

No. 751,289.

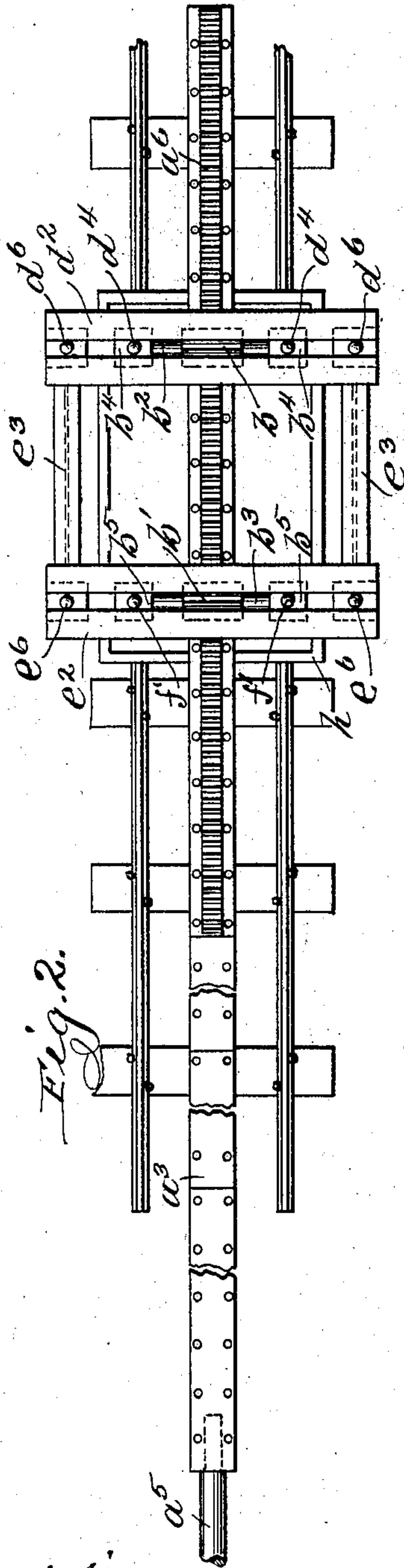
PATENTED FEB. 2, 1904.

G. W. JACKSON.
TUNNEL BAR.

APPLICATION FILED MAR. 30, 1901.

