(No Model.) 2 Sheets—Sheet 1.

G. H. VAN VLECK.

DEVICE FOR REMOVING THE DÉBRIS OF A BLAST FROM THE FACE OF A TUNNEL.

No. 333,266. Patented Dec. 29, 1885.

Fig. 1.

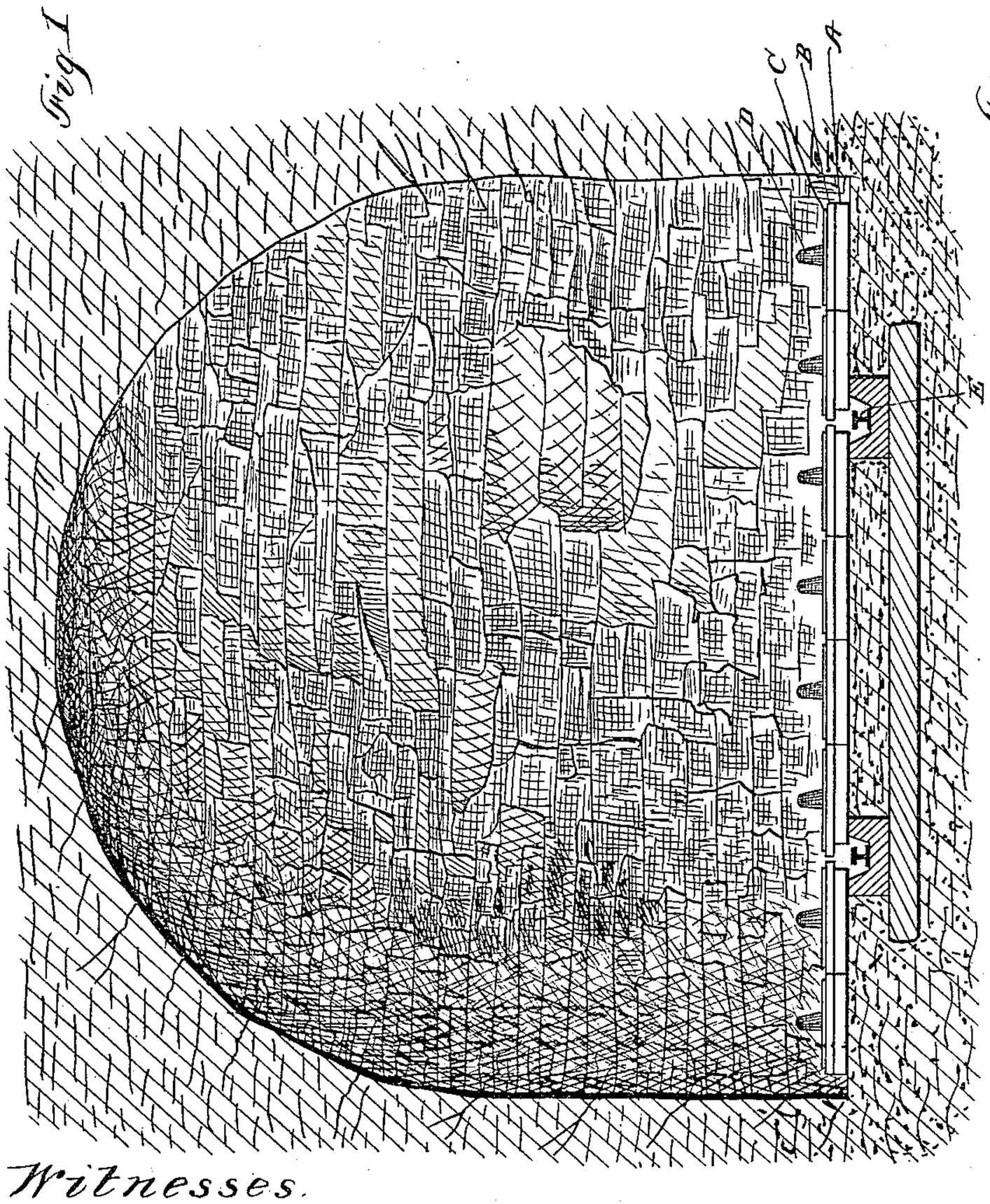
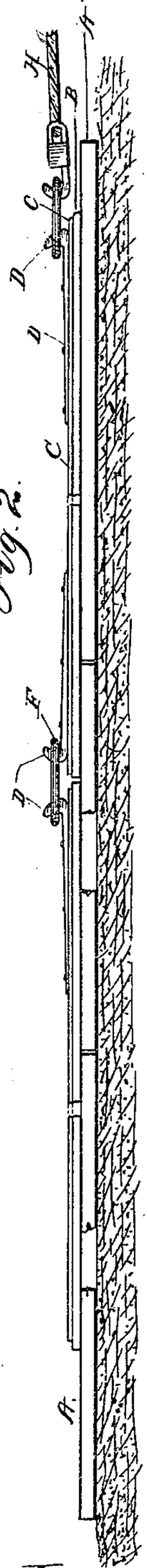


