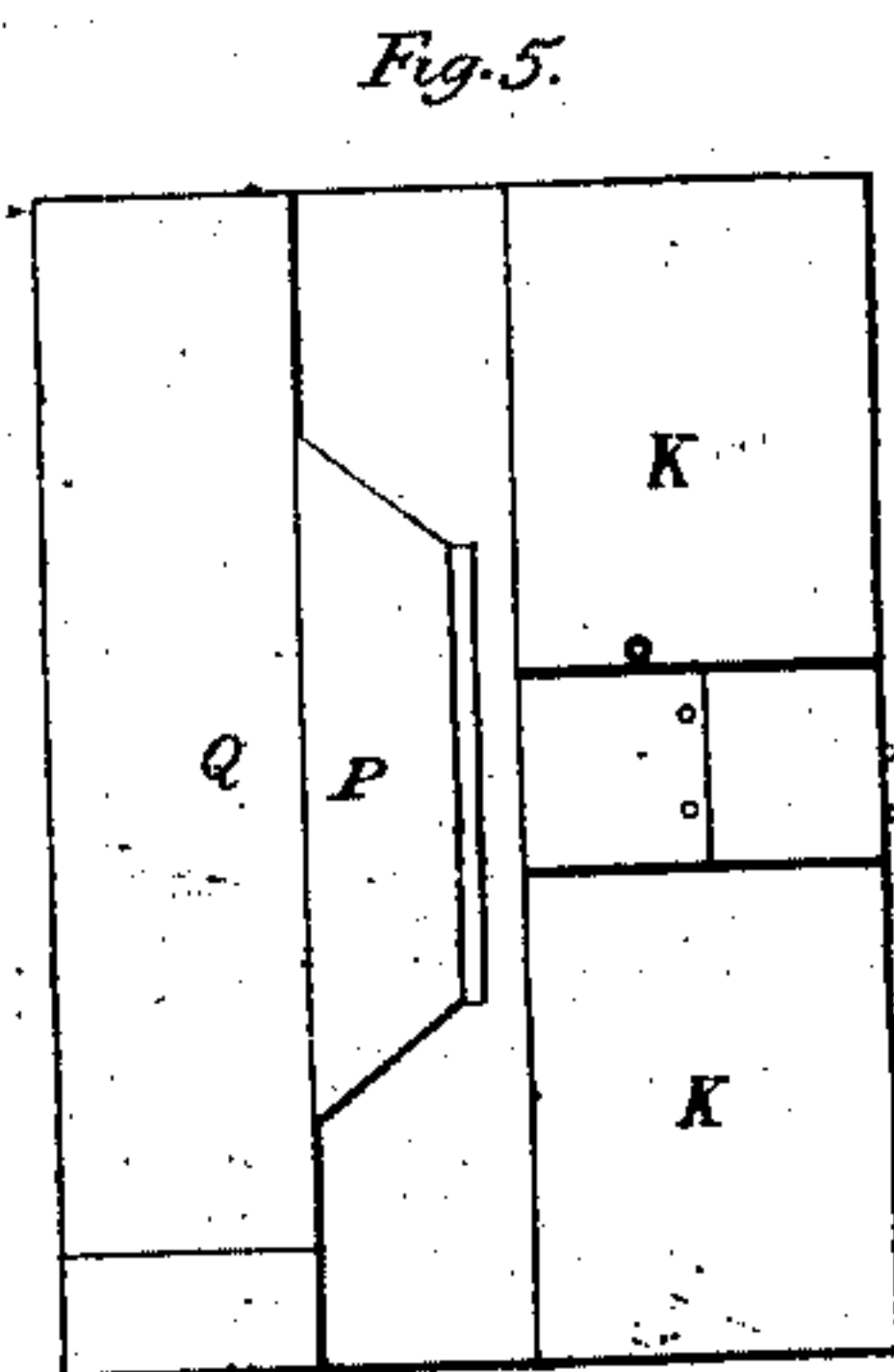
