

No. 757,581.

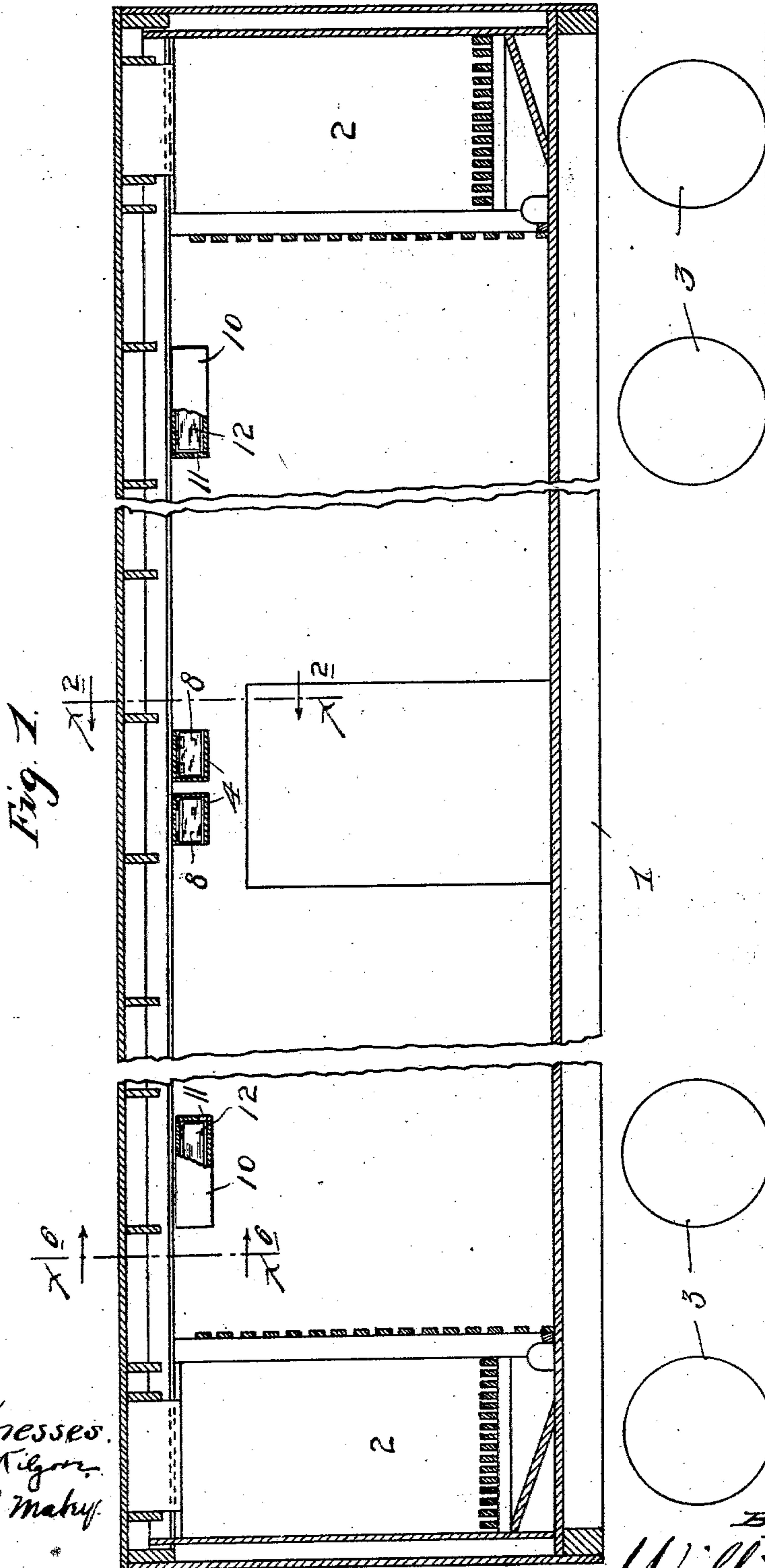
PATENTED APR. 19, 1904.

H. A. TURNER.
AIR AGITATOR FOR REFRIGERATOR CARS.

APPLICATION FILED AUG. 24, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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By his Attorneys:
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3 SHEETS—SHEET 2.

Fig. 2.

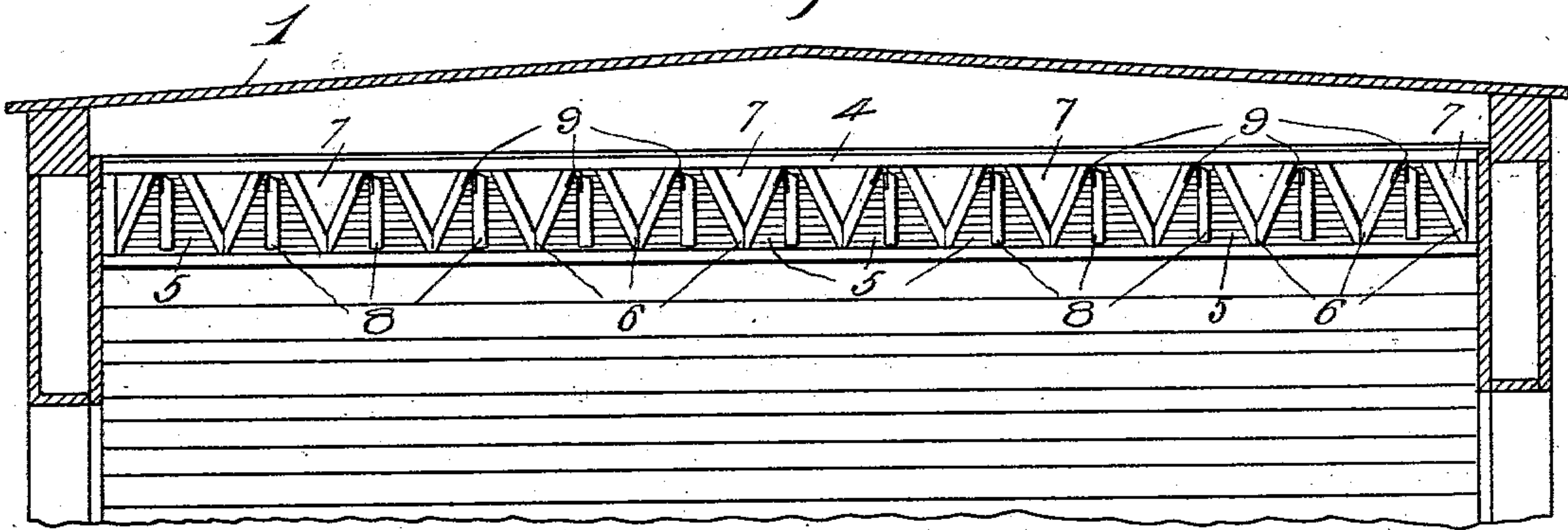


Fig. 3.

