

R. B. SIGAFOOS.

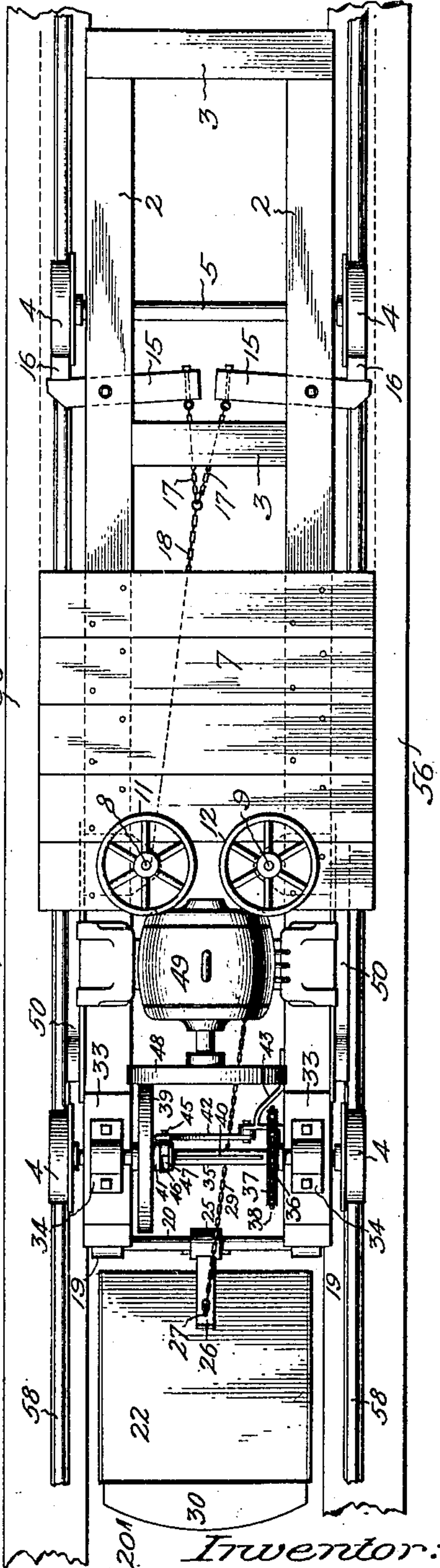
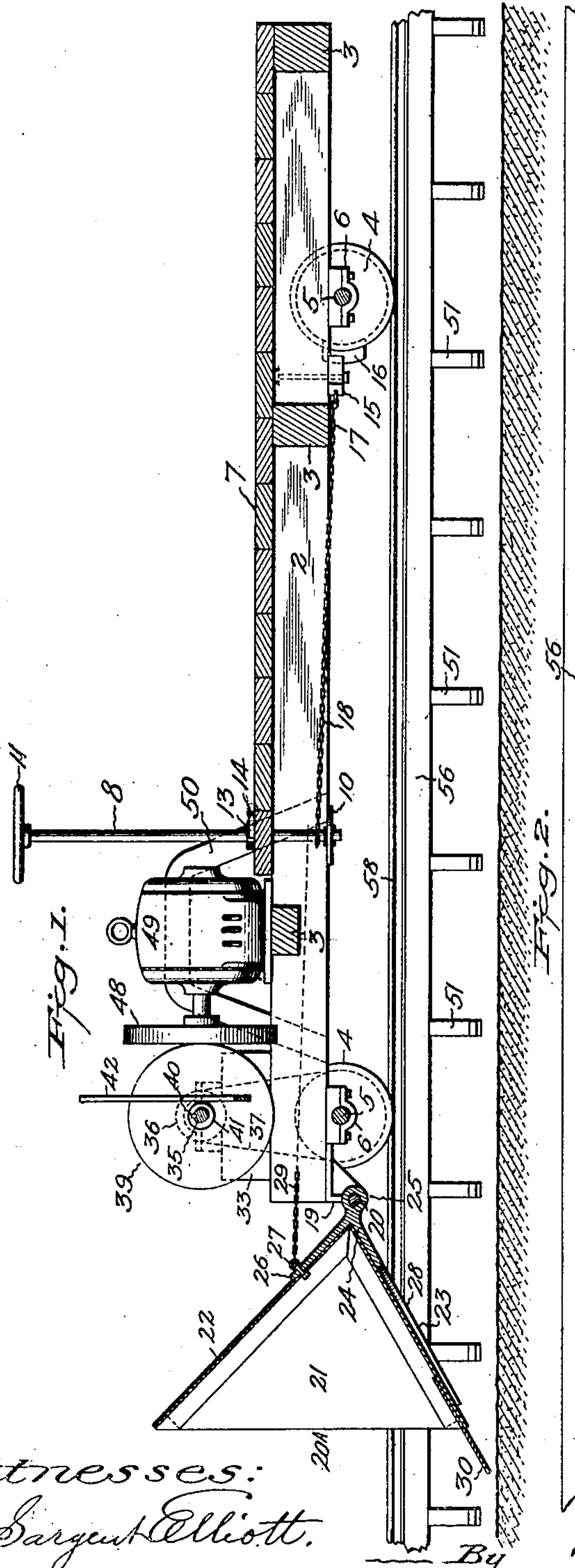
COMBINED MUCK CHANNEL FORMING TUNNEL TRACK AND MUCK DISCHARGING CAR.

