

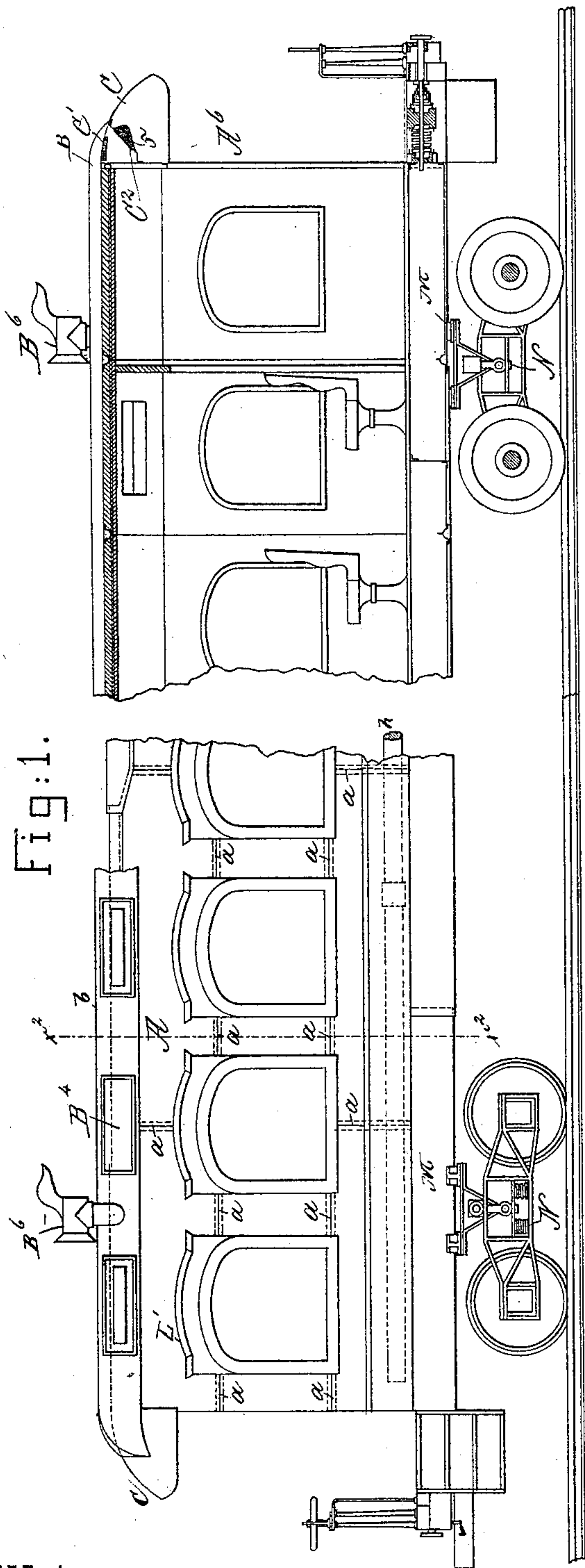
(No Model.)

4 Sheets—Sheet 1.

C. A. & C. M. SMITH.
VENTILATING RAILWAY CARS.

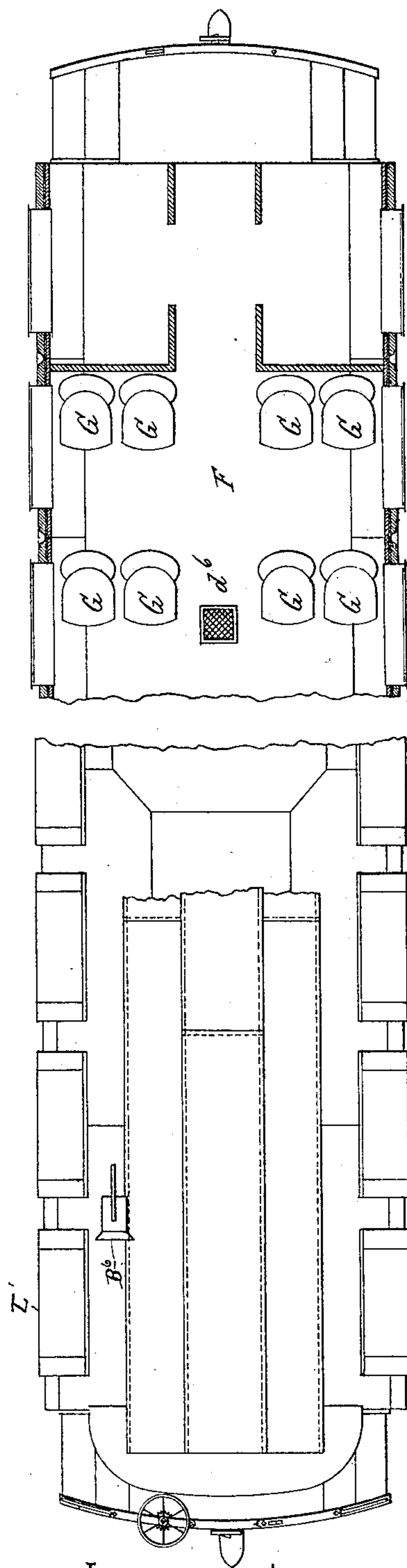
No. 366,520.

Patented July 12, 1887.



Witnesses.
Arthur Zippert.
John F. C. Printker.

Fig:2.



Inventors,
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Charles M. Smith,
by Crosby & Gregory attys.

(No Model.)