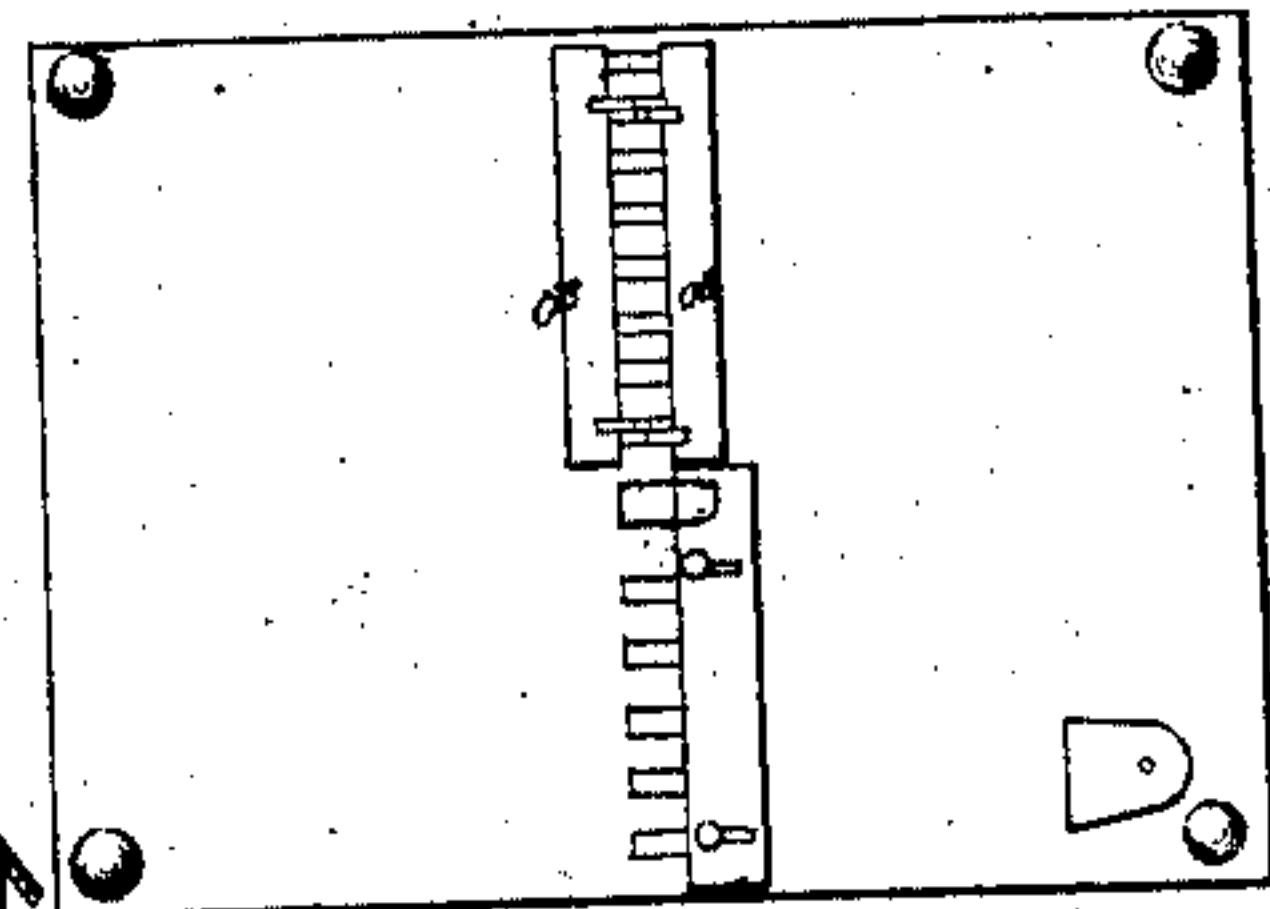
