Feb. 19, 1935. L. F. PARKER 1,992,129

APPARATUS FOR ROCK TUNNELING

Filed April 3, 1933 3 Sheets-Sheet 1

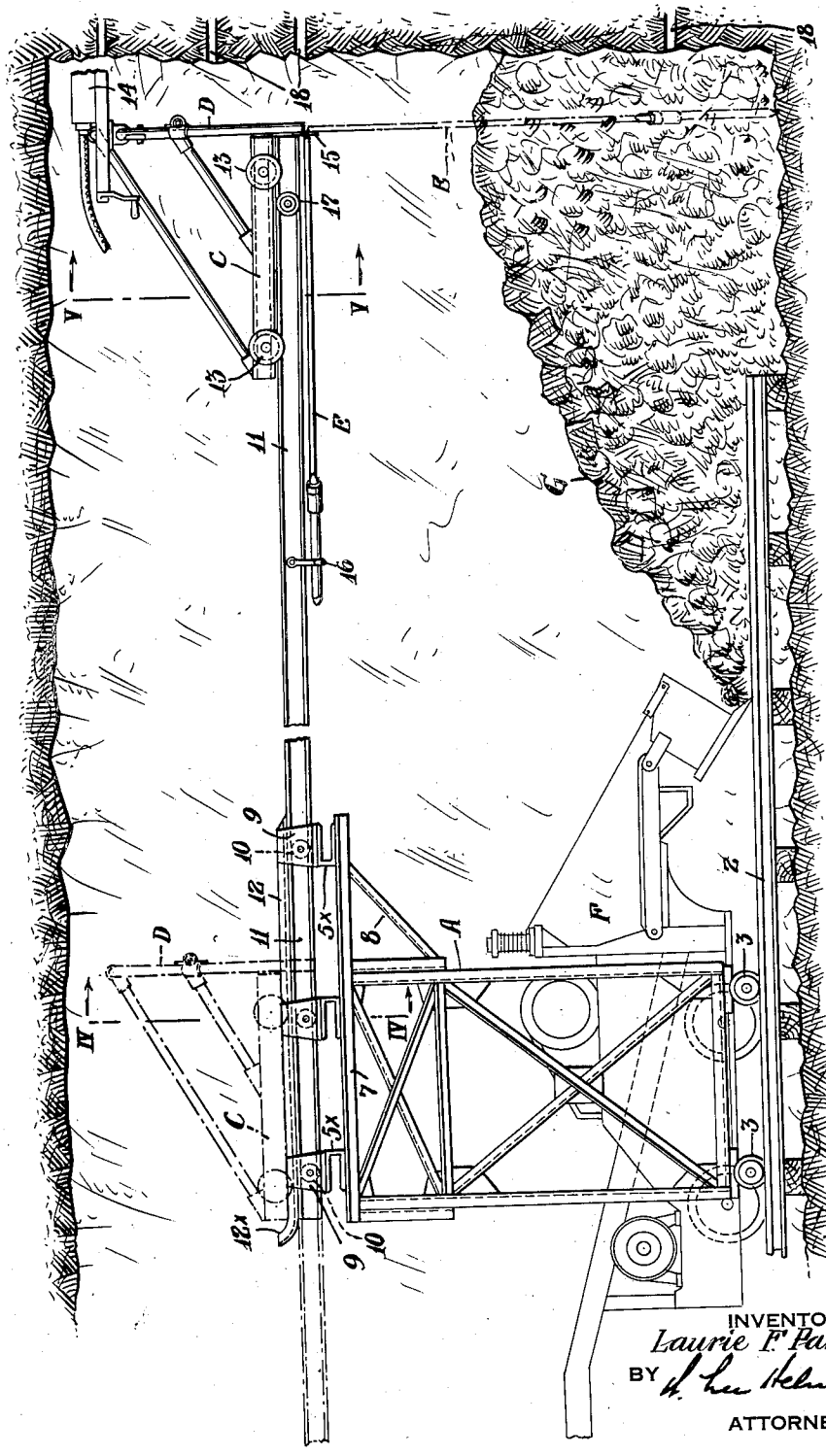


FIG. 1

INVENTOR-
Laurie F. Parker
BY H. Lee Helms