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

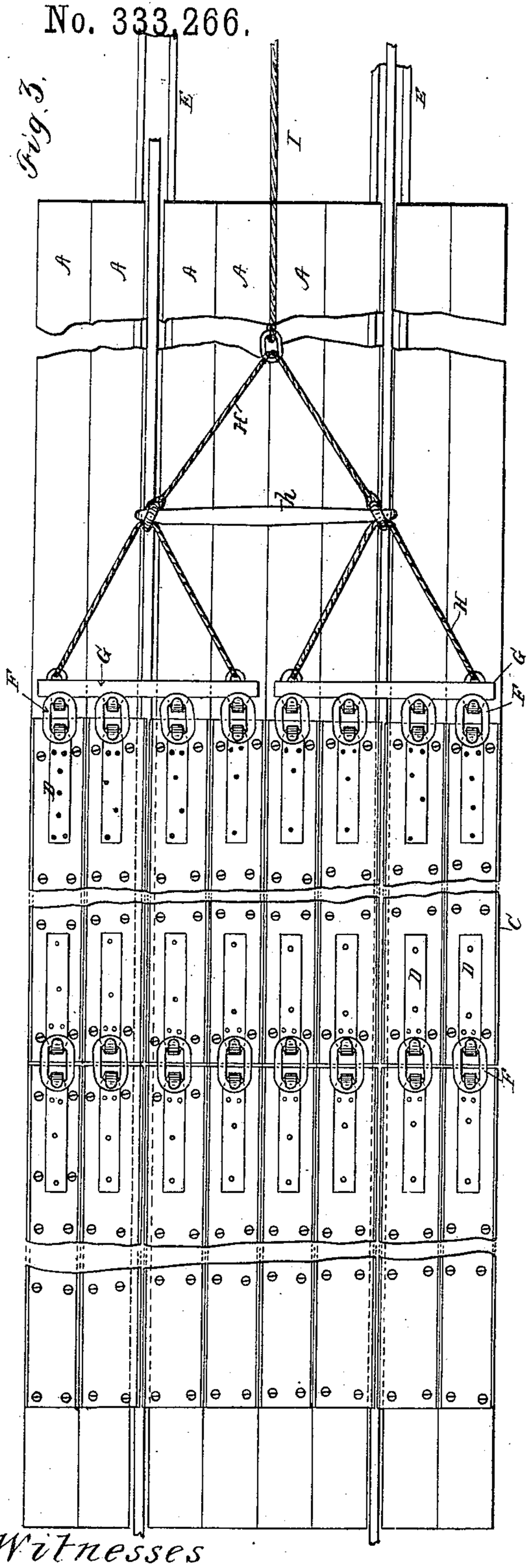
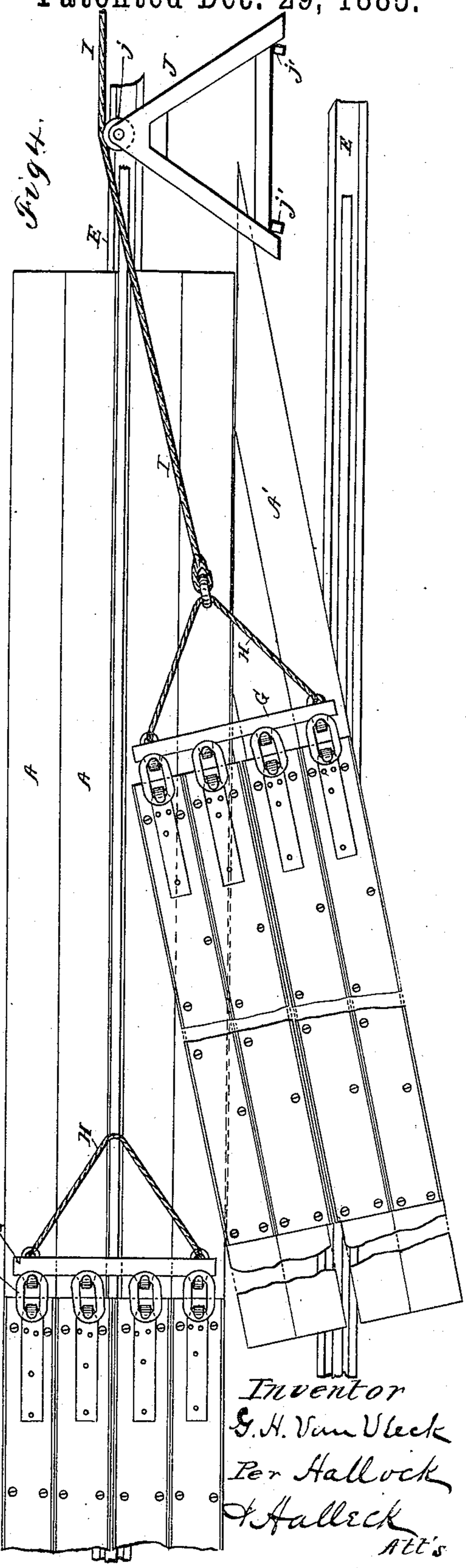


