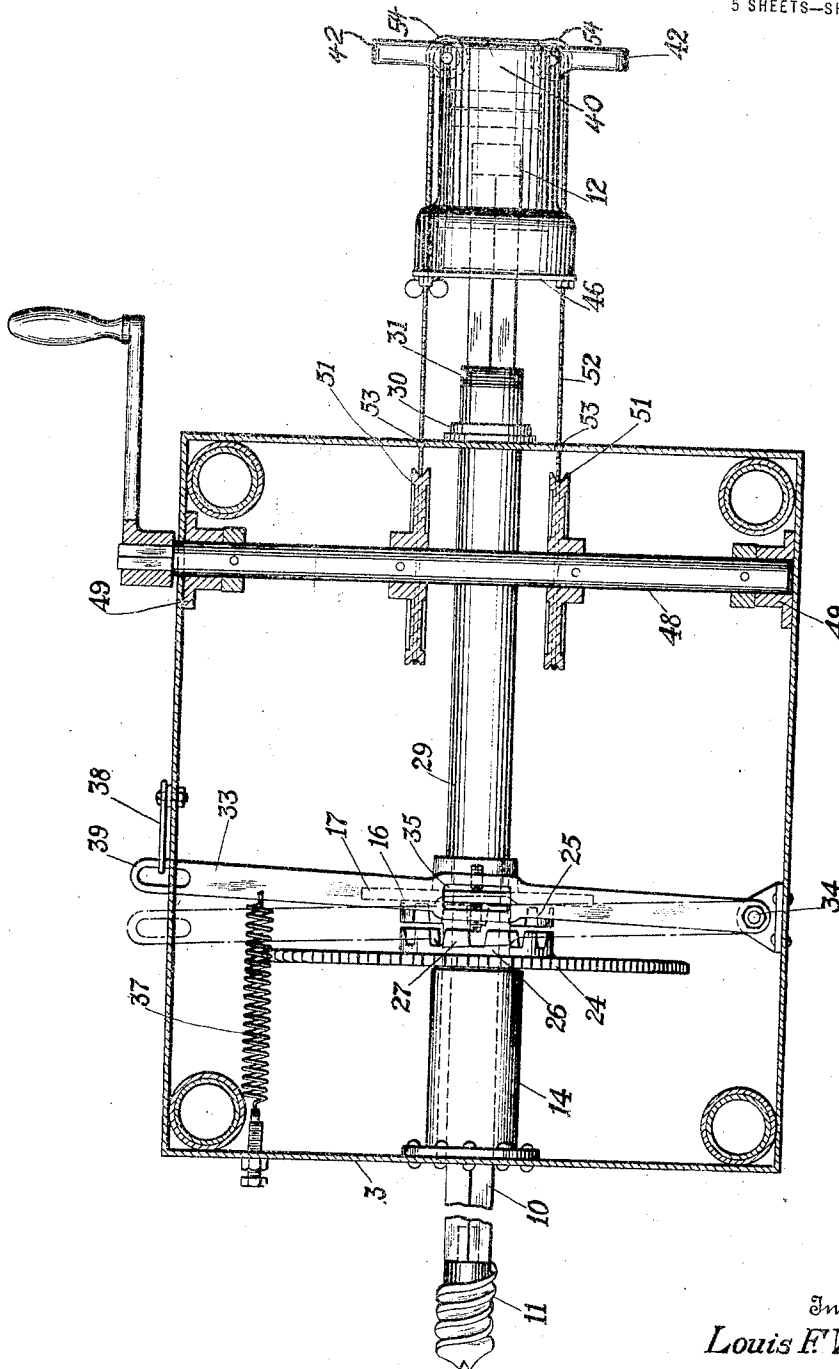


Fig. 4

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334

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5 SHEETS—SHEET 5.

