

No. 763,030.

PATENTED JUNE 21, 1904.

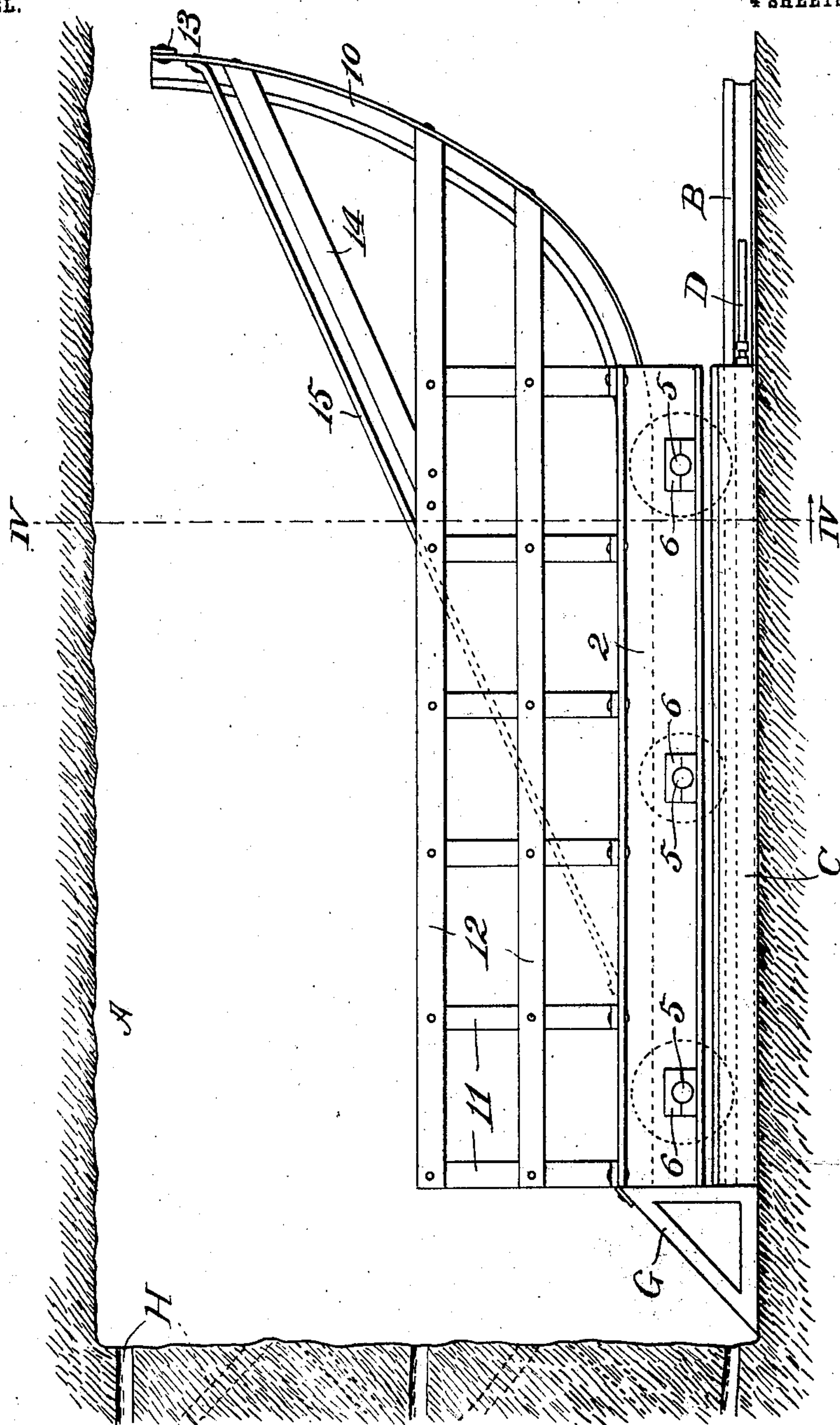
C. H. THOMPSON.  
MINING AND EXCAVATING APPARATUS.

APPLICATION FILED DEC. 15, 1902.

NO MODEL.

4 SHEETS—SHEET 1.

Fig. 1



Witnesses:

L. C. Healy  
Frederick D. Hyman

Inventor:

Charles Henry Thompson.

By J. O. W. Smed Bros.  
his attys.