APPLICATION FILED MAR. 17, 1908.

912,904.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.



Witnesses:
G. Sargent Elliott.
Adella M. Fowle

By
H. S. Bailey.

Inventor:
Russel B. Sigafos.
Attorney.

R. B. SIGAFOOS.

COMBINED MUCK CHANNEL FORMING TUNNEL TRACK AND MUCK DISCHARGING CAR.

APPLICATION FILED MAR. 17, 1908.

912,904.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 2.

Fig. 3.

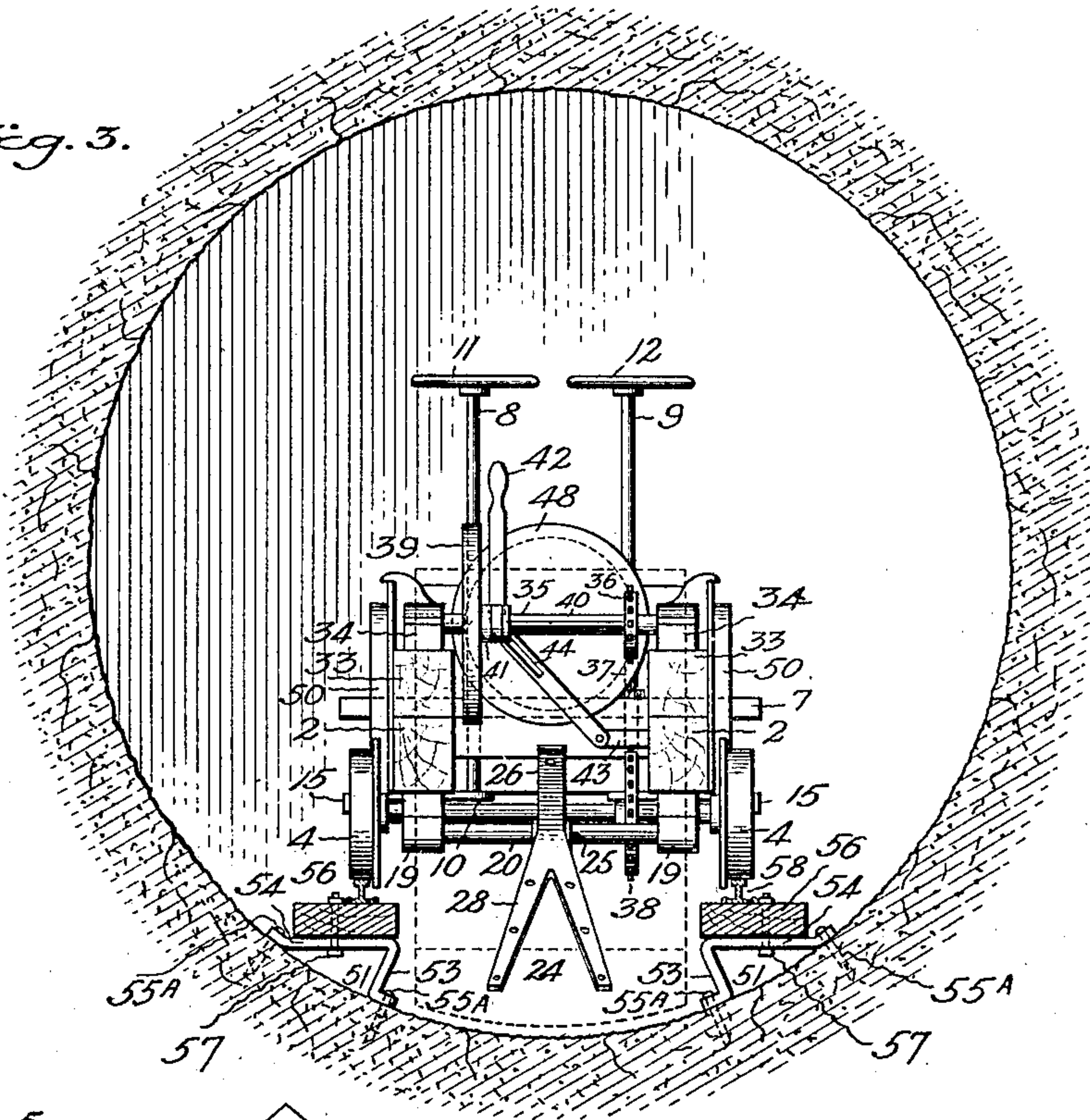


Fig. 5.

