

(No Model.)

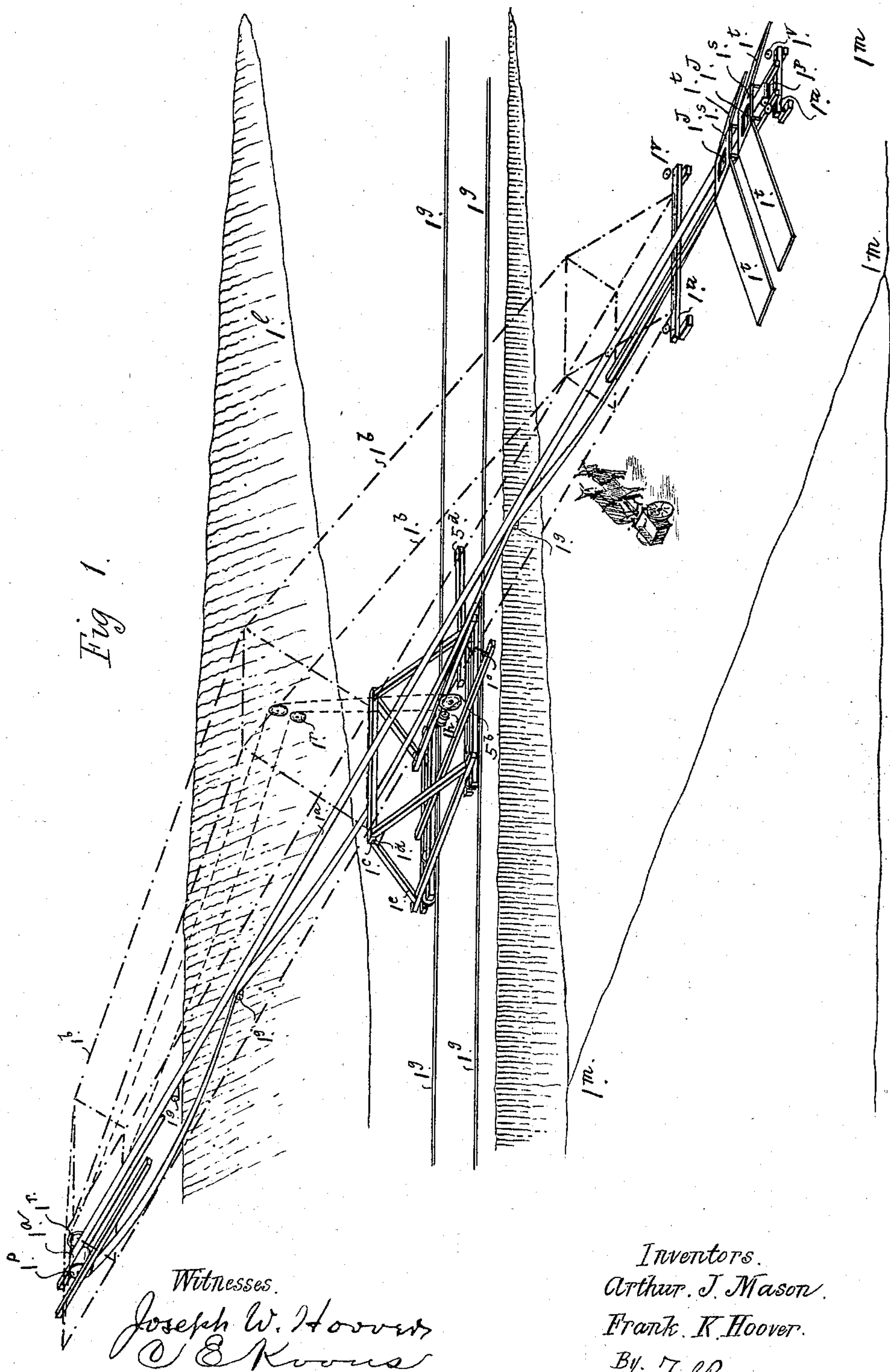
5 Sheets—Sheet 1.

A. J. MASON & F. K. HOOVER.

METHOD OF AND APPARATUS FOR STRIPPING COAL BEDS.

No. 591,047.

Patented Oct. 5, 1897.



Inventors.  
Arthur J. Mason.  
Frank K. Hoover.  
By J. S. Brown Atty.

(No Model.)

5 Sheets—Sheet 2.

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Fig 3.

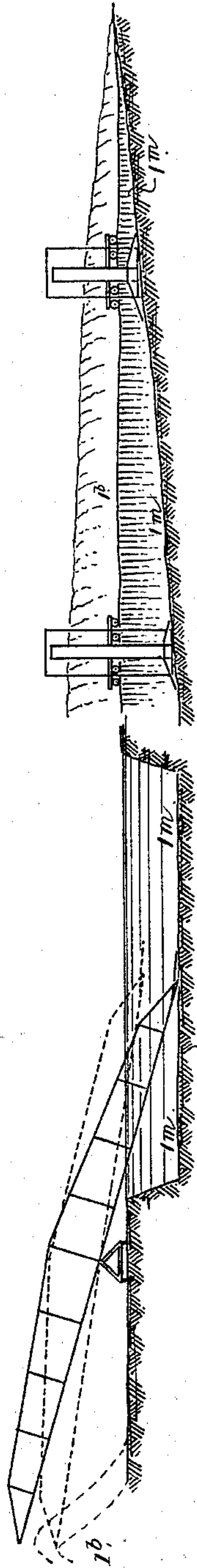


Fig 2.

