M. SHINGLER.

ROCK AND COAL DRILL.

APPLICATION FILED APR. 15, 1918.

1,280,092.

Patented Sept. 24, 1918.

4 SHEETS—SHEET 1.

Fig. 1.

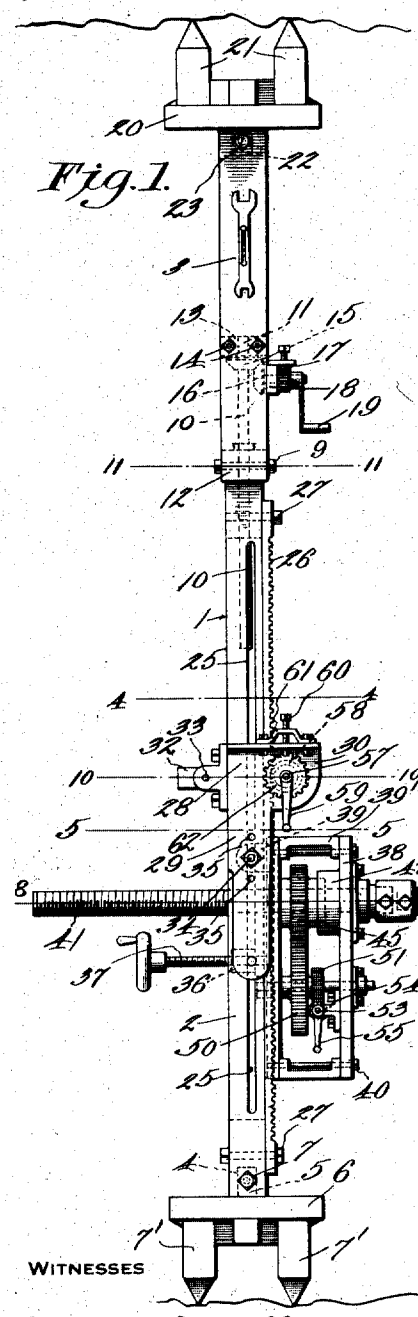
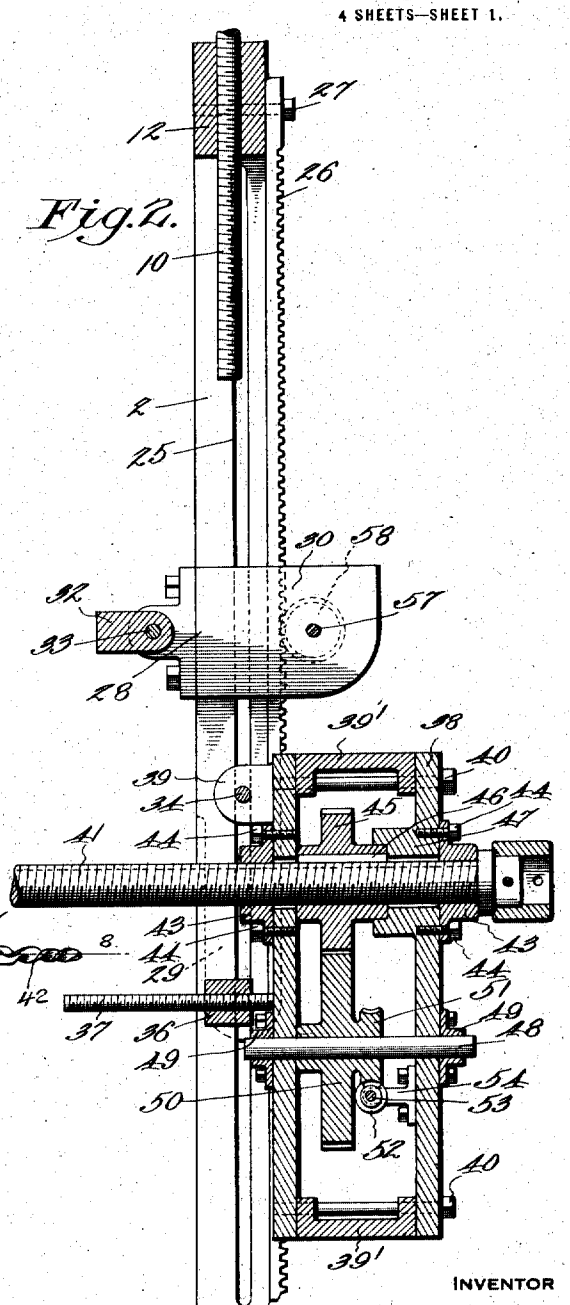