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE H. VAN VLECK, OF BUFFALO, NEW YORK.

DEVICE FOR REMOVING THE DÉBRIS OF A BLAST FROM THE FACE OF A TUNNEL.

SPECIFICATION forming part of Letters Patent No. 333,266, dated December 29, 1885.

Application filed April 12, 1883. Serial No. 91,475. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. VAN VLECK, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Devices for Removing the Débris of a Blast from the Face of the Tunnel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the art of mining, tunneling, and like subterranean excavation.

The object of this invention is to provide means for removing the débris after a blast from in front of the face of the tunnel or excavation more expeditiously than can be done by the present methods, and thus hasten the work. At present, after a blast, the débris has to be removed by laborers with wheelbarrows and like appliances, and when the blast has been large, and a large amount of rock or earth has been thrown down, it takes a great deal of time for the laborers to remove the débris, so as to permit the drills to again approach and work in the face of the excavation. By this invention the débris can be removed bodily far enough from the face of the excavation to enable the drilling-machines to approach the face of the tunnel and work therein, while laborers are employed in removing the débris from the excavation.

To effect the above result, the appliances employed are as follows: The floor or bottom of the tunnel or excavation for some distance back from the face is planked over with smooth-faced plank laid lengthwise of the excavation. On these plank is carefully spread a coating of tallow or other lubricant, and then upon these are placed other smooth-faced plank, which are well lined or backed with sheet-iron, said upper plank being laid longitudinally upon the bottom plank, and their ends being provided with strong hooks or other means of attachment thereto. These upper plank need only be laid out from the face of the tunnel as far as the débris will be thrown by the blast; but the lower plank should be laid as far out as it is desired to move the débris bodily. A power-winch is provided, either at the mouth of the tunnel or at some desirable place, and a cable is carried therefrom to the upper planks, to which it is connected by a draw-bar, like a double-tree somewhat, and links therefrom to the hooks on the plank. After the blast has occurred the winch is set in motion, and the upper planks, with the débris piled thereon, are drawn back from the face the required distance, and the drills can then be brought up to the face of the work and put in operation, while the débris is being carried off from the plank by which they were carried back as aforesaid. The carriage formed by the upper planking can be moved as a whole or in sections, according to the dimensions of the work and the power of the winch.

This invention is illustrated in the accompanying drawings, as follows:

Figure 1 is a view looking toward the face of the tunnel or excavation, and shows the planking in place. Fig. 2 is a side view of the planking. Fig. 3 is a top or plan view, and shows the method of attaching the upper planking to the cable. Fig. 4 is a plan view also, and shows one section of the planking being drawn obliquely across the tunnel, so as to get all the débris on one side of the excavation.

A A A are the lower or ground planks.

B are the upper or carrying planks.

