

(No Model.)

J. REES.  
TRAP DOOR FOR MINES.

No. 497,211.

Patented May 9, 1893.

Fig. 1.

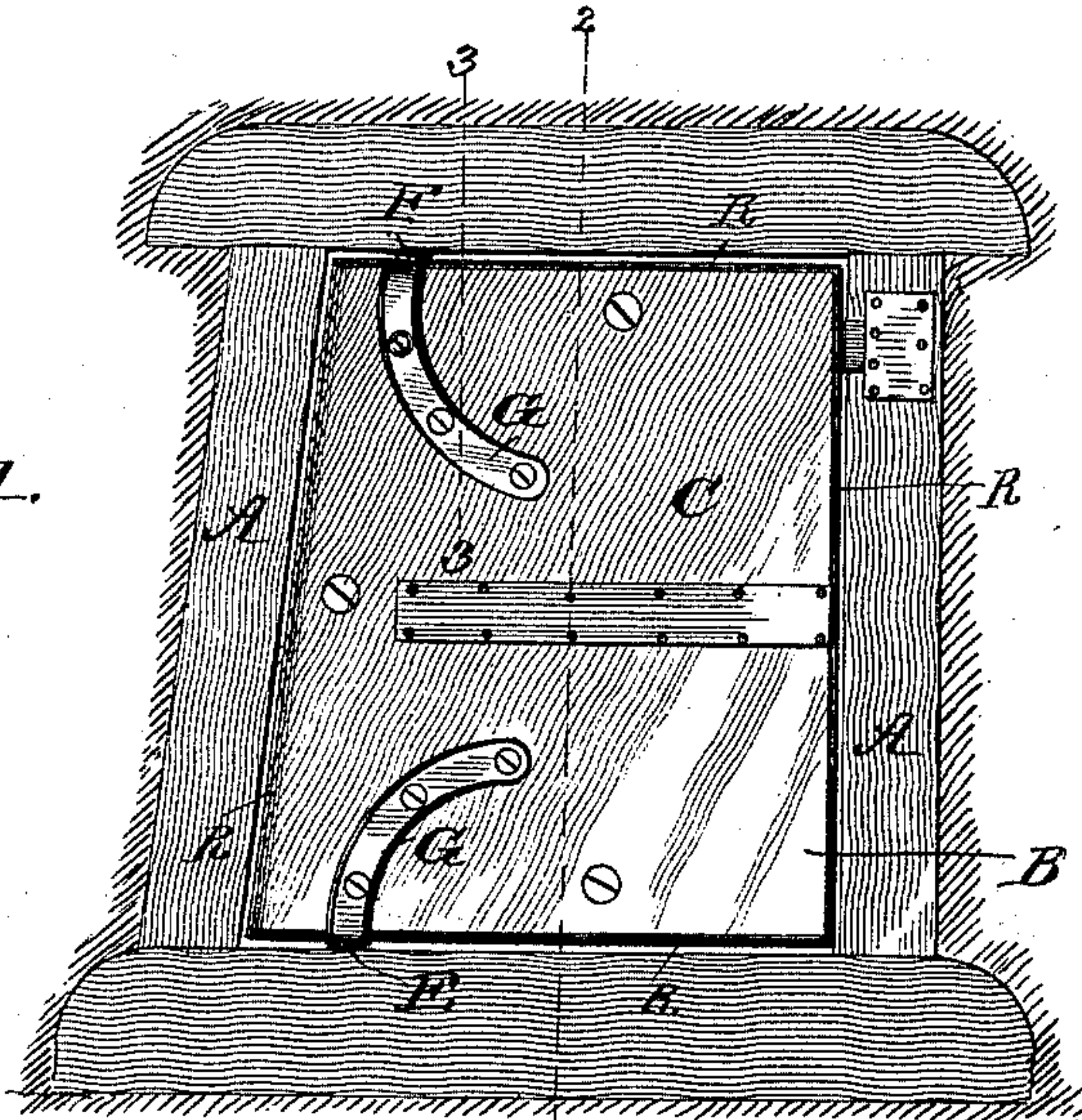


Fig. 2.