Fig. 2.



WITNESSES

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4 SHEETS—SHEET 2.

Fig. 3.

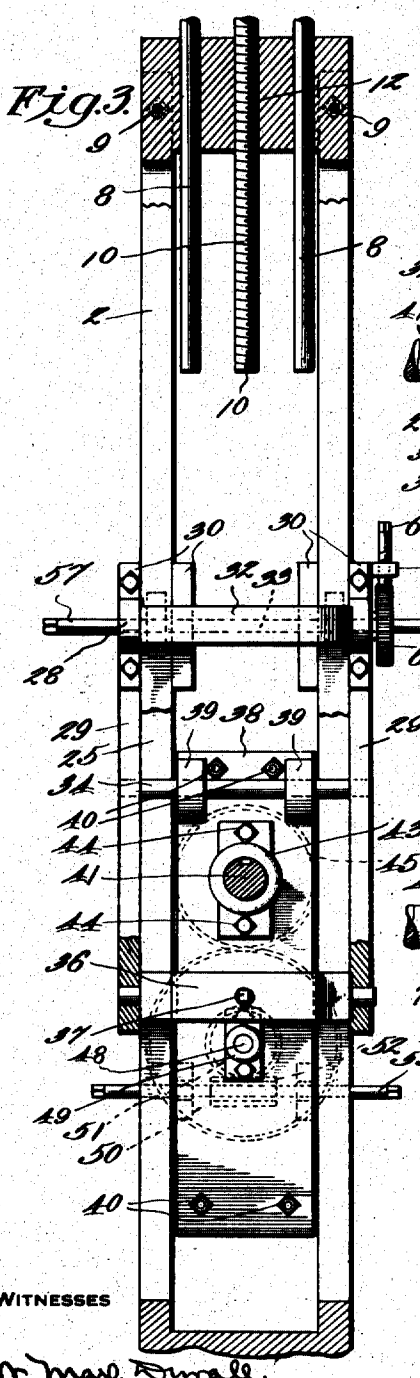


Fig. 4

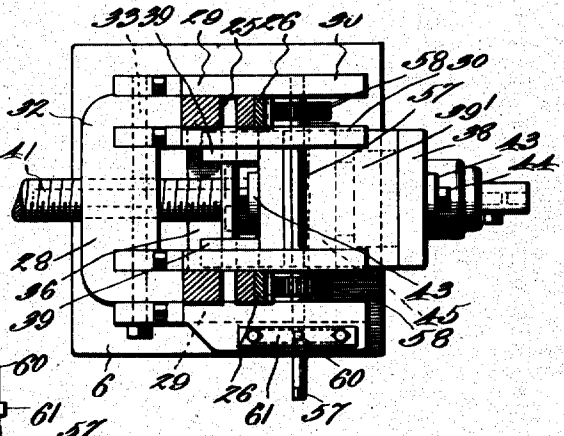
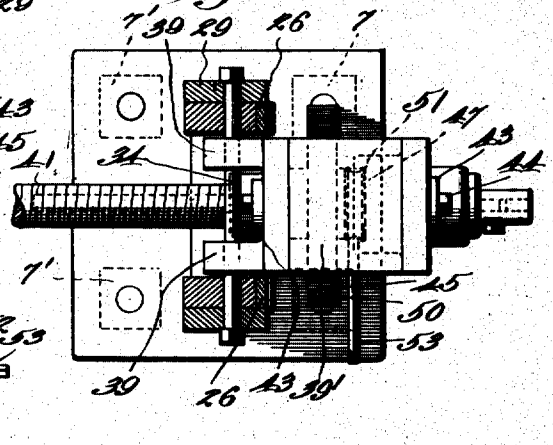


Fig. 5.