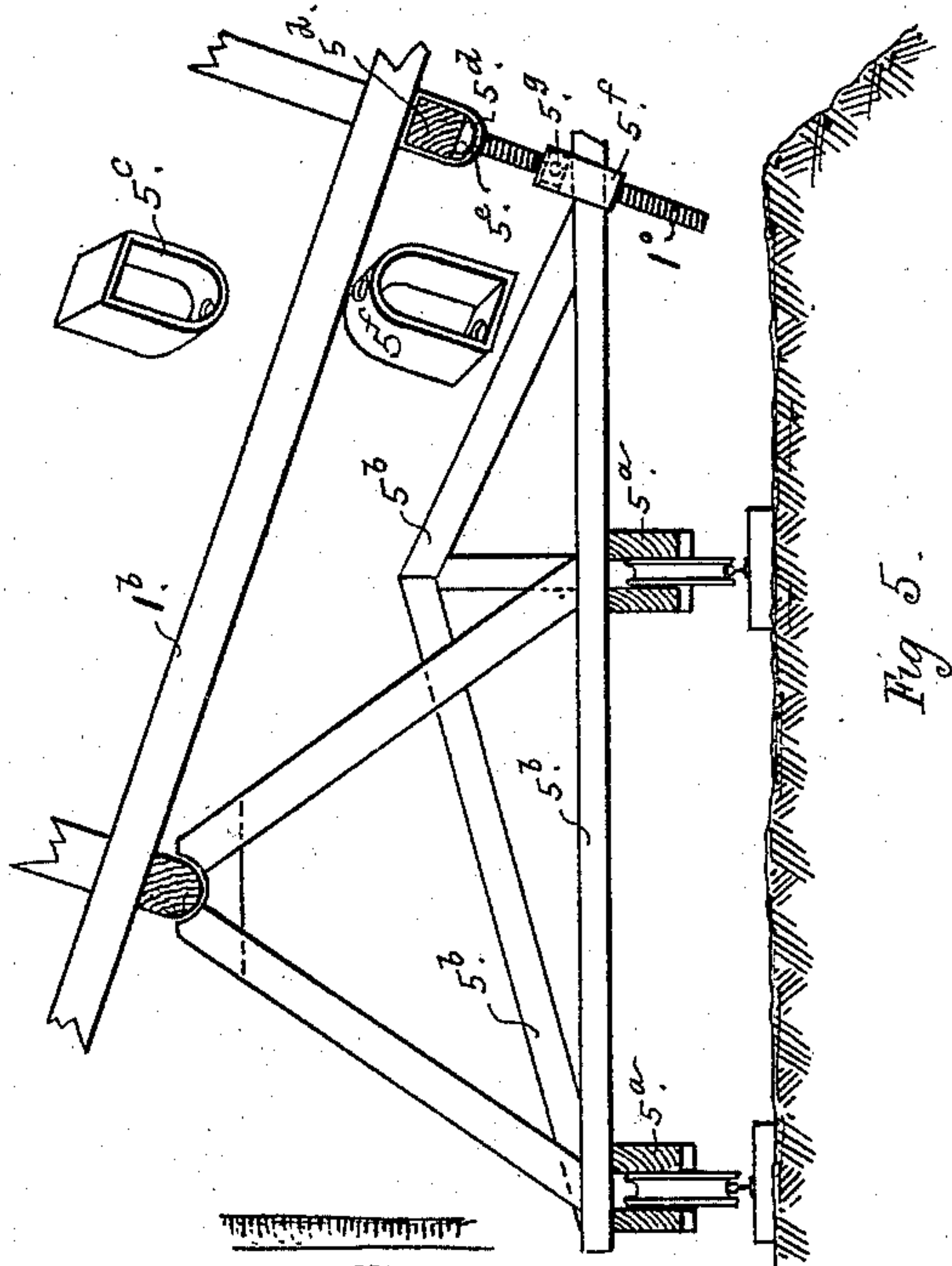


Fig 5.