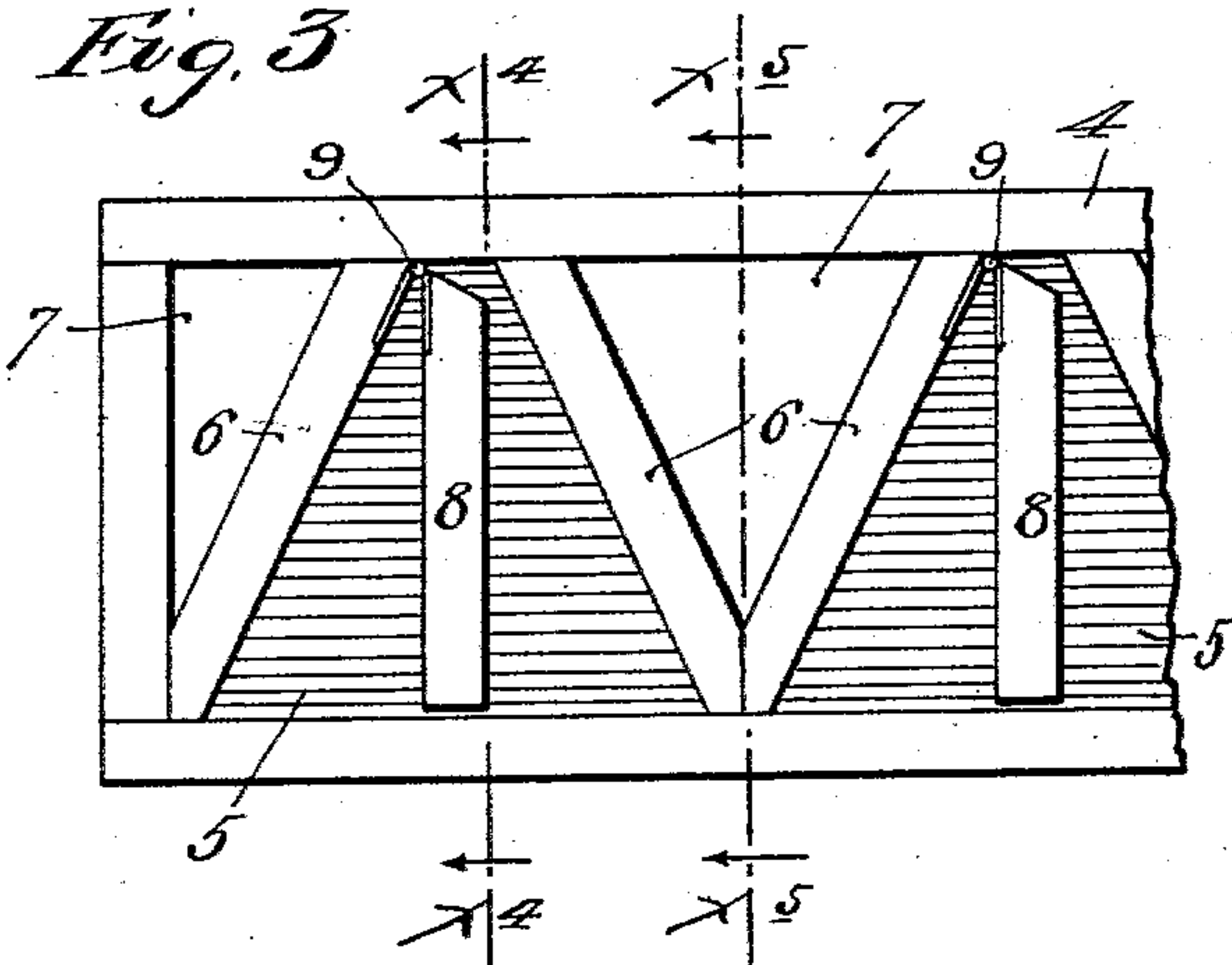


Fig. 4.

