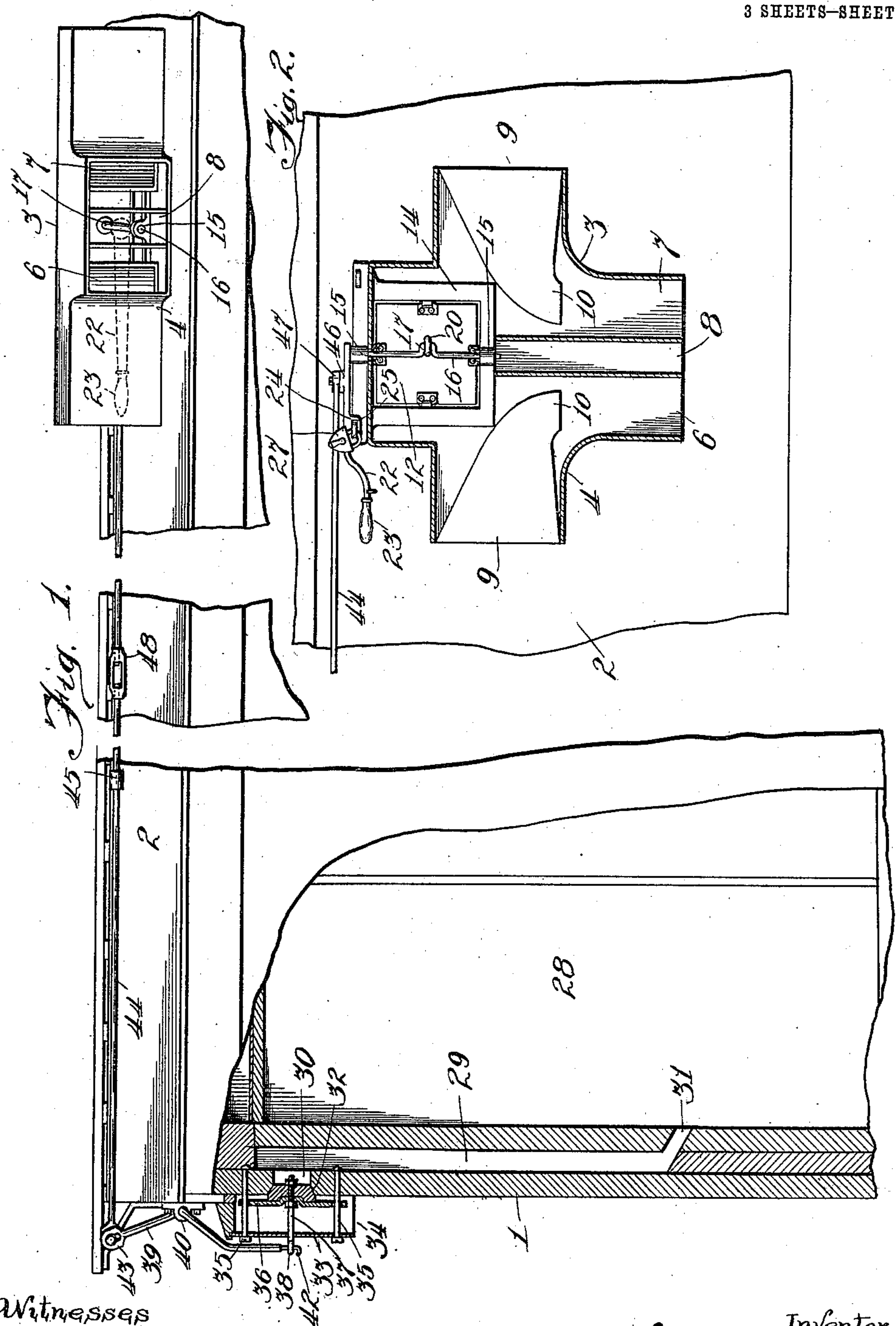


T. H. GARLAND.  
 CAR VENTILATING APPARATUS.  
 APPLICATION FILED JUNE 4, 1909.

989,840.

Patented Apr. 18, 1911.