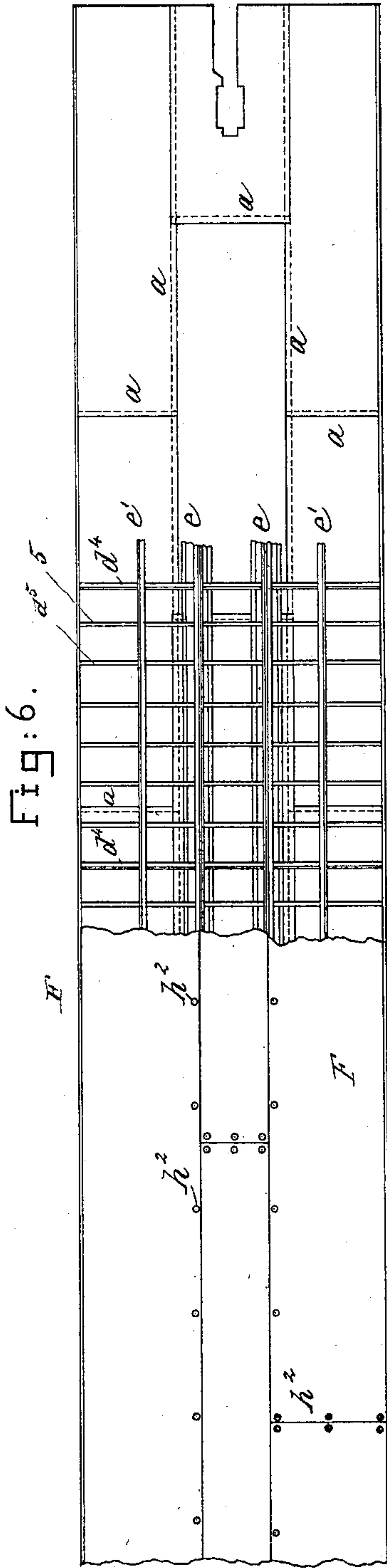
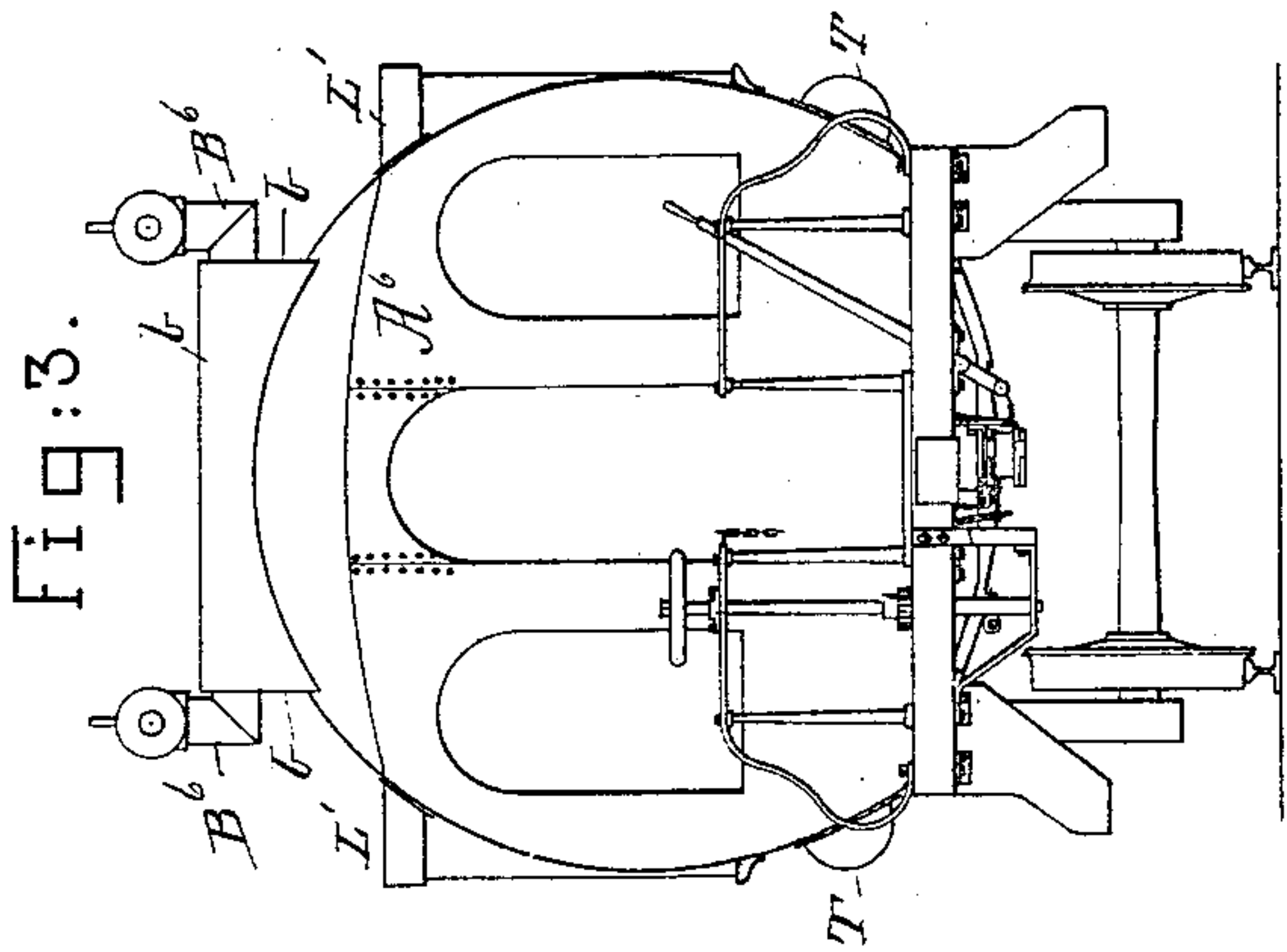