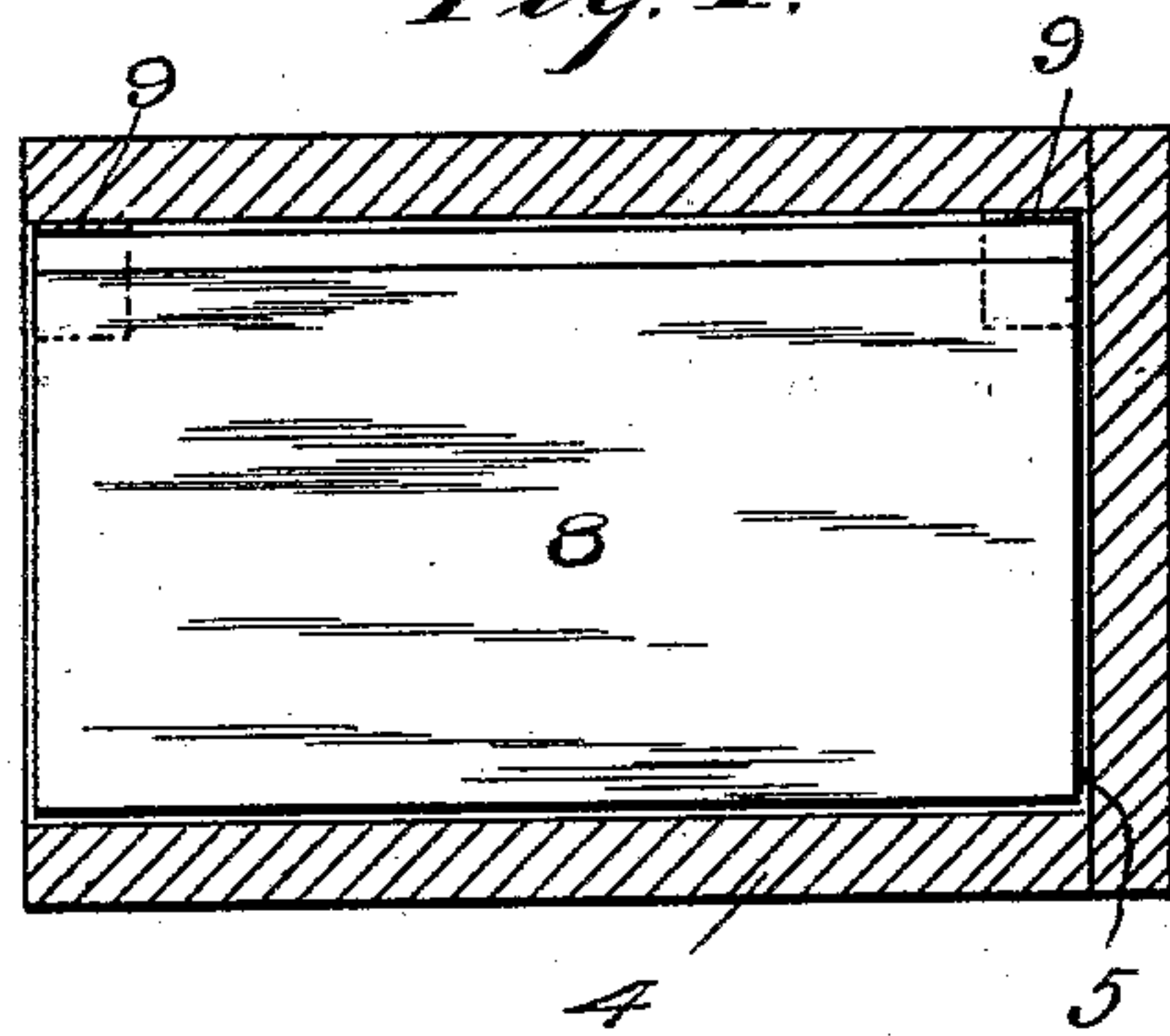
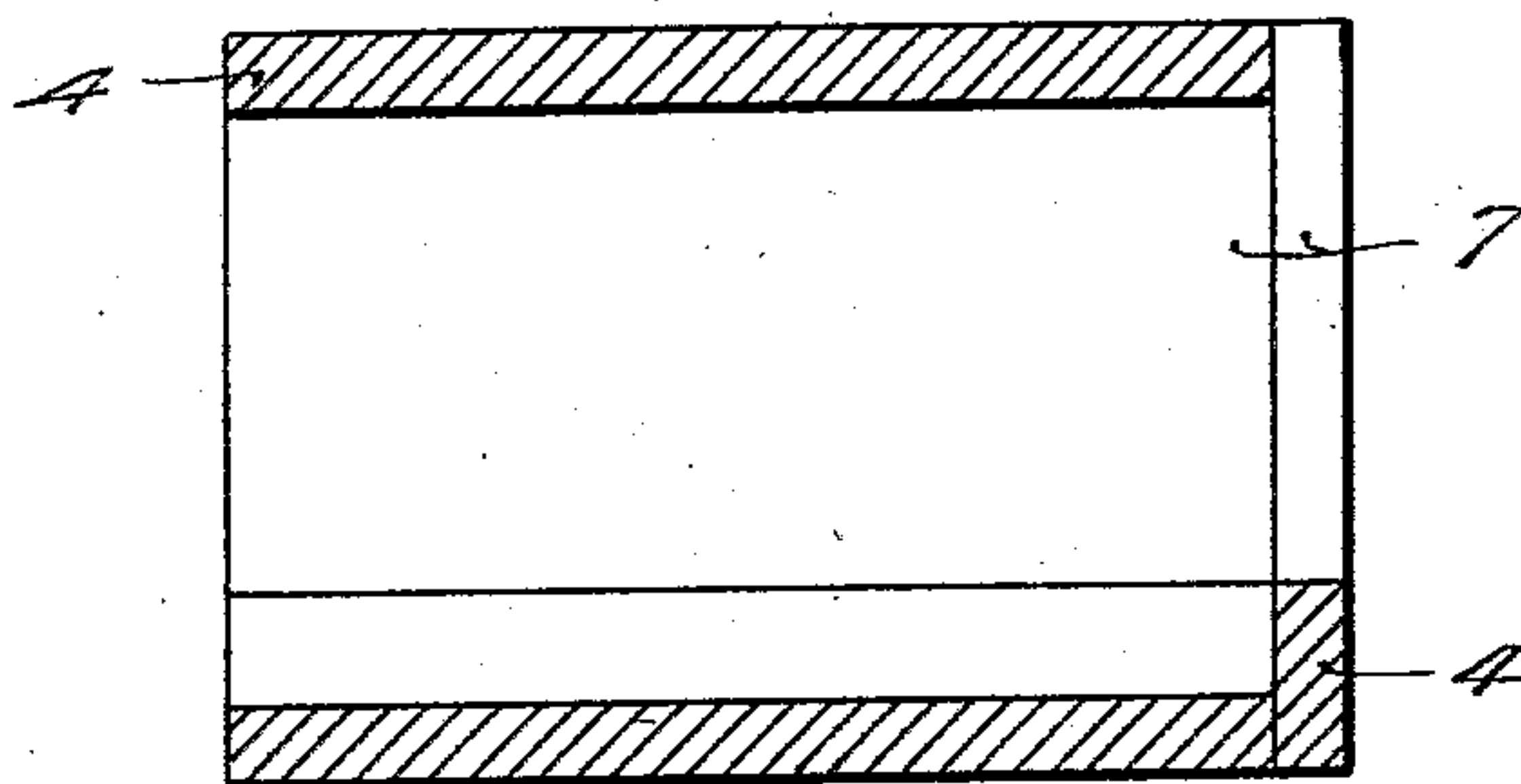