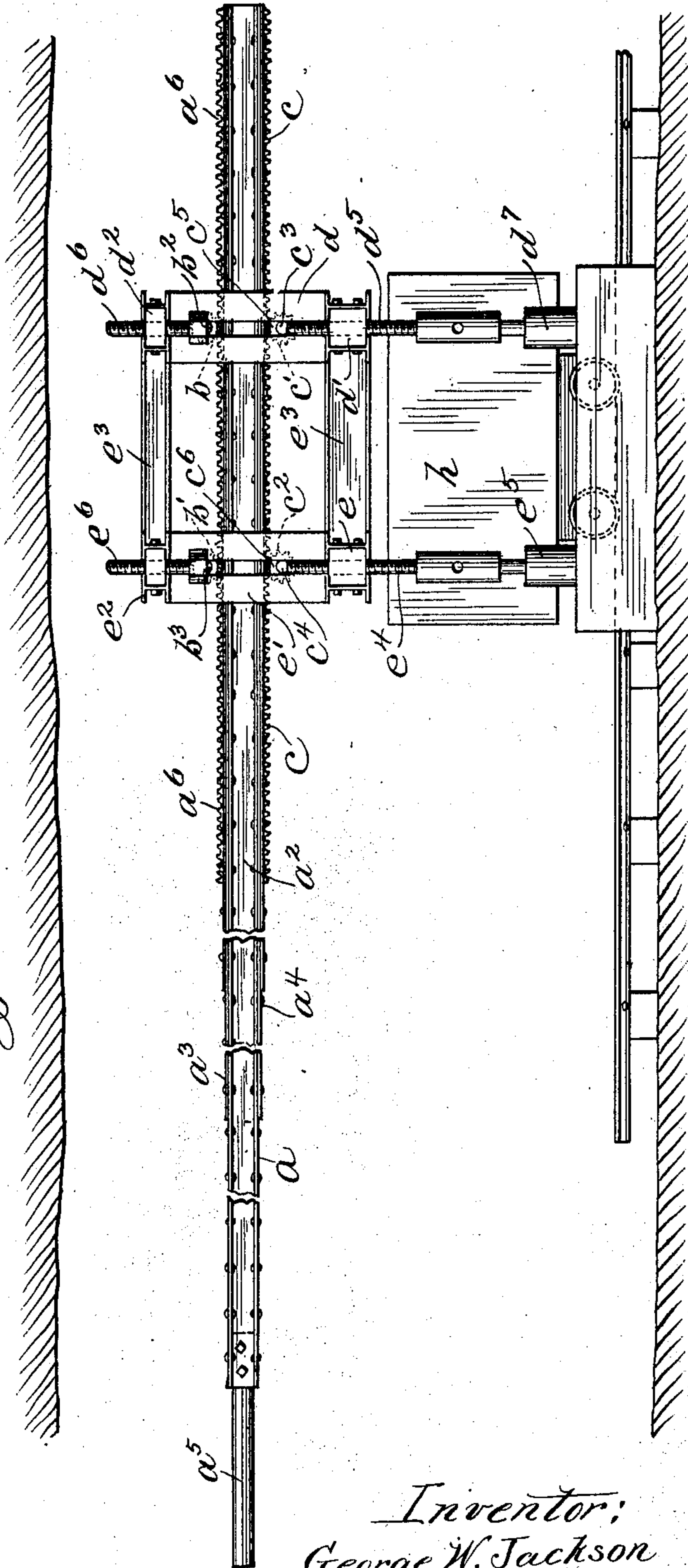
NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
W. J. Jackson
M. R. Nyman

Fig. 1.



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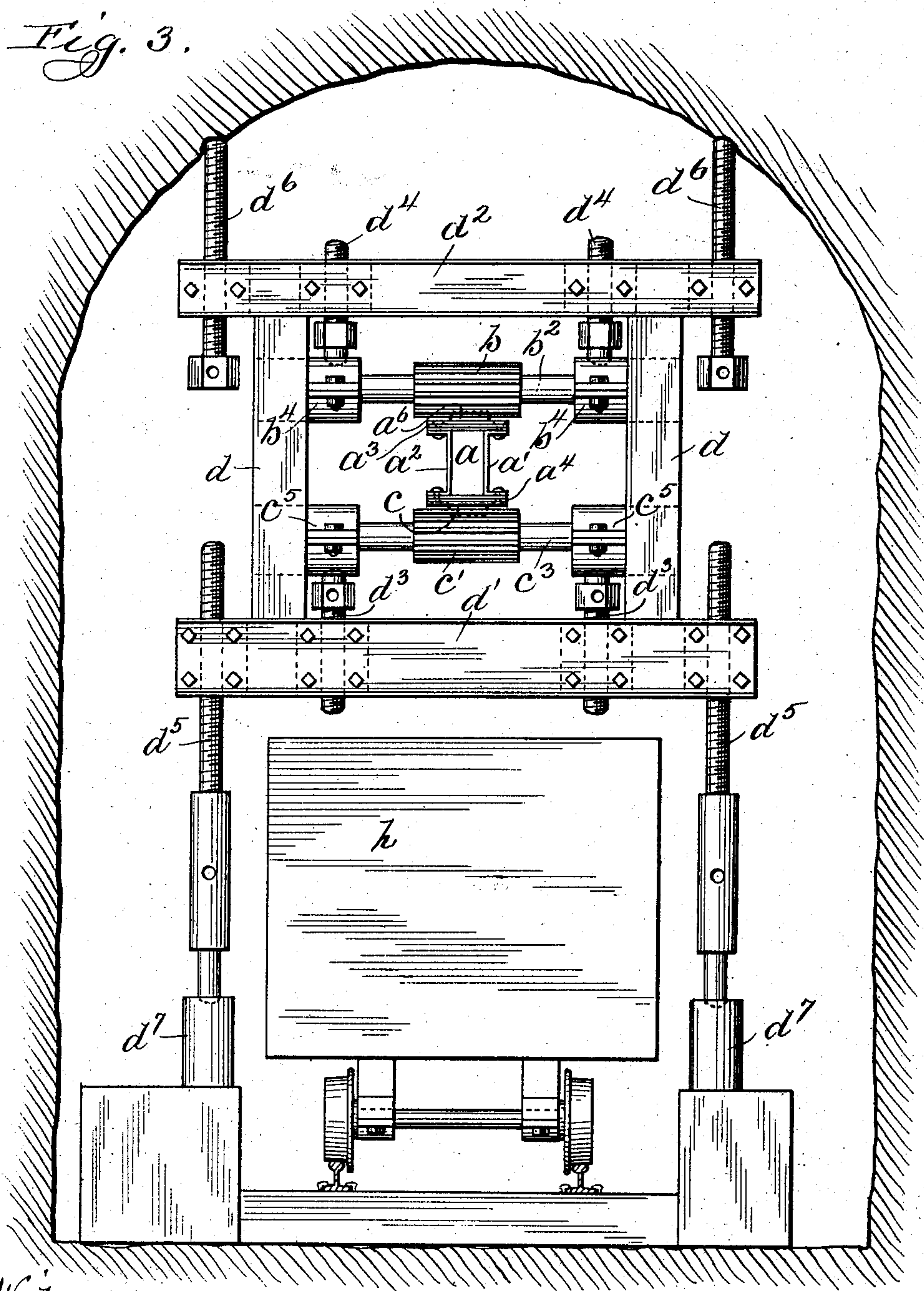
G. W. JACKSON.
TUNNEL BAR.