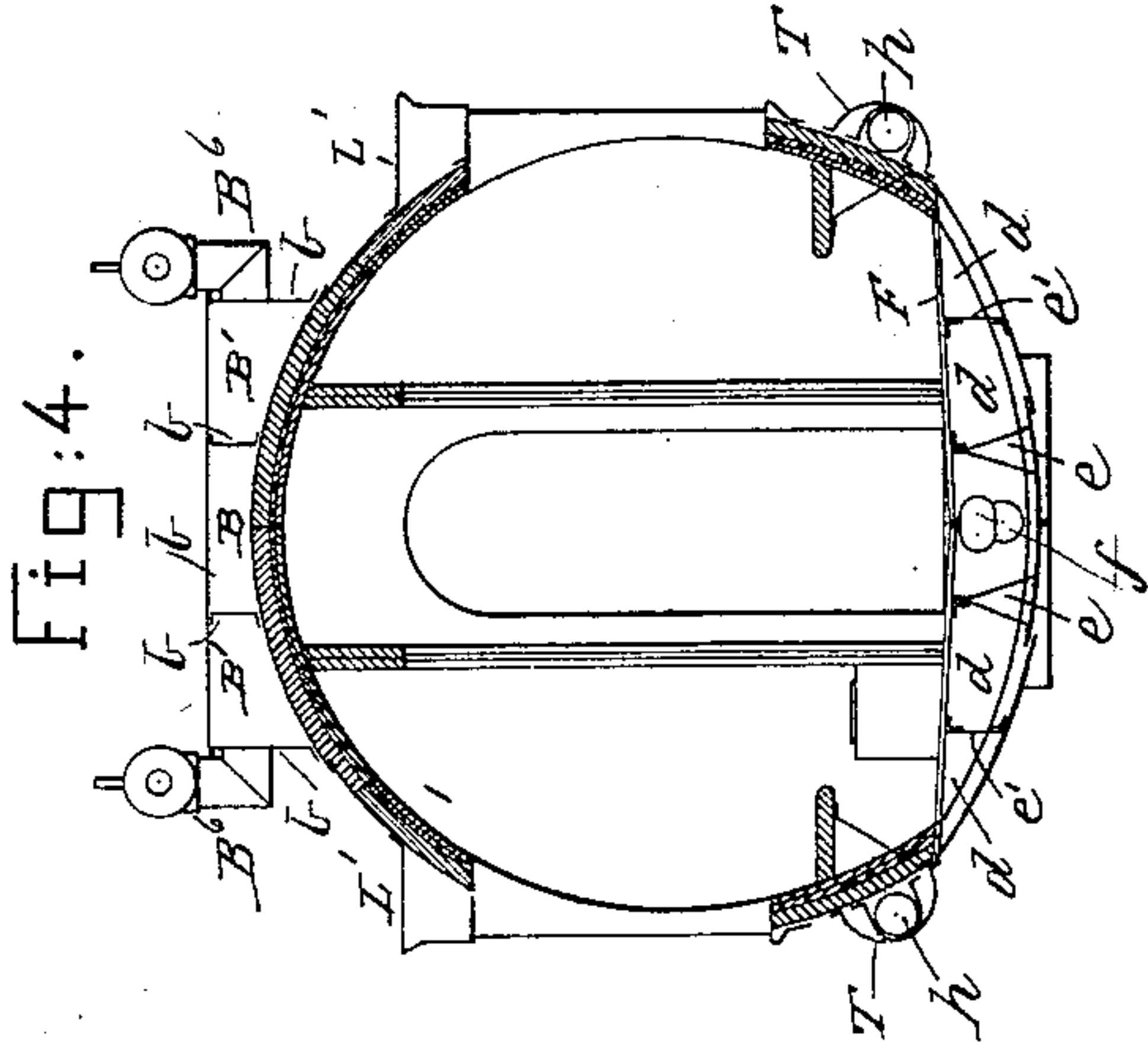
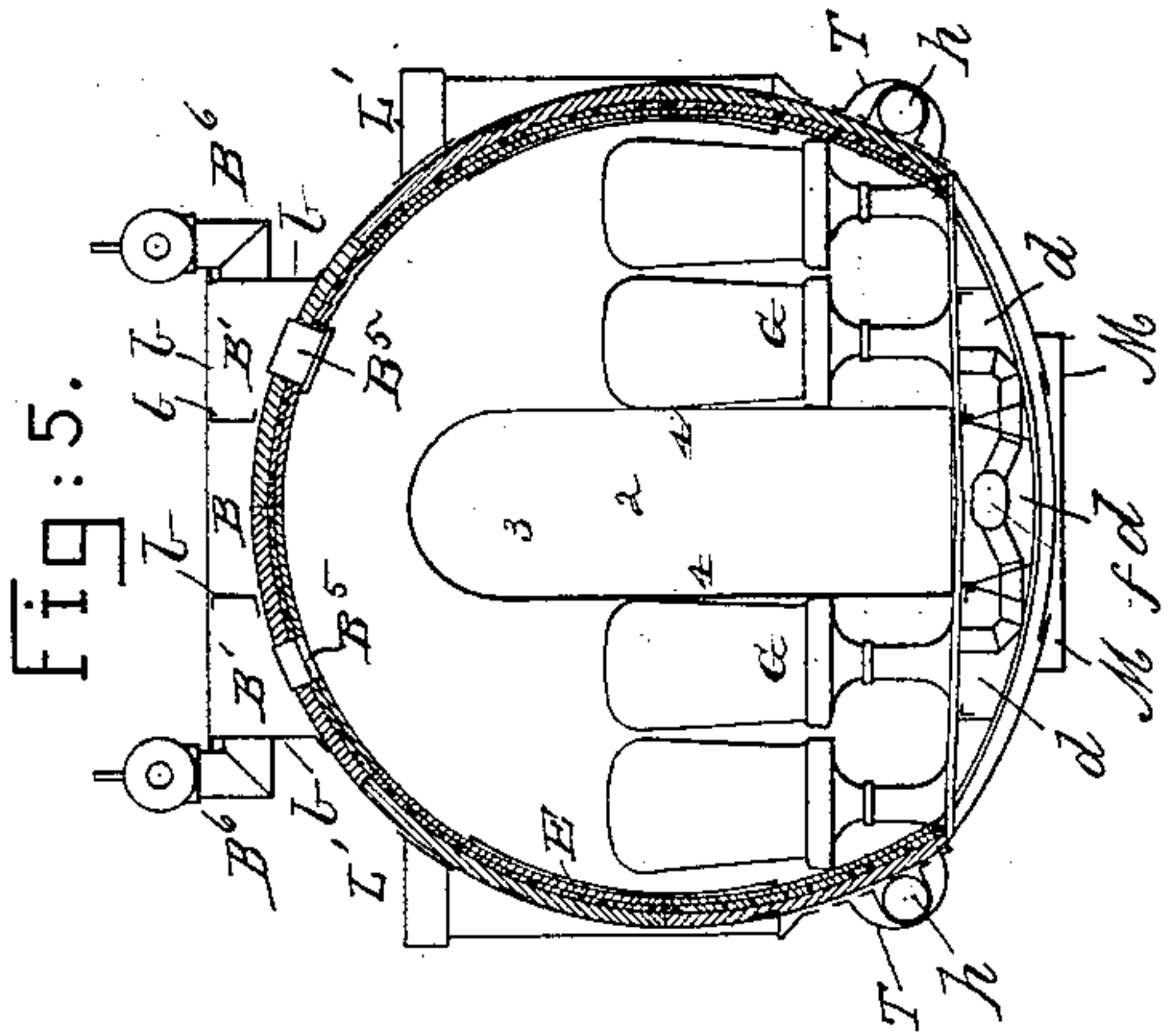
4 Sheets—Sheet 2.

