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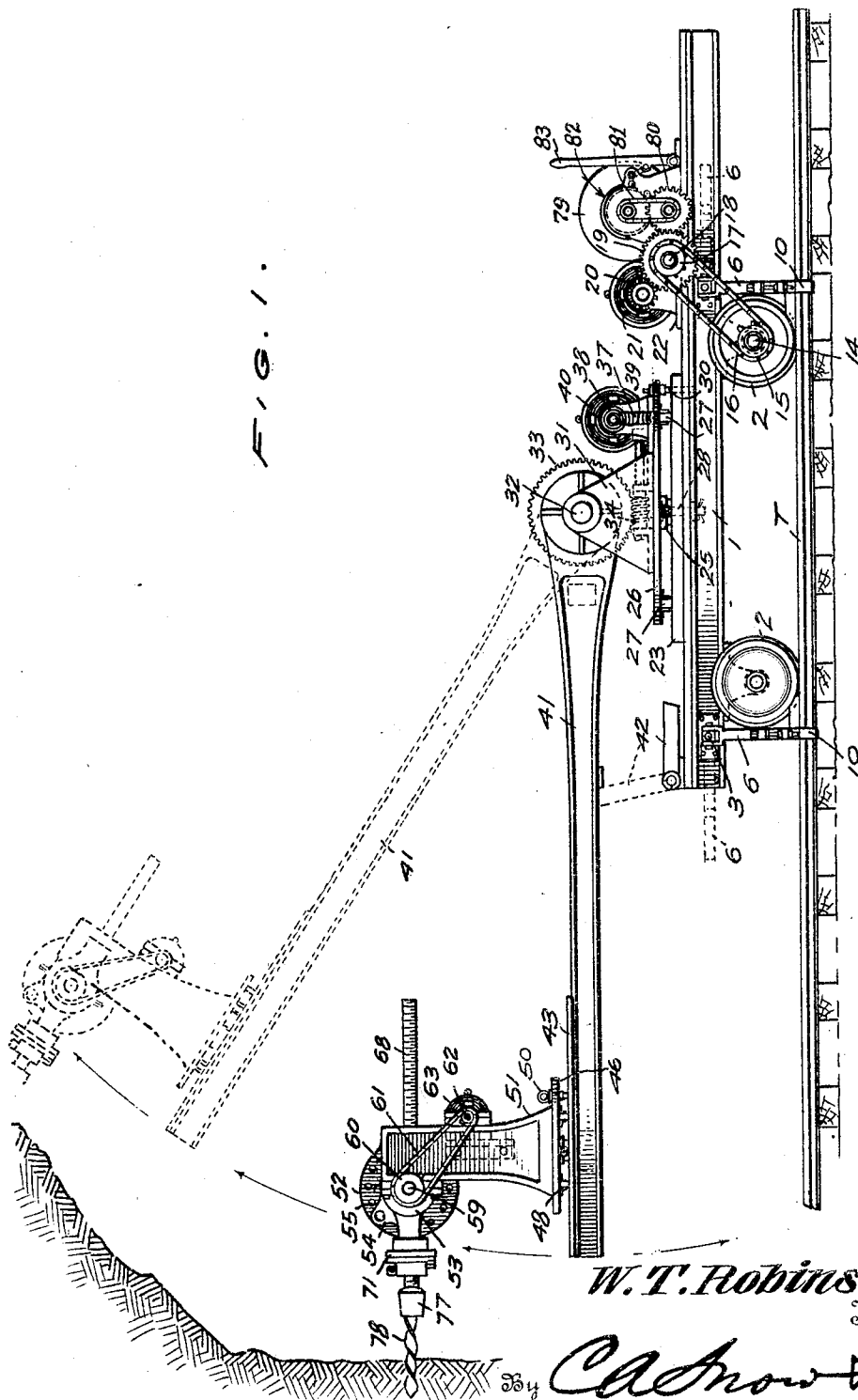
W. T. ROBINSON