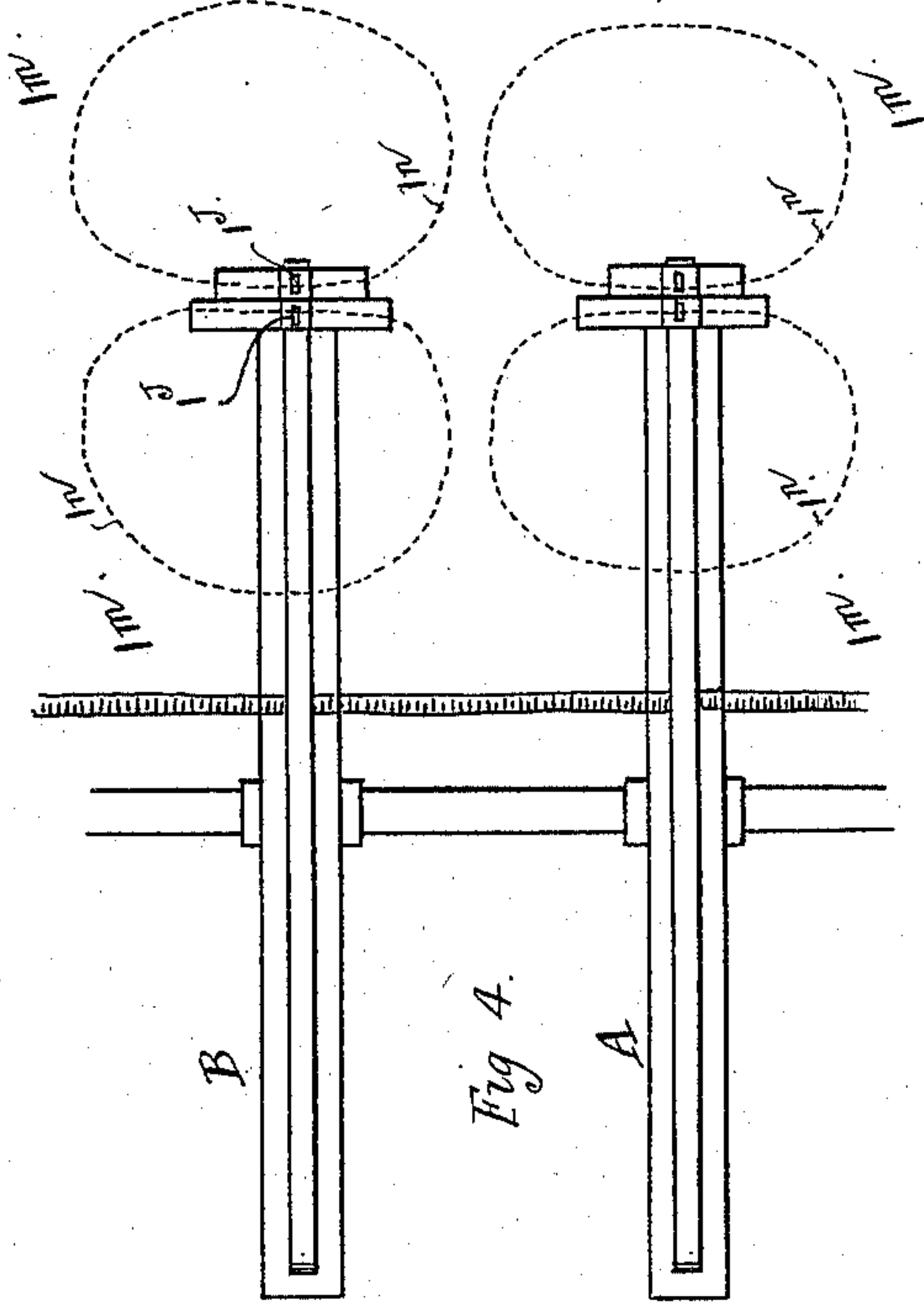


Fig 4.

Witnesses -  
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O. E. Hoover

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(No Model.)