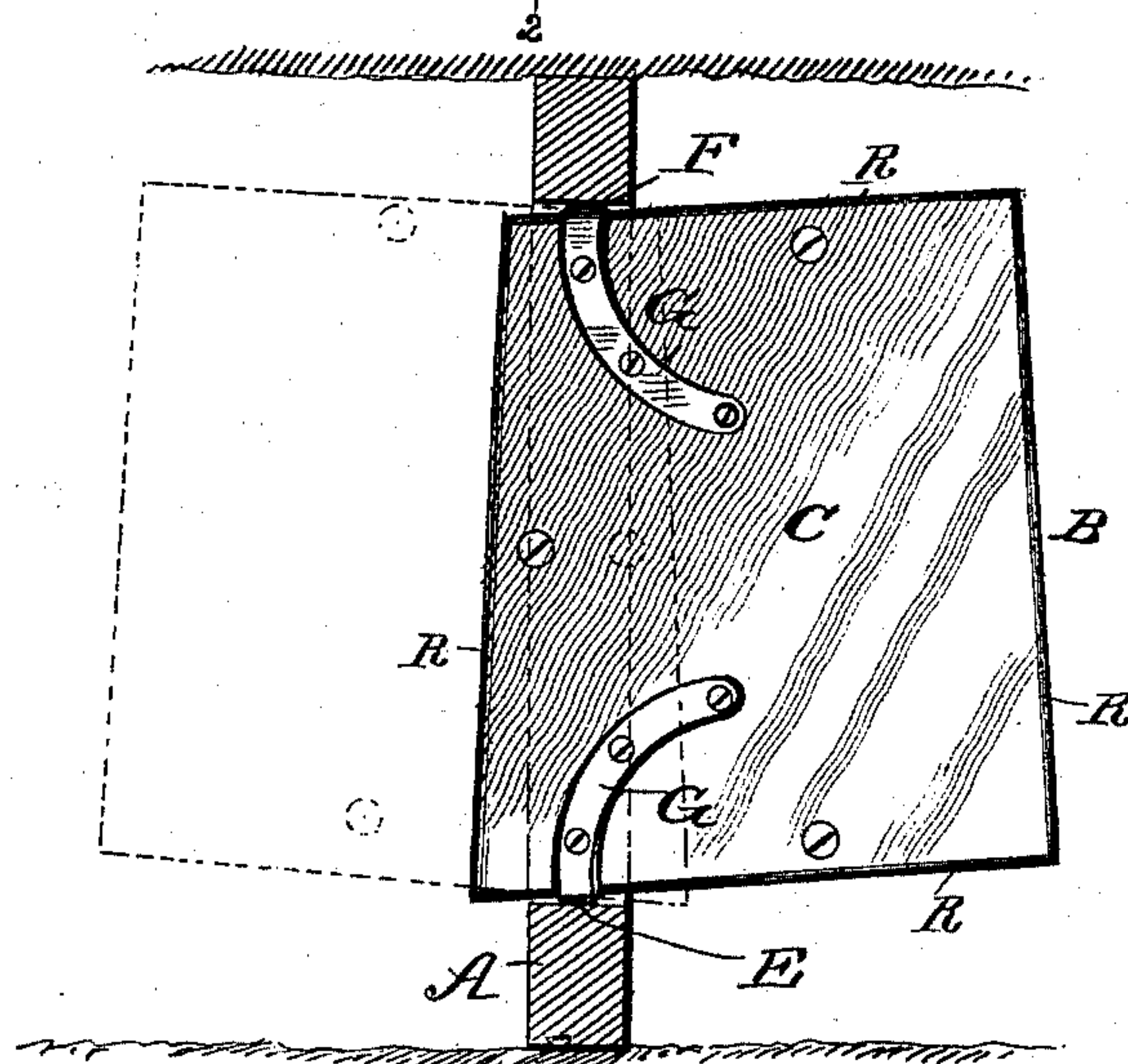