APPLICATION FILED MAR. 30, 1901.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE W. JACKSON, OF CHICAGO, ILLINOIS.

TUNNEL-BAR.

SPECIFICATION forming part of Letters Patent No. 751,289, dated February 2, 1904.

Application filed March 30, 1901. Serial No. 53,688. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. JACKSON, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Tunnel-Bars, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to tunnel-bars for mining and excavating purposes; and one object of my invention is to provide a supporting-framework readily adjusted in place at the breast of the tunnel and of simple construction adapted to span a mine-car in such manner that the same may closely approach the point of operation and receive the material directly, so as to obviate rehandling.

It is also my object to provide simple and positive-acting means whereby a wide variation in the range of operation of the bar may be quickly effected.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is a side view of my invention, showing a car underneath the mechanism. Fig. 2 is a top view thereof. Fig. 3 is an end view thereof.

Like letters refer to like parts in the several figures.

The tunneling-bar *a* is composed of the channel-irons *a'* and *a''* and the top and bottom plates *a³* and *a⁴*. The said top and bottom plates *a³* and *a⁴* are riveted to the said irons or secured in any preferred manner. Mounted in one end of the bar *a* is a solid turned bar *a⁵*, which is firmly secured to the irons *a'* and *a''* by rivets and upon which the drilling mechanism is adapted to be mounted.

Mounted upon and secured to the top plate *a³* is a rack *a⁶*. The said rack *a⁶* is adapted to be engaged by the pinions *b* and *b'*. The pinions *b* and *b'* are keyed or fixedly attached to the shafts *b²* and *b³*, respectively. The shaft *b²* is journaled in the bearings *b⁴ b⁴*, and the shaft *b³* is journaled in the bearings *b⁵ b⁵*.

Mounted upon and secured to the bottom plate *a⁴* is a rack *c*. The said rack *c* is adapted to be engaged by the pinions *c'* and *c''*.