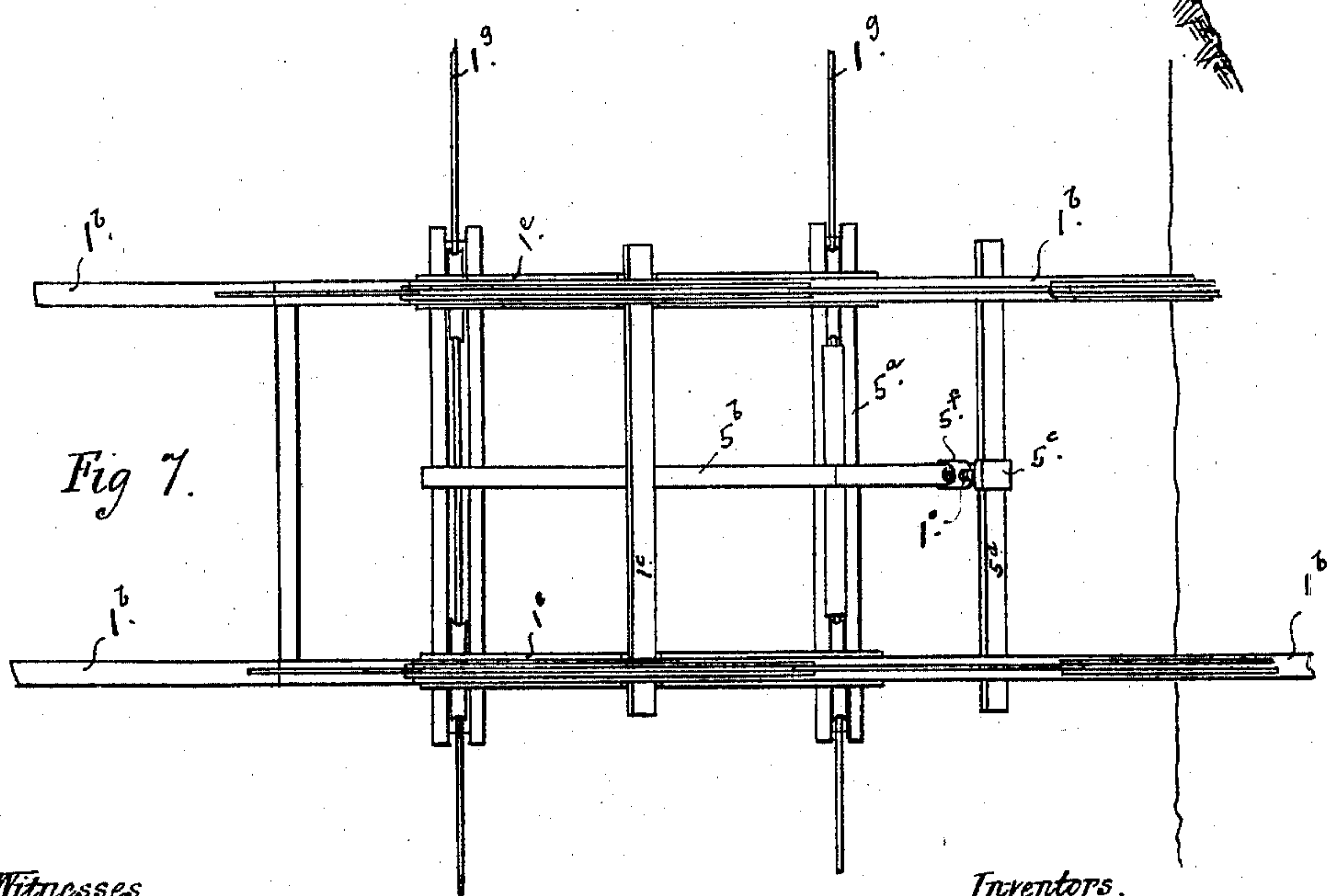
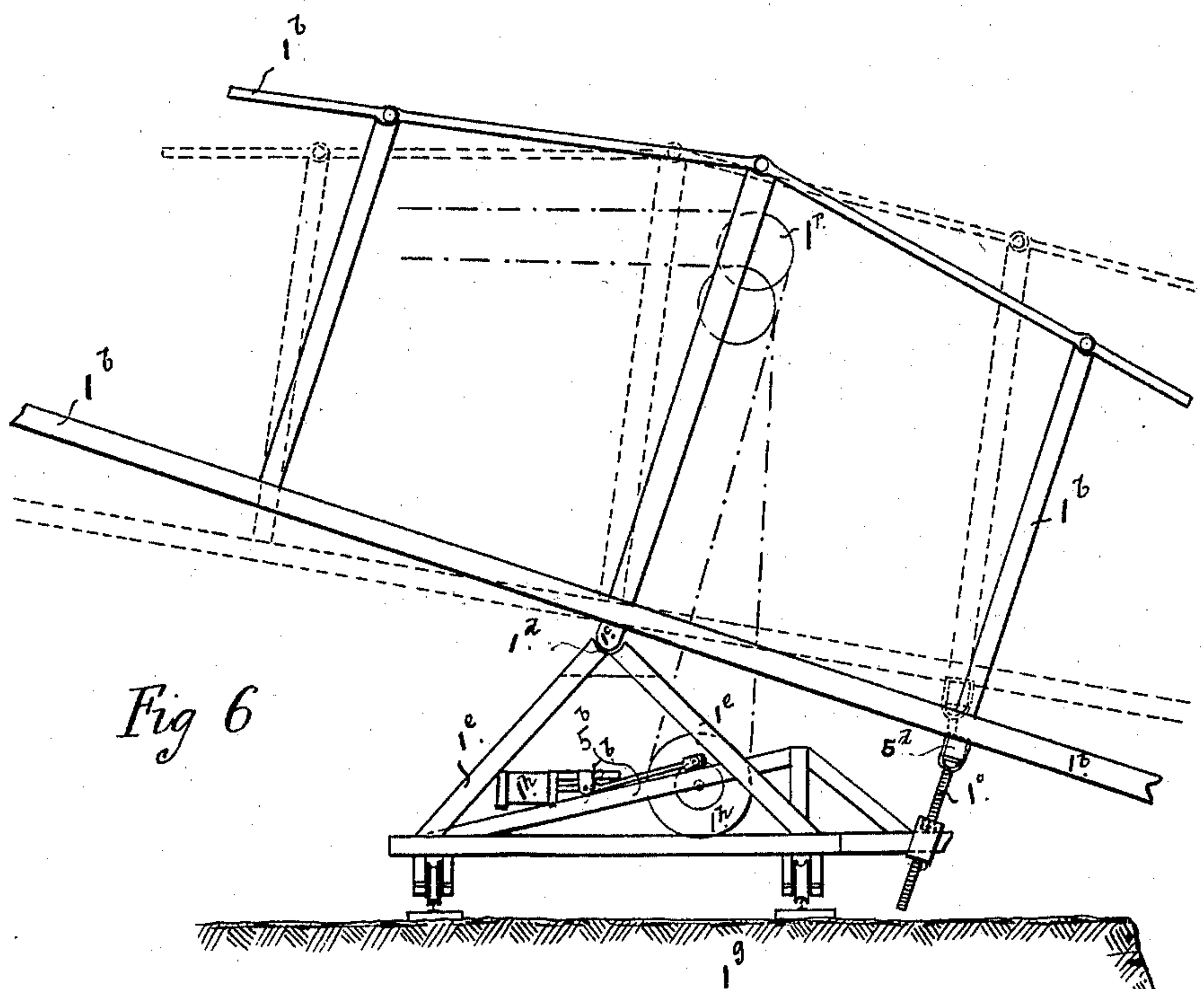
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Witnesses.