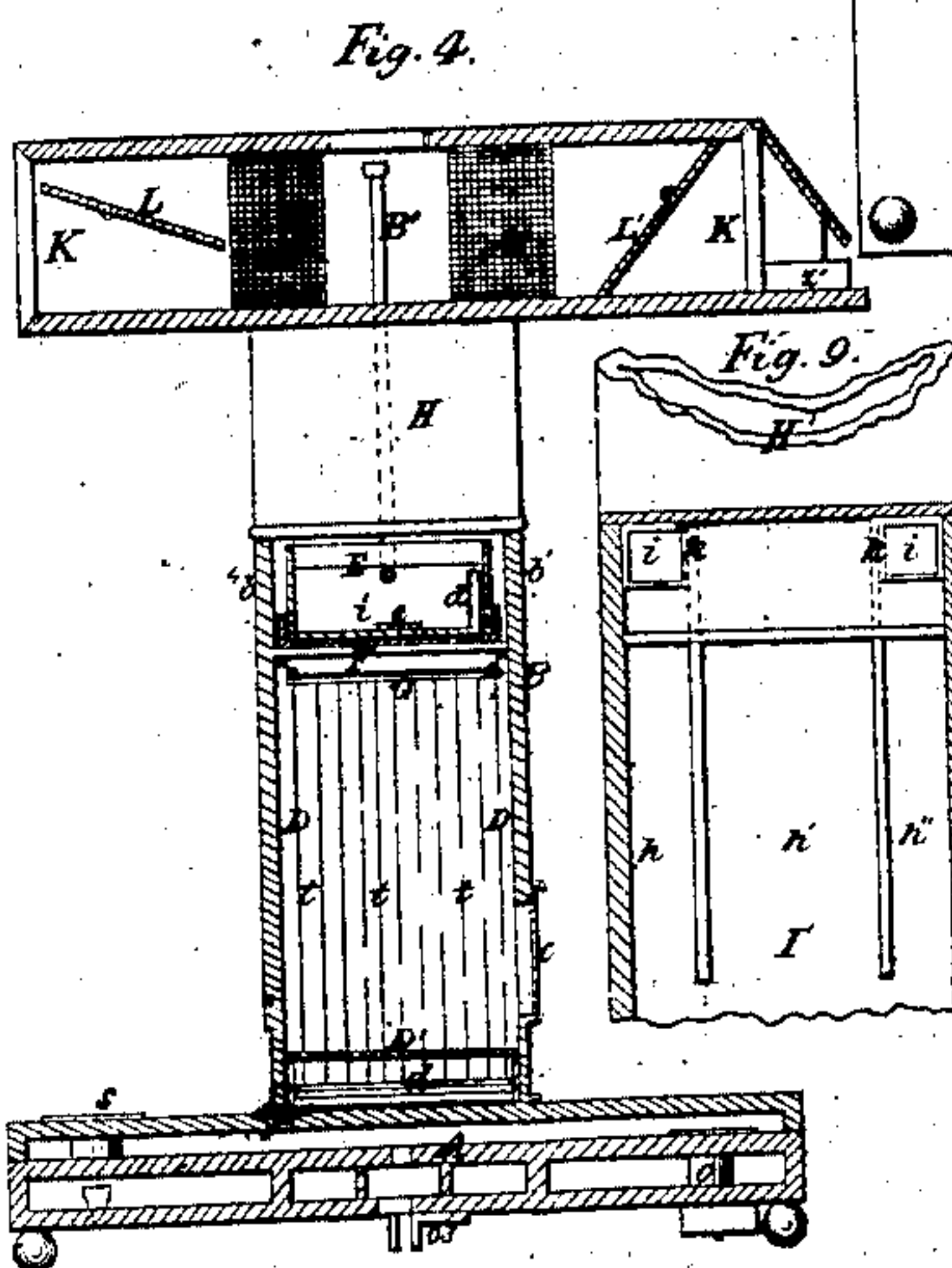
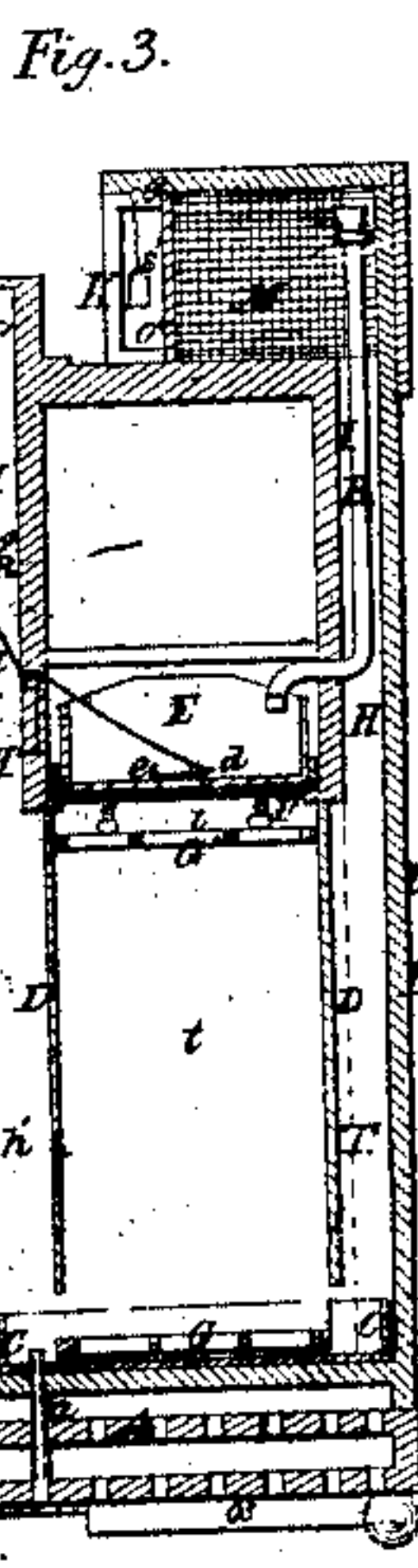