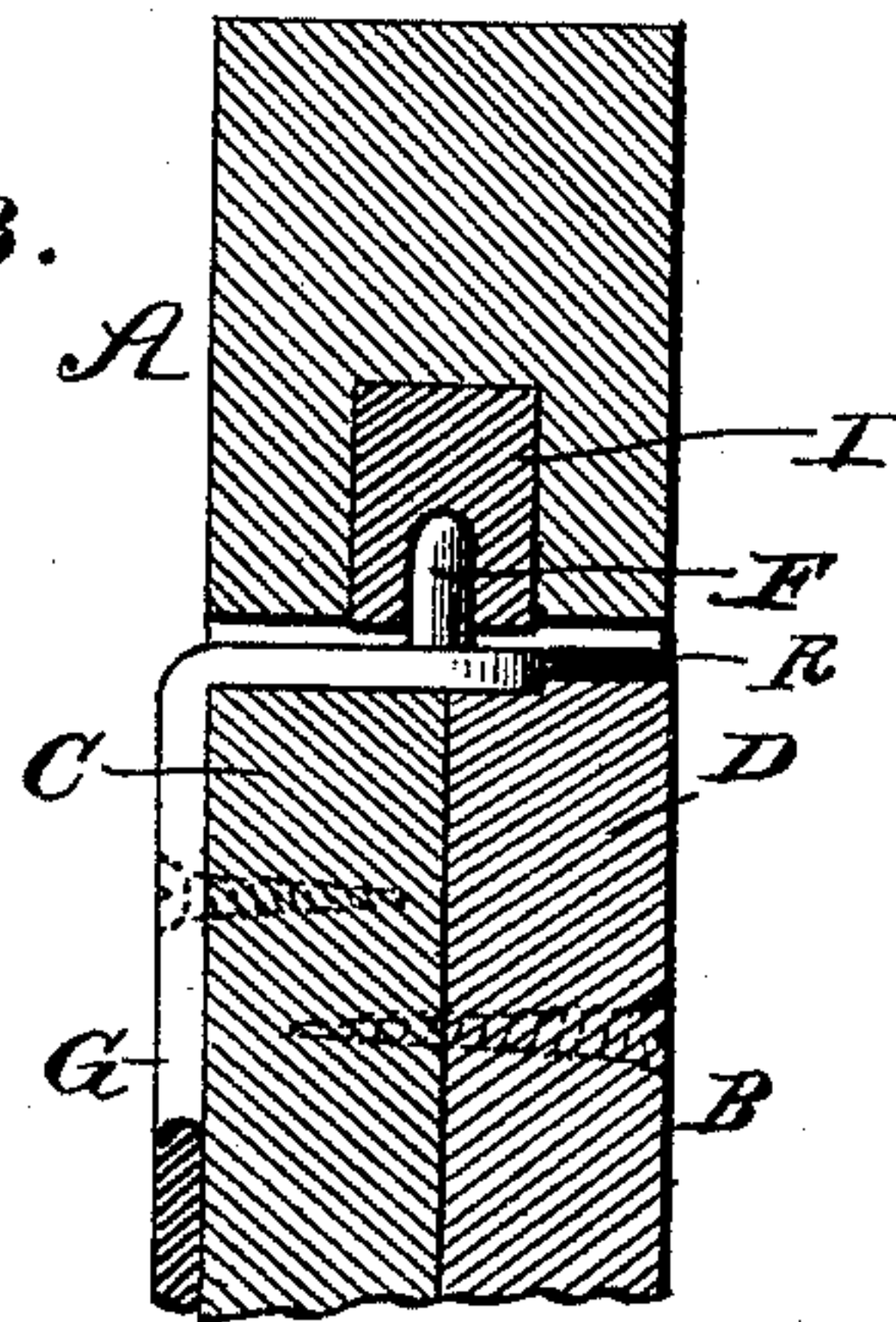