3 SHEETS—SHEET 1.



Witnesses  
 Milton Lenoir  
 Low. Force

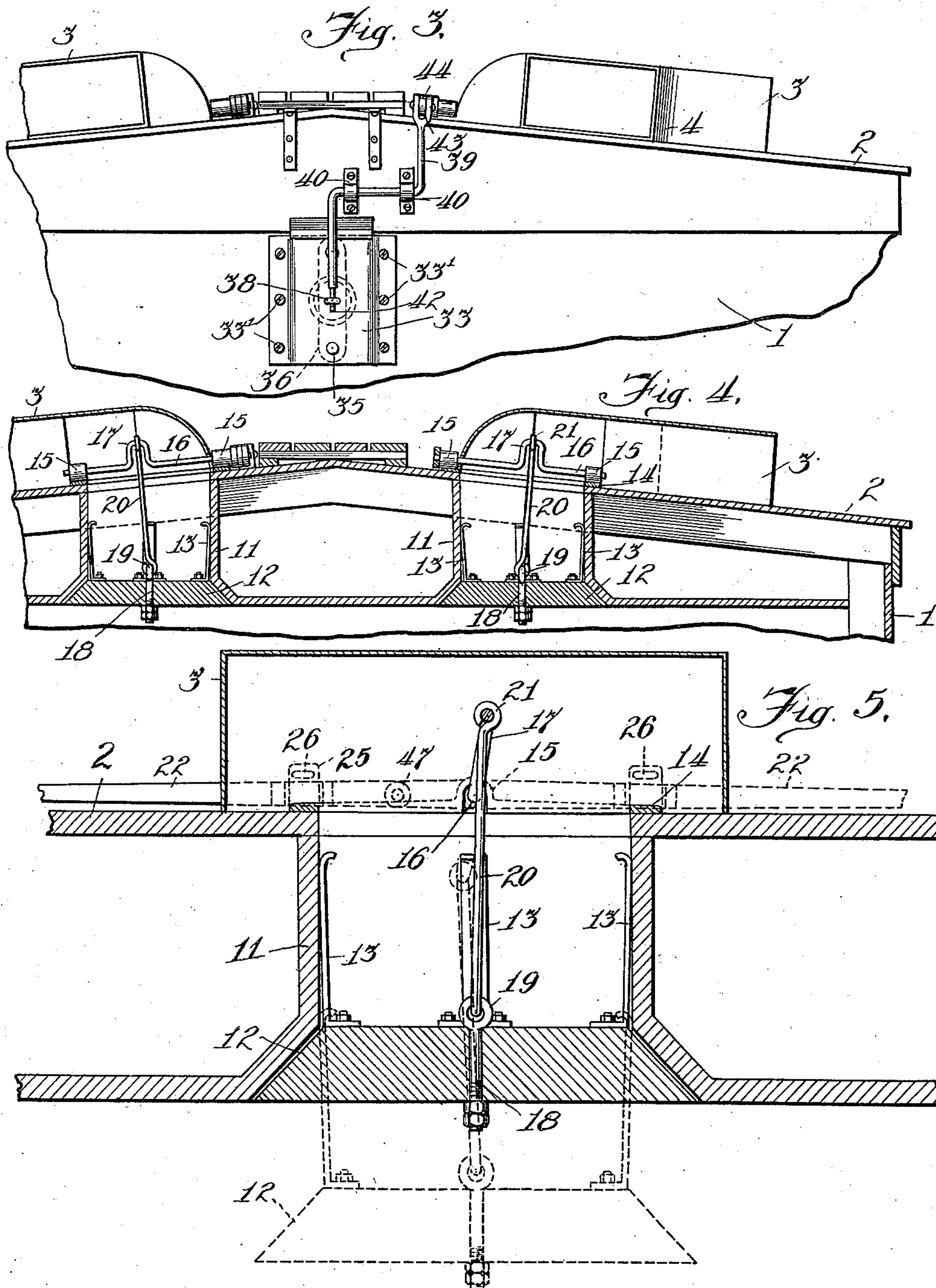
Inventor  
 Thomas H. Garland  
 By Pliny B. Smith.  
 Attorney

T. H. GARLAND.  
CAR VENTILATING APPARATUS.  
APPLICATION FILED JUNE 4, 1908.

989,840.

Patented Apr. 18, 1911.

3 SHEETS—SHEET 2.



Witnesses  
*Milton Lenoir*  
*Lois Force*

Inventor  
*Thomas H. Garland*  
By *Clayton B. Smith*  
Attorney.