1,885,295

MINING MACHINE

Filed Dec. 14, 1929

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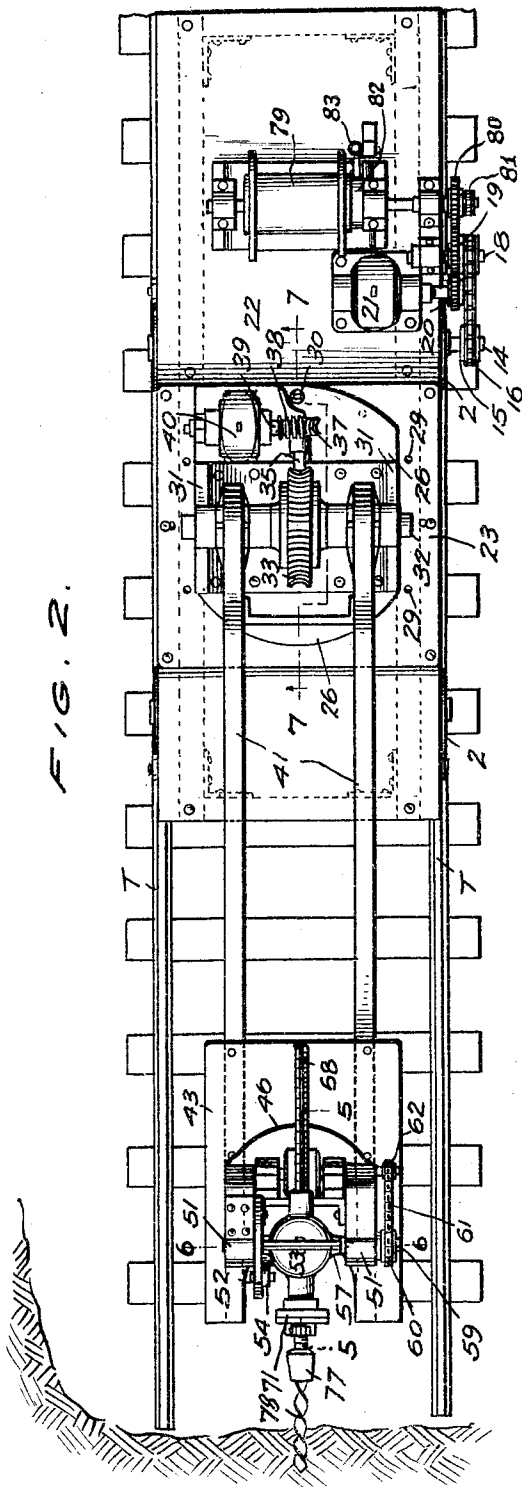


FIG. 4.

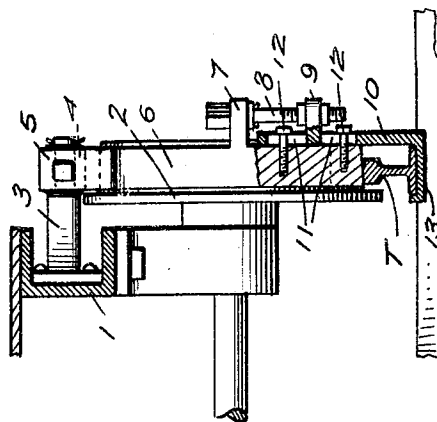
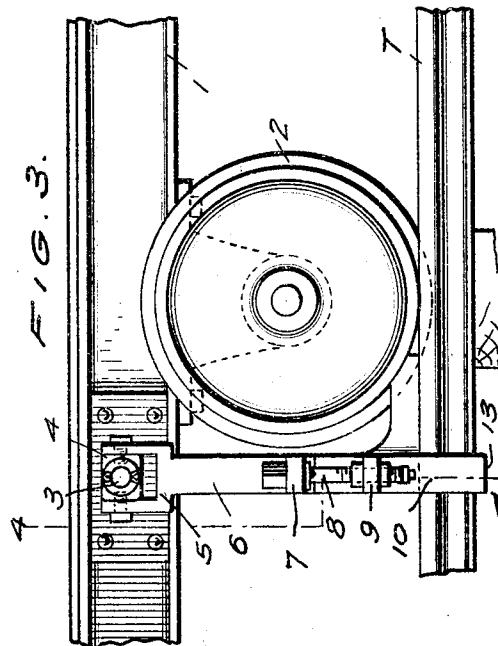


FIG. 3.