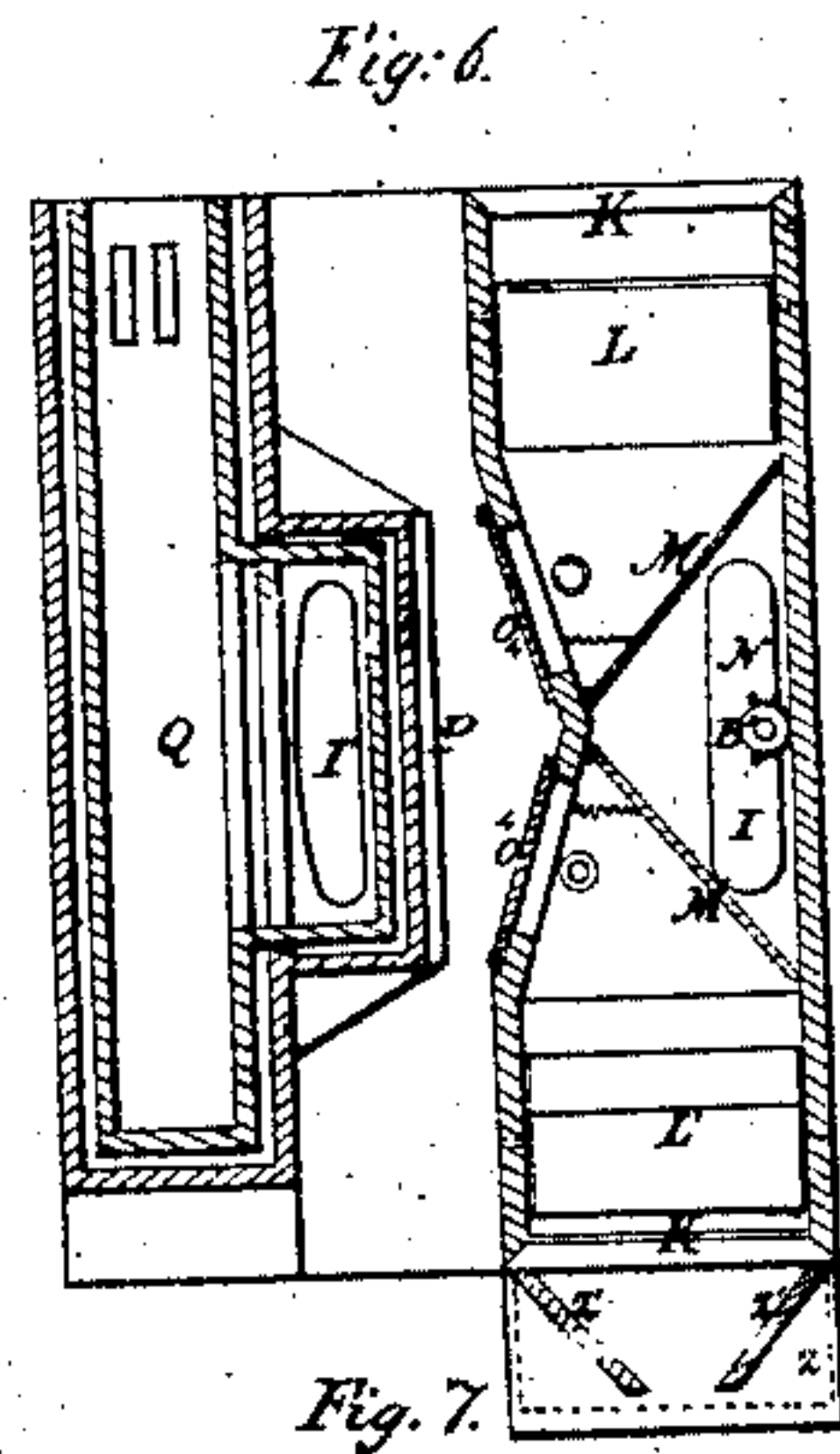