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(No Model.)

5 Sheets—Sheet 4.

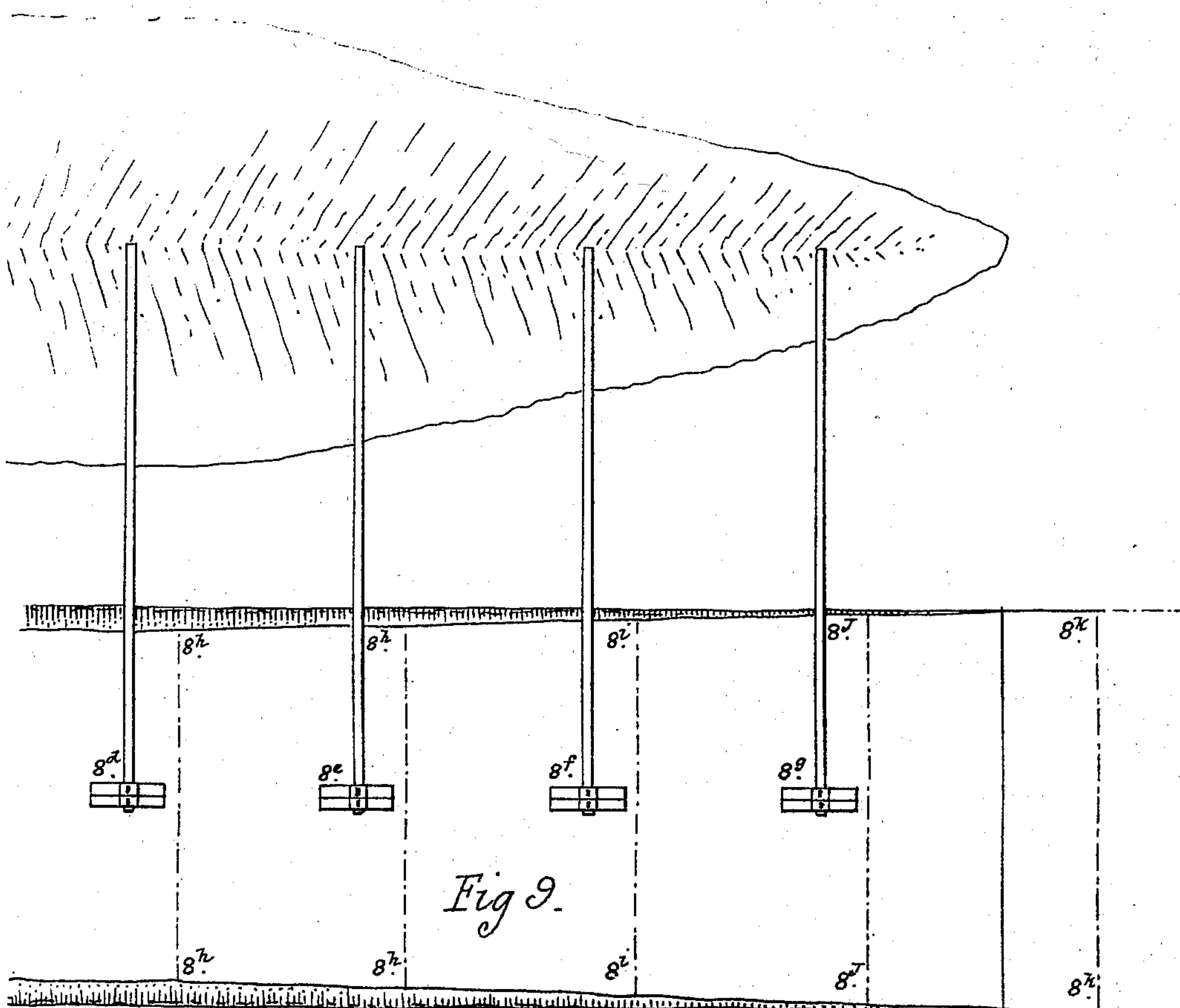
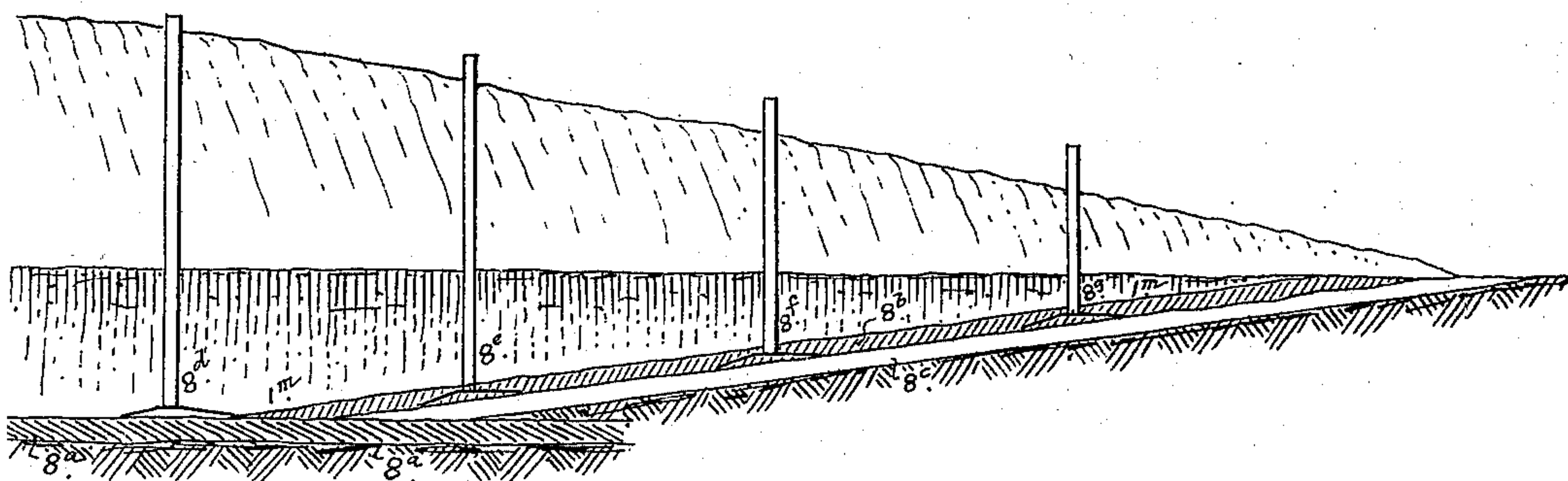
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*Fig 8.*



*Fig 9.*

Witnesses

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(No Model.)

5 Sheets—Sheet 5.

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Fig 10.

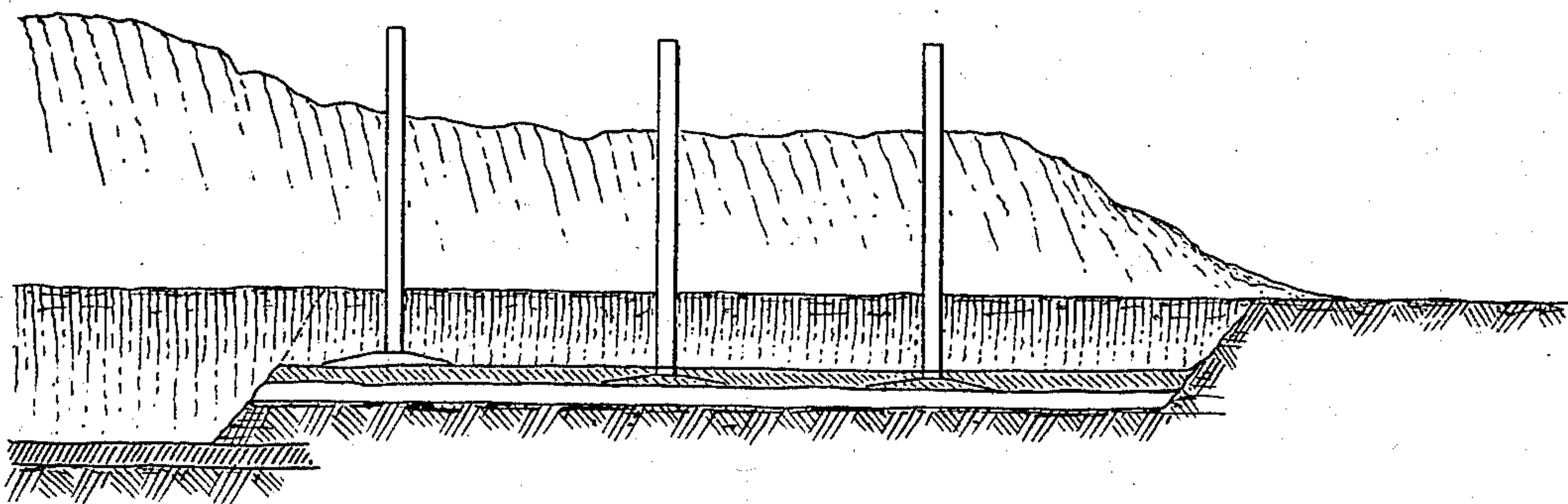


Fig 11.