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

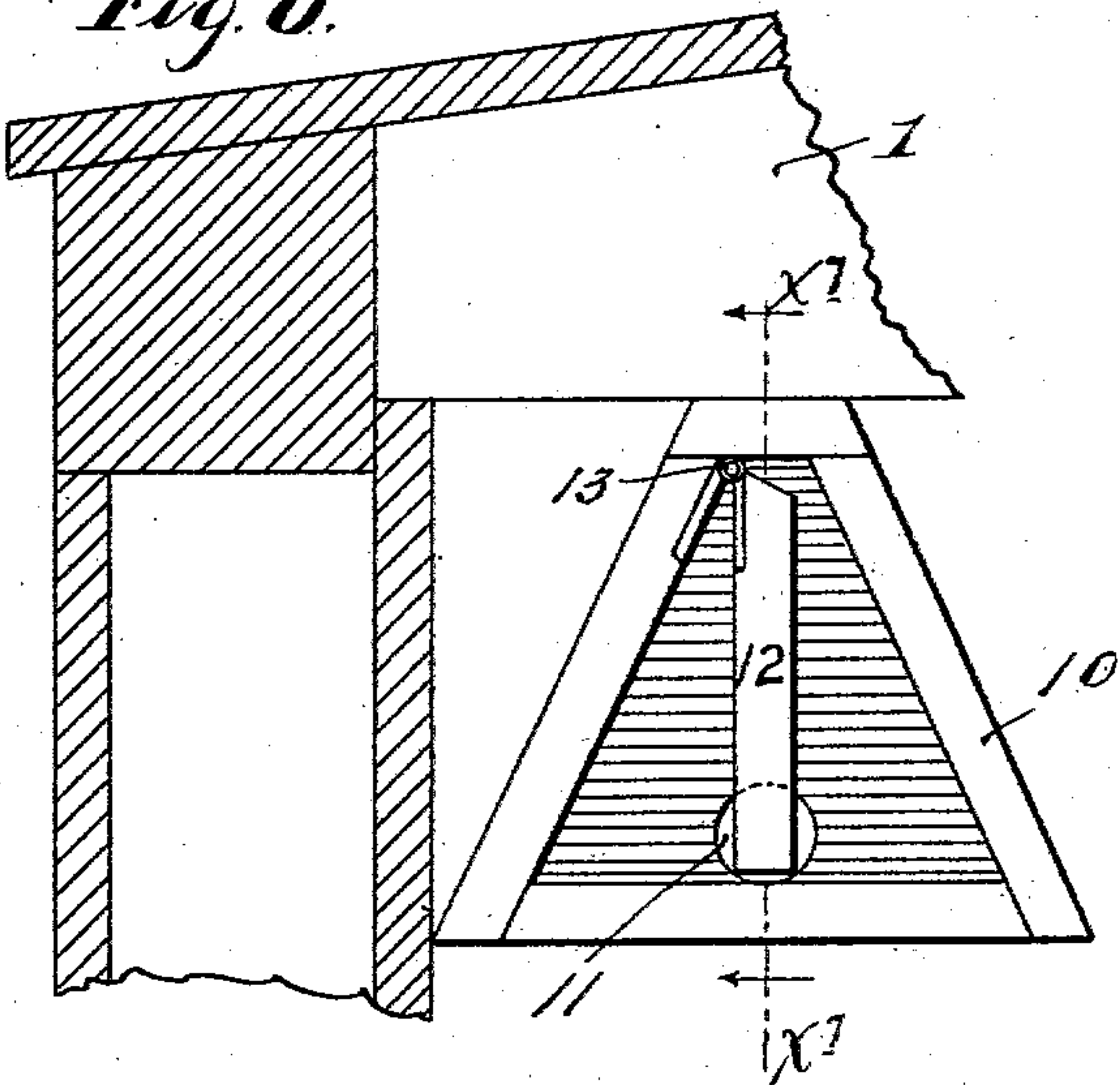


Fig. 7.