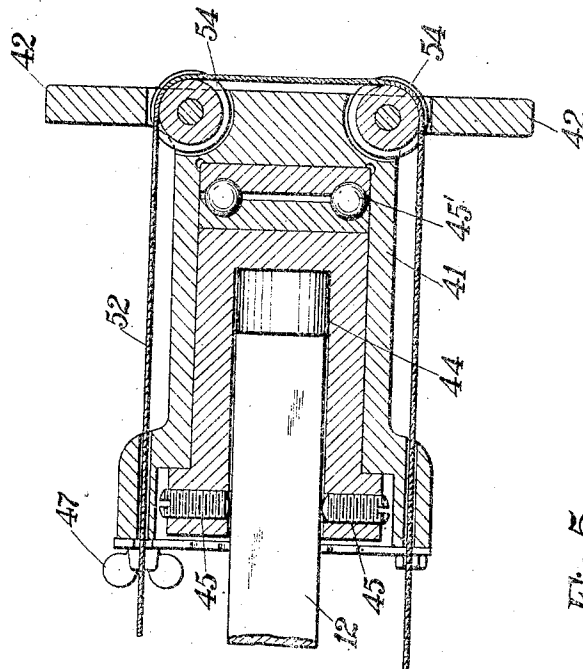


Fig. 5

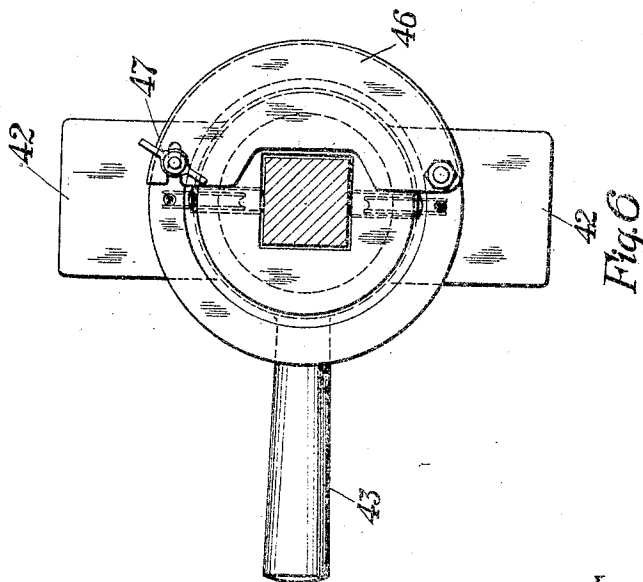


Fig. 6

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# UNITED STATES PATENT OFFICE.

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## MINING-DRILL DEVICE.

1,383,041.

Specification of Letters Patent. Patented June 28, 1921.

Application filed May 24, 1920. Serial No. 383,716.

*To all whom it may concern:*

Be it known that I, LOUIS FRANCOIS VERDY, subject of France, and resident of Pleasantville, in the county of Sullivan and State of Indiana, have invented certain new and useful Improvements in Mining-Drill Devices, of which the following is a specification.

This invention relates to improvements in power driven drilling machines adaptable for mining purposes.

Its primary object is to provide in a power driven drilling machine of this kind a drill rod having a feeding arrangement whereby said drill rod may be fed from the rear of its driving mechanism.

Another object is to provide in a power driven drilling machine, a drill rod having a pusher attached thereto and which may be operated from its rear by hand or from the side of said drilling machine by means of a crank handle.

A further object is to provide in connection with a drill rod having a pusher attached at its rear, balancing means for facilitating its true central forward motion.

A still further object is to provide in a power driven drilling machine a power transmission mechanism from the power source to the drill rod which is equipped with means adapted to facilitate the drill rod being driven, or to make it inoperative when so desired.

The importance of the power driven drill for mining, blasting, boring, etc., cannot be overestimated, it being the most essential apparatus for such work. Therefore, it is imperative that the imperfections in such a drill should be minimized and its working utility increased as much as possible.

In the past a great disadvantage in the use of such a drill has been its inability to drill deep holes without shifting with it, its driving mechanism. This inability was due to the fact that the drill rod was operated and fed from the front of its driving mechanism. Other disadvantages were the restricted operating possibilities of such device and the comparatively small space in front of the machine within which the operator had to do his work of correctly feeding and otherwise manipulating the drill and regulating its driving mechanism.