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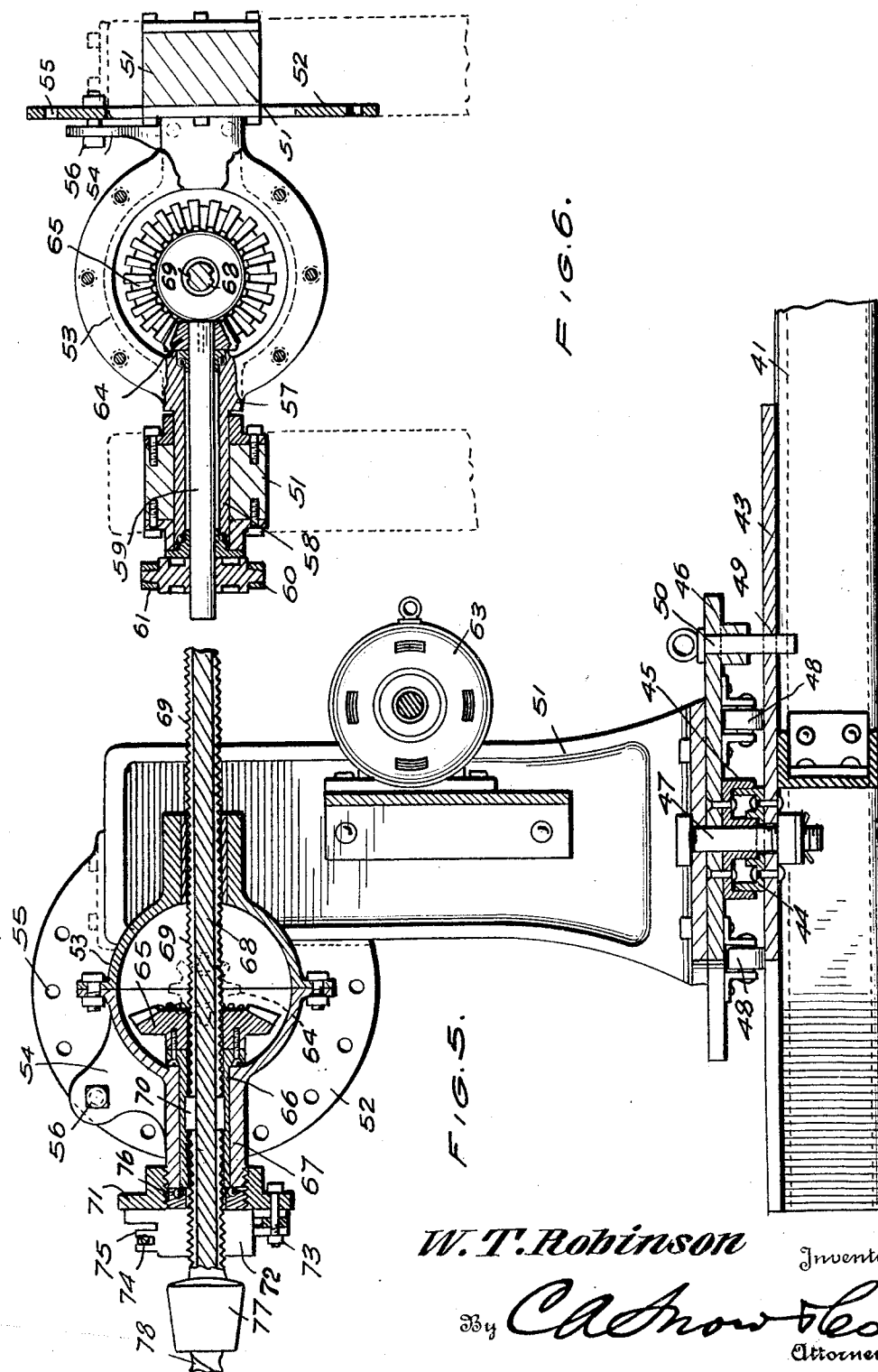
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