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4 SHEETS—SHEET 3.

Fig. 8.

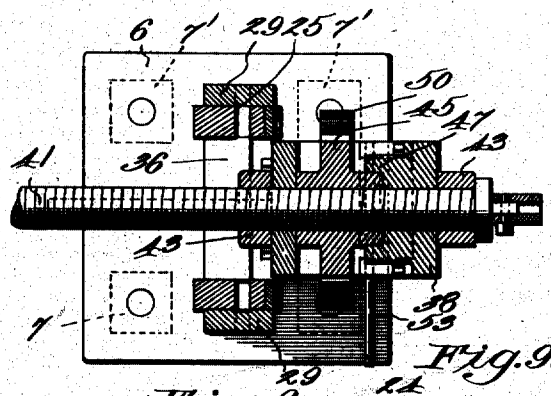


Fig. 9.

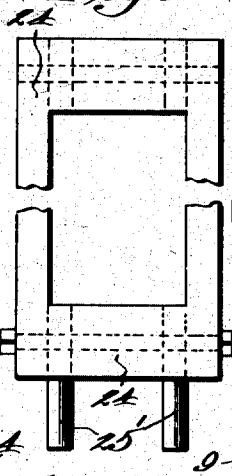


Fig. 6.

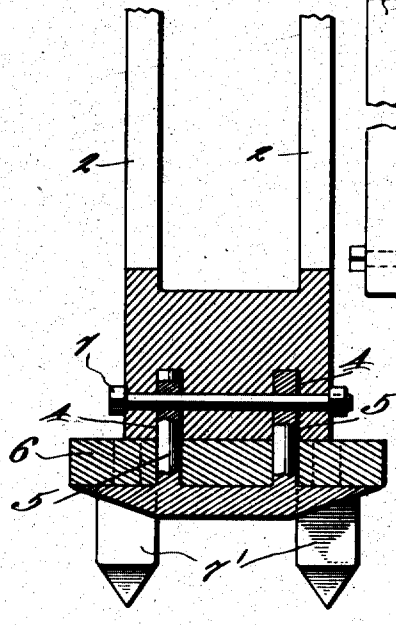
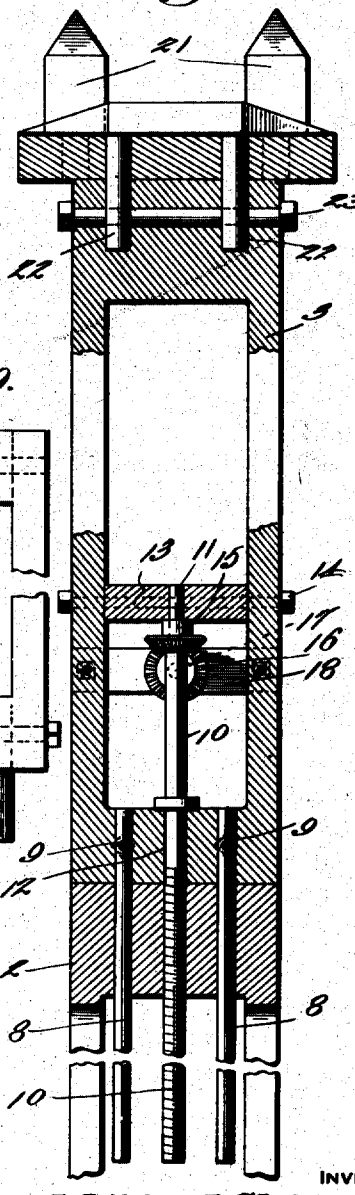


Fig. 7.