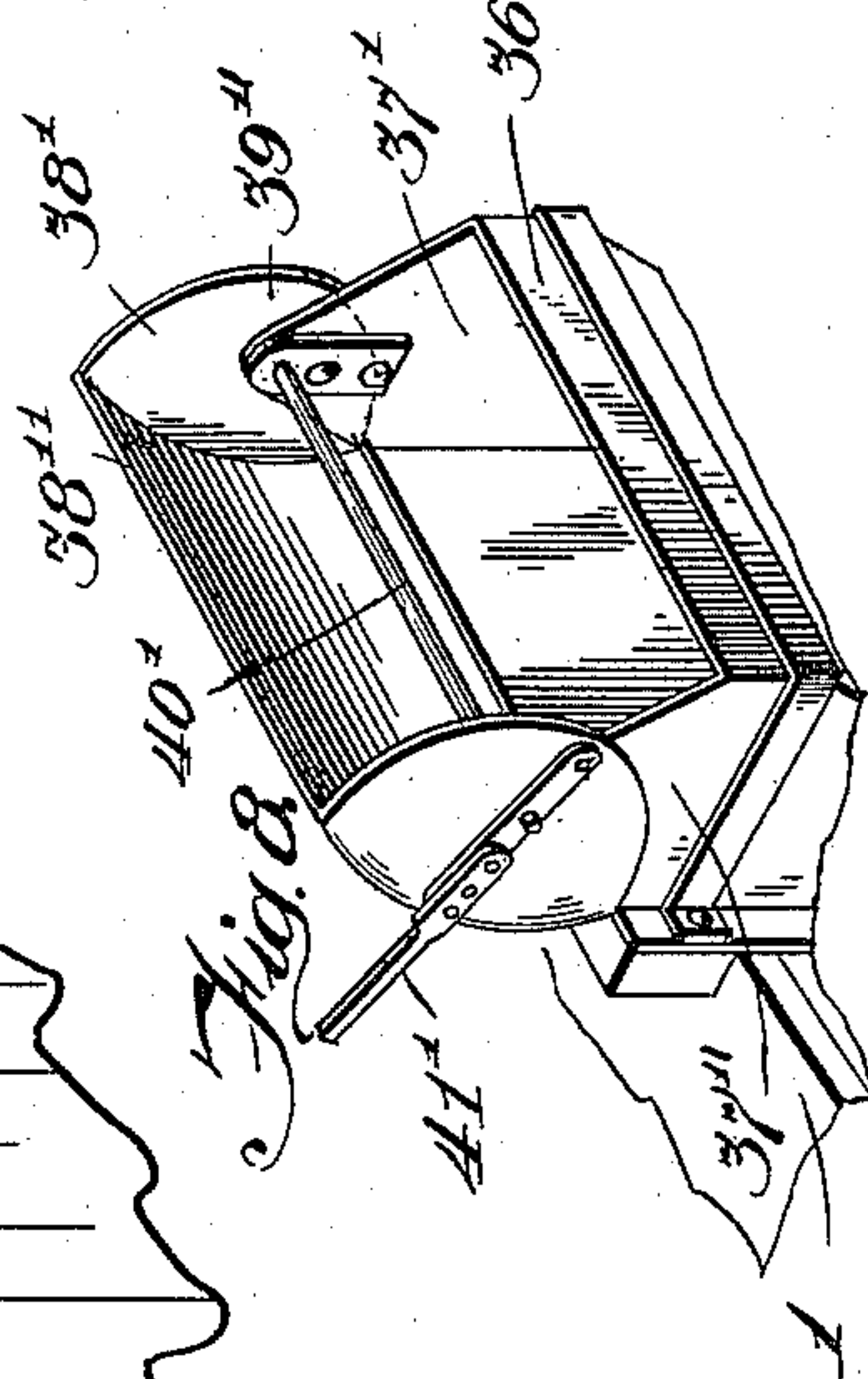