ATTORNEY-

Feb. 19, 1935. L. F. PARKER 1,992,129

APPARATUS FOR ROCK TUNNELING

Filed April 3, 1933 3 Sheets-Sheet 2

FIG. 3

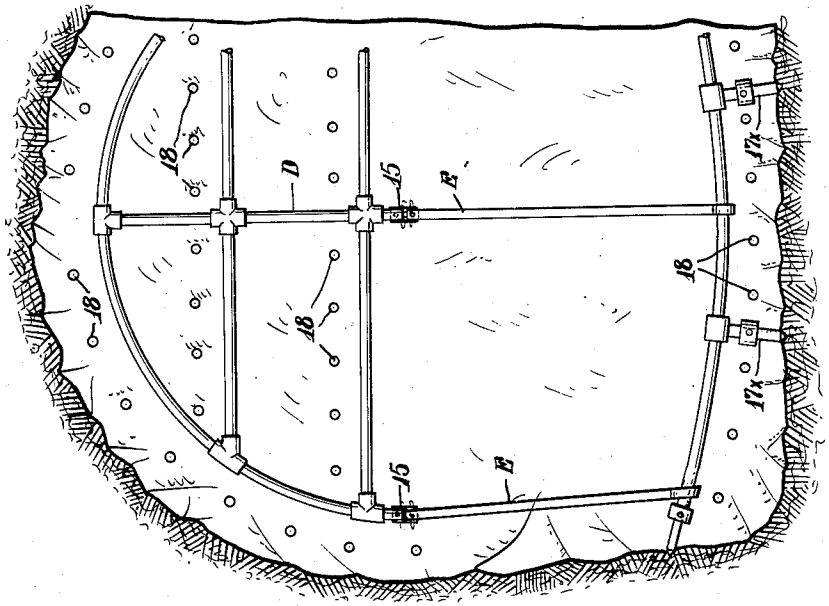
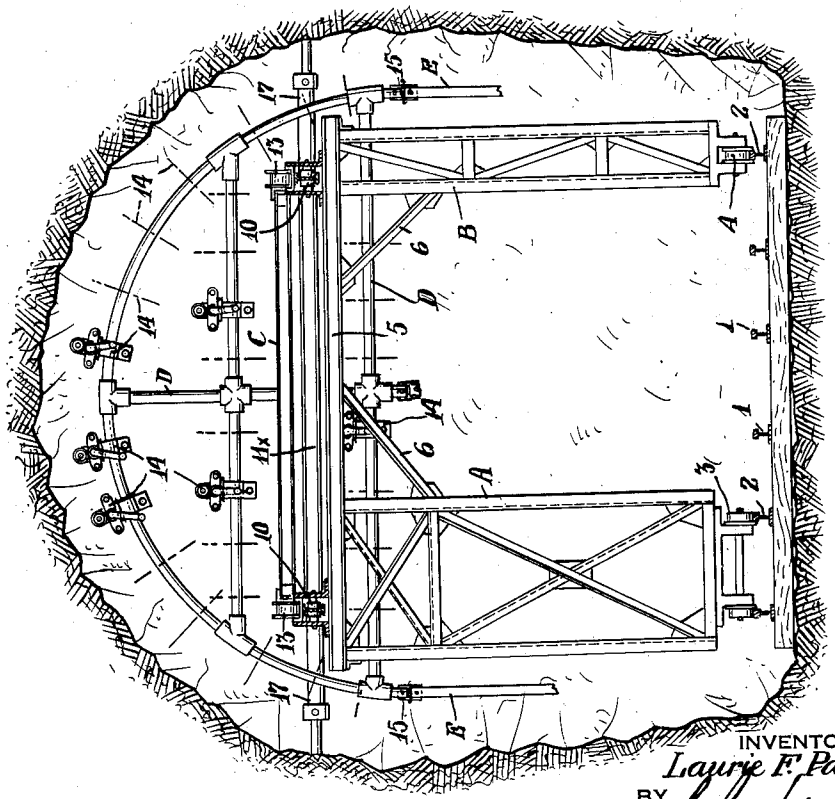