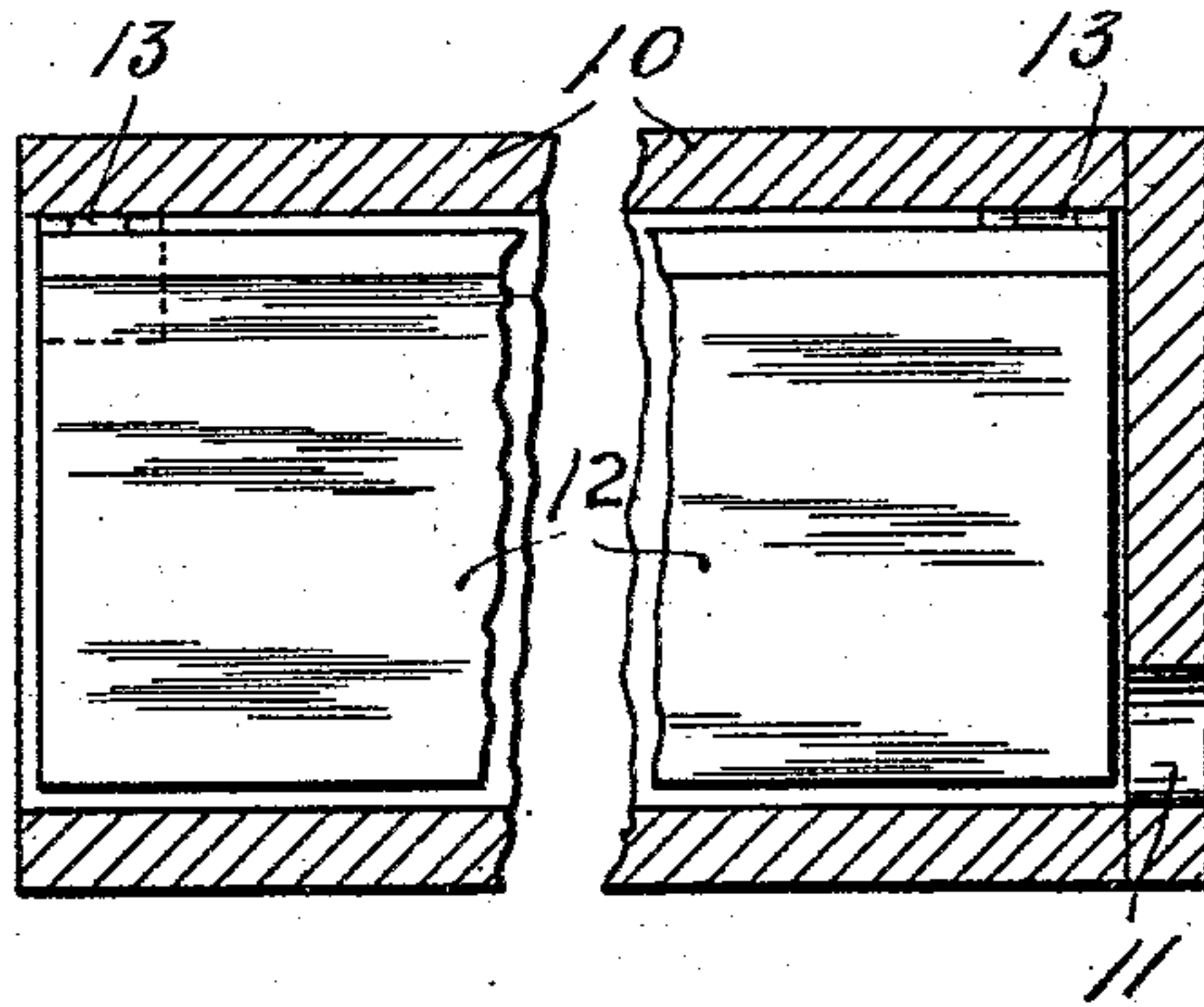


Fig. 8.

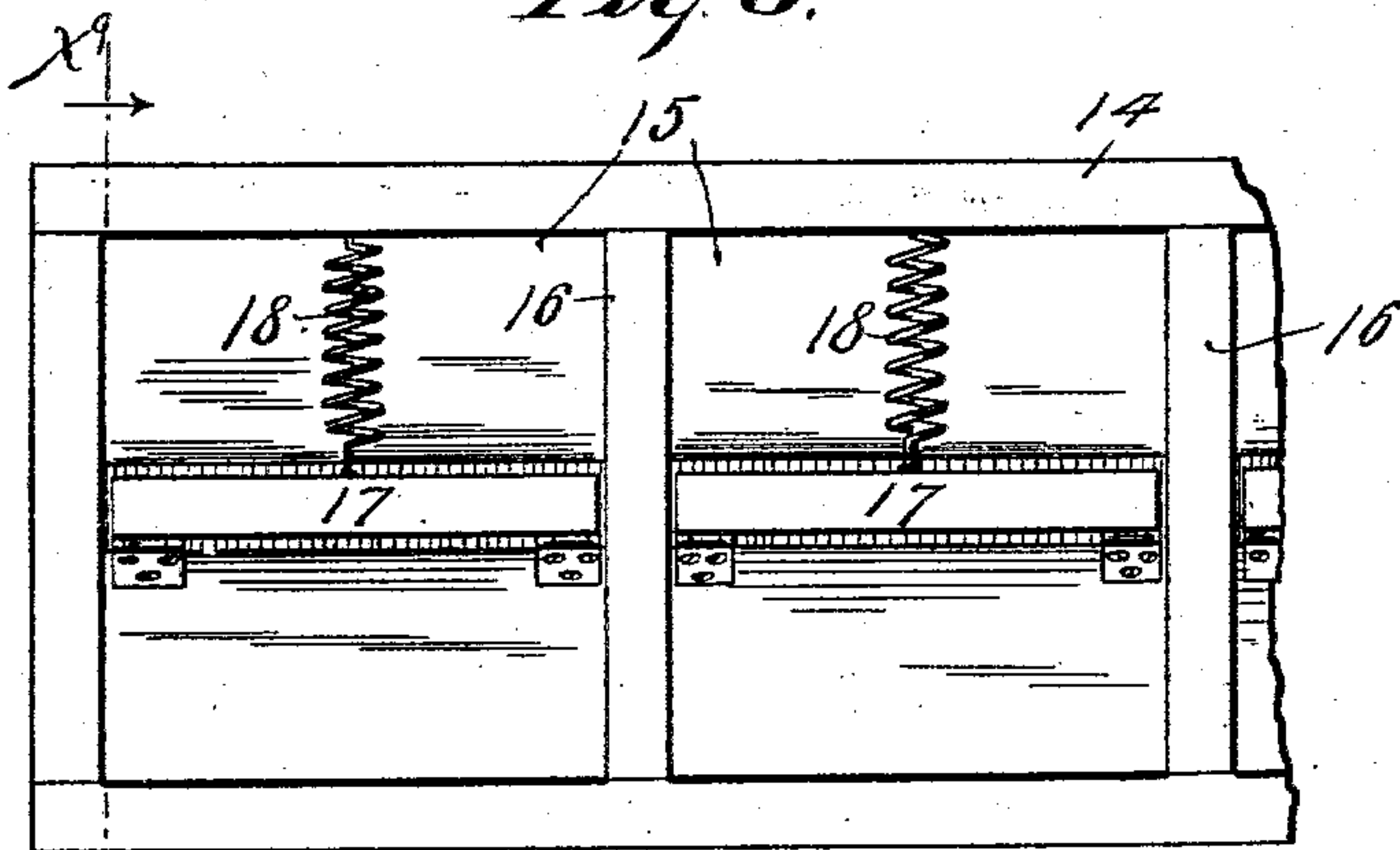


Fig. 9.