The pinions *c'* and *c''* are keyed or fixedly attached to the shafts *c³* and *c⁴*, respectively. The shaft *c³* is journaled in the bearings *c⁵ c⁵*, and the shaft *c⁴* is journaled in the bearings *c⁶ c⁶*. The said bearings *c⁵ c⁵* and *b⁴ b⁴* are adapted to slide up or down on the uprights or supports *d d*. The said uprights *d d* are mounted on the cross-beam *d'* and form the supports for the cross-beam *d²*. The bearings *c⁵ c⁵* are adapted to rest on the heads of the jack-screws *d³ d³* and to act as cups for said jack-screws. The cross-beam *d'* is provided with two bores, into which the jack-screws *d³ d³* are threaded. The jack-screws *d⁴ d⁴* are threaded into bores in the cross-beam *d²*, and the heads of said jack-screws are adapted to engage the bearings *b⁴ b⁴*, which bearings *b⁴ b⁴* act as cups for the said jack-screws. The function of these jack-screws *d³ d³* and *d⁴ d⁴* is to allow bar *a* to be raised or lowered, or they may be used to force the pinions together, thereby causing the axles of the same to bind and prevent the bar from projecting or retracting.

Threaded into bores in the opposite ends of the cross-beam *d'* are the jack-screws *d⁵ d⁵*. The opposite or lower ends of said jack-screws are adapted to work in the cups *d⁷ d⁷*. The said cups are "blocked up" on any suitable foundations on both sides of the car-track, which is adapted to be laid so that a car may be run between the jack-screws *d⁵ d⁵* and under the cross-beam *d'*.

The ends of the cross-beam *d²* are provided with bores into which are threaded the jack-screws *d⁶ d⁶*. The said jack-screws are adapted to be jammed against the roof of the tunnel. Thus when the cups *d⁷ d⁷* have been blocked up and the jack-screws *d⁵ d⁵* "jacked up," thereby raising the frame composed of the beams *d'* and *d²* and the uprights *d* and *d* from the top of the car upon which the beam *d'* is adapted to rest, the jack-screws *d⁶ d⁶* in the beam *d²* are forced against the roof of the tunnel, thereby forming supports which help to maintain the said frame in a fixed position and yet allowing a car to be run underneath the aforesaid structure. A second frame is composed of a cross-beam *e*, upon which are erected the uprights *e' e'*, the said uprights

supporting the cross-beam e^2 . The said frame is joined to the first-mentioned frame by four girders or joists $e^3 e^3$, &c., two of the said girders extending between and being secured to the cross-beams d^2 and e^2 , respectively, and the other two girders extending between and being secured to the cross-beams d' and e , respectively.

Threaded into bores in the opposite ends of the cross-beam e are the jack-screws $e^4 e^4$. The opposite or lower ends of said jack-screws are adapted to work in the cups $e^5 e^5$. The said cups are blocked up on any suitable foundations on both sides of the car-track, which is adapted to be laid so that a car may be run between the jack-screws $e^4 e^4$ and under the cross-beam e . The opposite end of the frame being similarly supported by the cross-beams d' , jack-screws $d^5 d^5$, and cups $d^7 d^7$, as heretofore explained, it will be seen that there is a free opening or passage-way extending the full length of the frame and that a car h may be run through the said passage-way and clear up to the face of the tunnel. The ends of the cross-beam e^2 are provided with bores into which are threaded the jack-screws $e^6 e^6$. The said screws are adapted to be jammed against the roof of the tunnel and perform the same function as the jack-screws $d^6 d^6$.

The bearings $c^6 c^6$ are adapted to rest on the heads of the jack-screws $f f$ and to act as cups for said jack-screws. The cross-beam e is provided with two bores into which the jack-screws $f f$ are threaded. The jack-screws $f' f'$ are threaded into bores in the cross-beam e^2 , and the heads of said jack-screws are adapted to engage the bearings $b^5 b^5$, which bearings $b^5 b^5$ act as cups for the said jack-screws. The function of these jack-screws $f f$ and $f' f'$ is to allow the bar a to be raised or lowered as it passes between the pinions b' and c^2 .