WITNESSES

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4 SHEETS—SHEET 4.

Fig. 10.

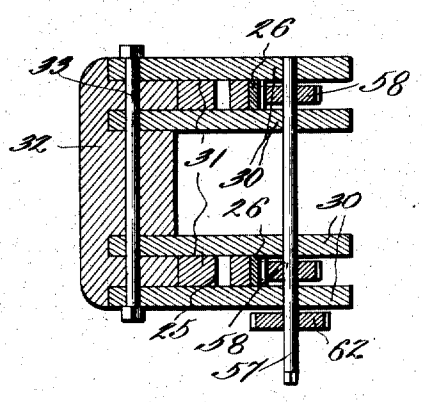


Fig. 12.

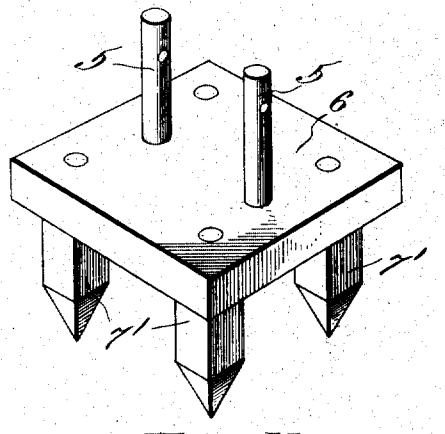


Fig. 11.

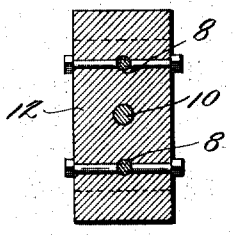


Fig. 13.

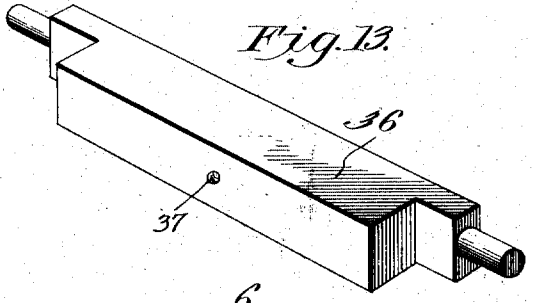
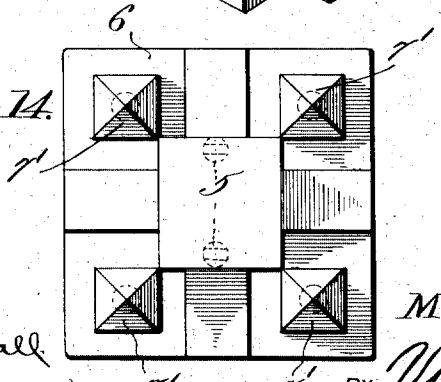


Fig. 14.



WITNESSES

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ROCK AND COAL DRILL.

1,280,092. Specification of Letters Patent. Patented Sept. 24, 1918.

Application filed April 15, 1918. Serial No. 228,726.

To all whom it may concern:

Be it known that I, MILFORD SHINGLER, a citizen of the United States, residing at Ashville, in the county of Cambria and State of Pennsylvania, have invented new and useful Improvements in Rock and Coal Drills, of which the following is a specification.

This invention is an improved hand drill for use in drilling rock, coal and the like and in mining operations, the object of the invention being to provide an improved machine of this kind which may be readily operated by one man, which is simple in construction, is strong and durable, and is not likely to get out of order.

Another object of the invention is to effect improvements in the construction of the main frame to enable the main frame to be vertically adjusted as may be required by the distance between the floor and the roof of the mine in which the drill is used.

Another object is to provide a carriage which is vertically movable on the main frame and which carries the drill frame and enables the drill to be operated at any desired elevation.