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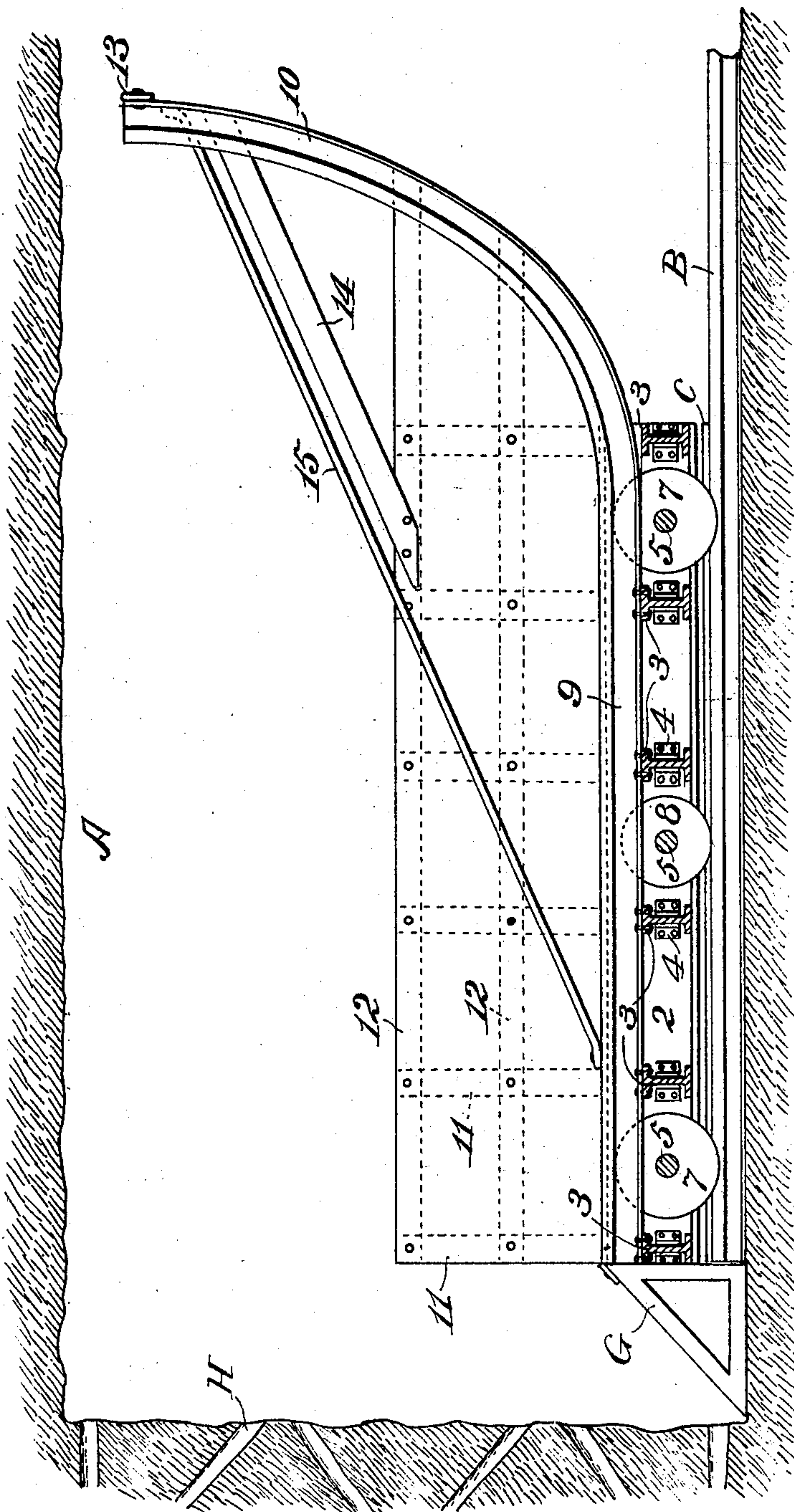
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NO MODEL.

4 SHEETS—SHEET 2.

Fig. II



Witnesses:

L. C. Kelly.

Frederick D. Hyman

Inventor:

Charles Henry Thompson.

Townsend Bros.  
his attys.



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4 SHEETS—SHEET 3.