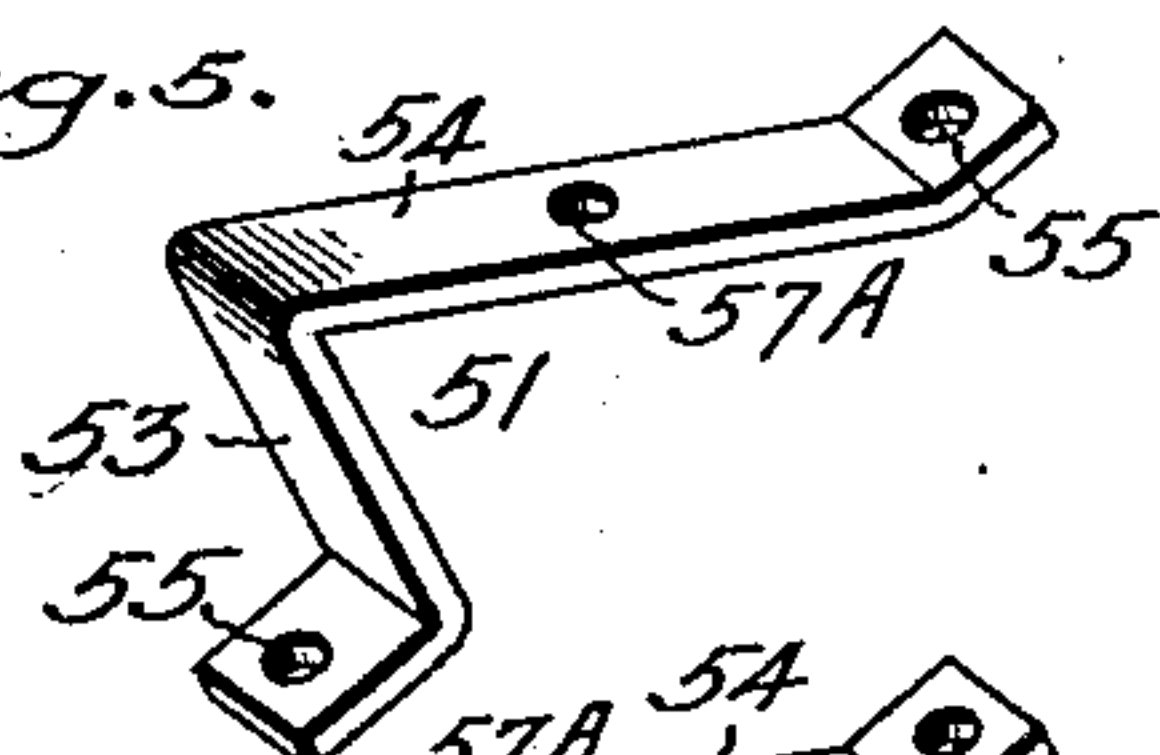


Fig. 6.