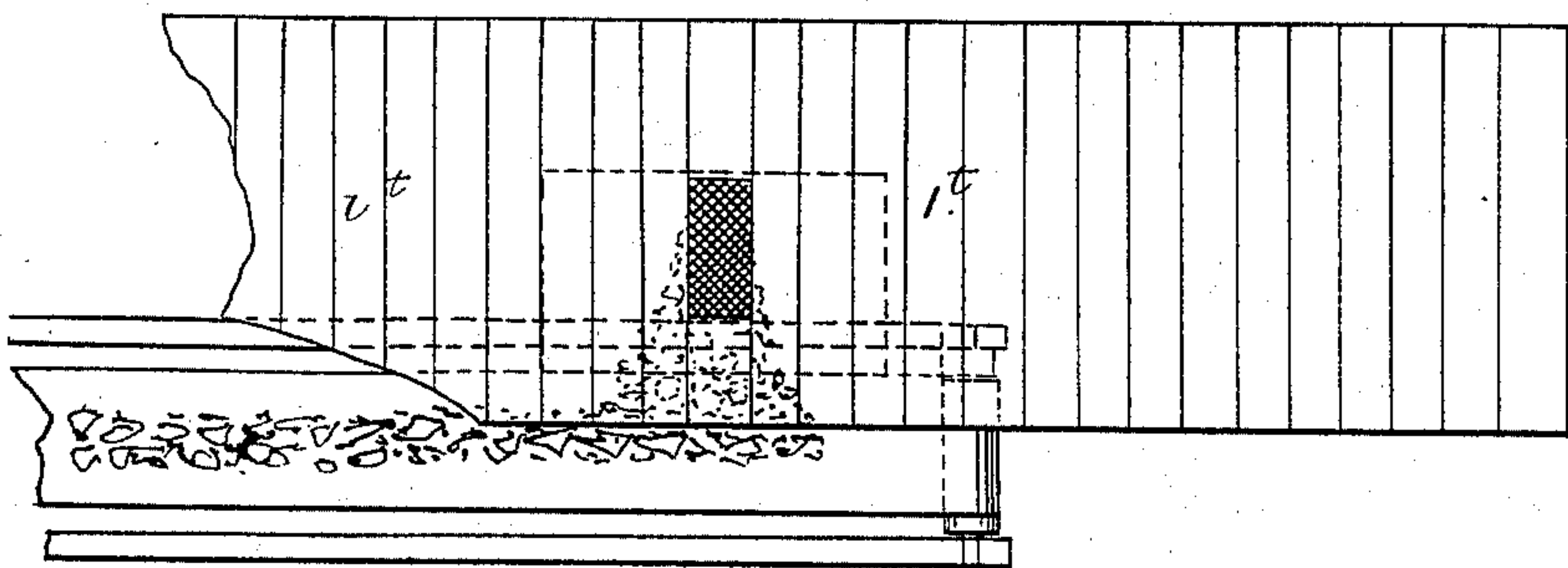


Fig 12.

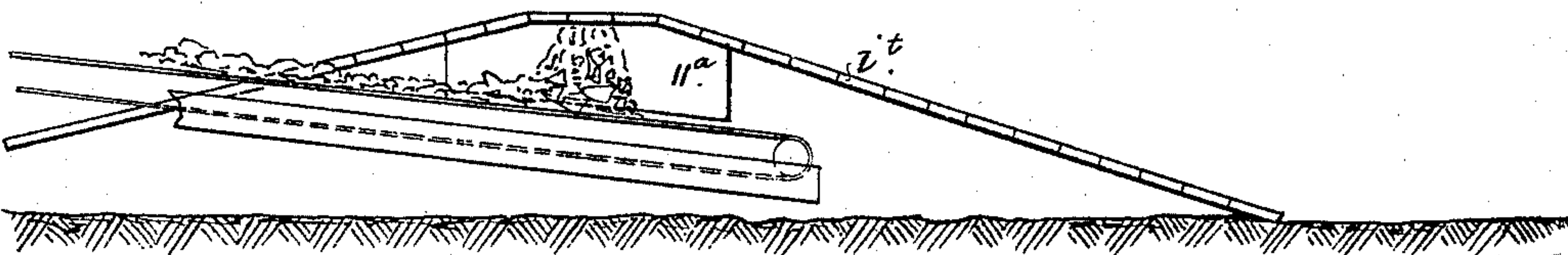
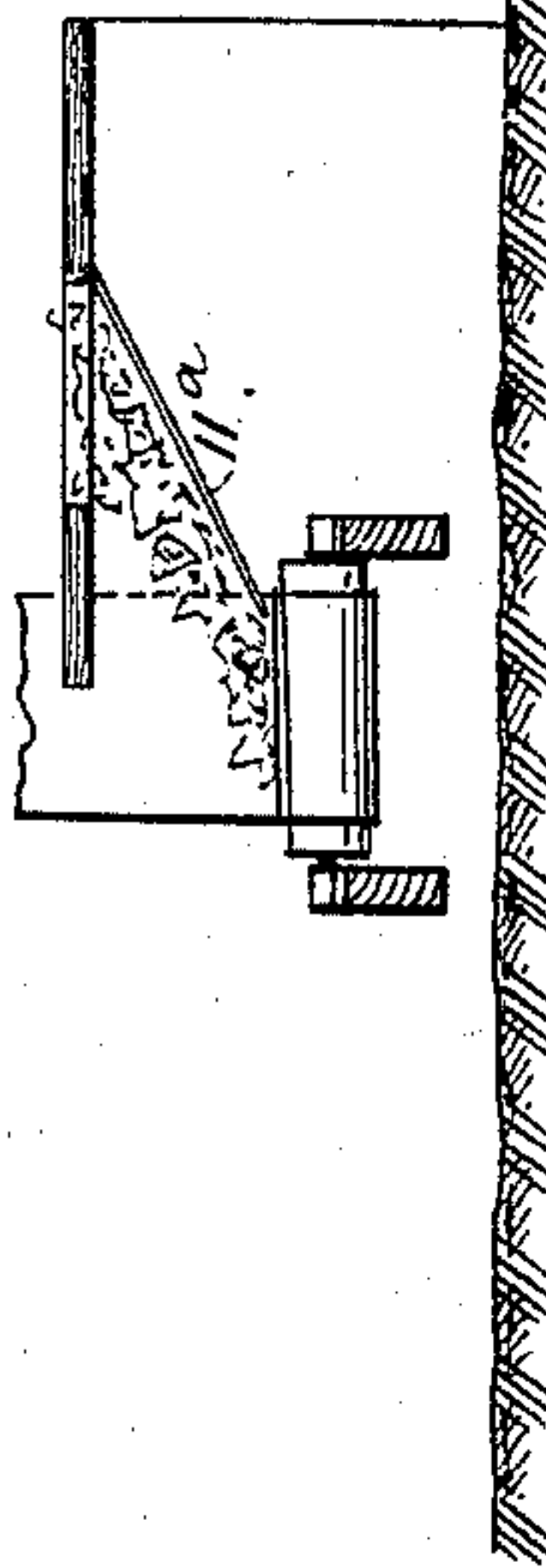