FIG. 2



INVENTOR-
Laurie F. Parker
BY
ATTORNEY-

Feb. 19, 1935. L. F. PARKER 1,992,129

APPARATUS FOR ROCK TUNNELING

Filed April 3, 1933 3 Sheets-Sheet 3

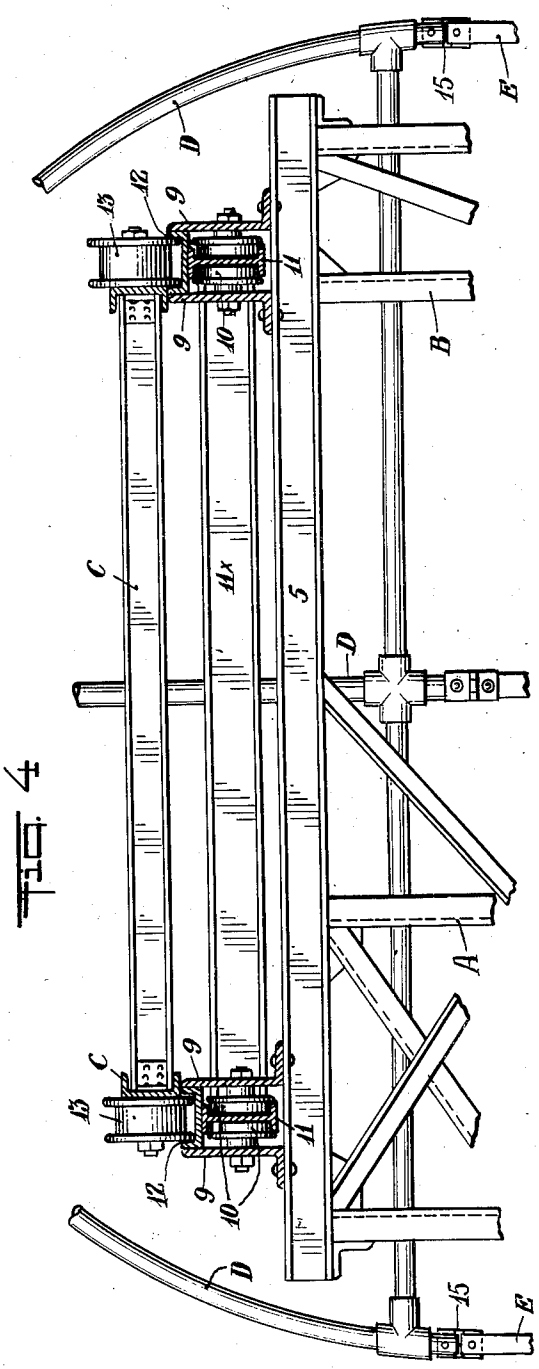


FIG. 4

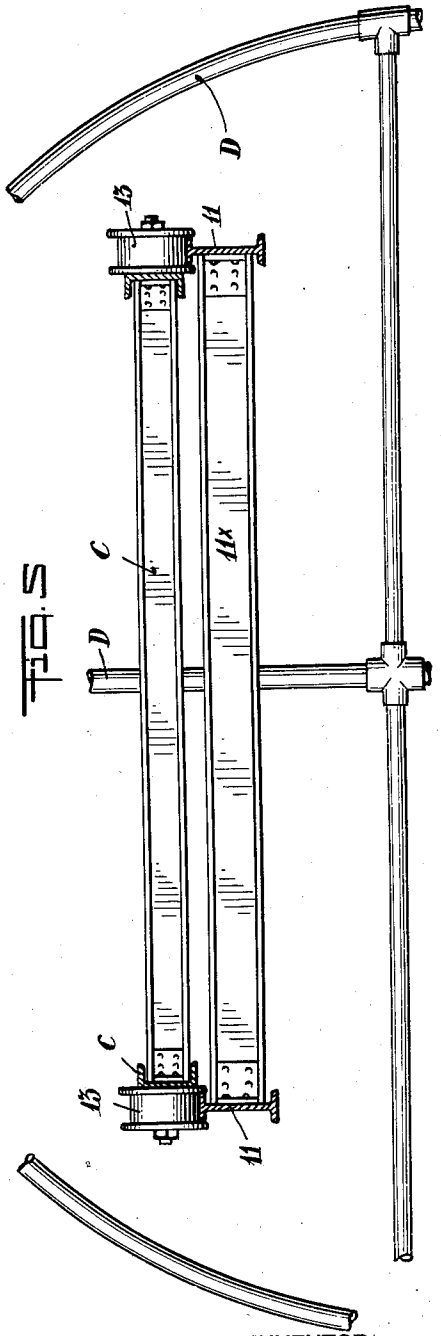


FIG. 5

INVENTOR-
Laurie F. Parker
BY
ATTORNEY-

Patented Feb. 19, 1935 1,992,129

UNITED STATES PATENT OFFICE

1,992,129

APPARATUS FOR ROCK TUNNELING

Laurie F. Parker, Stamford, Conn., assignor to Silas Mason Company, Inc., East Boston, Mass., a corporation of Delaware

Application April 3, 1933, Serial No. 664,169

6 Claims. (Cl. 255—51)

The object of the present invention is to provide a method and apparatus for rock tunneling by means of which the operations of drilling and muck pile removing may be simultaneously effected thus saving great time and enabling the projecting of the tunnel in substantially less time than under existing methods.

The invention will be described with reference to the accompanying drawings, in which

Fig. 1 is a longitudinal sectional elevation of a rock tunnel showing apparatus in position for carrying out the method.

Fig. 2 is a transverse vertical section of the tunnel at the rear of the apparatus with the mucking machine removed, a plurality of drills being shown on the drill rack and dotted lines indicating the positions of the remaining drills normally used.

Fig. 3 is a view similar to Fig. 2 showing as to apparatus the sectional drill rack only, with both sections thereof in operative position.

Fig. 4 is an enlarged transverse section on the line 4—4 Fig. 1.

Fig. 5 is an enlarged transverse section on the line 5—5 Fig. 1.

In rock tunneling in accordance with methods in common use, the drills are carried by a drill rack and positioned thereby for simultaneous operation, the rack being carried on tracks or skids for forward and rearward movement. After a drilling operation, the rack is moved far to the rear of the drilled rock face and is not again advanced until removal of the muck pile produced by the blast, the latter usually extending a considerable distance up the rock face and inclining downward therefrom to a point many feet distant. While the muck pile is being removed, the drills are idle. The present method saves this delay.

