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J. V. DAVIES.

APPARATUS FOR FACILITATING TUNNEL CONSTRUCTION.

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NO MODEL.

Fig. 2.

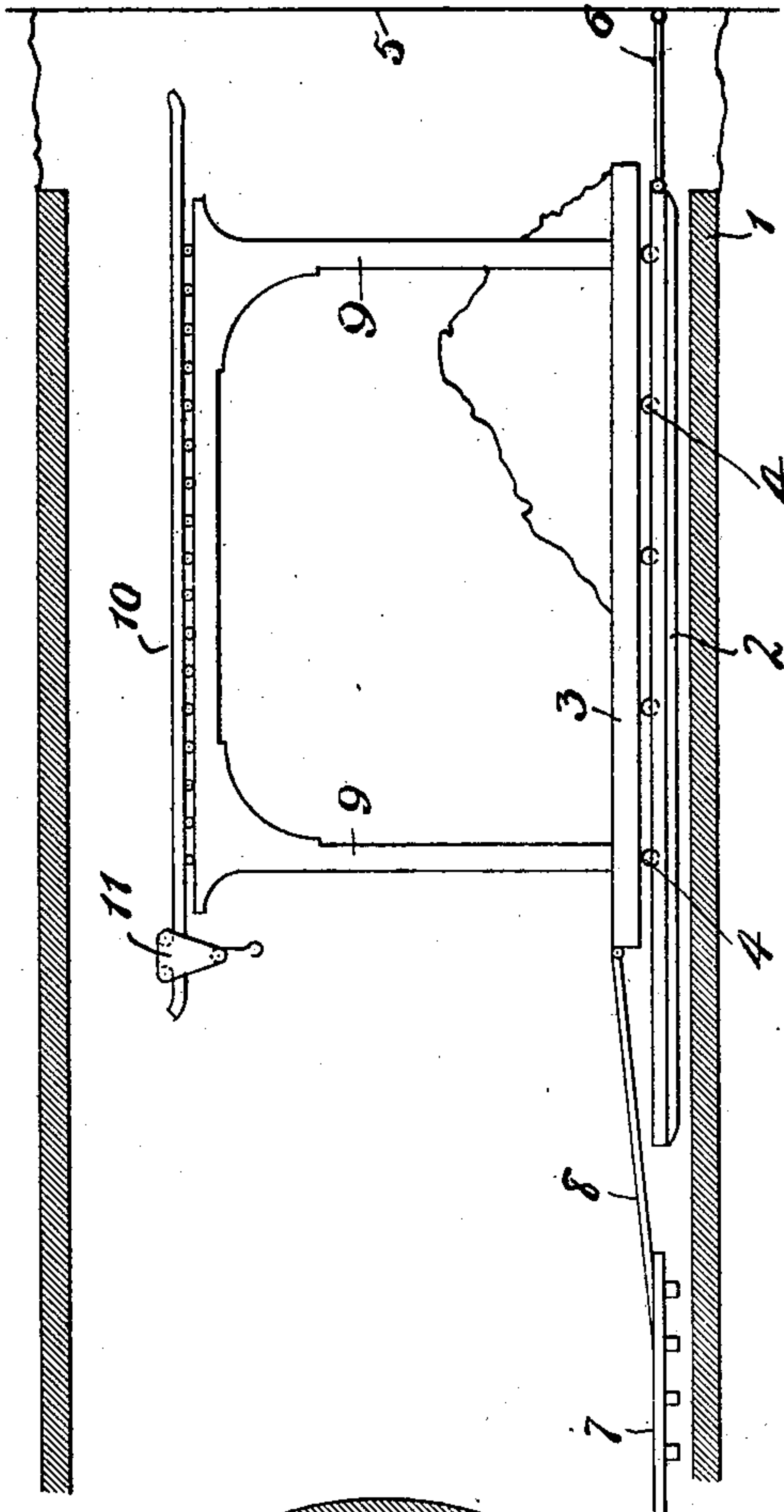
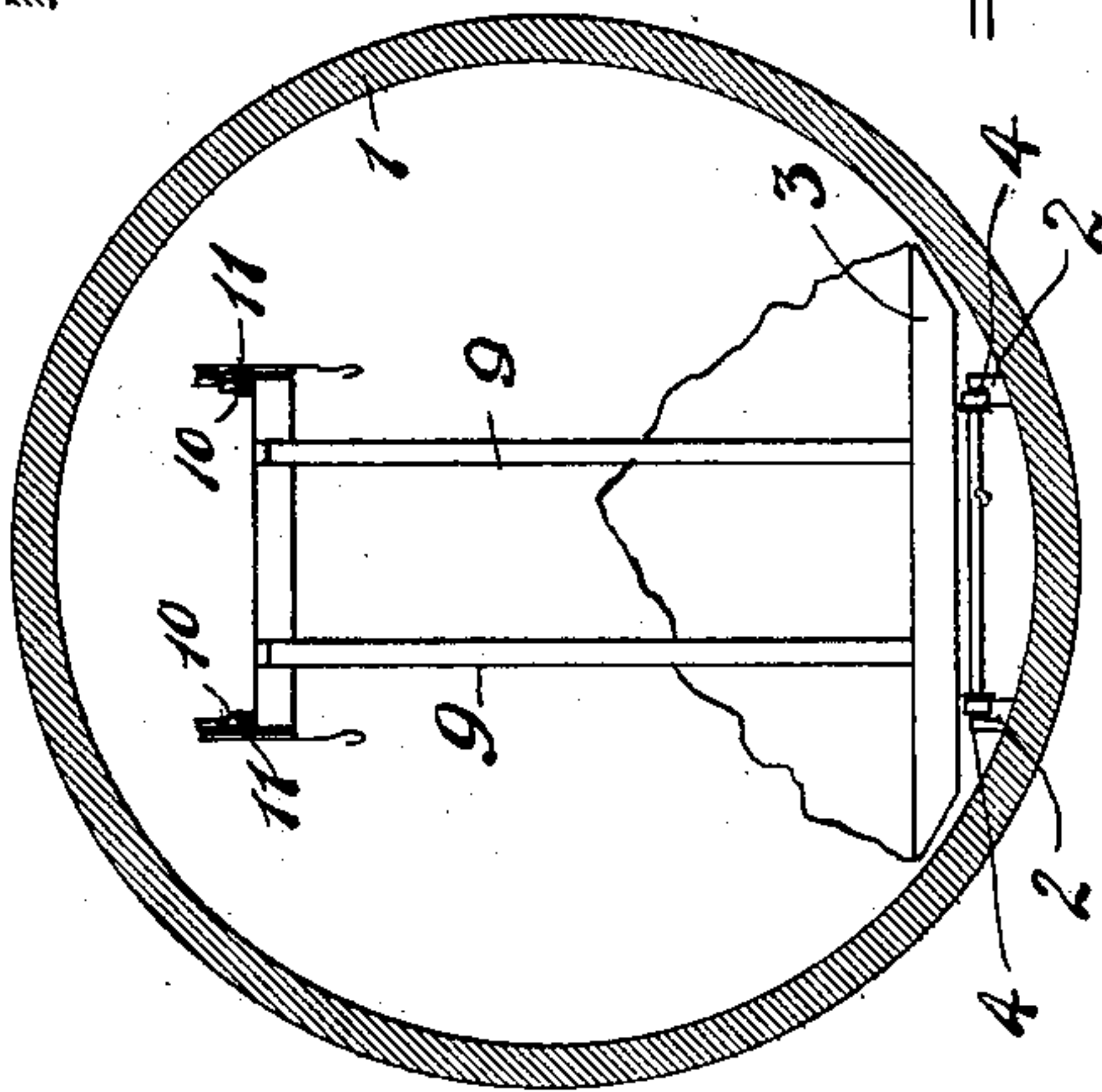