Fig 13.

Witnesses.

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# UNITED STATES PATENT OFFICE.

ARTHUR J. MASON AND FRANK K. HOOVER, OF KANSAS CITY, MISSOURI.

## METHOD OF AND APPARATUS FOR STRIPPING COAL-BEDS.

SPECIFICATION forming part of Letters Patent No. 591,047, dated October 5, 1897.

Application filed April 3, 1896. Serial No. 586,105. (No model.)

*To all whom it may concern:*

Be it known that we, ARTHUR J. MASON and FRANK K. HOOVER, of Kansas City, in the county of Jackson, in the State of Missouri, have invented certain new and useful Improvements in Methods of and Apparatus for Stripping Coal-Beds, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to improvements in methods of and apparatus for stripping coal-beds; and it consists of certain features of novelty hereinafter described, and pointed out in the claims. As at present carried on the operation of stripping coal and making like excavations is usually performed by teams with plows and scrapers, the earth being plowed in the excavation and collected by the scrapers and hauled out and up on the dump by the teams. To this operation runways from the excavation to the surface are necessary, and as the earth accumulates on the dump a long uphill haul on a steep grade results, making the work of excavating slow and laborious and confining the operation to narrow limits within the immediate vicinity of the runways. Not only so, but the runways interfere seriously with the work of plowing, and the teams doing the plowing and scraping being confined to a narrow area constantly interfere with each other, so that the full working efficiency of the teams, dissipated by the long uphill hauls and the interferences, is to but a small extent utilized. By our invention and improved method these difficulties, obstructions, and interferences are removed and the work of excavation is carried on with facility and despatch.

By our method the work in the excavation may be extended over as large an area as may be desired, to do which the working face of the excavation is preferably formed and maintained at an incline from the surface at the forward or advance end of the excavation to the bottom of the excavation at the rear or finished end, the sides remaining substantially perpendicular or at such angle as to prevent caving in. The work of plowing is done on this incline, and the work of scraping, collecting, and hauling the earth is all downhill, the work of the teams being thus

confined within the excavation where it can be most advantageously employed, the work of excavating and removing the material from the excavation being performed by a steam-operated conveyer having one end located within the excavation conveniently for access by the teams and scrapers and the other end extending over the dump. The inclined working face of the excavation is constantly maintained and the excavation is advanced upon planes substantially parallel with the inclined plane of the initial working face. As there are no runways or other obstructions within the excavation and no long uphill hauls it is apparent that the work of the teams is without obstruction, continuous, and uninterrupted and the fullest working efficiency is utilized and extended over as large an area within the excavation as may be within the coefficient of economy.

The steps in the method are as follows: The end face 1<sup>m</sup> is first established. The end face is then loosened, preferably by plowing, and the prism 8<sup>h</sup>, Fig. 8, thus prepared for the operation of scrapers. The receiving end of a conveyer is then placed at 8<sup>d</sup> and the loosened material within the area 8<sup>h</sup> is collected and carried downhill to the said conveyer and thereby transported to the dump. The receiving end of said conveyer is next brought to the position 8<sup>e</sup>, and the material within the area 8<sup>h</sup> 8<sup>i</sup> 8<sup>i</sup> 8<sup>h</sup> in a like manner removed. By successive locations of the conveyer to the sites 8<sup>f</sup> and 8<sup>g</sup> the whole of the material within the prism 8<sup>b</sup> is removed. The prism 8<sup>c</sup> is next removed in a similar manner. To strip the coal, a pit or excavation is thus advanced, leaving a form of canal behind the apparatus.

To effect this method, we employ certain mechanism of our invention, which will now be described.

Figure 1 represents a view of the apparatus in position for operation in stripping coal or making a like excavation. Fig. 2 represents a cross-section of the excavation and the dump, showing the operative relation of the apparatus thereto. Fig. 3 represents a longitudinal section of the same. Fig. 4 represents a plan view thereof. Fig. 5 represents a cross-section of the car and a portion of the truss upon which the conveyer is carried,



showing the means by which it is supported and adjusted thereon. Fig. 6 represents an end view of the car and side elevation of part of the truss supported thereon. Fig. 7 represents a plan view of the same. Fig. 8 represents a longitudinal section of the excavation, showing the successive steps by which the excavation proceeds. Fig. 9 represents a plan view of the same. Fig. 10 represents a longitudinal sectional view in which the plowing and collection is conducted on a substantially horizontal plane. Fig. 11 represents a plan view of the receiving end of the conveyer, showing the trap and drive-ways at the side thereof. Fig. 12 shows an end view of the same. Fig. 13 shows a side view of the same.