In my improved power driven drilling machine these and other disadvantages have been overcome. I have provided means

whereby the drill rod may be fed and guided either by hand from the rear and through the casing of its driving mechanism or pushed forward by a special arrangement operable from the side of the driving mechanism, while simultaneously maintaining the drill in perfectly balanced central position during its forward motion. I have also provided means whereby the drill rod may be made inoperative when so desired, although its driving mechanism may be kept working.

In order that the objects specified above and other objects in view may be clearly understood the following description is given, reference being made to the accompanying drawings forming part of this specification in which:—

Figure 1 is a perspective view of my device.

Fig. 2 is a top view of same.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2 with emery wheel detached and pusher attached.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3, showing coupling and feeding arrangements.

Fig. 5 is a longitudinal cross-sectional view of the drill rod pusher.

Fig. 6 is a front view of same.

In the drawings a frame is shown composed of a plurality of uprights 1 attached to a base-plate 2 and adapted to receive at their upper ends adjustable spindles 3 supporting a log or upper plate 4. The latter engages the upper structure or ceiling of the mine pit. The entire frame serves as a support for the housing of the drill mechanism. When the drill is used for open drilling a heavy plate 5 is connected with base plate 2 and prevents through its weight the drill mechanism from leaving its working position.

At about the center of the frame-work an engine housing or casing 6 is provided covering substantially the entire driving mechanism. In this casing an internal combustion engine 7 is shown representing the power source of my machine and having a driving shaft 8. Although the drawings disclose an internal combustion engine, be it understood that any other kind of power source may be substituted depending upon the use to which my device is put. For open work this type of engine is preferable while for work with in a closed mine a power source is employed

which will not consume oxygen or eject poisonous gases or smoke.

Upon shaft 8 is keyed a sprocket wheel 9 by means of which the actual drilling mechanism of my device is driven. This mechanism consists of a drill rod 10 made preferably of square shaped stock and having at one of its ends a boring or business head 11 made either separate and exchangeable or forming one piece with the bar, and at its other a tail or feeding end 12 preferably cut at right angles to its central axis.

At the front plate 13 of the casing 6 a bearing 14 is attached which extends inwardly into the casing. Rotatably mounted therein is a sleeve or bushing 15 provided at its end, protruding into the casing, with a flanged coupling member 16, the flange 17 of which dips into receiver 18 containing oil or other lubricant indicated at 19. Adjacent to the smooth face of flanged coupling member 16 and forming an extension of sleeve 15, a cylindrical receiver 20 is provided having a cone-shaped seat within as seen at 21. The sleeve 15 is somewhat longer than bearing 14 and provides at 22 a bearing for sprocket wheel 23 which may freely rotate thereupon. By means of sprocket chain 24 motion is transmitted from sprocket wheel 9 to sprocket wheel 23.

Facing the claws 25 of coupling member 16 and forming an integral part of sprocket wheel 23 is a counter coupling member 26 having coupling claws 27 adapted to be engaged by claws 25.

Set in receiver 20 is the reduced portion 28 of sleeve 29 which latter protrudes through the rear of engine housing 6 and is rotatably lodged in bearing 30. The protruding end is threaded at 31 for receiving auxiliary tools, for instance an emery wheel 32 (Fig. 2), by means of which the drill head 11 of the drill rod may be sharpened.

Guided in and engaged by the square-shaped hollow of the sleeve 15 is the drill rod 10, which, due to its being lodged in said sleeve, may not only rotate therewith but may also slide forth and back. The drill rod freely rotates in the longer rear sleeve 29 and protrudes with its tail end 12 through this sleeve and is engaged by a pusher described herein below.