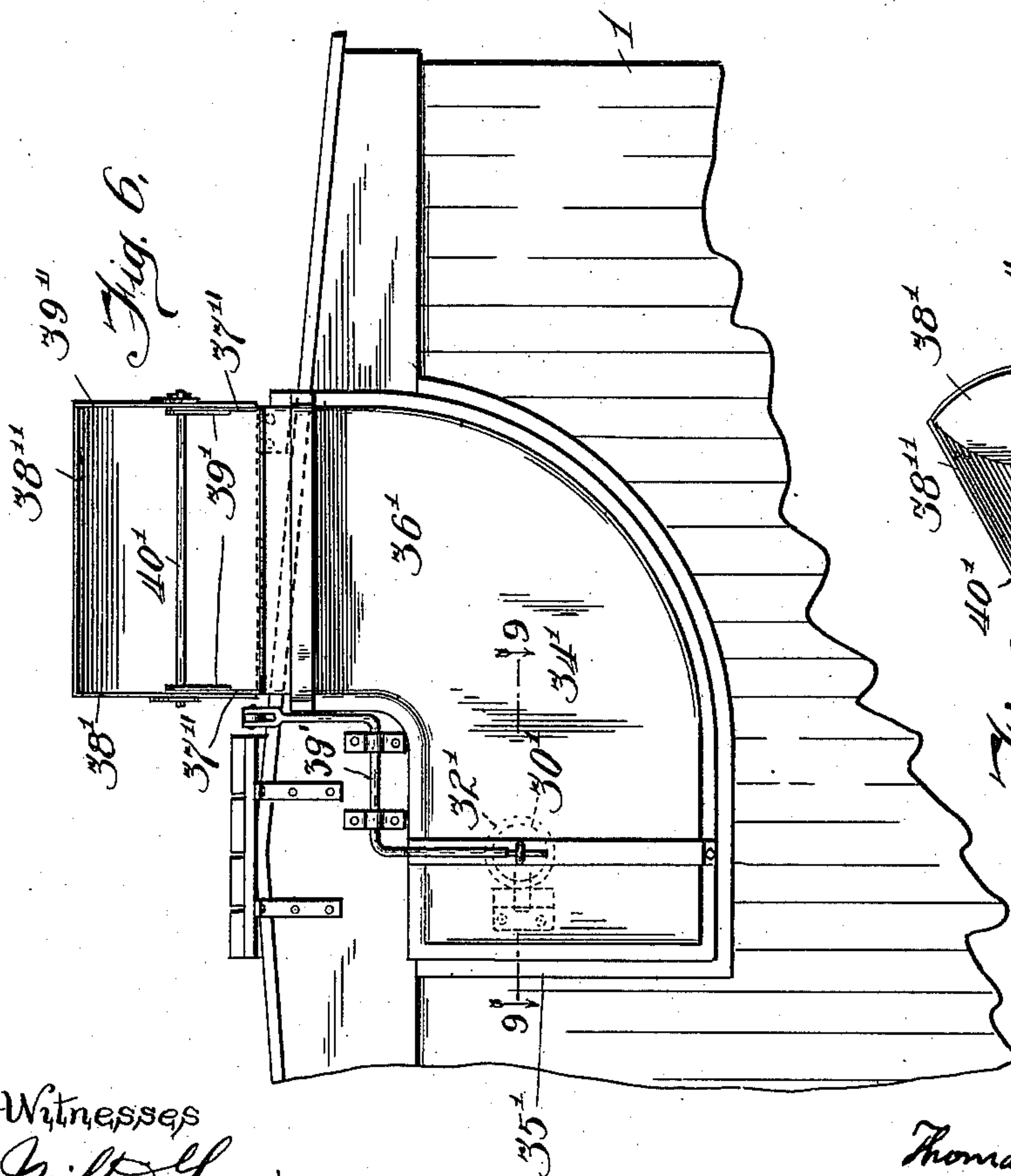
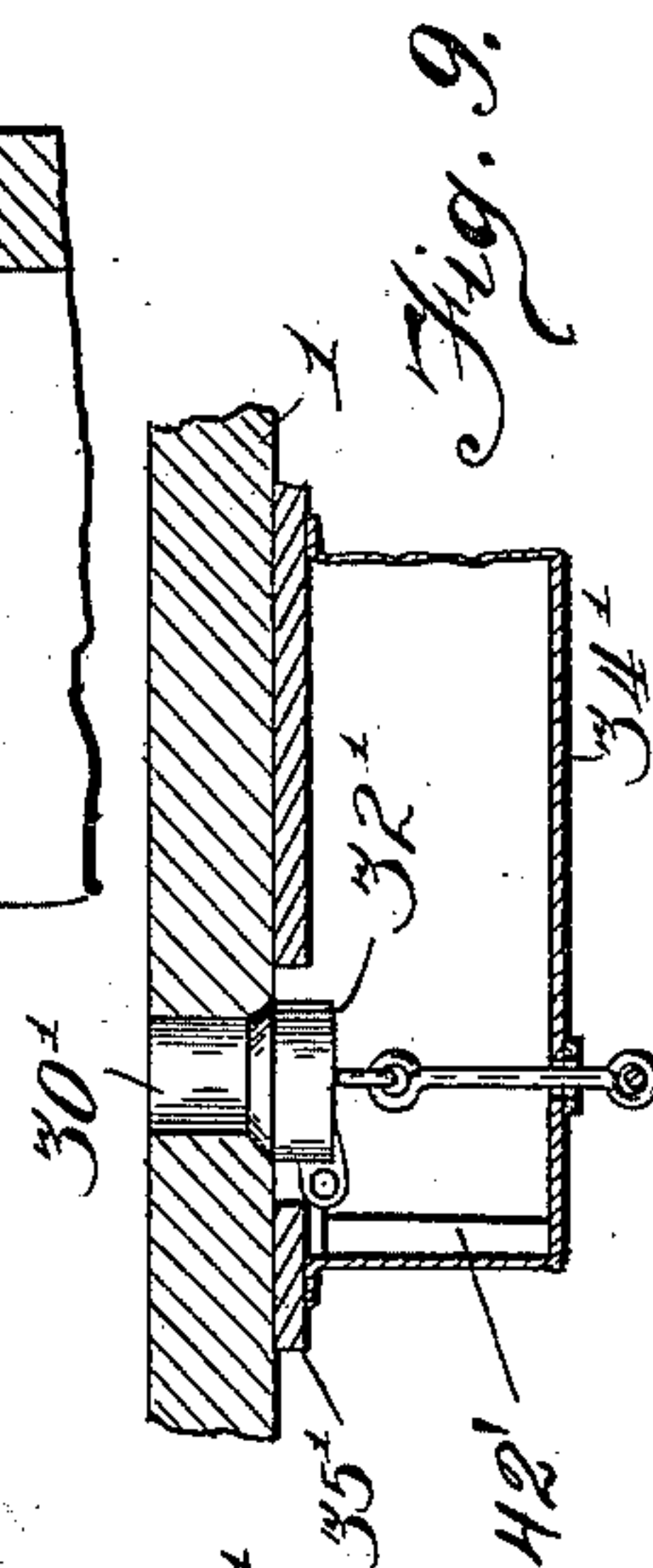