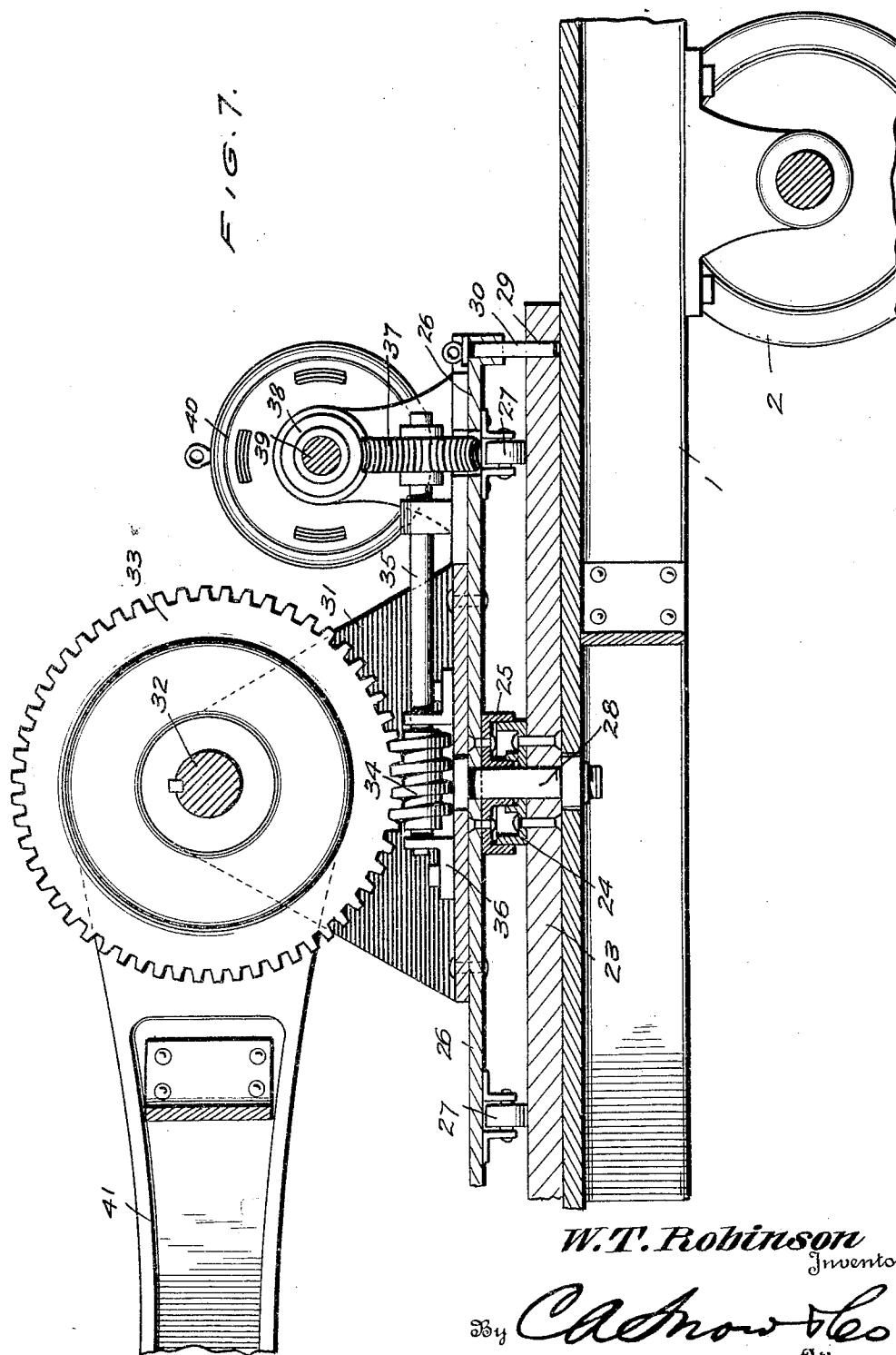
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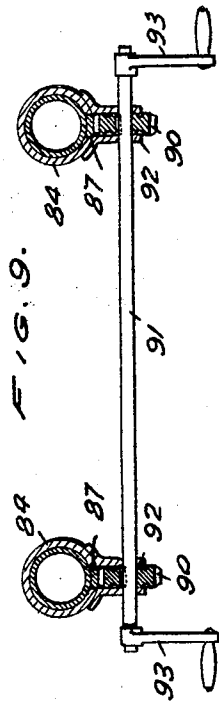