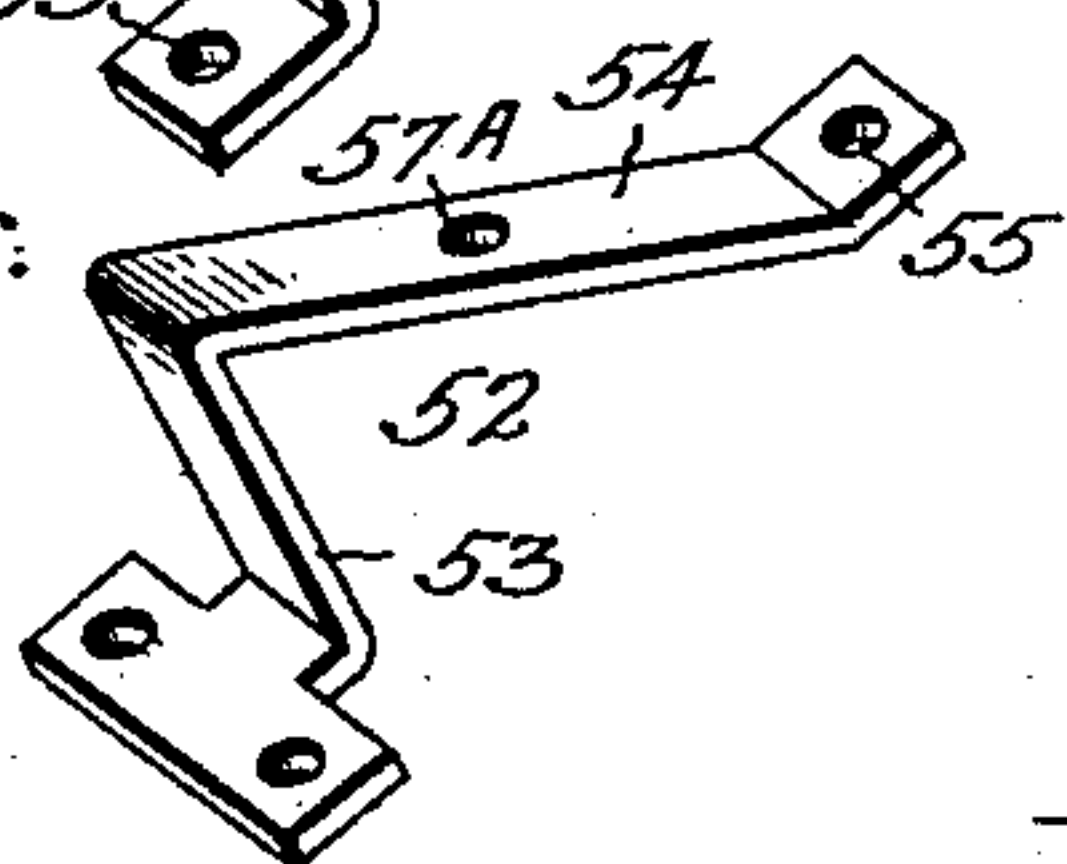


Fig. 8.

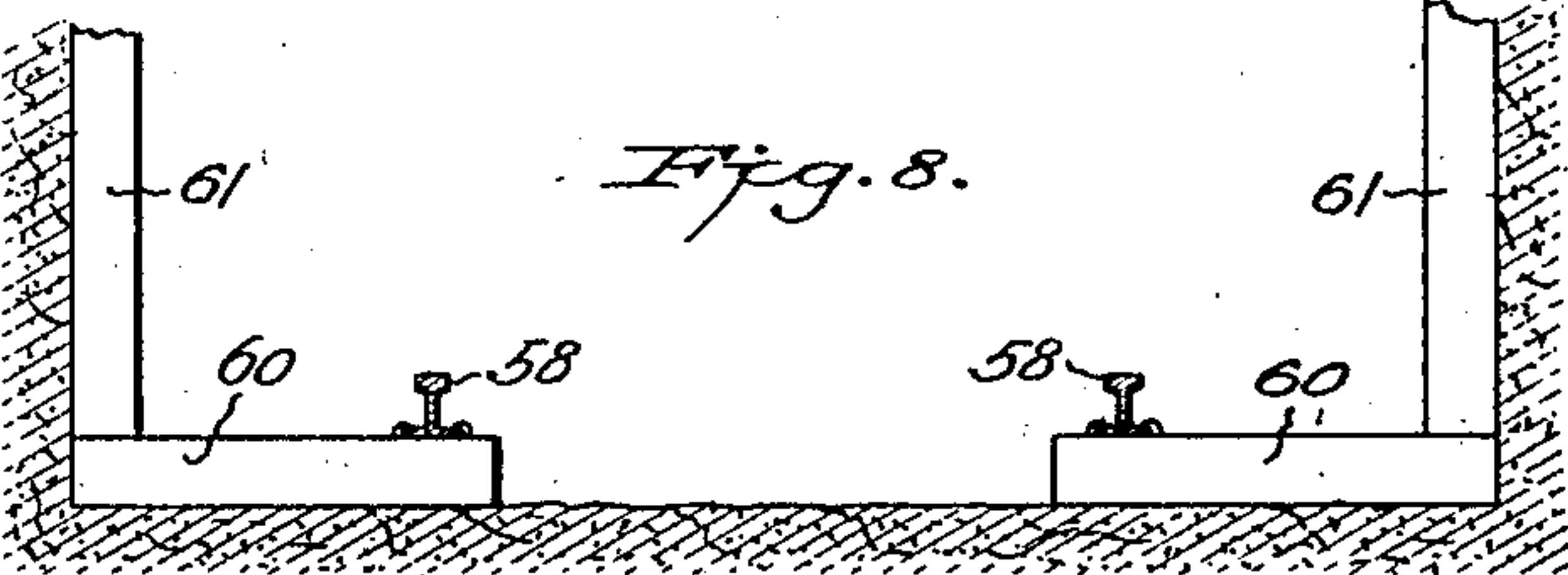


Fig. 7.

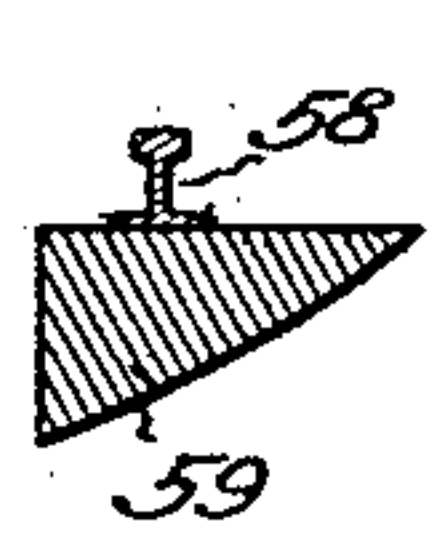


Fig. 4.