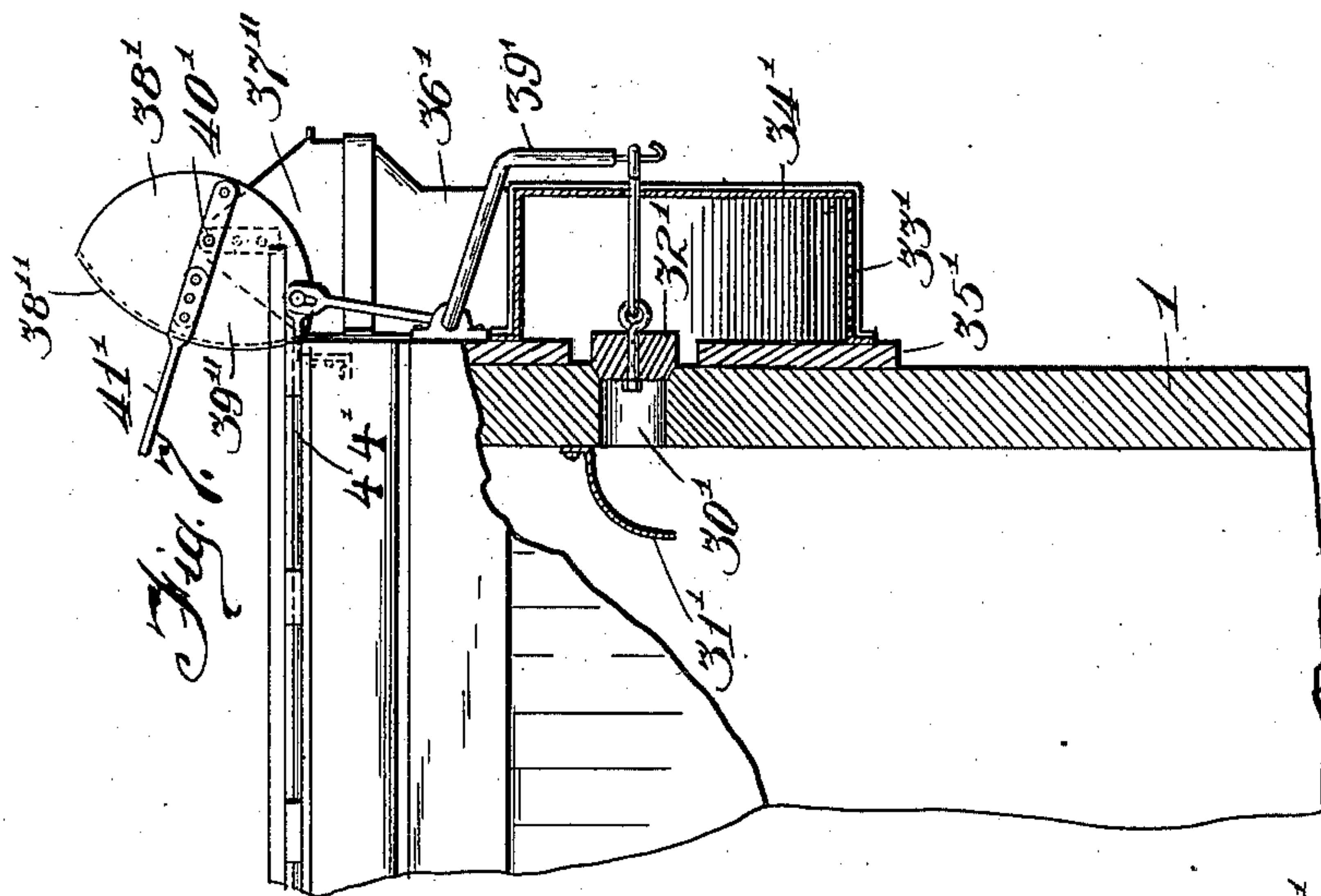