FIG. 8.

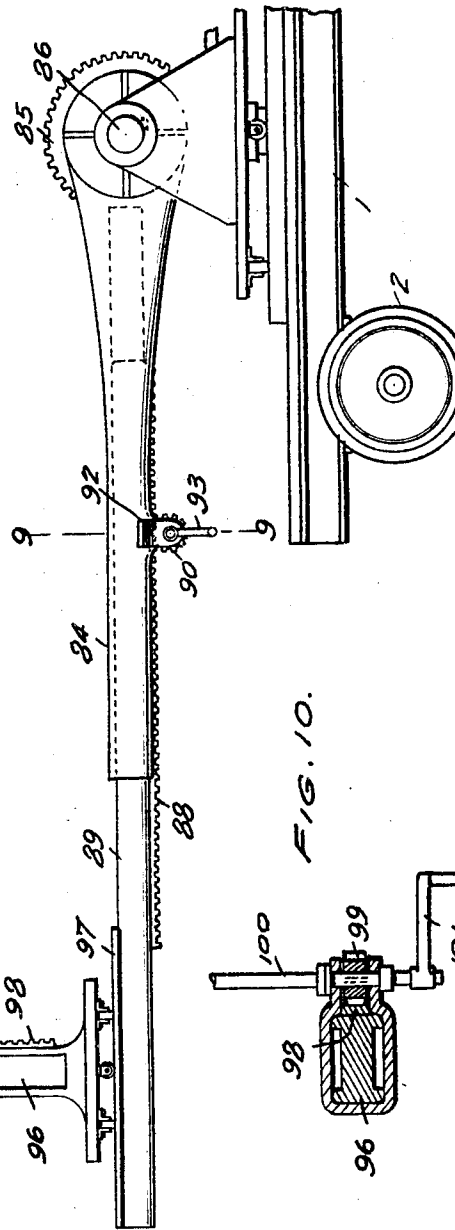
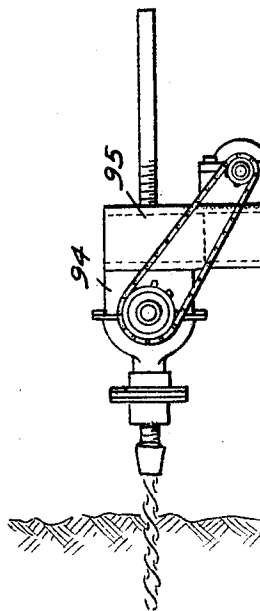
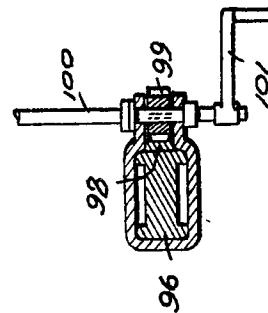


FIG. 10.



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UNITED STATES PATENT OFFICE

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MINING MACHINE

Application filed December 14, 1929. Serial No. 414,107.

This invention relates to a mining machine and while it is particularly useful for mining coal, it can also be employed advantageously in drilling rock.

5 One of the objects of the invention is to provide drilling mechanism carried by a truck which can be moved at will along the supporting surface, the drilling mechanism being so supported as to be readily adjusted to bore in any direction and at any desired elevation.

Another object is to provide simple and efficient means for adjusting the mechanism of the machine.

15 A further object is to provide a machine of this character having its drilling mechanism carried by an angularly adjustable boom.

A still further object is to provide a mining machine which can be used in either a narrow or a wide space within a mine.

20 With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred forms of the invention have been shown.

35 In said drawings,

Figure 1 is a side elevation of the machine, one of the positions of the drilling mechanism being indicated by broken lines.

Figure 2 is a top plan view.

40 Figure 3 is an enlarged side elevation of one of the means employed for anchoring the machine to a supporting track.

Figure 4 is a section on line 4—4, Figure 3.

45 Figure 5 is an enlarged section on line 5—5, Figure 2.

Figure 6 is an enlarged section on line 6—6, Figure 2.

Figure 7 is an enlarged section on line 7—7, Figure 2.

50 Figure 8 is a side elevation of a portion of

a modified form of machine utilizing an extensible or telescopic boom.

Figure 9 is a section on line 9—9, Figure 8, said section being on an enlarged scale.

Figure 10 is an enlarged section on line 10—10, Figure 8.

Referring to the figures by characters of reference, 1 designates the frame of a carriage supported by wheels 2 which, in turn, are adapted to travel along a track T. To each side of the frame 1 are attached studs 3. Each stud has a block 4 rotatably mounted thereon and to each block is pivotally connected the forked end 5 of a bar 6. This bar has an ear 7 in which is swivelled an adjusting bolt 8. The bolt is in threaded engagement with an ear 9 extending outwardly from a slide 10. Slots 11 are formed in the slide for the reception of guide bolts 12 projecting from bar 6. Slide 10 has a foot 13 adapted to be extended under one of the rails of the track T and by rotating the bolt 8 said rail can be gripped between the lower end of bar 6 and the foot 13. By providing several of these anchoring devices, the frame 1 can be held fixedly to the track. When it is desired to move the carriage, the slides 10 are lowered to disengage their feet from the track and thereafter bars 6 and the parts carried thereby can be swung upwardly out of the way as shown by broken lines in Figure 1.