With the above and other objects in view the invention consists in the construction, combination and arrangement of devices hereinafter described and claimed.

In the accompanying drawings:—

Figure 1 is a side elevation of a rock and coal drill constructed and arranged in accordance with my invention and showing the same set up ready for operation.

Fig. 2 is a vertical sectional view of a portion of the same on a larger scale.

Fig. 3 is an elevation of the same, partly in section on a plane at right-angles to that of Fig. 2.

Fig. 4 is a horizontal sectional view on the plane indicated by the line 4—4 of Fig. 1.

Fig. 5 is a similar view on the plane indicated by the line 5—5 of Fig. 1.

Fig. 6 is a detailed sectional view of the base and the lower portion of the main frame.

Fig. 7 is a similar view of the head and the upper portion of the upper member of the main frame.

Figs. 8 to 14, inclusive are detailed views.

The main frame 1 which serves as a stanchion to support the drilling machine and which is adapted to be arranged vertically in a mine and between the floor and roof of the mine, comprises a lower member 2 and an upper member 3. The lower member is provided at its lower end with vertical openings 4 which receive tenons or studs 5 which project upwardly from the base 6. A bolt 7 passes transversely through an opening near the lower end of the frame member 2 and through openings in the tenons and studs and coacts with the tenons or studs to securely detachably fasten the lower end of the main frame member 2 to the base. The base is provided at the corners with downwardly extending legs 7′, which have pointed lower ends to engage the floor of the mine.

The upper member 3 is provided at the lower end with downwardly extending guide bars 8 which operate in vertical openings in the upper end of the frame member 2. The upper ends of said guide bars are detachably fitted in openings in the lower end of the member 3 and are secured to said member by bolts 9. Hence the member 3 is connected to the member 2 for vertical movement to enable the frame, comprising the members 2 and 3, to be lengthened or shortened as required by the height of the mine in which the drill is used.

A vertically arranged adjusting screw 10 engages a threaded opening in the center of the upper end of the member 2. The upper portion of said screw forms a shaft 11 which is mounted in a bearing 12 in the bottom of the member 3 and also in a bearing 13 which is detachably secured in said member 3 by bolts 14. A beveled gear 15 is secured near the upper end of the screw shaft 11 and is engaged by a similar gear 16 on a shaft 17, which shaft is mounted in bearings in a pair of plates or bars 18 which are secured to and extend transversely across the frame member 3 at opposite sides of the latter. A hand crank 19 is provided which may be attached to the shaft 17 and turned to cause the gears to rotate the screw 10 and hence cause said screw to adjust the frame member 3 vertically as may be required by the height of the mine. A head 20 which is identical in construction with the base 5 and which has upwardly extending pointed legs 21 to engage the mine roof is detachably secured to the upper end of the frame member 3 by tenons or studs 22 which

engage in openings in the upper end of the member 3 and are secured to said member by a bolt 23.

When it is necessary to still further increase the length or height of the main frame a sectional frame member 24 is employed which is secured on the upper end of the member 3 by studs or tenons 25', the head having been removed from the upper end of the member 3 and secured by its studs or tenons on the upper end of the member 24.

The lower frame member 2 is provided with a vertical slot 25 in each side and is also provided on each side with a rack 26. The racks are detachably secured in place by bolts 27. A carriage 28 has its vertical sides 29 slidably arranged on the outer surfaces of the sides of the member 2 and is provided at its upper end with horizontally arranged arms 30 each of which has a vertical slot 31 to clear and receive one side of the frame member 2 and open at the front end. A cross yoke or bar 32 connects the arms 30 together, bears against the front side of the frame member 2 and is detachably secured to the arms 30 of the carriage by a bolt 33. A bolt 34 connects the sides of the carriage, passes through openings therein and also passes through the slots 25 so that the carriage is mounted on the lower member of the main frame for vertical adjustment. A vertical series of openings 35 are provided in the sides of the carriage for the bolt 34 to permit vertical adjustment of said bolt with respect to the carriage. The lower ends of the sides of the carriage are provided with openings for the reception of the reduced ends of a cross bar 36. Said cross bar passes through and is slidably movable in the slots 25 and carries a screw 37 which is employed to adjust the drill frame angularly in a vertical plane and to hold the drill frame at any required adjustment.