T. H. GARLAND.  
CAR VENTILATING APPARATUS.  
APPLICATION FILED JUNE 4, 1909.

989,840.

Patented Apr. 18, 1911.

3 SHEETS—SHEET 3.



Witnesses  
Milton Lenoir  
D. J. Normoyle

Inventor  
Thomas H. Garland  
By Pliny B. Smith  
Attorney



# UNITED STATES PATENT OFFICE.

THOMAS H. GARLAND, OF CHICAGO, ILLINOIS.

## CAR-VENTILATING APPARATUS.

989,840.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed June 4, 1909. Serial No. 500,200.

*To all whom it may concern:*

Be it known that I, THOMAS H. GARLAND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Ventilating Apparatus, of which the following is a specification.

This invention relates to improvements in car ventilating apparatus, and refers more particularly to a construction adapted for use with refrigerator and fruit or vegetable cars used in transporting fruit and vegetables, and for any kind of cars where a circulation of air through the cars is desired.

Among the salient objects of the invention are to provide an improved apparatus for controlling the ventilation of refrigerator or fruit cars; to provide a construction of such character that currents of air induced by the motion of the car will enter the ends or other parts of the car, circulate over and through the contents of the car and finally pass out through ventilators located on the roof of the car, or other outlet ports; to provide a construction in which such circulation can be carried on continuously and automatically, or may be positively cut off and the car sealed against the passage of air currents; to provide a construction in which said circulation is effective in whatever direction the car be moving; to provide a construction which will prevent the entrance of smoke, cinders, dust, rain, etc., into the car; to provide a construction in which the damper mechanisms controlling the corresponding inlet and outlet ports are interconnected to operate together, and may be positively locked in either closed or open position, or may be operated separately; to provide a construction of the character referred to having an air-gathering hood for the inlet opening, which serves as an effective air-entraining passage; to provide a simple and effective apparatus for inducing either mild or strong currents of air to pass through refrigerator, fruit or vegetable cars, when such cars are refrigerated or without being refrigerated, to carry off the heat and gases given off by the fruit or vegetables, which causes rapid deterioration; and in general, to provide simple and effective apparatus for carrying out the above objects, which may be economically manufactured and may be readily applied to various types of cars.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the drawings—Figure 1 is a fragmentary side elevation of a refrigerator car equipped with my invention, parts of the car being broken out and shown in section to more clearly bring out details of construction; Fig. 2 is a horizontal section of the ventilator forming part of the apparatus in question; Fig. 3 is a fragmentary end elevation of the car showing the damper mechanism controlling the inlet; Fig. 4 is a transverse sectional view taken across that part of the car on which the ventilators are mounted; Fig. 5 is an enlarged sectional view taken at right angles to Fig. 4 and showing the damper and controlling mechanism of the ventilator; Fig. 6 is a fragmentary end elevation of the car showing a modified construction of the hood which takes in air at the ends of the car; Fig. 7 is a fragmentary side elevation of the view shown in Fig. 6, parts, however, being broken away and shown in section to more clearly bring out details of construction; Fig. 8 is a perspective view of the upper part of the hood shown in Figs. 6 and 7; Fig. 9 is a horizontal sectional view taken on line 9—9 of Fig. 6 and looking downwardly, showing more particularly the manner in which the hinged damper is interconnected with the actuating crank.

Referring to the drawings, 1 designates fragmentary parts of the body of a refrigerator car, upon the roof 2 of which at either side of the running board thereof is mounted a ventilator, designated as a whole 3. These ventilators are generally similar in construction to the improved ventilators heretofore invented and patented by me, Patents Nos. 800,438 and 874,320. Each ventilator comprises a centrally disposed main trunk or conductor 4 arranged transversely on the roof of the car; one end being openly exposed to the free sweep of air and the other down-turned and arranged to communicate with a trunk 11 extending between the roof and ceiling of the car. The main conductor 4 is sub-divided as shown more clearly in Fig. 2 so as to provide aspirating conduits 6 and 7 and a central inductive conduit 8. These conduits terminate at their outer ends co-incidentally and they are freely exposed to the cross drafts incident to the forward motion of the car, or to the