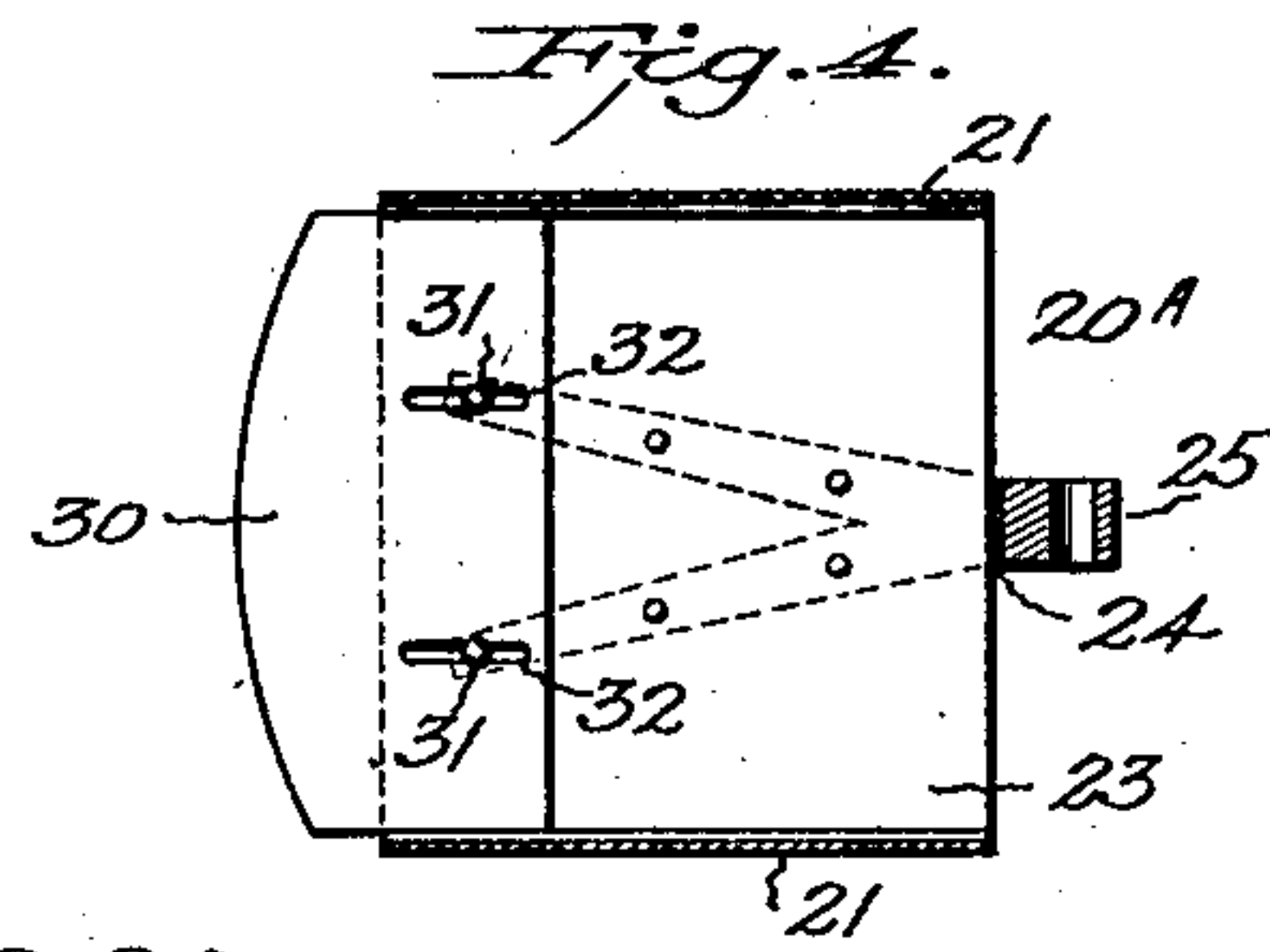
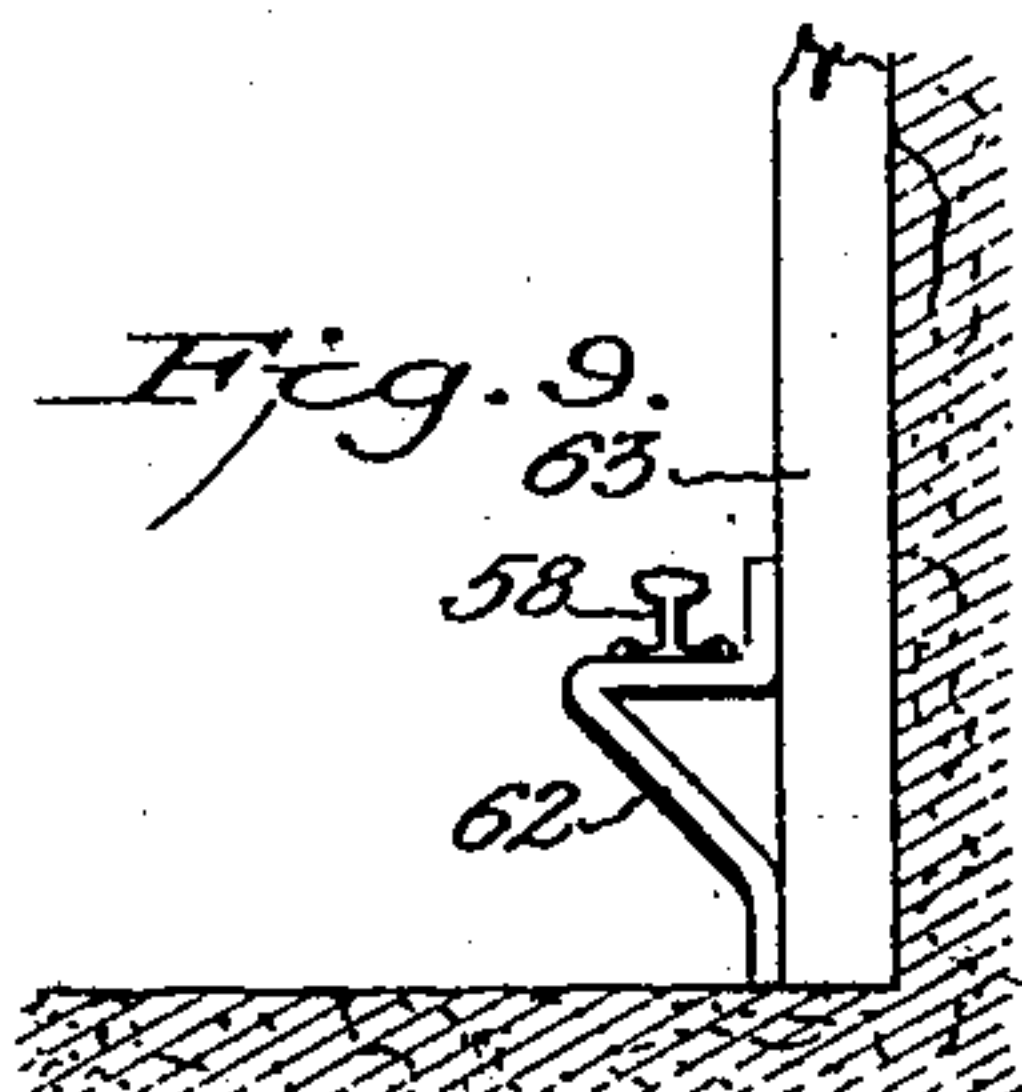