Fig. III

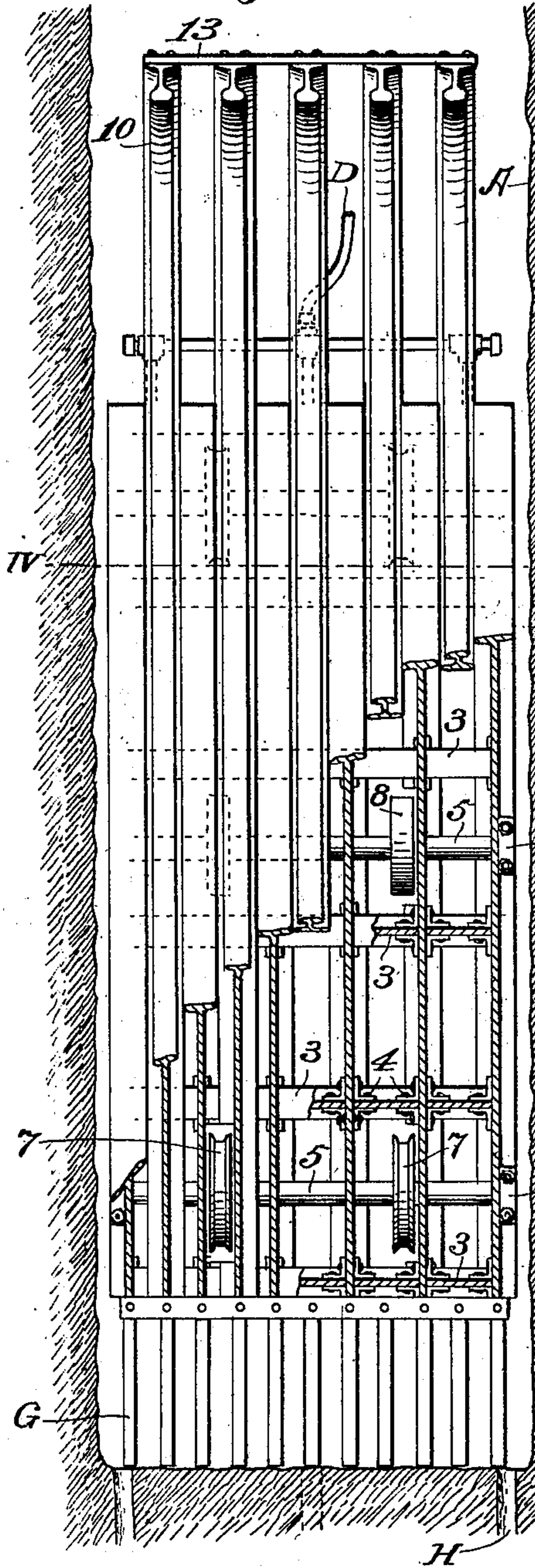


Fig. IV