The drill frame 38 is slidably arranged between the sides of the lower frame member 2 and is provided on its front side near its upper end with bearings 39 through which the bolt 34 extends said bolt serving as the supporting pivot for the drill frame. The rear end of the adjusting screw 37 bears against the front side of the drill frame.

The front and rear sides of the drill frame are spaced apart and are connected together at their upper and lower ends by blocks 39' which are secured by bolts 40. A screw shaft 41 for operating the drill or auger 42 passes through and is longitudinally and revolubly mounted in unthreaded openings in the front and rear sides of the drill frame and also passes through and engages threaded openings in members 43 which are secured by bolts 44 to the front and rear sides of the drill frame. A spur gear 45 is splined on the screw shaft 41 as at 46 for rotation with the screw shaft and to permit the screw shaft to move longitudinally through said gears. The gear has a hub which is mounted in a bearing 47 with which the rear side of the drill frame is provided. A shaft 48 is arranged below and parallel with the drill shaft and is mounted in bearings 49 which are bolted to the front and rear sides of the drill frame. A gear 50 which engages the gear 45, is fast on the shaft 49, a worm gear 51 is also fast on said shaft. Said worm gear is engaged by a worm 52 on a shaft 53, which shaft is mounted in bearings 54 which are bolted to the inner side of the rear side of the drill frame. A suitable hand crank 55 may be attached to said shaft and used to manually turn the latter and hence cause the worm, worm gear and the gears 50, 45 to rotate the drill screw shaft. Hence the drill or auger may be turned as required to drill or bore in the rock or coal and owing to the provision of the threaded members 43 with which said shaft 41 is threadedly engaged and the provision of the splined mounting of the gear 45 on said shaft, said shaft will also be movable longitudinally as required to feed the drill or auger to the work. The drill or auger may be arranged to work at any desired inclination or horizontally by appropriately adjusting the drill frame by means of the hand screw 37.

To move the carriage and hence also the drill frame and the drill operating mechanism up or down on the main frame member 2 as may be required I provide a shaft 57 which is mounted in bearings in the arms 30 of the carriage and is provided with pinions 58 which engage the racks. A suitable hand crank 59 is provided for this shaft to enable it to be manually turned. To secure the carriage at any desired elevation I provide a vertically arranged screw 60 which engages a threaded opening in a bearing 61 on one side of the top of the carriage. Said screw may be engaged with or disengaged from a stop gear 62 with which the shaft 57 is provided.

While I have herein shown and described a preferred form of my invention I would have it understood that changes may be made in the form, proportion and construction of the several parts, without departing from the spirit of my invention and within the scope of the appended claims.

Having thus described my invention, what I claim is:—

1. In a drilling machine of the class described, a main frame having side members each provided with a longitudinal slot, a carriage mounted for longitudinal movement on the sides of the main frame, a drill frame arranged for movement between the sides of the main frame and a pivot for the drill frame extending through and arranged for movement in the slots of the side mem-

bers of the main frame and attached to the carriage.

2. In a drilling machine of the class described, a main frame having spaced side members each provided with a longitudinal slot and also with a rack, a carriage mounted for longitudinal movement on the main frame, a drill frame arranged between the sides of the main frame and pivotally connected to and carried by the carriage, the pivot which connects the carriage and the drill frame extending through and being arranged to operate in the said slots, a shaft mounted in the carriage and having gears engaging the racks, means to turn said shaft and means carried by the carriage to angularly adjust and hold the drill frame.

In testimony whereof I affix my signature.

MILFORD SHINGLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."