In the drawings I have shown an apparatus for carrying out the method. Referring to Fig. 2 it will be seen that I provide a center trackway 1 for a mucking machine, and trackways for a wheeled gantry. The gantry comprises a primary member A built up of vertical and horizontal beams and diagonally arranged reinforcing struts, bolted or welded together and mounted on wheels 3, and a similarly constructed secondary member B mounted on wheels 4 at the top thereof the members A and B are connected by transverse horizontal beams such as 5, suitably reinforced as by bracket arms 6. Each member A and B also carries at its top one or more longitudinal beams of which are forwardly projected as shown in Fig. 1, the projecting portions being reinforced as by diagonal bracket struts 8.

Bolted directly upon appropriate transverse beams 5, as shown in Fig. 4, or upon transverse U beams 5× as shown in Fig. 1, are two sets of opposed roller cages 9, each cage rotatably supporting two rollers 10, as shown in Fig. 4, each set of cages being in line and slidably supporting, by said rollers, an I beam 11.

Intermediate the sides of each set of roller cages 9, at the top thereof, there is welded a side-flanged carriage supporting plate 12 having its rear end up-turned at 12× to form a stop. This plate is adapted to initially support a wheeled carriage C for the sectional drill rack.

The drill carriage C is provided with flanged wheels 13, the flanges of which are adapted to over-ride I beam 11 when the carriage is moved forwardly beyond the front end of flanged plate 12, as indicated in Fig. 1. The drill carriage is connected to and supports the drill rack, the latter comprising an upper section D and a lower section E hinged thereto.