C. A. & C. M. SMITH.

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(No Model.)

4 Sheets—Sheet 3.

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Fig: 10.

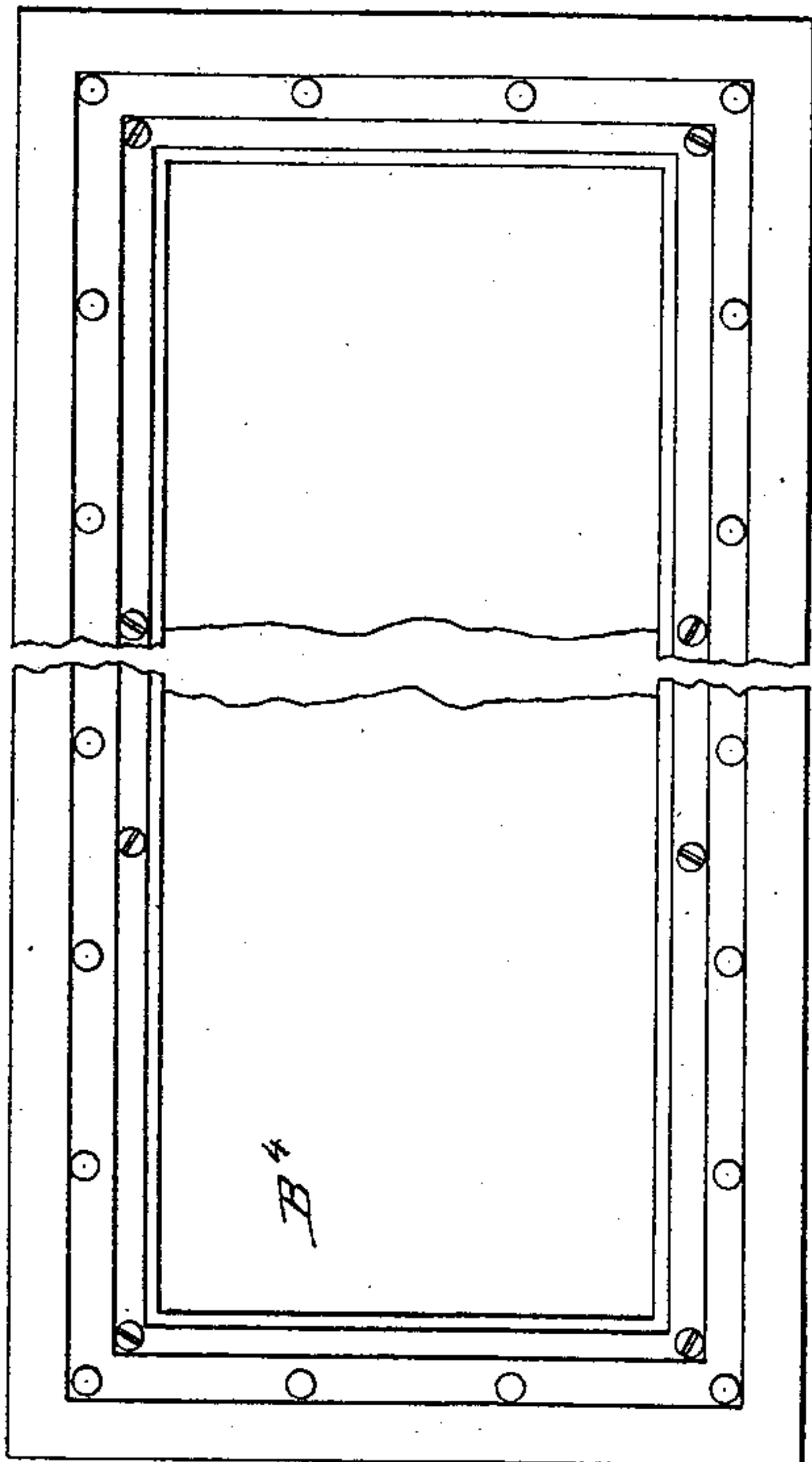


Fig: 9.