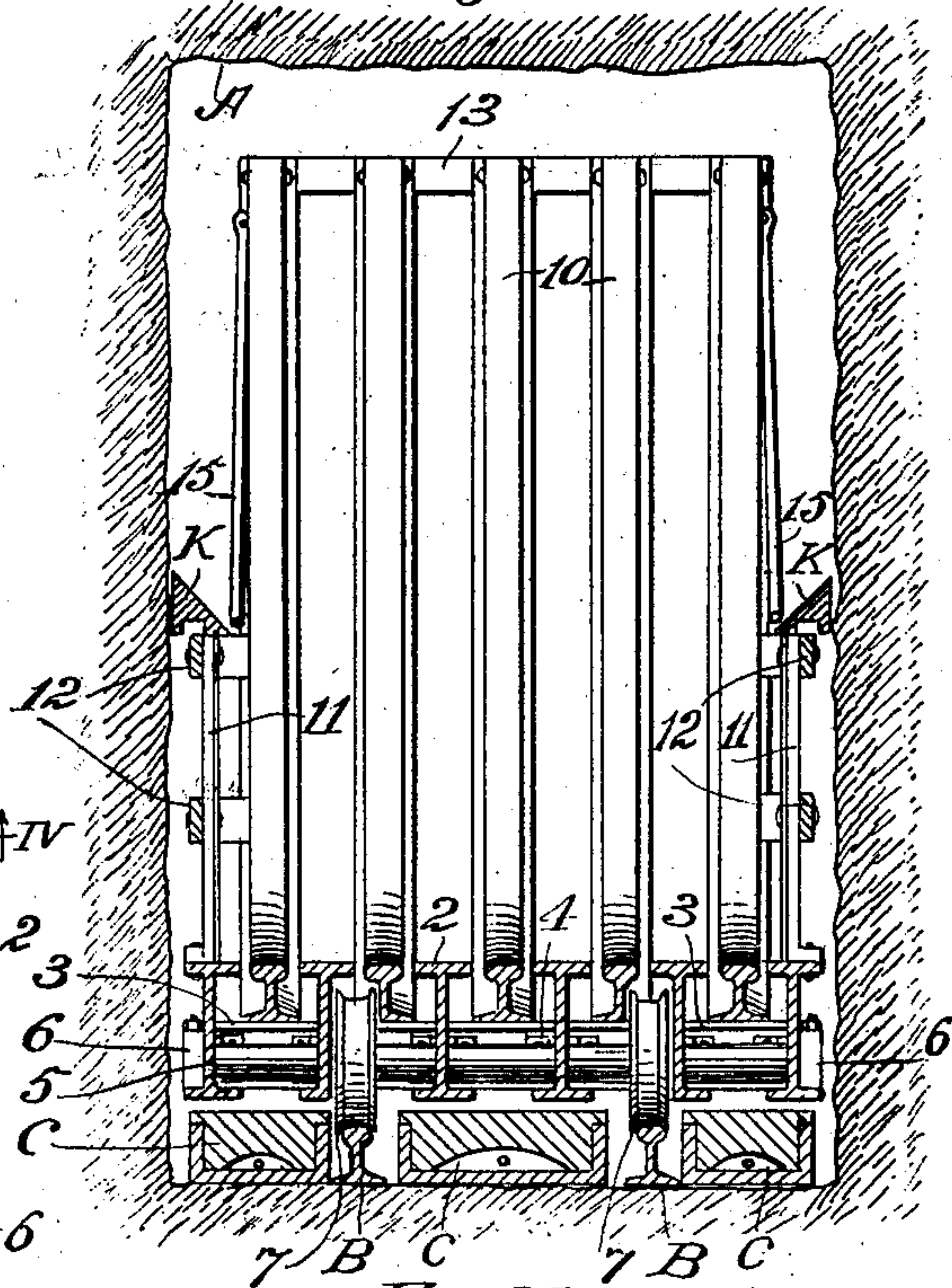
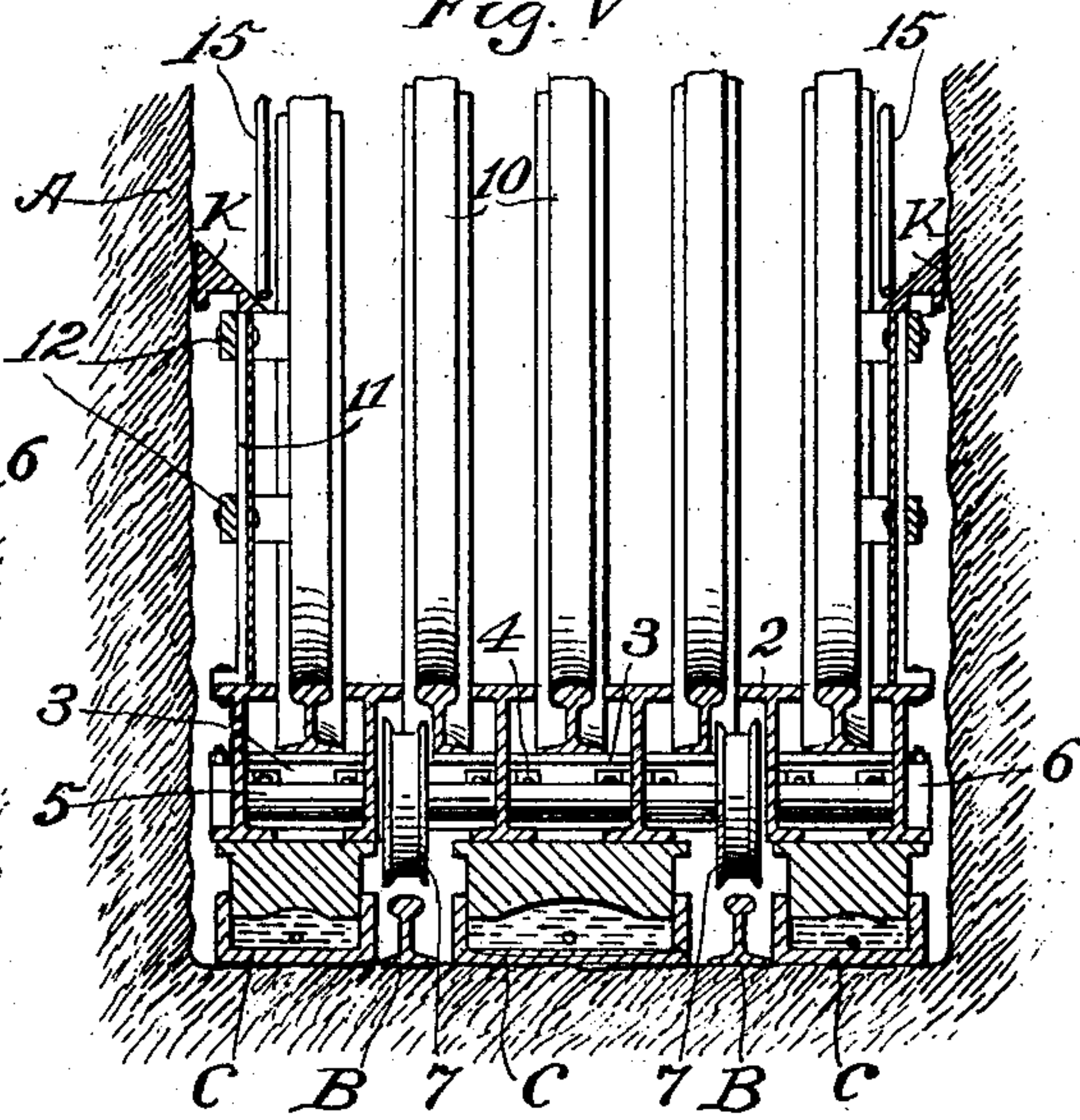