The upper section D of the drill rack is built up of an arcuate outer drill supporting member and transverse drill supporting members, a plurality of drills 14 being shown mounted in position thereon in Fig. 2, the dotted lines indicating the positions of additional drills. The lower section E of the drill rack is built up of arms hinged at 15 to the upper section and carrying an arcuate lower drill supporting member for drilling the lifter holes. The lower section may be swung upwardly to horizontal position as indicated in Fig. 1 and held by latch hooks as at 16, Fig. 1.

In Fig. 1, I have shown a known type of mucking machine at F having wheels mounted on tracks 1 and straddled by the gantrys A and B. Thus the mucking machine may be operated without interfering with the positioning of the gantrys and the operation of the drilling apparatus, as indicated in said figure in conjunction with Fig. 2.

In the operation of the apparatus, following the formation of a muck pile, as indicated at G, Fig. 1, the mucking machine and gantrys may be simultaneously run into operative position. At such time the extension beams 11 will be retracted and carriage C will rest upon supporting plate 12. Thus the beams will be free from the weight of the carriage and drill rig and may be projected to the position shown in Fig. 1. The carriage may then be moved forwardly until it leaves supporting plate 12 and rides upon the extension beams 11 to operative position, but preparatory thereto

jacks carried by the extension beams as at 17, Fig. 1, will be operated to clamp the extension beams to the sides of the tunnel so as to relieve the roller cages from unnecessary leverage. Intermediate the beams 11 may be secured a cross reinforcing strut 11×.

As the mucking machine operates to remove the muck pile the drills on the upper section will operate to drill the upper blasting holes, and this may be completed by the time the pile is cleared away. The lower drill rack section E will then be lowered and the lifter holes at 18 drilled, the said section being held in the meanwhile by jacks 17×.

After the drilling is completed, carriage C will be rolled back to supporting plate 12, while the beams 11 are held firmly at their front ends by jacks 17. The jacks will then be released and the beams moved rearwardly. To prevent tilting of the gantrys, one or both may be loaded with ballast.

The drilling being completed the gantrys and mucking machine may be moved rearwardly on their tracks and covered with a blanket to await the blasting operation.

It will be understood that various modifications may be made in the form and arrangement of the elements illustrated in the drawings without departing from the spirit of the invention.

Having described my invention, what I claim and desire to secure by Letters Patent, is as follows.—

1. In apparatus for rock tunneling, a movable support, spaced beams, roller connections intermediate said beams and the support, a carriage, a drill rack supported by the carriage, the carriage being mounted upon and movable endwise of said beams.

2. In apparatus for rock tunneling, a gantry, spaced beams, bearing members supporting said beams and mounted upon the top of the gantry whereby the beams may be given endwise movement, a wheeled carriage mounted upon the beams and movable endwise thereof, and a drill rack mounted upon the wheeled carriage.

3. In apparatus for rock tunneling, a gantry, spaced beams, bearing members adapted to support said beams, the bearing members being mounted on the gantry, a supporting member carried by the gantry above the bearing members, a wheeled carriage mounted upon the beams for endwise movement thereon, a drill rack carried by the wheeled carriage, the carriage being movable from the beams to said supporting member to relieve the beams of the weight of the carriage when the beams are given a movement on said bearing members.

4. In apparatus for rock tunneling, a gantry, an extensible trackway carried by the gantry, a wheeled carriage on said trackway, and a drill rack carried by the wheeled carriage, said rack comprising an upper section and a lower section hinged thereto.

5. In apparatus for rock tunneling constructed in accordance with claim 4 in combination with means for holding the hinged section of the drill rack in retracted position during operation of the upper section of the rack.

6. In apparatus for rock tunneling, a primary gantry and a secondary gantry laterally spaced therefrom, frame members connecting the gantrys, bearing members carried upon said connecting frame members, beams extensibly supported by said bearing members, a wheeled carriage on said beams and a drill rack supported by said wheeled carriage.

LAURIE F. PARKER.