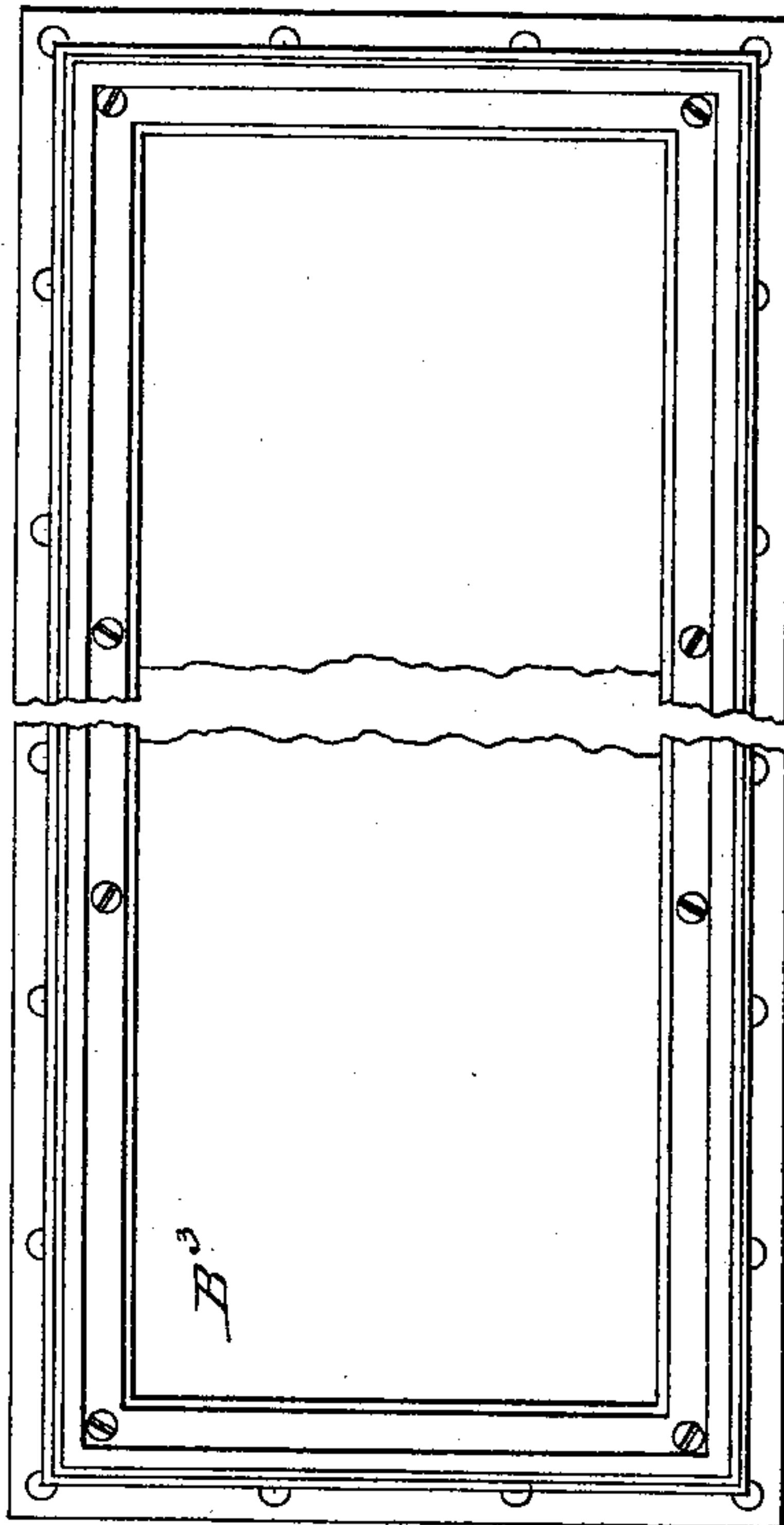


Fig: 7.