wind, in case the car be standing; the operation of the ventilator being more particularly described in said Patents Nos. 800,438 and 874,320. Associated with each aspirating conduit is an air-gathering funnel or cowl 9, said funnels respectively pointing toward the respective ends of the car and arranged with their contracted discharge ends 10 extending into the corresponding aspirating conduits 6 and 7. The discharge ends of these cowls are deflected laterally outward so as to discharge toward the outlet ends of the conduits as shown. The passage of air currents through each trunk 11 is positively controlled by a damper 12 seated in the inner end of said tank, the sides of the damper being preferably beveled as shown. In order to guide the damper into and out of its opening the former is provided at either side thereof with guides 13. Describing the means for operating these dampers, a casting 14 extends around the top of each trunk 11 and is provided at opposed sides with journal bearings 15 in which is mounted a rock shaft 16 having at its central portion a bell crank 17. The damper is provided with an adjustable through bolt 18 having at its inner end an eye 19 to which is connected one end of a connecting rod 20. The other end of this rod engages the crank 17 as shown at 21. One end of the shaft 16 extends through the corresponding bearing block 15 and is provided with an operating lever 22 having a handle portion 23. The parts just described are so arranged that when the lever 22 is swung to the position shown in full lines in Fig. 5 the damper will be closed and when the lever is swung to the opposite position shown in dotted lines the damper will be open. In order to lock the lever in either of these positions the inner side of the lever is provided with an off-set portion 24 apertured to receive an up-standing lug 25 carried by the casting 14. Each of these stops is apertured as shown at 26 to receive a padlock pin or seal 27 whereby the handle may be positively locked or secured to the casting. Each of these ventilators 4 is adapted to exhaust air from the interior of the car body, which induces air to enter the ends of the car through the ports 30 into the ice chambers 28 and then pass over and through the contents of the main body of the car. At either end of the car is provided a transversely-broad air passage 29, its upper end is connected with the inlet port 30 and its lower end with a discharge opening 29. Each of these inlet ports 30 is controlled by a damper 32 beveled as shown in order to fit closely within its inlet port. These ports 30 are each protected by a hood or housing 33 open at its lower end as shown at 34, and secured to the end wall of the car. To the

outer face of the damper 32 is secured a supporting plate 36 by means of a screw bolt 37 the outer end of which extends through the face of the hood and terminates in an eye 38. This supporting plate is slidably mounted upon through bolts 35 extending through the hood and car body. In order to move the damper into open or closed position, a crank 39 is mounted in suitable bearings 40 secured to the end of the car as shown more clearly in Fig. 3. The lower end of this crank is provided with a hooked extension 42 engaging the eye 38, while the upper end is forked as shown at 43. This forked extension 43 has a slot-and-pin connection with an actuating rod 44 extending through suitable guides 45 alongside of the running board of the car. The other end of this rod is connected as shown at 47 to a boss 46 mounted upon the outer face of a lever arm 22. In order to adjust the length of the actuating rod 44 it is provided with an ordinary turn buckle 48.

From the foregoing it will be seen that the crank arm controlling the damper 32 is actuated by means of the handle 22 through the connecting rod 44. Furthermore, the parts are so arranged that the dampers 12 and 32 will operate together, *i. e.* they will both either be closed or opened at the same time.

Assuming the dampers are open, the operation of the apparatus may be briefly described as follows:—As the car travels the air gathered in at the larger end by the then forwardly facing cowls of each ventilator, flows inwardly, being accelerated by the inwardly converging shape of the funnel and is discharged with considerable velocity into the corresponding aspirating conduits. This current produces a well understood aspirating action and entrains substantial currents of air through the ventilating conduits which flow through the ports 30 into the ice chambers 28. The air will then pass over and through the contents in the main body of the car and out through the outlet ports into the corresponding ventilators, carrying with it the heat and gases from the contents.

In Figs. 6, 7 and 8 I have shown modified construction of the air intake covering or housing. In this construction the port instead of opening into a downtake passage opens directly into the interior of the car, but a deflector 31' is arranged to overhang the port 30' and direct the incoming air downwardly. The ports 30' are controlled by dampers 32' which in this construction, however, are each hinged at one edge so as to swing horizontally outwardly, door fashion. These dampers are inclosed in a tubular housing or duct 34', which is secured to the end wall of the car, and in addition to inclosing the damper, extends



upwardly as indicated at 36' to a point as high as the roof of the car. At its upper end each duct is provided with a relatively large mouth or opening 37', the sides of which are bounded by up standing pivot supports 37''. On these projections is pivotally mounted a deflecting hood 38' which serves to check and deflect the air downwardly into the duct and thence through the port 30' into the car. This deflecting hood in the preferred construction shown comprises a slightly convex top 38'' and end wall 39'' through which the pivot stud 40' is inserted into the upstanding supports referred to. The hood is reversible and can be set with its convex side either toward the front or rear of the car, thus deflecting air in whichever direction the car may be going, in either of which positions the then lower edge of the convex portion encounters the upper edge of the mouth or chute and holds the deflector at the proper angle. A handle 41' is provided upon the deflector hood whereby it may be adjusted. The connection between the actuating rod 44' and the damper 32' is through a crank 39', constructed in general like the crank 39' hereinbefore described. The lower end of this crank, however, connects with the hinged door or damper 32' by means of a link which affords the relative flexing movement between these parts. Inasmuch as the housing 34' of this modification is provided with a bottom wall, I provide through said bottom wall a slot-like port 42' which permits the discharge from the duct of the dust, cinders, rain and snow which may enter the duct, and thus prevent the same entering the car or accumulating in the duct.