Fig. 9.



Witnesses:
G. Sargent Elliott.
Adella M. Fowle

Inventor:
By Russel B. Sigafos.
H. S. Bailey. Attorney.

UNITED STATES PATENT OFFICE.

RUSSEL B. SIGAFOOS, OF DENVER, COLORADO.

COMBINED MUCK-CHANNEL-FORMING TUNNEL-TRACK AND MUCK-DISCHARGING CAR.

No. 912,904.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed March 17, 1908. Serial No. 421,663.

To all whom it may concern:

Be it known that I, RUSSEL B. SIGAFOOS, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Combined Muck-Channel-Forming Tunnel-Track and Muck-Discharging Car, of which the following is a specification.

10 This invention relates to improvements in a combined muck channel forming tunnel track, and muck discharging car for tunnels.

The object of the invention is to provide an apparatus to facilitate the removal of 15 muck from mining and railway tunnels, comprising a motor-driven car, having an adjustable scoop pivotally secured upon one end thereof, means being provided for reversing the car and for regulating the speed 20 of the same, the tracks being supported upon independent bed timbers mounted upon suitably constructed brackets, whereby the scoop is permitted to extend down between the tracks and their supports, and move close to 25 the bottom of the tunnel.

In carrying out my invention, I provide a form of track construction for tunnels, whereby a muck discharging channel is formed between the two tracks, which permits the unobstructed discharge of flowing 30 muck and water from tunnels, as ordinarily operated, or worked, and when ordinary cars are used, or which permits of the employment of a suitable scoop, which is operated 35 by a power driven car, the scoop being adapted to extend down between and below the level of the tracks so as to extend to the bottom of the tunnel or move close to the same.

40 These objects are accomplished by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a longitudinal, vertical, sectional view of the improved mucking apparatus, showing the scoop in operative position. Fig. 2, is a plan view of the same, a portion of the platform of the car being removed for the purpose of clearer illustration. Fig. 3, is a vertical, transverse sectional view through a tunnel, showing specially constructed track supports secured to 50 the face of the tunnel, the car being shown in front elevation, mounted upon the tracks, and the scoop being omitted for purposes of clearness, but shown in dotted lines. Fig. 4,

is a horizontal, sectional view through the scoop, showing the bracket which supports it, and an adjustable wear plate secured to the bottom of the scoop. Figs. 5 and 6, are perspective views of forms of brackets for 60 supporting the track timbers in a circular tunnel. Fig. 7, is a sectional view of a modification of the track support. Fig. 8, is a transverse sectional view through a square tunnel, showing one way of supporting the 65 tracks so as to leave an uninterrupted space between them. And Fig. 9, is a similar view, showing a modification of the track support.

Similar numerals of reference refer to 70 similar parts throughout the several views.