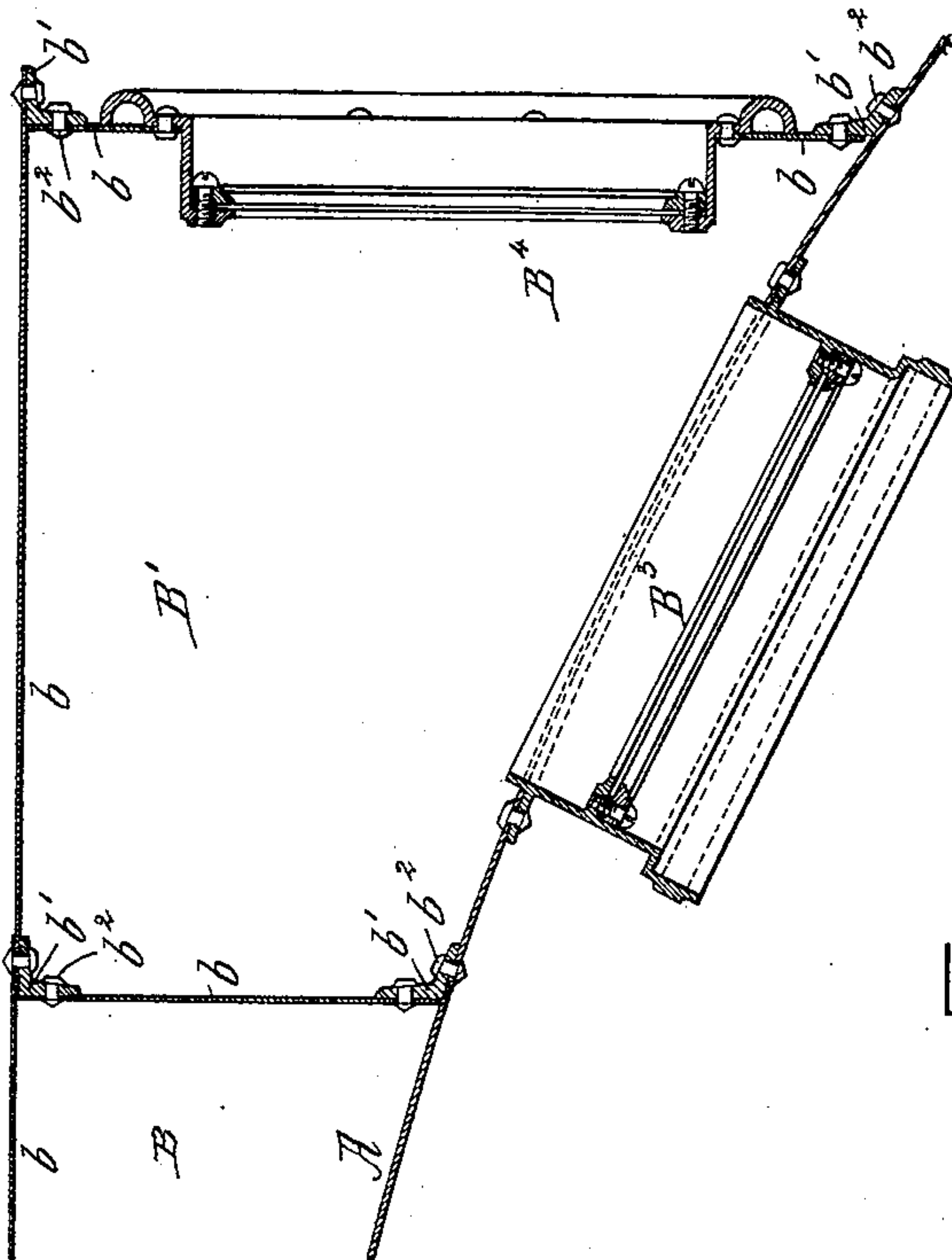
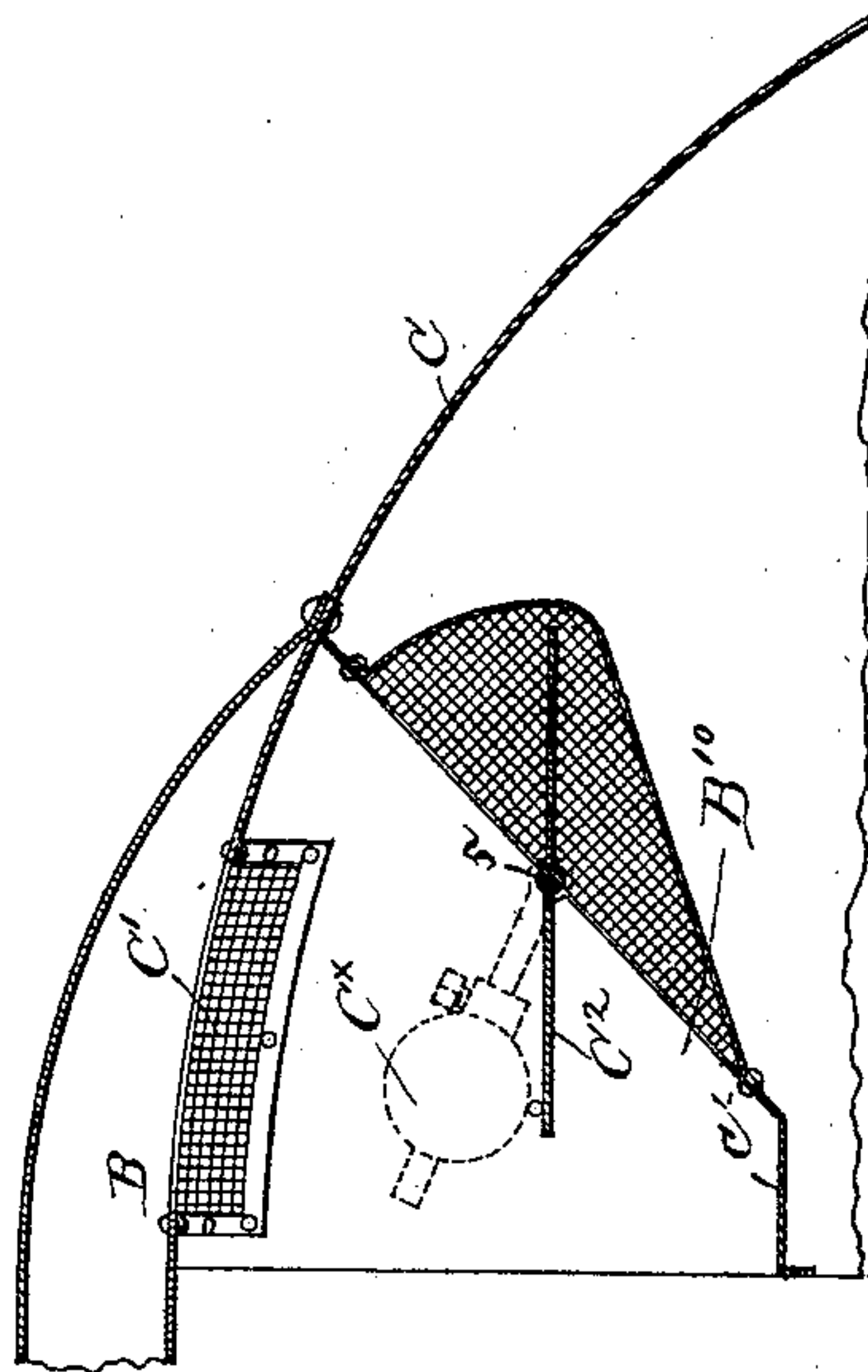


Fig: 8.



Witnesses.