Fig. V



Witnesses:

*C. C. Holly*  
*Frederick D. Ryan*

Inventor:

Charles Henry Thompson.

*by Townsend Bros.*  
*his attys.*



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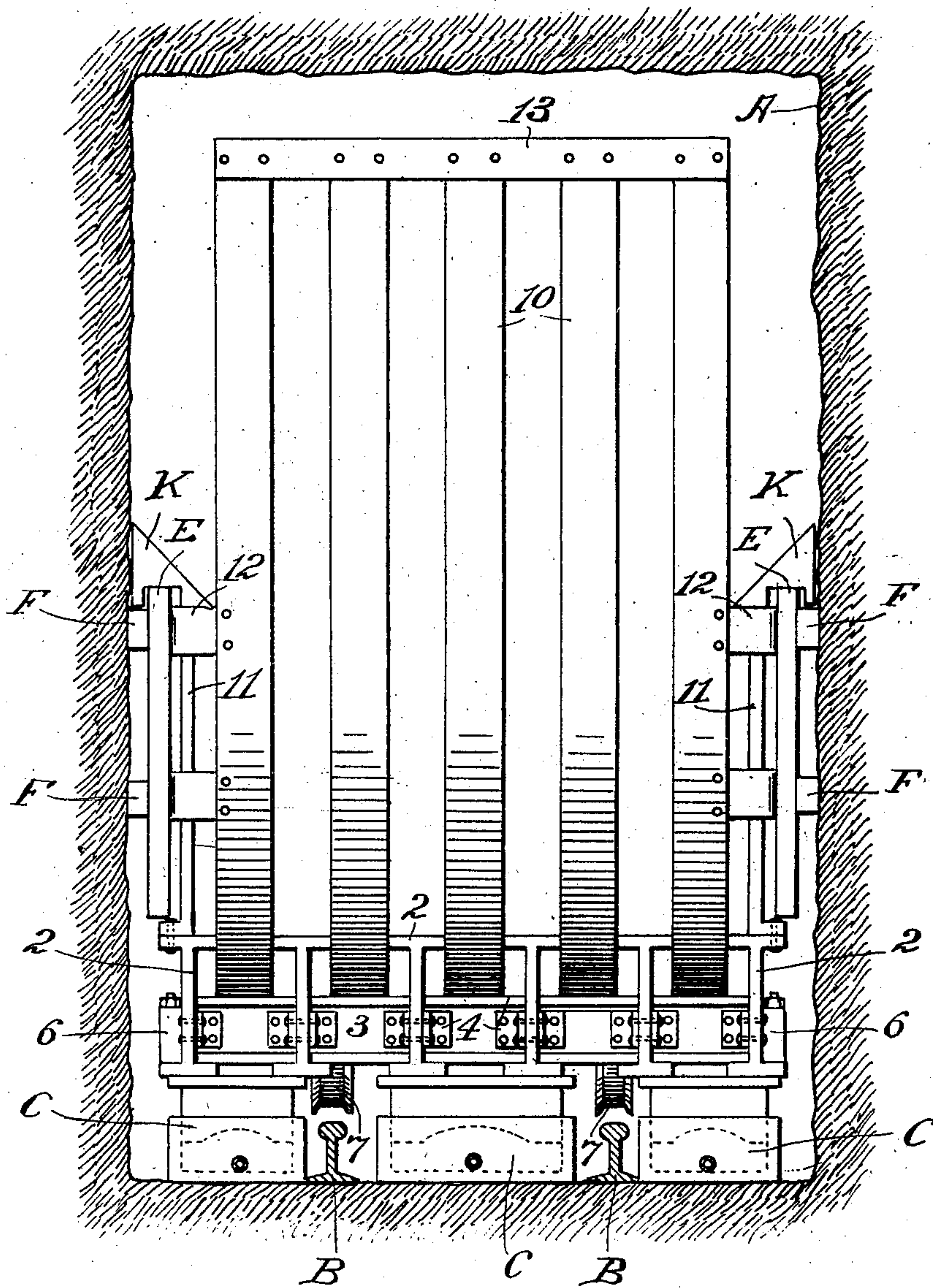
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MINING AND EXCAVATING APPARATUS.