Any suitable means may be employed for actuating the carriage. For example, two of the wheels 2 can be fixedly secured to their axle 14 and a sprocket 15, which is fast on said axle, can be driven through a chain 16 from a sprocket 17 on a countershaft 18. Motion is transmitted to the countershaft through gears 19 and 20 from a motor 21 secured on a platform 22 located on the rear portion of frame 1. This drive mechanism can be controlled by any suitable mechanism and it is not deemed necessary to show or describe the same.

Secured on the frame 1 above the space between the wheels 2 is a base 23 to the central portion of which is fastened a centering disk or swivel member 24. This member is embraced by another centering disk or swivel member 25 secured to and depending from

the central portion of a table 26 which is provided with supporting wheels 27 adapted to travel on the base 23. A king bolt 28 extends through the center of the table and the centers of the swivel members 25 and 24, this bolt being secured in the base 23 and serving to hold the table properly assembled with the base and with the frame 1.

A circular series of apertures 29 is formed in base 23 concentric with the king bolt 28 and any one of these apertures is adapted to receive a locking pin 30 movably connected to the table 26. Thus it will be seen that the table can be rotated to any desired position and thereafter held against further movement, it being necessary merely to drop pin 30 into the aperture 29 thereunder.

Table 26 has upwardly extending bearing members 31 in which is journaled a shaft 32. To this shaft is secured a large gear 33 which is constantly in mesh with a worm 34 carried by a shaft 35. This shaft is journaled in bearings 36 provided therefor on the table and it has a worm gear 37 adapted to be actuated by a worm 38 carried by the shaft 39 of an electric motor 40. Thus it will be seen that by controlling a circuit to the motor the gear 33 can be rotated at will and at a slow speed.

Fixedly secured to the shaft 32 so as to rotate therewith is a boom 41 which, as shown particularly in Figure 2, can be in the form of an elongated frame. When gear 33 and shaft 32 are actuated as heretofore explained, this boom can be swung upwardly or downwardly relative to the carriage and as indicated by arrows in Figure 1.

While the carriage is being moved from place to place, the boom can be supported substantially in a horizontal position by means of a pivoted prop 42 carried by frame 1 and adapted to engage the bottom portion of the boom as shown by broken lines in Figure 1.

Secured on the outer portion of boom 41 is a base 43 on which is arranged a centering disk or swivel member 44 extending into and movably engaged by an upper centering disk 45 attached to and depending from a table 46. A king bolt 47 extends through the table and through the centering members and serves to hold these parts assembled with the base 43.

Wheels 48 are connected to the table 46 and adapted to travel on the base 43. An annular series of apertures 49 concentric with king bolt 47 is formed in base 43 and any one of these is adapted to receive a locking pin 50 extending through table 46 so that said table can thus be held in any position to which it may have been rotated.

A pedestal 51 is secured to the table 46 and has a segmental flange 52 secured to one side portion thereof. Suspended between the sides of the pedestal is a gear housing 53 which can be formed of separable members as shown and extending from this housing is an ear 54. A series of apertures 55 is provided

in flange 52 and any one of these is adapted to receive a bolt 56 extending from the ear.

A trunnion 57 is extended from one side of the housing 53 and journaled in one side portion of pedestal 51. Alining with this trunnion and extending from the other side of the housing is a tubular trunnion 58 journaled in the adjacent side of the pedestal. In this tubular trunnion is journaled a shaft 59 having a sprocket 60 at its outer end adapted to receive motion through a chain 61 from a sprocket 62 secured to the shaft of a motor 63. This motor is mounted between the side portions of the pedestal and its operation can be controlled by any suitable means provided for that purpose.

Secured to that end of shaft 59 within housing 53 is a beveled gear 64 which meshes with a large beveled gear 65. This gear is secured to one end of a sleeve 66 journaled in a bearing extension 67 on the housing.

A screw-threaded shaft 68, constituting a feed screw, is slidably mounted in gear 65 and sleeve 66. This shaft has one or more longitudinal keyways 69 into each of which projects a key 70 carried by sleeve 66. Thus while the shaft is caused to rotate with the sleeve and with gear 65, it is also free to move longitudinally relative thereto.