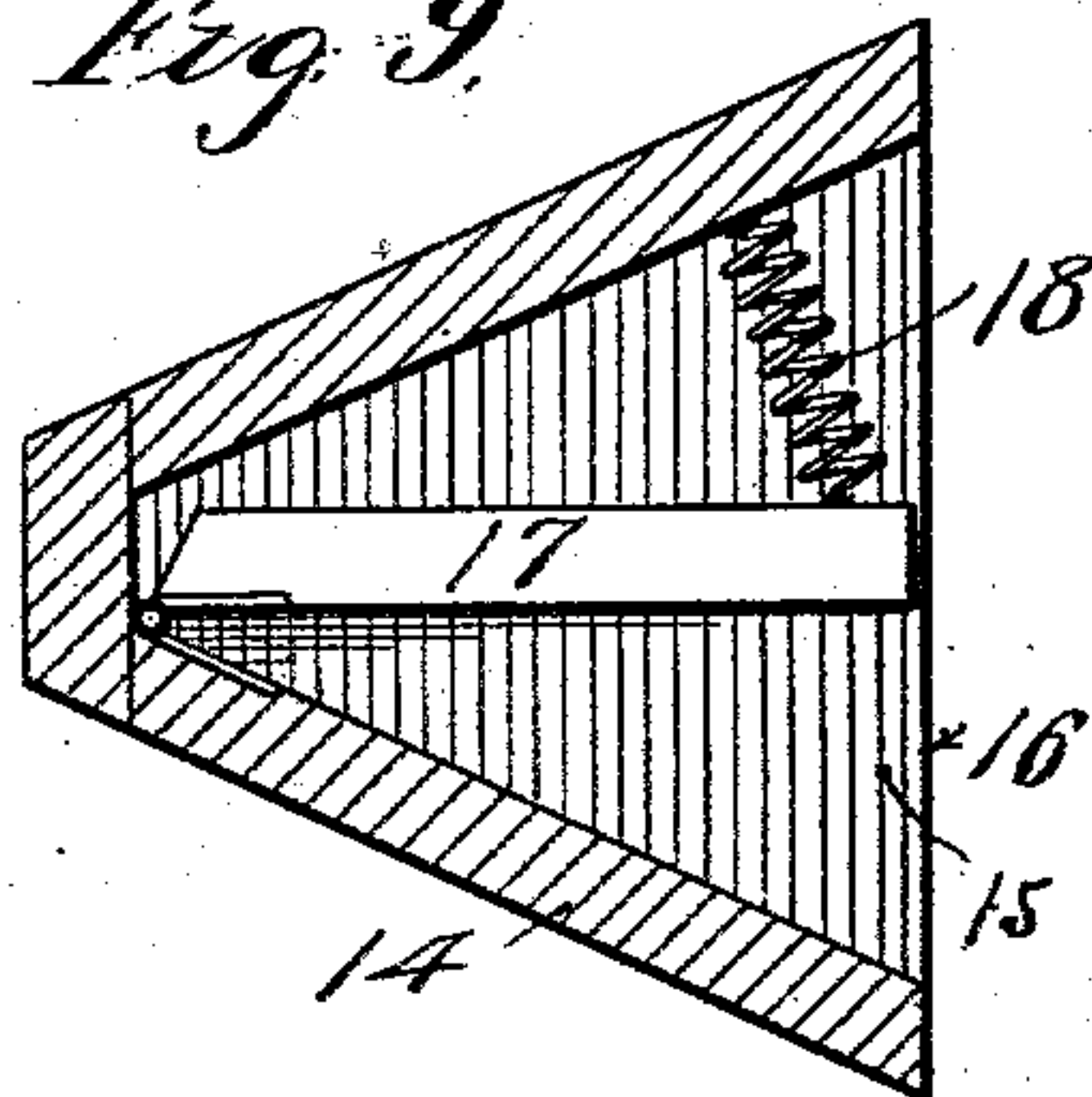


Fig. 11.