APPLICATION FILED DEC. 15, 1902.

NO MODEL.

4 SHEETS—SHEET 4.

*Fig. VI*



Witnesses:

*C. C. Kelly.*  
*Fredrick Thompson*

Inventor:

Charles Henry Thompson.

*by* *Townsend Bros*  
*his atty*



# UNITED STATES PATENT OFFICE.

CHARLES H. THOMPSON, OF LOS ANGELES, CALIFORNIA.

## MINING AND EXCAVATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 763,030, dated June 21, 1904.

Application filed December 15, 1902. Serial No. 135,323. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HENRY THOMPSON, a citizen of the United States, and a resident of the city and county of Los Angeles, State of California, have invented certain new and useful Mining and Excavating Apparatus, of which the following is a specification.

My invention relates to mining and excavating apparatus, and particularly to providing means whereby ore and excavating cars may be filled in the tunnel or excavation directly by the blast which loosens the ore, rock, or earthy matter from the tunnel or excavation by adapting the explosion of such blast to cause the ore, rock, or earthy matter to fall into and fill the car.

The primary object of my invention is to provide such an ore or excavating car and such means for supporting the same in the tunnel at the end thereof that the blasting explosion will cause the loosened ore, rock, or earthy matter to fall into the car without the force of the blast having any destructive effect on the car and without permitting any movement of the car away from the loosened rock, ore, or earthy matter. For this purpose, before the blast is discharged, the car is raised from and supported above the rails, preferably by hydraulic means, thereby preventing the force of the explosion driving the car away from the blast and the ore, rock, or earthy matter loosened thereby.

A further object is to provide such a car in connection with such means in simple, cheap, and durable form, which shall be positive and efficient in operation.

Further objects and results to be attained will be disclosed hereinafter.

To these ends my invention consists generally in an ore or excavating car of novel construction, and particularly adapted for this purpose, in combination with means for raising and securely supporting the same in the tunnel or excavation to effectuate these purposes.

The invention consists, further, in the mechanism, constructions, and combinations hereinafter described, and particularly pointed out in the claims, and will be more readily understood by reference to the accompanying drawings, in which—

Figure I is a side elevation of an ore-car embodying my invention, the same being shown in a tunnel. Fig. II is a longitudinal sectional view thereof showing the raising and supporting means. Fig. III is a plan view. Fig. IV is a transverse sectional view on line IV-IV of Fig. III looking in the direction of the arrow, the car being shown as resting on the track. Fig. V is a similar view, the car being shown raised and supported in position for the explosion. Fig. VI is an enlarged rear end view, the car being shown raised from the track and supported in position for the explosion, the means which I provide for supporting the sides of the car against lateral strain having been put in place.

As shown in the drawings, A represents a tunnel or excavation which is to be extended. I provide a suitable track B on the floor thereof, and in connection with the track I provide a series of portable hydraulic jacks C, having elongated upper members adapted to extend longitudinally beneath the beams 2, and thereby support the car. I have shown three of these jacks, but any desired number may be used, and they may be of ordinary or any preferred construction.

2 represents I-beams, which form the longitudinal supporting-frame of the car. Transverse I-beams 3 are provided at suitable intervals and are fastened to the I-beams 2 by clamping-plates 4, bolted or riveted to the beams 2 and 3, as shown best in Fig. III. Through the I-beams 2, through suitable bearings provided therein, pass the axles 5, supported at the sides of the car in suitable boxes 6 of the ordinary or any preferred construction. These axles are free to turn in their bearings. In the drawings I have shown three of these axles, but in use may provide any desired number. The axles 5 at the respective ends of the car carry wheels 7, which are provided with double flanges, as shown, the flanges being adapted to depend on the respective sides of the rails of the track B.