By working the jack-screws $d^4 d^4$ and $d^3 d^3$ simultaneously and in the same direction with the jack-screws $f f$ and $f' f'$ the tunnel-bar a is given a vertical movement. The bar a also has a horizontal movement, due to its being mounted on the pinions $b c' b' c^2$, which are adapted to rotate in suitable bearings. The bar a may also be operated at an angle to the horizontal by lowering the jack-screws $f f$ and $f' f'$ and by raising the jack-screws $d^4 d^4$ and $d^3 d^3$, and vice versa.

Another feature of this invention embodies the method of removing the tunnel-bar and its supports with the drilling-machine which is mounted on the end of the tunnel-bar when it is desired to blast. This is accomplished by running the tunnel-bar back until it is balanced and then letting the frames which carry the tunnel-bar down upon the car h , the beams d' and e resting on the top of the car and running the car, with the apparatus on the top of it, back in the tunnel to a sufficient distance so as not to be injured

by the concussion of the explosion. In this manner it will be noticed that the whole apparatus may be handled easily and with very little expenditure of energy.

I do not wish to be understood as confining myself to the construction as shown in the drawings and described in the specification, as the different parts may be subjected to various modifications and still not depart from the spirit of my invention.

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

1. In a tunneling device, the combination with a frame, of a tunnel-bar, four independently-adjustable supports for said bar mounted on said frame, said supports controlling the angle of the incline of said bar, and supports for holding the frame in position, substantially as described.

2. In a tunneling device, the combination with a tunnel-bar having racks upon its upper and lower edges, of a frame, means carried by said frame upon which said bar is fulcrumed, a pinion adjustably mounted in said frame to engage upon the upper edge of said bar, a second pinion adjustably mounted in said frame to engage the lower edge of said bar, and means for supporting said bar in the rear of said pinions, substantially as described.

3. In a tunneling device, the combination of a tunnel-bar having racks upon its upper and lower edges, a frame, two sets of pinions adjustably mounted in said frame in position to engage the rack upon the upper edge of said bar at different points thereon, and two pinions adjustably mounted in said frame in position to engage the lower edge of said bar at different points thereon, substantially as described.

4. In a tunneling device, the combination of a tunnel-bar having racks upon its upper and lower edges, a frame, two pinions mounted in said frame in position to engage the rack upon the upper edge of said bar at different points thereon, two pinions mounted in said frame in position to engage the lower edge of said bar at different points thereon, and means for separately adjusting said pinions, substantially as described.

5. In a tunneling device, the combination of a frame, having cross-beams of sufficient length to span a track for a mine-car, jacks near the ends of said beams for independently adjusting the same in a vertical direction, said jacks being located at a sufficient distance apart to receive a mine-car therebetween, means co-operating with said jacks for securing said frame in the tunnel, a tunnel-bar, and a rack-and-pinion device for controlling said tunnel-bar, substantially as described.

6. In a tunneling device, the combination of a frame, having cross-beams of sufficient length to span a track for a mine-car, jacks near the ends of said beams for independently adjust-

ing the same in a vertical direction, said jacks
being located at a sufficient distance apart to
receive a mine-car therebetween, means co-
operating with said jacks for securing said
5 frame in the tunnel, a tunnel-bar, racks upon
the upper and lower edges of said bar, and a
set of not less than four independently-adjust-
able pinions mounted in said frame and co-
operating with said rack for controlling the
10 position of said tunnel-bar, substantially as
described.

7. In a tunneling device, the combination
with a frame, of a tunnel-bar, four independ-
ently-adjustable supports which engage the

upper and lower edges thereof mounted in 15
said frame, means for clamping said bar be-
tween said supports whereby said tunnel-bar
may be radially and rectilineally adjusted, and
supports for holding said frame in position,
substantially as described. 20

In witness whereof I have hereunto sub-
scribed my name in the presence of two wit-
nesses.

GEORGE W. JACKSON.

Witnesses:

ALFRED SLADE,
CORNELIUS HOGAN.