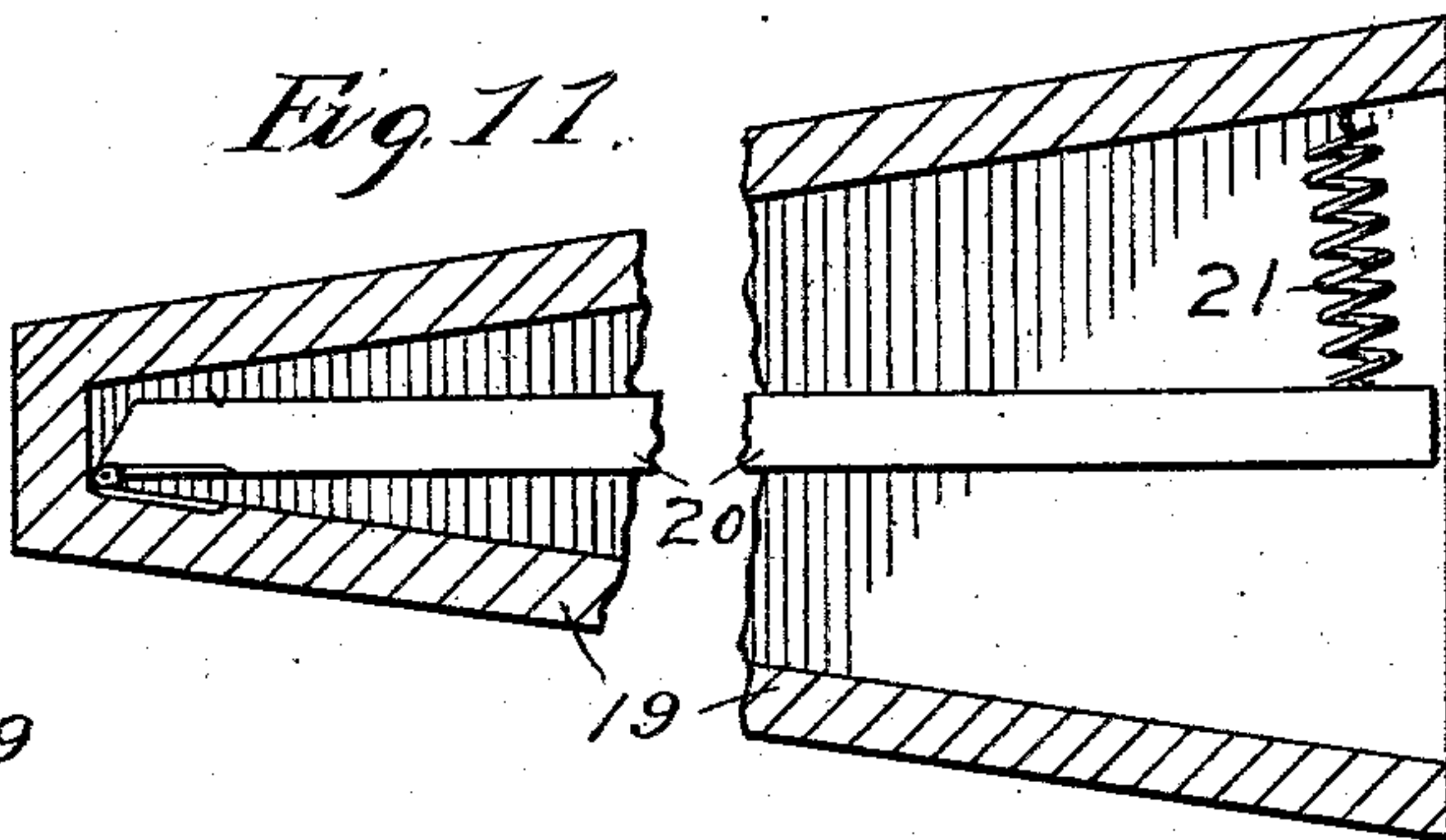
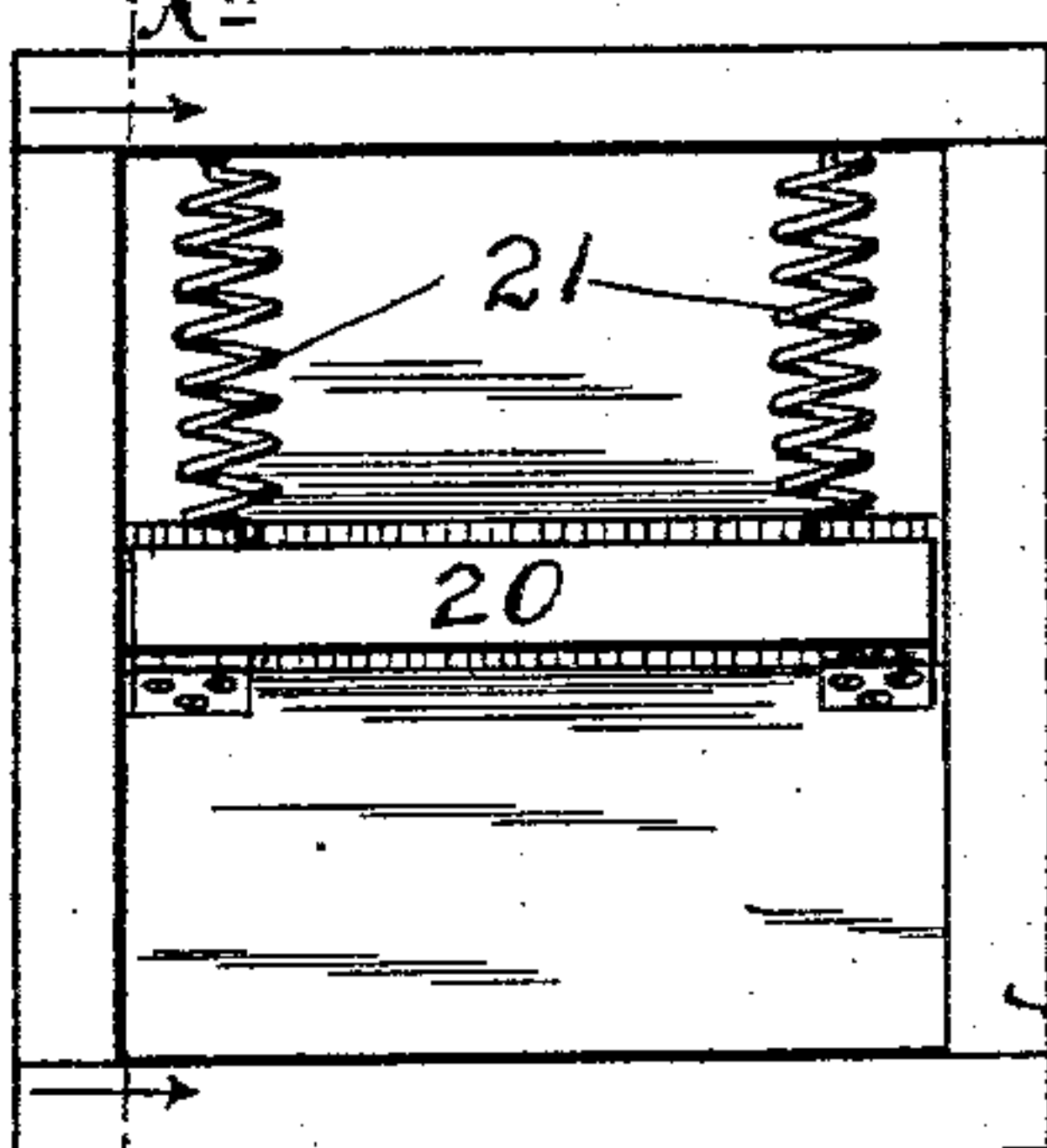


Fig. 10.



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UNITED STATES PATENT OFFICE.

HOWARD A. TURNER, OF MINNEAPOLIS, MINNESOTA.

AIR-AGITATOR FOR REFRIGERATOR-CARS.

SPECIFICATION forming part of Letters Patent No. 757,581, dated April 19, 1904.

Application filed August 24, 1903. Serial No. 170,519. (No model.)

To all whom it may concern:

Be it known that I, HOWARD A. TURNER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Air-Agitators for Refrigerator-Cars; 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.

My present invention has for its especial object to provide simple and efficient means for producing a forced circulation of air within refrigerator-cars, but is capable of general use in cars of various other characters.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a longitudinal vertical section taken centrally through a refrigerator-car equipped with several of my improved air-circulating devices or agitators, some parts of the car being broken away and others being indicated only in diagram. Fig. 2 is a transverse vertical section taken on the line $x^2 x^2$ of Fig. 1. Fig. 3 is a detail in elevation showing, on an enlarged scale, a portion of one of the transversely-arranged series of agitators. Fig. 4 is a vertical section on the line $x^4 x^4$ of Fig. 3. Fig. 5 is a vertical section on the line $x^5 x^5$ of Fig. 3. Fig. 6 is a section on the line $x^6 x^6$ of Fig. 1, some parts being broken away. Fig. 7 is a section approximately on the line $x^7 x^7$ of Fig. 6. Fig. 8 is a modification of the construction shown in Fig. 3. Fig. 9 is a section on the line $x^9 x^9$ of Fig. 8. Fig. 10 illustrates a modified construction of the agitator shown in Fig. 6; and Fig. 11 is a section on the line $x^{11} x^{11}$ of Fig. 10, some parts being broken away.