The claws 25 and 27 of coupling members 16 and 26 respectively may be engaged or disengaged by the operation of a transversely disposed lever 33 having its fulcrum within and at one side-plate of the engine housing as seen at 34, and provided at substantially its center with a generally rectangular slot or aperture 35. Protruding into the slot and disposed opposite each other are set screws 36 adapted to engage flange 17 of coupling member 16. The helical tension spring 37 secured at one end to front plate 13 of engine casing 6 and at its other end to

lever 33 keeps coupling members 16 and 26 normally engaged. When it is desired to disengage said coupling members lever 33 is pulled back, simultaneously shifting bushing or sleeve 15 of which coupling member 16 forms a part. In order to hold lever 33 in disengaged position a hook arrangement 38 is provided which engages an aperture 39 in said lever.

The drill rod holder or pusher 40 attached to the tail end 12 of drill rod 10 comprises a hollow generally cylindrical casing 41 having a pair of sidewise disposed adjusting holders 42 and central handles 43 projecting downward, a square shape hollowed cylindrical thimble 44 for receiving and set screws 45 provided at its open end for securing the tail end 12 of drill rod 10, said thimble 44 being adapted to revolve with said drill rod. An anti-friction thrust bearing 45' is provided at the bottom of and between thimble 44 and the bottom of hollow casing 41. A thimble guard 46 held by wing screw 47 from swinging open prevents thimble 44 from leaving casing 41.

Above and perpendicular to drill rod 10 a shaft 48 is rotatably mounted in bearings 49 secured within to the sides of engine casing 6 and may be operated by hand crank 50. Keyed to the shaft at both sides of long sleeve 29 are sheaves 51. Secured thereto and passing around the sheaves 51 are the ends of cord 52 which passes through openings 53 of the rear plate of casing 6 and around balancing sheaves 54 mounted at the horizontal center-line and within adjusting handles 42 of pusher 40. By manipulating the crank 50, pusher 40 is caused to be fed in the direction of the center line of drill rod 10 when in operation. If it is desired, drill rod 10 may be directed by hand through adjusting handles 43.

The arrangement of sheaves and cord is specially designed to provide self adjusting balancing feeding means whereby the drill rod is pushed forward in as nearly a perfectly straight direction, as the vibrations caused by the drill's operation permit. The pusher 40 serves as auxiliary bearings when the drill rod is protruding far out to the rear of the driving mechanism. The provision made at the rear of sleeve 29 for attaching auxiliary tools as for instance, the emery wheel 32 permits the drill being kept always in fit condition for use without resorting to outside means.

Having thus described my invention and reserving for myself the right to make necessary alterations and amendments within the broad scope of my invention, I claim:—

In a power driven drilling machine having a frame, a casing attached to said frame, and a stationary motor in said casing, the combination of a longitudinally disposed square drill rod passing through said casing

having a business head and a tail end, a flanged bearing having its flanged end secured inwardly at the vertical center line of the front portion of said casing, a sleeve rotatably mounted in said bearing and terminating at its inner end in a coupling member having an annular flange of larger diameter than the coupling member, a square shaped aperture in said sleeve to receive said drill rod, a counter coupling member provided at the inner face of said first coupling member, means for rotating said counter coupling member, a transversely disposed lever secured to, and having its fulcrum at, one side of said casing, a generally rectangular aperture provided at substantially the center of said lever and having set screws provided at its sides engaging the flange of said first coupling member, a helical tension spring secured at one end to the front of said casing and near the free end to said lever facilitating the said coupling members being normally engaged, a hook adapted to engage the free end of said lever in a position when said coupling members are disengaged, a bearing provided at the rear of said casing, a long sleeve rotatably mounted in said bearing having its open end protruding outwardly from the rear of said casing and its other end secured to said first coupling member, means at the free end of said sleeve adapted to receive auxiliary tools, when desired, a pusher provided at the feeding end of said drill rod, means for rotatably securing said drill rod in said pusher, and means for feeding said pusher.

Signed at New York city, in the county of New York, and State of New York, this 23rd day of April A. D. 1920.

LOUIS FRANCOIS VERDY.