C is the sheet-iron backing of the plank B.

D D are the hooks at the ends of the upper planks for connecting therewith.

F is a link for connecting the draw-bar or other drawing device to the hooks on the plank, or for connecting two planks together end to end.

G is the draw-bar, and I the cable.

In Fig. 3 the preferable method of attaching the cable to draw all the plank out together is shown, and in Fig. 4 the method of drawing them in sections is shown, and also the method of drawing one section out in front of the other section. This latter operation is effected by a deflector-frame, J, with a sheave, *j*, at its apex, and secured at its base by stakes *j' j''*, or other secure fastening. This device holds the draft-cable to one side of the tunnel, and hence causes it to draw the section off to one side. The number of plank in each section will be

wholly regulated to suit the circumstances of the case, and after they have been drawn out they can be subdivided, so as to enable them all to be laid along the sides of the tunnel, clear of the drill-carriage tracks E E, so that the drill-carriage can be run forward past the débris to work at the face of the excavation. By this system the débris can be got away so as to permit the drills to work again in a very short time, thus enabling the drills to work many more hours a day, and hence much greater speed in the work of excavation can be effected, and hence great saving in the cost of the work can be made.

The construction of the winch or other device by which the cable is drawn is not in any way connected with this invention, for any proper machine for the purpose may be employed.

The object of the iron sheeting on the upper planks is to protect them against the falling rocks from the blast. The iron used should be about as thick as medium boiler-iron, for the falling rocks strike them with great force, and they should be well able to resist the shock.

What I claim as new is—

1. A device or apparatus for removing the débris of a blast from in front of the face of an excavation, consisting of the combination of the following elements or instrumentalities, substantially as set forth: a track or way on the bottom of the excavation formed of smooth-faced plank, a platform formed of plank laid on said way in front of the face of the excavation in position to receive the débris of the blast, a proper lubricant or anti-friction material placed between the faces of the planks forming said platform and those forming said way, and finally means, substantially as shown, for attaching a draft-cable to said upper platform.

2. In a device or apparatus for removing the débris of blasts from the face of an excavation, the combination, substantially as shown, of the following elements: a way formed on the bottom of the excavation of smooth-faced plank lying longitudinally with the cut or tunnel and made slippery by proper means, a movable platform on said way formed of smooth-faced iron-backed plank laid parallel over the plank forming the way, each of said last-named plank being provided with a hook or other means of attachment thereto for draft purposes, and finally means, substantially as shown, for connecting said upper plank singly or in lots with the draft-cable, whereby all or any number of said upper plank can be connected with the cable and drawn on the said way, for the purposes mentioned.

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

GEO. H. VAN VLECK.

Witnesses:

JNO. K. HALLOCK,

ELMER S. SMITH.