An annular flange 71 is provided at the outer ends of bearing extension 67. To this flange are secured the opposed members 72 of a split feed nut. These members are pivotally connected by a bolt 73 which serves to attach them to flange 71. Members 72 can be drawn together by a bolt 74 extending through slotted ears 75 carried by the members. Thus the feed nut can be tightened about the feed screw so that when the screw is rotated it will be fed forwardly. By releasing bolt 74, however, the members of the feed nut can be swung apart out of engagement with screw 68 to permit quick sliding movement of the screw. A thrust bearing formed of balls or the like indicated at 76 can be interposed between the feed nut and the bearing extension 67.

The outer end of the feed screw or shaft 68 can be provided with any suitable form of clutch 77 for engaging one end of a drill 78.

Instead of actuating the boom 41 by means of gear 33 and the parts cooperating therewith, a reel 79 can be mounted on the carriage. A gear 80 which receives motion from gear 19, is adapted to drive chain and sprocket mechanism indicated generally at 81 whereby motion may be transmitted to a clutch member 82. By means of a hand lever 83 and any suitable mechanism controlled thereby, the actuation of the wheel can be kept under the control of the operator.

Reel 79 can be connected by a cable (not shown) to the boom so that when the reel is rotated, the boom can be caused to move upwardly or downwardly to bring the drill-

ing mechanism into proper position. As before explained this reel is to be used instead of the adjusting mechanism shown for example in Figure 7.

5 In practice the machine is moved along the track T until brought close to the place where the drilling operation is to be carried out. Boom 41 is adjusted angularly and thereafter the housing 53 is rotated about its transverse
10 axis to bring drill 78 to the correct angle relative to the material to be drilled. By means of bolt 56 the housing is locked against further movement. Motor 63 is then actuated to drive shaft 59 so that motion will be transmitted
15 through gears 64 and 65 to sleeve 66. As the feed shaft 68 rotates with the sleeve it will move forwardly through the feed nut and advance drill 78 slowly as it rotates. Following the drilling operation, the nut 72 is
20 opened, drill 78 and shaft 68 are slid backwardly and the nut then closed onto the shaft. The parts are thus reset to repeat the operation before described.

Importance is attached to the fact that the
25 drill can be adjusted angularly in a vertical plane relative to the pedestal 51 and that the pedestal can be adjusted about its king bolt 47. Thus it is possible, in combination with the angular adjustment of the boom, to bring the
30 drill to any desired position.

Instead of forming the boom of a non-extensible frame as heretofore described, it can be made extensible or telescopic as shown in Figures 8 and 9. In this modified structure,
35 the boom includes spaced tubular members 84 mounted to swing with gear 85 and its shaft 86. These tubular members have longitudinal slots 87 in which slide rack bars 88 arranged longitudinally along slidable boom members
40 89 which are located in the members 84. Racks 88 engage gears 90 carried by a shaft 91 extending transversely of the boom and supported by bearing members 92 depending from the frame members 84. By means of a
45 crank arm 93 or the like shaft 91 and gears 90 can be rotated to shift the members 89 longitudinally relative to members 84, thereby to increase or reduce the length of the boom.

If desired, and as shown in Figures 8 and
50 10, the drilling mechanism indicated generally at 94 can be mounted on a slidable structure 95. This structure is mounted on and guided by a pedestal 96 adjustably mounted on a base 97 at the outer end of the
55 boom. The pedestal, which can be formed of spaced side members, has rack bars 98 arranged longitudinally of each side member. These rack bars are engaged by gears 99 secured to a shaft 100. By means of a crank
60 arm 101 or the like, the shaft can be rotated to raise or lower the structure 95 relative to the pedestal.

Obviously, any suitable means can be employed for holding the structure 95 and the
65 slidable members 89 against movement after

they have been adjusted. Such means are well-known to the skilled mechanic and it is not deemed necessary to illustrate or describe the same.

What is claimed is:

In a machine of the class described a carriage, a base fixed on the carriage, a centrally pivoted table supported for rolling engagement with the base, a motor supported by
70 and rotatable with the table, a gear supported above and rotatable with the table, an extensible boom movable with the gear for vertical swinging movement, means on the table and driven by the motor for rotating the gear, a base fixedly carried by the free end
80 portion of the boom, a vertically extensible pedestal supported on the base and mounted for rotation thereon about an axis perpendicular to the base, a drilling mechanism adjustable angularly on the pedestal, and motor
85 driven means on the pedestal for operating said drilling mechanism while in any angular position.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.
90 WILLIAM THOMAS ROBINSON.

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