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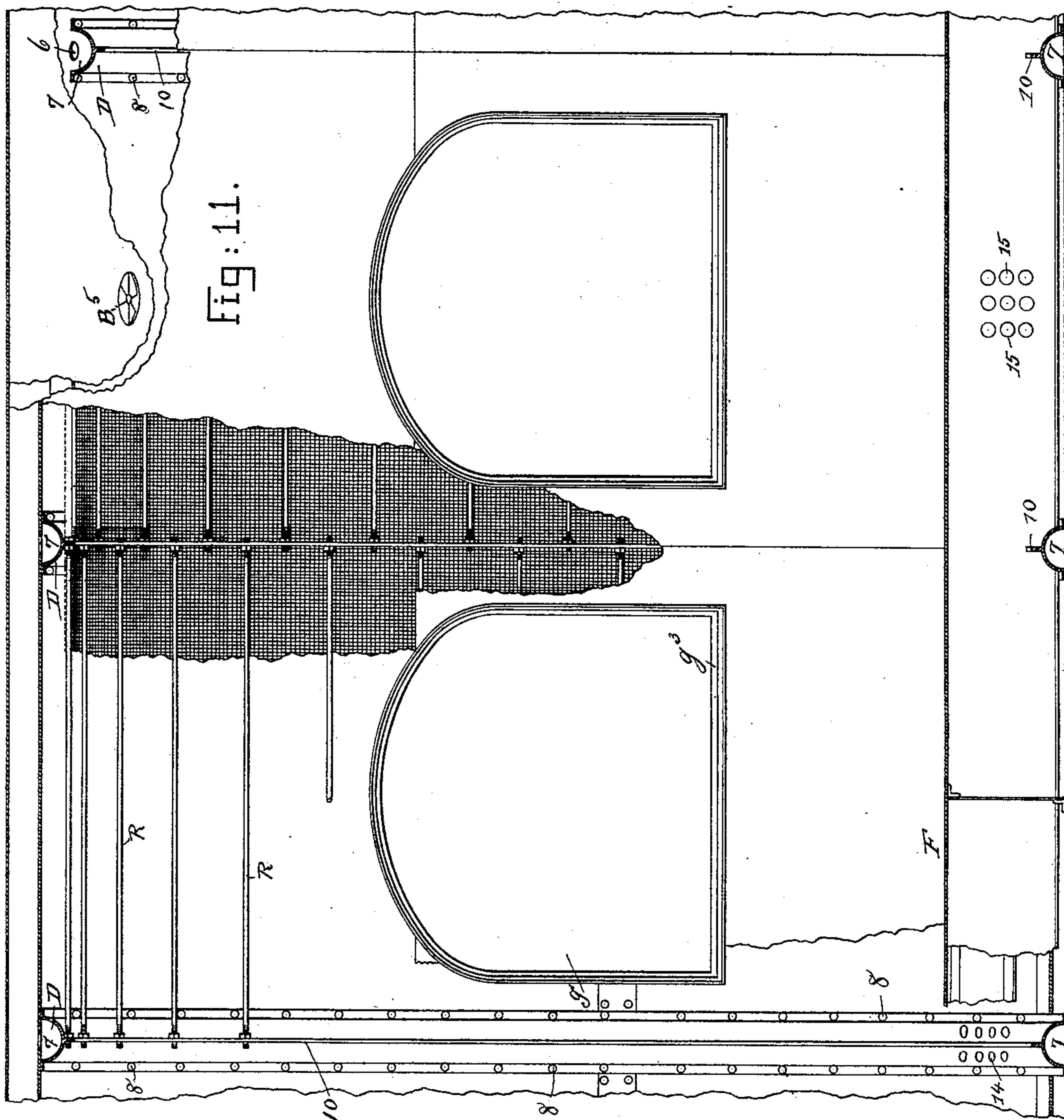
(No Model.)

4 Sheets—Sheet 4.

C. A. & C. M. SMITH.
VENTILATING RAILWAY CARS.

No. 366,520.

Patented July 12, 1887.



Witnesses

Alfred L. Emery,
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Inventors.

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UNITED STATES PATENT OFFICE.

CHARLES A. SMITH AND CHARLES M. SMITH, OF BOSTON, MASSACHUSETTS,
ASSIGNORS TO LEWIS J. BIRD, TRUSTEE, OF SAME PLACE.

VENTILATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 366,520, dated July 12, 1887.

Application filed October 26, 1885. Serial No. 180,949. (No model.)

To all whom it may concern:

Be it known that we, CHARLES A. SMITH and CHARLES M. SMITH, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Ventilating Railway-Cars, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Our invention has for its object to ventilate railway-cars of the class shown and described in the application of C. M. Smith, Serial No. 215,545, filed October 7, 1886, in a novel and efficient manner. *pat 366519*

The upper portion of the car-body, composed of metal plates, as described in said application, is provided externally with a monitor top having longitudinal air-passages, one of which co-operates with the ribbed braces employed to strengthen the car at its inner side to supply air to the car, the air entering the said passages through valves placed under the platform-hood, one or the other being operative as the air-inlet, according to the direction of the movement of the car, while the other passage serves to conduct the vitiated air from the car, preferably through usual ventilators in connection therewith. The fresh air is conveyed from the passages in the monitor top to the space below the car-floor by means of the ribbed braces referred to.

The space below the car-floor, and between it and the interior of the cylindrical car-body, receives the pipes used in heating the car, and the heat introduced into the car is that induced by indirect radiation, the fresh atmospheric air introduced into the space between the floor and body and therein warmed by the heating-pipes entering the car through registers in the floor, which, besides affording an ample supply of warmed fresh air, also obviates all danger of fire, for the heater, which is not herein shown, but described in application Serial No. 213,237, is arranged entirely below and outside the car.

In summer the spaces below the registers may be provided with boxes containing cooling materials to thus cool the air.