Fig. 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN REES, OF HAMILTON, IOWA.

## TRAP-DOOR FOR MINES.

SPECIFICATION forming part of Letters Patent No. 497,211, dated May 9, 1893.

Application filed June 1, 1892. Serial No. 435,178. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN REES, of Hamilton, in the county of Marion and State of Iowa, have invented a new and useful Improvement in Trap-Doors for Mines, of which the following is a specification.

My invention is an improved trap door for mines and consists in the novel constructions and combinations of parts as will be herein-  
after described and pointed out in the claims.

In the drawings, Figure 1 is a face view of my improved door. Fig. 2 is a vertical section on about line 2—2 Fig. 1 showing the door opened to one side in full lines and indicated in dotted lines as opened to the opposite side, and Fig. 3 is a detail section on about line 3—3 of Fig. 1 through the upper bearing.

The frame A is built of stout timbers properly framed together and formed to fit at the desired point in the mine passage and adapted to be moved from place to place as may be desired.

The door proper B is made to fit in said frame A and is preferably made in two face sections C and D secured together by bolts or in other suitable manner. This door is hinged in the frame so that it will open in both directions and will automatically close when opened in either of said directions.

In hinging the door the lower pintle E is placed in rear of the upper one F so that as the door swings open in one or the other direction its swinging edge will rise. This will be best understood from Fig. 2 in which it will be seen that as the door is opened it will swing upward so that its gravity will tend to close it whether it be opened in one direction or the other. In hinging I provide straps G bolted to the face of the door and curving in and forward from its upper and lower edges toward its front or swinging edge. These straps extend over the upper and lower edges of the door and are provided with pintles or studs E F which fit in the bearings I in the frame such bearings I being in practice usually made of Babbitt metal to prevent rusting or corrosion and render the construction more durable. It will be seen that the door opens readily in both directions rendering it im-

possible for a driver or mule to be injured by passing through or striking against it. As it closes automatically it avoids the expense of a trapper or door tender and the consequent uncertainty resulting from the employment of irresponsible help, who at times by going to sleep or carelessness fail to properly tend the doors and are the occasion of loss of property and life.

In practice the door will retain its position against the air without the use of springs or any machinery which would be liable to get out of order and by closing automatically the door will be one of the best safeguards against explosions as it keeps the air under constant control.

It is preferred to make the door with its swinging edge vertical as shown and its opposite edge inclined the frame being correspondingly formed.

It may be preferred in some instances to arrange a strip R of rubber edgewise around the door as shown in Fig. 2 to make it perfectly air tight.

It will be noticed that the door has an imperforate extension in rear of its hinge axis or center of motion. This is important as it permits the arrangement of the pivots in such manner as to secure the automatic closing of the door without affecting the function of the door as a trap or air door. At the same time this imperforate portion operates to ease the movements of the door in both its movements and renders the movements thereof smooth and easy.

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

1. An improved trap door for mines consisting of the supporting frame, and the door proper therein said door proper being hinged at its top and bottom with its upper hinge in advance of its lower one and having an imperforate extension in rear of its hinge axis or center of movement the gate being adapted to open in either direction and to automatically close substantially as shown and described.

2. In a trap door for mines the combination

of the supporting frame, the door proper having its rear edge sloped outward from its upper to its lower end, and the hinges having their straps G extended along and secured to  
5 the face of the door and bent along the upper and lower edges of the door and provided between the opposite faces thereof with the pintles fitting in the bearings of the frame said pintles being arranged the upper one in ad-

vance of the lower the door having an imperforate portion extended rearwardly beyond the said pintles substantially as shown and described.

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Witnesses:

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