Similar numerals refer to similar parts throughout the several views.

1<sup>b</sup> represents a truss carried on the rocking beam 1<sup>c</sup>, mounted in the bearing 1<sup>d</sup>, formed in the tower 1<sup>e</sup>, supported upon the car-truck. As seen in Figs. 5 and 6, on said truck-frame is provided a support 5<sup>b</sup>, on which is mounted the jack-screw 1<sup>o</sup>, connected by a beam 5<sup>d</sup> with the bottom longitudinal members of the truss, whereby said truss is rocked in its bearing upon the tower.

1<sup>p</sup> represents drums mounted at or near the ends of the truss upon which travels the belt conveyer 1<sup>a</sup>, there being provided at suitable intervals intermediate rollers 1<sup>q</sup> to support the same. The conveyer is driven, preferably, by rope passing over the sheaves 1<sup>r</sup>, power being supplied by the engine 1<sup>h</sup>, located on the car. At or near the end of the truss extending into the excavation over the conveyer is erected the platform 1<sup>s</sup>, provided with the trap 1<sup>j</sup> and having the lateral wings or drive-ways 1<sup>t</sup>. At said end the truss is also provided with the members 1<sup>u</sup> and the jacks 1<sup>v</sup> for maintaining the level of the truss upon the incline of the excavation. In operation the scraper loaded with material from the excavation is drawn down the incline upon the platform and dumped through the trap upon the conveyer, and by it is elevated from the excavation and transported to and emptied upon the dump.

It is thus apparent that by the use of our invention and improvements the work of the scraper and team is confined to a limited area and a minimum haul within the excavation, approximately as shown by the dotted lines 1<sup>n</sup> in Fig. 4, while the more arduous and tedious labor of conveying the material from the excavation to and upon the dump is performed by the conveyer, thereby effecting a very great saving of time and largely increasing the capacity of the teams.

When it is desired to move the apparatus, by the operation of the jack-screw 1<sup>o</sup> the truss is rocked on its bearing and the platform end is raised. The whole weight of the truss is then carried on the car, the car is moved on the track 1<sup>s</sup> to the desired position, the platform end is lowered by means of the jack-

screw 1<sup>o</sup>, the jack-screws 1<sup>v</sup> are then adjusted to give a substantial bearing, and the work of excavation is resumed. The operation of excavation is continuously forward, advancing the face uniformly to the right in Fig. 1. Preferably the working surface of the excavation is maintained at an incline, as shown in Figs. 1 and 3, and the excavation is advanced upon planes substantially parallel with the plane of the initial working face, as shown in Figs. 8 and 9, so that the haul of the loaded scraper is wholly on a downgrade, thus further increasing the working efficiency of the team and reversing the ordinary course of the operation in common usage, in which the haul of the loaded scraper is always up an elevation equal to the depth of the excavation plus the height of the dump. It is apparent that the conveyer may be moved forward and backward, locating the traps upon the incline within the desired haul. Such working surface may, however, be maintained in a substantially horizontal plane, as shown in Fig. 10, the sides of the excavation being cut down in a substantially perpendicular relation, free from runways and like obstructions, and the excavation advanced upon a plane or series of planes substantially parallel with the plane of such initial working surface, and the driveways 1<sup>t</sup> may be placed longitudinally with relation to the conveyer instead of transverse thereto, and a chute 11<sup>a</sup> provided to deliver the material from the trap upon the conveyer, as shown in Figs. 11, 12, and 13.

Having fully described our improvements, what we claim as our invention, and desire to secure by Letters Patent, is—

1. The method of stripping coal or making like excavations, which consists in forming and maintaining an inclined working end face, loosening the said end face, and hauling or scraping the material downhill upon said end face to the receiving end of a conveyer located upon the bed of the excavation, and by said conveyer transporting the material to the dump; from time to time removing said conveyer to different sites on said working face in order to command all the loosened material upon said face within a desired short haul, in such a manner as to remove successive prisms from the end or working face and thus maintain the face at a desired constant and economical form substantially as set forth.

2. The method of stripping coal or making like excavations, which consists in forming and maintaining a working face or plane, loosening the material on said plane, collecting, hauling or scraping the same to the receiving end of a conveyer located upon said working face or plane and transporting the material to the dump by said conveyer: from time to time removing said receiving end of the conveyer to different sites on said plane, in order to command all the loosened material upon said face within a desired short haul, in



such a manner as to remove successive prisms from said working face substantially as set forth.

3. An apparatus for stripping coal-beds and facilitating and increasing the efficiency of wheel or other scrapers in such operation, consisting of a truss supported upon a movable truck and adapted to rock thereon, a conveyer adapted to travel on said truss, a platform upon said truss at or near one end thereof provided with a trap-opening upon said conveyer, and wings or driveways connected with said platform for approaching said trap, substantially as set forth.

4. In an apparatus for stripping coal-beds, the combination with a truss of a single movable truck on which said truss has a rocking bearing, a jack-screw mounted on said truck for rocking said truss thereon and so arranged that when the receiving end of the truss is elevated the entire weight of the truss is carried upon said truck, a conveyer traveling on said truss, and a belt traveling over suitable sheaves for operating said conveyer substantially as set forth.

5. An apparatus for stripping coal-beds and facilitating and increasing the efficiency of

wheel and other scrapers in such operation, consisting of the combination with a conveyer, a movable support, a truss having a rocking bearing on said support, and upon which said conveyer is adapted to travel, and a jack-screw for rocking said truss upon its support, of a platform on said truss at or near one end thereof, a trap in said platform over said conveyer, and wings or driveways connected with said platform for approaching said trap, substantially as set forth.

6. In an apparatus for stripping coal-beds, the combination with a movable support, a truss having a rocking bearing on said support and adapted to rock thereon, and a conveyer adapted to travel on said truss, of a platform at or near one end of said truss provided with a trap over said conveyer, and wings or driveways connected with said platform for approaching said trap, substantially as set forth.

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