The numeral 1 indicates the body of a refrigerator-car of standard construction, hav-

ing at its ends the ice-boxes 2, which of course open into the main body of the car.

The numeral 3 indicates wheels of the car-trucks, said wheels being shown only in outline.

With refrigerator-cars as hitherto constructed it has been found that while the air is circulated more or less in the ends of the car—that is, in the immediate vicinity of the ice-boxes—it is not properly circulated at the central portion of the car. Hence in accordance with my invention I provide devices which will agitate or positively circulate the air at the central portion of the car or at any other point or points where the air is liable to become dead or still.

In carrying out this invention I employ any desired number of agitating leaves or blades and support the same within the car in such a manner that they will be moved to produce a forced circulation of air under vibratory movement of the car-body. It is a well-known fact that when a car is under motion it is subject to a lateral or swaying or rocking motion, as well as to an up-and-down movement. Either of these movements of the car-body may be used to vibrate the agitating blades or leaves; but the lateral movements of the car are greater than the vertical movements, and hence best serve the purpose.

In carrying out my invention, as illustrated in Figs. 1 to 5, inclusive, a pair of trough-like cases 4 are secured at the central portion of the car-body, near the top thereof. The said cases 4 are placed with their backs close together and with their open sides pointed toward the end of the car. These cases 4 are divided into a plurality of downwardly-diverging stalls 5 by means of inclined partitions 6, and between the said stalls the backs of the said cases are cut away, as shown at 7, to permit the free circulation of air through such openings. In each stall 5 is a gravity-suspended agitating blade or leaf 8, which is loosely hinged at its upper edge, as shown at 9, to the upper portion of the said case 4 in

such manner that it is free to vibrate between the downwardly-diverging partitions 6 under the lateral movements of the car. Preferably the hinges 9 are applied at one side of the blades and to the adjacent partitions 6, so that the latter may swing into parallel engagement with the former. The other partitions 6 are so disposed that the opposite faces of the said leaves or blades 8 may swing into parallel engagement with the same. In virtue of this arrangement the air caught between the said blades and the partitions will act as a cushion to prevent the former from pounding against the latter. It is, of course, evident that when the leaves or blades 8 swing within the stalls 5 they will draw air into the stall at one side thereof and force air out from the stall at the opposite side, which will have the effect of agitating the air in the vicinity thereof and driving the same in a general direction toward the ends of the car.

At each side of the car, between the central portions thereof and the ice-boxes, I also preferably provide supplemental agitators of the construction shown in detail in Figs. 6 and 7, but also in Fig. 1. These supplemental agitators involve each a downwardly-diverging stall or compartment 10, which is suitably secured to the body of the car, near the top thereof, and is closed at its sides, bottom, and top, is open at its outer end, and is closed at its inner end, except for a perforation 11. Within each stall 10 is an agitating blade or leaf 12, which is suspended from the top of the stall by a hinge 13, so that it operates very much in the same manner as do the agitating-blades 8, already described. The stalls 10 are very much deeper or longer than the stalls 5, and hence I have deemed it advisable to perforate the inner end walls thereof, as shown at 11, so that more or less air may be drawn into said stalls through said perforations. These supplemental agitating devices also tend to force the air toward the tops of the ice-boxes. Of course, if desired or if found advisable, the end walls of the stalls 5 might also be perforated.

The agitating devices so far described will be operated under lateral vibrations or oscillations of the car-body. The two forms of the device (illustrated in Figs. 8 to 11, inclusive) will be operated by vertical up-and-down vibratory movements of the car-body.

The form of the device illustrated in Figs. 8 and 9, which is intended as a substitute for the agitators contained within the trough-like cases 4, comprises the case 14, which has diverging upper and lower walls and is divided into stalls 15 by parallel vertical partitions 16. In each of these stalls 15 is a hinged agitating blade or leaf 17, which is normally held

in an approximately horizontal position by a light spring 18 and is adapted to be vibrated vertically to produce a circulation of air under vertical vibration of the car-body.

The device shown in Figs. 10 and 11 comprises only a single stall 19, an agitating-blade 20, and a pair of springs 21, yieldingly holding the latter in an approximately horizontal position. This construction is almost identically like that illustrated in Figs. 8 and 9 except as to the number of stalls and blades and except for the fact that the said single stall and blade are much longer than those shown in said Figs. 8 and 9.

The agitating devices above described act very much after the manner of a bellows to produce a forced circulation or agitation of the air and may take various other forms than illustrated in the drawings. The simplest form of the device would be one or more agitating blades or leaves suspended in open space within the car-body. Such leaves or blades might be suspended in open space directly from the top of the car. Any arrangement of agitating leaves or blades or similar devices whereby they will receive movements under vibrations of the car-body will be within the scope of my invention as herein set forth and claimed.

I do not, of course, limit myself to any particular manner of locating the so-called "air-agitating" devices within the body of the refrigerating-car or other car to which it is applied. As already indicated, the device, while especially adapted for application to refrigerating-cars, is also adapted for application to ventilated passenger or other cars, and in making such applications the said agitating devices would be disposed at such places and in such manner as may be found to give the best results. Where a downdraft or agitation other than a horizontal draft or circulation is required, the compartments or stalls in which the agitating blades or leaves are mounted will be formed with closed sides and ends, but with open bottoms.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A car-body having means for agitating or circulating the air within the same, involving one or more blades or leaves, arranged to be vibrated, with respect to the car-body, under vibrating movements of the latter, substantially as described.

2. A car-body having means for producing a circulation or agitation of air therein, comprising a case or stall and an agitating blade or leaf mounted therein and arranged to be vibrated, with respect to the car-body, under vibratory movements of the latter, substantially as described.

3. A car-body having means for producing a circulation or agitation of air therein, comprising one or more agitating blades or leaves loosely suspended within said car-body and
5 adapted to be vibrated, under vibratory movements of the car-body, substantially as described.

4. A car-body having means for producing a circulation or agitation of air therein, comprising
10 a plurality of diverging open stalls, and a

plurality of agitating blades or leaves mounted within said stalls and adapted to be vibrated, under vibratory movements of the car-body, substantially as described.

In testimony whereof I affix my signature in 15
presence of two witnesses.

HOWARD A. TURNER.

Witnesses.

H. D. KILGORE,

F. D. MERCHANT.