Figure 1 in side elevation, partially broken out, represents a sufficient portion of a railway passenger-car embodying our improve-

ments to enable our invention to be understood. Fig. 2 is a plan view, with part of the monitor roof and of the top of the car-body and of the side walls broken out to show the interior. Fig. 3 is an end view of Fig. 1. Fig. 4 is a section of Fig. 1, looking toward the right. Fig. 5 is a section of Fig. 1 in the line $x^2 x^2$, looking in the same direction. Fig. 6 is a detail showing the top of the floor of the car, the latter being partially broken out to show the keelsons, cross-braces, floor-beams, and spaces between the keelsons, and then at the right the parts last referred to as below the floor are all broken away except the smoke-pipes, they being above the bottom or under side of the car-body. Fig. 7 is a detail of the monitor roof, the figure being a partial cross-section; Fig. 8, a longitudinal sectional detail of the hood, the box therein, and valve; Figs. 9 and 10, details of the windows shown in Fig. 7; and Fig. 11 is a partial vertical section showing part of the upholstery as broken out.

The car-body A, composed of numerous sheets or plates of metal riveted together, as in application Serial No. 215,545, is provided at its upper side with a monitor top composed of metal plates $b b$, (see Figs. 4, 5, and 7,) joined to the body, and together to form longitudinal passages $B B' B'$, (herein shown as three,) the plates $b b$, comprising the monitor top, being connected with the body and with each other by means of angle-irons b' and rivets b^2 , as best shown in Fig. 7; but it will be understood that the said junction may be made by flanging the plates b and inserting the rivets directly through them.

Each passage B' , at the sides of the monitor top, has one or more windows, B^3 , opening into it from the interior of the car-body, and at its outer side the monitor top has one or more windows, B^4 , preferably one, for each window B^3 , the said windows B^3 and B^4 serving for the admission of light into the top of the car.

The top of the car, at suitable intervals, has registers B^5 —such as shown in Fig. 5—to permit the exit of air from the car-body into the space B' , the outer case or part of the monitor top having usual ventilators, B^6 , to effect the removal of the air from the spaces B' .

The central passage, B, opens at each end immediately under the platform-hood C, the

end of the passage being protected by a box, C', screened at its open face, (see Figs. 1 and 8,) the box containing an inwardly-closing valve, C², (best shown in the enlarged detail, 5 Fig. 8,) the said valve being supported on a horizontal pivot, 5, and counterbalanced or weighted at its lower edge, as at C^x, (see Fig. 8,) so as to normally close the air-inlet passage B¹⁰ to cut off the entrance of air into the pas- 10 sage B, as shown at the left in Fig. 1, except when the speed or direction of movement of the car is such as to cause the air coming under the said hood to overcome the weight or counter-balance C^x. Of the two valves held 15 in this way only that one at the front end of the car, or the end in the direction in which the car is moving, will be opened. The air entering the passage B will find exit therefrom through a series of holes, 6, opening into the 20 spaces 7 of the ribbed braces D, which, as herein shown, are made of wrought metal rolled into the shape shown at Fig. 11, and thereafter bent into annular form, the diameter of the said ribbed braces externally being 25 just the size and shape of the interior of the car-body in cross-section, the external flanges of the said ribbed braces being secured in place by suitable rivets, 8, (see Fig. 11,) the 30 flange 10 at the inner or central portion of the said braces being drilled at proper intervals to receive the rods or supports R, which aid in retaining the upholstery in position, the said upholstery being shown and described in the application, Serial No. 215,543, filed Octo- 35 ber 7, 1886.

The hollow ribbed braces D, (see Fig. 11,) referred to, at or below the floor F, have suitable openings, 14, (see Fig. 11,) to enable the air driven into the said spaces 7 from the pas- 40 sage B to be discharged into the air-spaces *d* below the floor and extending from end to end of the car.

The space between the under side of the floor and the inner side of the car-body, (see 45 Fig. 4.) is divided into several small spaces *d* by the keelsons *e e'*, as set forth in the application, Serial No. 215,545, the said keelsons having, at suitable intervals, openings 15, (see Fig. 11,) in number sufficient to enable a uni- 50 form circulation of air to be maintained in the spaces below the car and between it and the car-body.

The central space *d* will receive in it the smoke-pipe *f* and other pipes in connection 55 with the furnace or furnaces for heating the car, the said pipes and furnaces being shown and claimed in another application, Serial No. 213,237, filed September 10, 1886, to which reference may be had.

The smoke-pipes and the pipes connecting 60 the furnaces and extended through the space *d* act to heat the air introduced therein, and the said air is delivered through registers *d'* in the floor F, one register being preferably 65 in the passage-way between the seats G.

We claim—

1. A railway-car body composed of metal plates riveted together and having a metallic monitor top divided longitudinally to form 70 passages B B', the former for the reception of air to be introduced into the car and the latter for the reception of air from the car, combined with ventilators in connection with the pas- 75 sage B', substantially as described.

2. A car-body composed of metal plates 75 riveted together, and the metallic monitor top thereon provided with an air-supply passage, B, open for the reception of air, combined with hollow braces D, to sustain the interior 80 of the car-body, the floor F, supported a little above the interior of the lower part of the car-body, and registers in the car, the said braces being provided with openings for the reception 85 of air from the passage B and for the discharge of air into the space *d* below the floor, substantially as described.

3. The car-body composed of metal plates riveted together, and the metallic monitor top having the air-spaces B B', and the air inlet and outlet passages B¹⁰ and B⁵, respectively, 90 combined with windows B⁴ and B³, located, respectively, in the monitor top and on the upper part of the car-body, substantially as described.

4. The car-body, its connected platform- 95 hood C, and the boxes C', located below and close to the under side of the said hood, and the valves C² in the said boxes, combined with the monitor top having the passage B for the reception of air, and with the hollow braces 100 D to conduct air into the spaces below the floor of the car, substantially as described.

5. The metallic car-body composed of sheets of metal riveted together, and the floor F, 105 combined with two or more keelsons at each side of the longitudinal center of the car, the said keelsons being provided with openings for the circulation of air in the space below the floor and below it and the body and the keelsons, substantially as described. 110

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES A. SMITH.
CHARLES M. SMITH.

Witnesses:

G. W. GREGORY,
F. L. EMERY.