Fig. 1.



WITNESSES:

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APPARATUS FOR FACILITATING TUNNEL CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 735,718, dated August 11, 1903.

Application filed June 1, 1903. Serial No. 159,500. (No model.)

To all whom it may concern:

Be it known that I, JOHN VIPOND DAVIES, a citizen of Great Britain, residing at Flushing, in the county of Queens, State of New York, have invented certain new and useful Improvements in Apparatus for Facilitating Tunnel Construction, of which the following is a full, clear, and exact description.

My invention relates to apparatus for facilitating tunnel construction, the object of my invention being to expedite the removal of excavated material by making it possible to remove the same simultaneously with the construction of the tunnel-lining. Heretofore in driving tunnels it has been necessary to excavate, load up, and remove all the spoil material broken down before it has been possible to commence the erection of any portion of the permanent lining of the tunnel. This work has been accomplished by slow labor, and has consequently delayed the rapid progress of tunnel construction. This invention provides a means whereby the loading of the excavated material is a mere incident to its being broken down. Immediately upon a certain amount of spoil material being cut away or broken down it is removed mechanically a sufficient distance to permit the erection of the tunnel-lining simultaneously with the manual removal of the said material from the conveyer.

The accompanying drawings illustrate conventionally a portion of a tunnel and my improved apparatus for facilitating the construction of the same.

In the drawings, Figure 1 is a cross-sectional view of a tunnel with my apparatus located within the same and illustrated in elevation. Fig. 2 is a longitudinal section of the tunnel and side elevation of my apparatus.

1 represents the lining of a tunnel.

2 2 represent a pair of skids constituting a carriage, which may be pushed to and fro upon the inside bottom of the tunnel-lining 1.

3 is a conveyer-platform extending across the tunnel-lining near the bottom, yet slightly above it, the edges of the said platform lying closely adjacent to the inner wall of the tunnel-lining 1 and so as to act as a partition.

The platform 3 is mounted upon suitable rollers or bearings 4, guided upon the skids 2 2, which, in effect, may form tracks for said

rollers or antifriction-bearings. When a shield, such as is well known in tunnel construction, is used at 5, the same may be coupled with the skids 2 2 by means of a suitable link 6, so that as the shield advances the skids will also advance. The platform 3 may be slid back and forth upon the skids 2. The forward end of the skids 2 when in their extreme advanced position stand substantially over the forward end of the completed tunnel-lining. This is best seen in Fig. 2.

7 represents a track which may be laid in the bottom of the completed tunnel-lining.

8 represents a bridge spanning the gap between the track 7 and the platform 3, so that a car may be moved through the tunnel close up to or on the platform 3 to be filled with the excavated spoil which may be upon the platform 3.

9 9 are uprights mounted on the platform 3 and carrying a track 10, upon which may be slidably mounted a carriage 11. The length of this track 10 is preferably greater than the length of the platform 3. If desired, a pair of tracks 10 10, as shown in Fig. 1, and a pair of carriages 11 11, as shown therein, may be employed.

From the foregoing description of the parts the operation may be understood. The skids are first moved, so that their forward ends stand substantially over the inner or forward end of the tunnel-lining 1. When the material to be excavated is cut down, it will fall upon the conveyer-platform 3, which may be advanced to the shield or forward wall to close the gap—for example, over link 6. Since the platform substantially partitions off the bottom of the tunnel, this spoil material will not get underneath the platform, so as to interfere with its being moved back upon the skids 2. When the platform is loaded, it is moved back from its forward position, so that its rear end will stand over the rear end of the skids. The moving back of the platform withdraws the spoil material, so that the mechanics may have room to set up and secure the tunnel-lining in place in front simultaneously with the removing of the muck or spoil to the rear. This may be accomplished in the usual way, excepting that instead of removing it from the bottom of the tunnel it is conveyed by the movable parti-

tion-platform simultaneously with the setting up of the lining-plates. The lining-plates may be carried forward simultaneously by means of the carriage 11, to which the
5 plates may be attached and by which they may be moved forward over the spoil material to their destination. The spoil material may be loaded onto cars, which may be brought up to the platform by the track 7 and bridge
10 8, and as soon as the spoil is removed the tunnel-plates and the lining-plates are in place. The skids may be again advanced to the forward edge of the tunnel-lining. The carriage may be advanced and an additional
15 amount of spoil deposited thereon to be quickly removed by retracting the platform, whereupon the further extension of the tunnel by the introduction of new plates may be carried on.

20 By my invention it will be apparent to an engineer familiar with this art that a substantial saving in time and labor, and consequently in expense, is attained.

What I claim is—

25 1. In an apparatus for facilitating the con-

struction of tunnels, a movable platform partitioning off the bottom of the tunnel, a support for said platform comprising skids or the like movable in said tunnel.

2. In an apparatus for facilitating the con- 30
struction of tunnels, a movable platform partitioning off the bottom of the tunnel, a support for said platform comprising skids or the like movable in said tunnel, and means carried by the platform for transferring tun- 35
nel-plates or other devices from one end of said platform to the other and over or around spoil that may be thereon.

3. In an apparatus for facilitating the con- 40
struction of tunnels, a movable platform partitioning off the bottom of the tunnel, a support for said platform comprising skids or the like movable in said tunnel, tracks within the tunnel, and a bridge connecting said platform with said tracks.

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Witnesses:

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