The central shaft or axle 5 carries a pair of wheels 8. These wheels are smooth-faced, as shown, and are not provided with flanges. The wheels 7 and 8 are loosely mounted on the shafts or axles 5 and are free to rotate thereon. I prefer this construction in order to



eliminate friction and do not provide flanges on the central or intermediate wheels 8, owing to the fact that the tracks in tunnels and excavations are often irregular, and by permitting the wheels 7 and 8 slight movement on the axles I provide sufficient play to compensate for the unevenness. It is obvious that any desired number of axles 5 and wheels may be provided, or I may use a pair of service-trucks in tunnels having curves.

The series of railroad-rails 9 have upturned ends 10 extending up from the floor of the car. These rails are bolted or riveted to the upper flanges of the I-beams 3, as shown best in Fig. II. The floor of the car is formed of the straight portions of the rails 9 and the upper flanges of the I-beams. The sides of the car are preferably constructed of uprights 11, suitably spaced, and longitudinal bars 12, preferably of steel, riveted together as indicated. The upturned ends of the rails 10 are fastened together by being bolted, as shown in Fig. III, to a connecting-bar 13.

Supports 14 are riveted to the side frames and to the respective outer upturned ends 10 of the rails. Supplemental supports 15 are riveted to the floor of the car, as shown, and extend up to and are riveted upon the flanges of the upturned ends 10 of the rails. This supplemental support is preferably inside the car. The front end of the car is preferably left open, as shown.

In using my apparatus the car is moved along the track B to the end of the tunnel. The jacks C, as best shown in Fig. IV, then come under the depending flanges of the I-beams 2 3. Hydraulic power is applied from a suitable source to the jacks through proper means, such as hose or pipe D, Fig. III. The hydraulic jacks then being raised lift the car until the wheels are free from the rails and the car supported entirely upon the I-beams and jacks. I then insert vertical braces E (see Fig. VI) against the respective uprights 11 and wedge in between the walls of the tunnel and the supports E longitudinal braces or wedges F, thus supporting the sides of the car against strain.

G represents a series of guides, preferably in the form of metal triangles, adapted to fit between the end of the tunnel and against the end of the car, as shown best in Figs. I and II, so that the material below the level of the car-floor loosened by the blast is directed up into the car.

H represents the drill-holes into and through which the blasting-powder is inserted. The blast having been put in place in the usual manner and my apparatus being in position, as shown in Fig. VI, when the blast is discharged the explosion causes the precipitation of the rock, ore, and earthy matter from the end of the tunnel. This is blown forward and falls into the car, the guide-frame G guiding up onto the car that portion of the detached

material which is normally below the level of the car-bed.

In practice, if desired, the explosives in the drill-holes may be fired by a battery in series, so that I may fire the lower half or upper half of the blast or such portion as is requisite to fill the car, then run out the car, dump the contents, return the car to place, fire another portion of the blast, and so on, as required. By this means I am able to save a large amount of the cost of "mucking," which is the most vexatious item in tunneling, the greater portion of the loosened material being blown directly into my car.

Means in addition to the guides G are preferably provided to aid in directing into the car the material loosened by the blast. Such additional means are shown in Figs. IV and VI, where K K represent longitudinal beams which I provide, adapted to direct into the car the material thrown to the sides of the tunnel by the explosion.

If desired, I may bind the load on the car after the explosion, so that the weight of material cannot bulge out the sides. For this purpose I may use any desired number of toggle-chains of the ordinary or any preferred construction adapted to be fastened over the top of the load and also over the end and extend from one side of the car to the other, thereby holding the sides from spreading. It is thus seen that as the jacks rest upon solid rock and the I-beams support the car on the jacks the axles or running parts cannot be sheared or broken, and the upturned ends 10 of the rails provide a series of openings through which the concussion directly passes.