I claim as my invention:

1. The combination with a car body, of an education ventilator mounted exteriorly thereof, a plug damper controlling the inner end of said ventilator, and a bell-crank operatively connected with said damper, said damper being provided with guides co-operating with the ventilator and whereby the damper is guided in its opening and closing movements.

2. In combination with a car body a closed education ventilator, an air trunk affording communication between said ventilator and car body, a plug damper seated in the inner end of said air trunk, a connecting rod secured to said damper, a bell crank for actuating said rod to open and close the air trunk, and means for positively holding said damper in either of its positions.

3. In combination with a car, an education ventilator, a damper controlling the passage through said ventilator, a bell-crank operatively connected with said damper, a second damper controlling an inlet port in the car body, mechanism for ac-

tuating said latter damper, a connecting rod extending from the bell-crank of the first damper to and connected with the operating mechanism of the second damper, and means for manually operating said parts. 70

4. In a car ventilating apparatus, the combination with a car body having an inlet and an outlet port, a ventilator communicating with said outlet port, a damper controlling each port, leverage mechanism for actuating said dampers, said mechanism being operatively interconnected, and means for locking said dampers in open or closed position. 75

5. In a car ventilating apparatus, the combination of a car body having an inlet and an outlet port, a damper controlling each port, leverage mechanism for actuating said dampers, said mechanisms being inter-engaged to operate in timed relation. 85

6. In a car ventilating apparatus, the combination with a car body having an inlet and outlet port, a damper controlling each port, leverage mechanism for actuating each damper, adjustable connections between said leverage mechanism whereby the latter are operated synchronously, and means for locking said dampers in open or closed position. 90

7. In a car ventilating apparatus, the combination with a car body provided with an inlet and an outlet port, a damper controlling said outlet port, a rock-shaft journaled in said car body and provided with a crank-arm, a connecting rod operatively connecting said damper and rock-shaft, a lever arm for actuating said rock-shaft, a damper controlling said inlet port, and leverage mechanism for operating said damper, said leverage mechanism being operatively connected with said lever arm. 95 100 105

8. In a car ventilating apparatus, the combination with a car body having an inlet and an outlet port, of a damper controlling said outlet port, a rock shaft journaled on the car body, operative connections between said rock shaft and damper, a second damper controlling said inlet port, leverage mechanism controlling said second damper, a lever arm for actuating said rock shaft, and operative connections between said leverage mechanism and said lever arm. 110 115

9. The combination with a car body having an inlet and an outlet port, of a ventilator communicating with said outlet port, a damper controlling each port, a hood for protecting the damper of the inlet port, and leverage mechanism for actuating each damper, said leverage mechanism being interconnected to operate synchronously. 120 125

10. The combination with a car body having an inlet and an outlet port, of ventilating apparatus for automatically inducing the circulation of air through said car body during the travel of the car, and means for 130



synchronously opening and closing said ports.

11. The combination with a car body having an inlet and an outlet port, a ventilating apparatus for automatically circulating air through said car during the travel of the latter in either direction, mechanism for synchronously opening and closing said ports, and means for locking said mechanism in open or closed position.

12. In a car ventilating apparatus, the combination with a car body having a ported trunk forming an outlet passage, a damper for closing one end of said trunk, said damper being provided with guides extending into the body of the trunk, a connecting rod extending through said trunk and secured at one end to the damper and a crank secured at the other end of said rod whereby said damper may be shifted into open or closed position.

13. The combination with a car body having an inlet and outlet port with a ventilator communicating with said outlet port, a damper for closing each port, a hood for protecting the damper of the inlet port, said hood having at its outer end an air gathering cowl, and means for synchronously actuating said dampers.

14. The combination with a car body having an inlet and outlet port, of a ventilator communicating with said outlet port, a dam-

per for closing each port, a hood protecting the inlet damper and having an air gathering cowl extending beyond the body of the car, and means for positively actuating each damper.

15. A substantially closed car provided with a ventilating device for exhausting the air from within the car and with an opening at the end for admitting air, valves for said ventilating device and said end opening respectively, and means connected to both said valves for opening or closing them simultaneously.

16. A substantially closed car provided with a ventilating device at the top for exhausting air from within the car, a valve therefor, an end opening having a valve, a rod running along the top of the car and connected to said valve, and means for shifting said rod to open and close both said valves simultaneously.

17. In a car of the class described having a hatch, a casing for covering said hatch and serving as a ventilator, a plug in said hatch and a handle exterior to said casing journaled therein and attached to a crank within said casing, said crank being adapted to open and close said plug.

THOMAS H. GARLAND.

Witnesses:

ARTHUR G. SAYLES,  
D. J. NORMOYLE.