Referring to the accompanying drawings, The numeral 1, designates a car, made up of longitudinal side timbers 2, which are connected at intervals by cross timbers 3, the 75 said car being mounted upon track wheels 4, secured upon axles 5, which are mounted in bearings 6, upon the under sides of the side timbers 2. A platform 7, made up of transverse planks, is secured upon the side timbers, and extends from the rear end of the 80 car, to a point near its forward end, at which point a pair of rods 8 and 9, are pivotally mounted in the platform, and extend down below the same, their lower ends being supported in bearing brackets 10, secured to the 85 under edges of the side timbers 2. Hand wheels 11 and 12 respectively, are secured to the upper ends of the rods 8 and 9, and the rods are provided with ordinary ratchet 90 wheels 13, which rest upon the platform, and which are engaged by pawls 14, pivoted to the platform, as will be understood. A pair of brake levers 15, are pivotally secured to the under side of the side timbers of the 95 car, adjacent to the rear wheels, and upon the outer ends of these levers are secured brake shoes 16, which are designed to engage the treads of the adjacent wheels. Short chains 17, are secured to the inner ends of the brake 100 levers, and these chains are attached at their free end to the rear end of a chain 18, the forward end of which is made fast to the lower end of the rod 8. Thus, by turning the hand wheel 11, the chain 18 is drawn 105 upon to brake the rear wheels, and the rod 8 is held against back movement by the pawl and ratchet.

Upon the forward ends of the side timbers of the car, are secured bearings 19, in which 110

is mounted a shaft 20, and upon this shaft is mounted the improved muck scoop 20^A, which is made up of two triangular side plates 21, and top and bottom plates 22 and 23, which unite at an apex at their rear ends, the front end of the scoop being open, as shown. This scoop is supported in a bracket 24, comprising a hub 25, which is keyed centrally upon the shaft 20, from which hub extends an arm 26, which is secured to the top plate 22 of the scoop, by an eye bolt 27, and a forked arm 28, which is secured to the bottom plate of the scoop. A chain 29, is secured at one end to the eye bolt 27, and its opposite end is made fast to the pivoted rod 9, having the hand wheel 12, and by manipulating this wheel, the chain 29 is operated either to raise or lower the scoop.

A wear plate 30, is secured upon the forward portion of the bottom plate of the scoop, by bolts 31, which pass through slots 32, in the said wear plate, and through holes in the bottom plate of the scoop and in the ends of the forked arm 28. The slots 32, permit the plate 30, to be adjusted upon the bottom of the scoop, in order to compensate for the wear of the forward edge of the plate through contact with the bottom of the tunnel.

The car is propelled either forward or backward in the following manner: Upon the upper edges of the forward ends of the side timbers 2, are secured blocks 33, upon which are bolted bearings 34, in which is mounted a feather shaft 35, which is directly above the forward axle of the car. A sprocket wheel 36 is rigidly mounted on this shaft adjacent to one of its ends, and is connected by a chain 37, with a sprocket wheel 38, on the said forward axle. Upon the shaft 35, is also mounted a friction disk 39, which has a sliding movement thereon, but is prevented from turning independently of the shaft by a spline or feather 40 on the shaft, which fits in a groove in the hub 41 of the said disk 39. This disk is slid upon the shaft by a lever 42, which is pivoted at its lower end to a bracket 43, secured to one of the side timbers of the car. This lever is provided with a slot 44, through which passes a pin or stud 45, projecting from a band 46, which is loosely mounted in a circumferential groove 47, in the disk hub 41.

The disk 39, is operated by a friction disk 48, which is mounted on the shaft of an electric motor 49, connected with a source of power. The motor is supported upon standards or brackets 50, which are secured to the sides of the car. Thus, the disk 48 actuates the disk 39, which turns the shaft 35, and its sprocket wheel 36, which, through the chain 37, and axle sprocket 38, propels the car. I have described the disk 39, as being slid upon the shaft 35, by the lever 42, but any other practicable means for accom-

plishing the movement of this disk may be employed.

In order that the scoop may contact with or lie adjacent to the bottom of the tunnel, when in practical operation, it is necessary to dispense with the usual cross tie upon which the tracks are laid, and to employ means for supporting the tracks independently of each other, whereby an unobstructed channel is formed along the tunnel between the two tracks, through which the scoop may pass. I accomplish this feature in the following manner: When the tunnel is circular, as illustrated in Fig. 3, I place at intervals along its bottom, and a suitable distance on each side of its vertical center, brackets 51, which may be of a design most clearly shown in Fig. 5, or of a style of bracket 52, as illustrated in Fig. 6. These brackets are each in the form of a step, having an upright member 53, and a horizontal or tread member 54, and the extremities of these two members are bent at such an angle as to conform to the curvature of the tunnel, and are apertured, as shown at 55, to receive suitable spikes or pins 55^A, which are driven through the apertures 55, and into holes drilled in the floor of the tunnel for that purpose, by which the brackets are secured to the floor or bottom of the tunnel. Upon each set of brackets are laid bed timbers 56, which are secured to the brackets by bolts 57, which pass through apertures 57^A, in the horizontal portions of the brackets, and upon these bed timbers are laid tracks 58, which are spiked to the timbers in the usual manner. The brackets 51—52, may be dispensed with, if desired, and the tracks may be laid directly upon timbers 59, the lower sides of which are curved to conform to the curvature of the tunnel. When the improved mucking device is employed in a square tunnel, as shown in Fig. 8, and particularly when the tunnel is considerably wider than the mucker, as shown by this figure, the tracks are laid on short ties 60, which extend from each track to the adjacent side of the tunnel, where they are secured to posts 61 which extend to the top of the tunnel. In narrower tunnels, brackets 62 and posts 63 may be employed, as shown by Fig. 9, and besides, I may employ various modifications of the forms of track supports illustrated in the drawings, the chief object of this form of construction being to provide an open drain or channel, between the tracks, which will permit the unobstructed movement of the scoop along or adjacent to the floor of the tunnel.