It is obvious that in lieu of the guides G, I may extend the ends of the rails 9 down and rest them on a plate, securing the same result, the concussion passing directly through between the guides G or the downturned ends of the rails. It is also obvious that as the equivalent of the portable hydraulic jacks C, I may use wedges formed of timbers or other suitable material, one wedge being driven upon the other to raise the car on the I-beams. Many forms of such wedges are well known and I do not confine myself to any specific kind of means for raising the car from the track and supporting the same in its raised position. It is obvious also that many other equivalents for the constructions and combinations of parts shown and described will readily suggest themselves to one skilled in the art, and I therefore do not confine myself to the exact constructions, means, or parts shown or described, but may use many equivalents therefor.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the class described, the combination with the track, of a car provided with means for directing the material



from a blast into the car and retaining such material on the car, and means for raising and rigidly supporting the car above said track to adapt said cars to receive the impact  
5 of the loosened material from the blast without injury to the running-gear of the car.

2. In an apparatus of the class described, the combination with the track, of a car open in front and with the sides, rear and floor  
10 closed sufficiently to retain blasted material thereon but with sufficient openings to permit free passage of the concussion, and means for raising and rigidly supporting the car above said track to adapt said cars to receive  
15 the impact of the loosened material from the blast without injury to the running-gear of the car.

3. In an apparatus of the class described, the combination, with a track and a car adapted  
20 to run thereon, said car provided with an upwardly-extended end and with a series of depending beams, of hydraulic jacks adapted to engage said beams to raise said car from said track and support said car rigidly, thereby  
25 adapting said car to receive the material projected by the blast with the impact without injury to the running-gear of the car.

4. In an apparatus of the class described, the combination, with a tunnel-track and a  
30 car adapted to run thereon and provided with an upwardly-extended rear end and an open forward end, of a directing-slide adapted to be inserted between the forward end of the car and the end wall of the tunnel to direct  
35 material into the open end of said car, and means adapted to raise said car from the track and support the same rigidly thereabove to receive the material projected by the blast.

5. In an apparatus of the class described,  
40 the combination, with a tunnel-track and a car adapted to run thereon and provided with an upwardly-extended rear end and an open forward end, and with a series of supporting-beams, of a directing-slide adapted to be inserted  
45 between the forward end of the car and the end wall of the tunnel to direct material into the open end of said car, and means operating against said beams adapted to raise said car from the track and support the same  
50 rigidly thereabove in position to receive the material projected by the blast.

6. In an apparatus of the class described, the combination, with a track and a car, said  
55 car provided with a series of supporting-beams extending longitudinally therebeneath, of a lifting-jack having an elongated upper member adapted to extend longitudinally beneath said beams and thereby rigidly support the car and protect its running-gear when ma-  
60 terial is thrown into said car by a blast.

7. A car for the purpose specified, comprising a series of longitudinal I-beams, a series of transverse I-beams, a series of rails form-

ing the floor of the car and provided with upwardly-extending ends, and axles and wheels  
65 therefor.

8. A car for the purpose described, comprising a frame, wheels journaled therein, floor-rails on said frame having upwardly-extending rear ends and means for supporting  
70 the frame independently of the wheels.

9. A car for the purpose specified, comprising a series of longitudinal I-beams, a series of transverse I-beams, a series of rails forming the floor of the car and provided with upwardly-extending ends, and axles journaled  
75 in said I-beams and adapted to rotate freely in their journals, and wheels loosely mounted on said axles.

10. A car for the purpose specified, comprising a series of longitudinal beams having  
80 portions depending below the floor of the car and upon which the car is adapted to be raised, a series of transverse beams, a floor for said car, an upwardly-extended end for said car,  
85 and suitable axles and wheels.

11. A car for the purpose specified, comprising a series of longitudinal beams, a series of transverse beams, said beams having depending portions upon which the car is adapted  
90 to rest when raised from the track, a series of rails secured on said beams and forming the floor of the car, said rails having upturned extended ends, suitable sides for said car, axles and wheels.  
95

12. A car for the purpose specified, comprising a series of longitudinal beams, a series of transverse beams, said beams having depending flanged portions upon which the car is adapted to be supported when raised from  
100 the track, a series of rails secured on said beams and forming the floor of the car, said rails having upwardly-extended ends, means uniting said upwardly-extending ends, suitable sides for said car, means whereby said upwardly-extended ends are suitably supported,  
105 and suitable axles and wheels.

13. In an apparatus of the class described, the combination, with a track and a portable  
110 car, of means for raising and rigidly supporting the car above the track to adapt said car to receive the loosened material from the blast, means directing the material blasted from below the level of the car up into the car, and means directing the material falling at the  
115 sides of the tunnel into the car.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California,  
120 this 4th day of December, 1902.

CHARLES H. THOMPSON.

Witnesses;

FREDERICK S. LYON,  
JAMES R. TOWNSEND.