In operation, the car is backed into the tunnel to the desired point, the scoop being elevated sufficiently to be out of the way of the muck lying between the tracks. The hand wheel 12 is then operated to lower the scoop to an operative position, and the lever

42 is reversed, carrying with it the driven friction disk 39, which is thereby caused to contact with the driving friction disk 48, at a diametrically opposite point upon the said disk, and upon the opposite side of its axial center. The rotation of the disk 39 is now reversed, and the car is started forward, its speed being governed by the position of the said disk relatively to the axial center of the driving disk 48, it being apparent that the greatest speed is accomplished when the disk 39, contacts with the disk 48, at the farthest point from the latter disk's axial center, and that the speed is gradually diminished as the disk 39 is moved toward the axial center of the disk 48. As the car proceeds, the muck in the channel between the tracks is collected and pushed in advance of the car until it is conveyed without the tunnel.

Besides fulfilling the office of a mucking machine, the car is intended to be used, generally, as a tunnel car, for transporting the men with their tunneling equipments into and away from the tunnel.

The apparatus is simple and practical, and by its employment in connection with the particular form of track construction herein described, the muck is more easily and quickly removed from a tunnel than by any other of the processes which are at present in use.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a mucking machine, as specified, the combination with a power driven car, of a scoop pivotally attached to one end thereof; a vertical rod pivotally mounted upon the car, having a hand wheel at its upper end; a flexible connection attached at one end to the scoop, and secured at its opposite end to the rod, and a pawl and ratchet mechanism in connection with said rod, for preventing backward rotation of the same.

2. In a mucking machine, as specified, the combination with a power driven car, of a scoop pivotally secured upon one end thereof; means for raising and lowering the scoop, and means for reversing the direction of the car and for regulating its speed.

3. In a mucking machine, as specified, the combination with a car, and a motor on said car, of a friction disk mounted upon the motor shaft; a feather shaft mounted on the car above the forward axle; a sprocket wheel on the axle; a sprocket wheel on the feather shaft, and a chain connecting the two

wheels; a friction wheel slidably mounted on the feather shaft, and contacting with the power driven friction disk; a lever pivoted to the car, and connected with the hub of the friction wheel, for moving the said wheel on its shaft; a scoop pivotally connected to the forward end of the car; a rod pivotally mounted on the car and provided with a hand wheel at its upper end; a chain connected to the scoop and to the rod, and a pawl and ratchet device for preventing backward rotation of the rod; brake levers pivotally connected to the car and provided with brake shoes for engaging the rear car wheels; a pivoted rod having a hand wheel at its upper end; a chain connecting the rod and brake levers; and a pawl and ratchet mechanism in connection with said rod.

4. In a mucking machine, as specified, the combination with a car having a scoop pivotally attached to its forward end, and means for adjusting the said scoop in the arc of a circle; of means for propelling and reversing said car and for governing the speed of the same, comprising a motor, a friction disk mounted upon the shaft of the motor; a spline shaft mounted on the car above its forward axle; a friction wheel on the spline shaft, in contact with the motor driven friction disk; a hub on said friction wheel having a circumferential groove, a band loosely mounted in the groove, having a projecting pin; a lever pivoted at one end to the car and provided with a slot through which the said pin passes; a sprocket wheel on the spline shaft, a sprocket wheel on the forward car axle, and a chain connecting the wheels.

5. In a mucking machine for tunnels, the combination with two independent rows of brackets; bed timbers secured to said independent rows of brackets, and tracks secured to said bed timbers; of a power-driven car mounted on the tracks; a scoop pivotally mounted on one end of the car so as to extend down between and below the tracks; a rod having a hand wheel at its upper end, pivotally mounted on the car; a chain connected with the scoop and with the rod, and pawl and ratchet mechanism connected with the rod for preventing backward rotation of the same.

In testimony whereof I affix my signature in presence of two witnesses.

RUSSEL B. SIGAFOOS.

Witnesses:

FRANK M. KEISER,
G. SARGENT ELLIOTT.