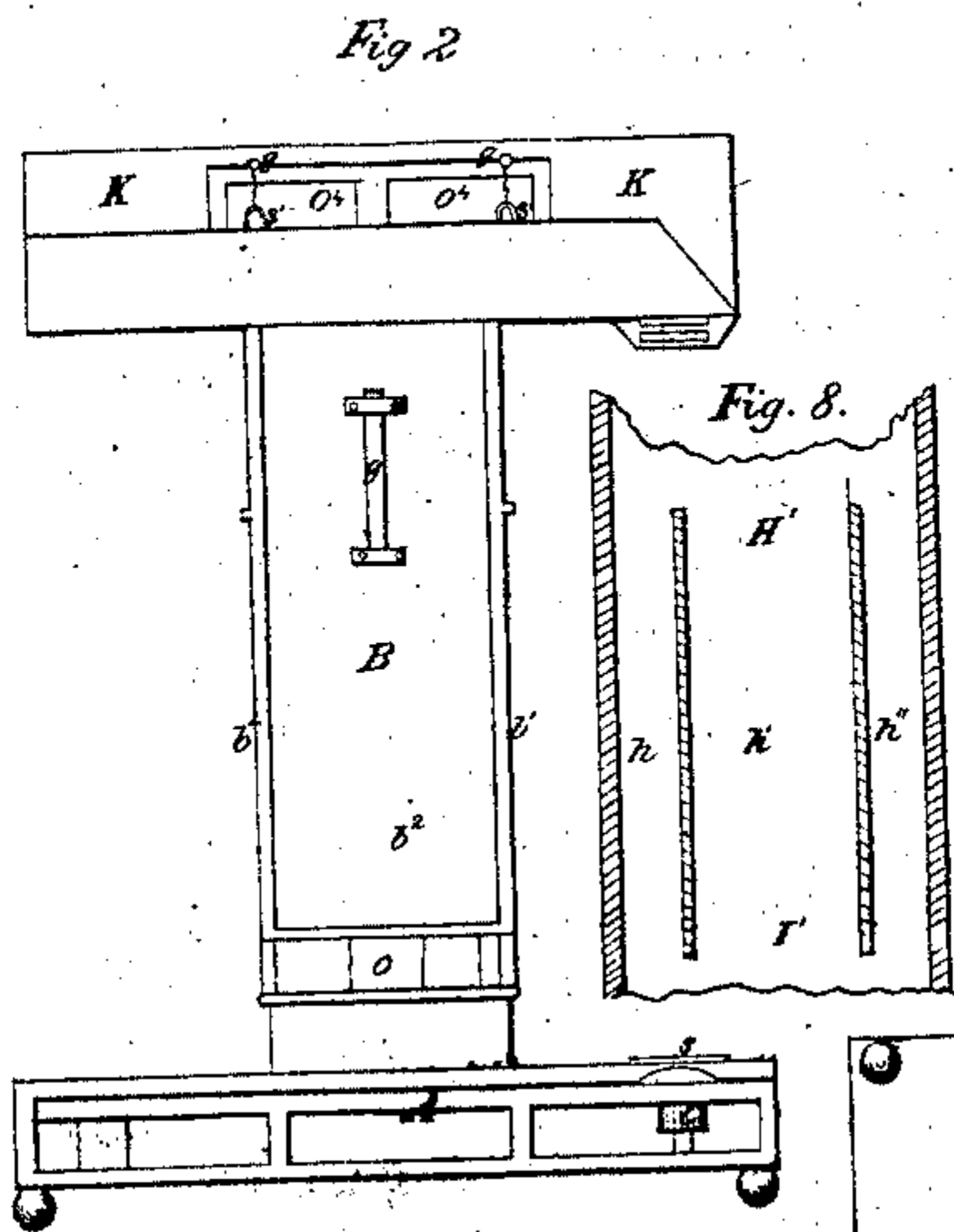
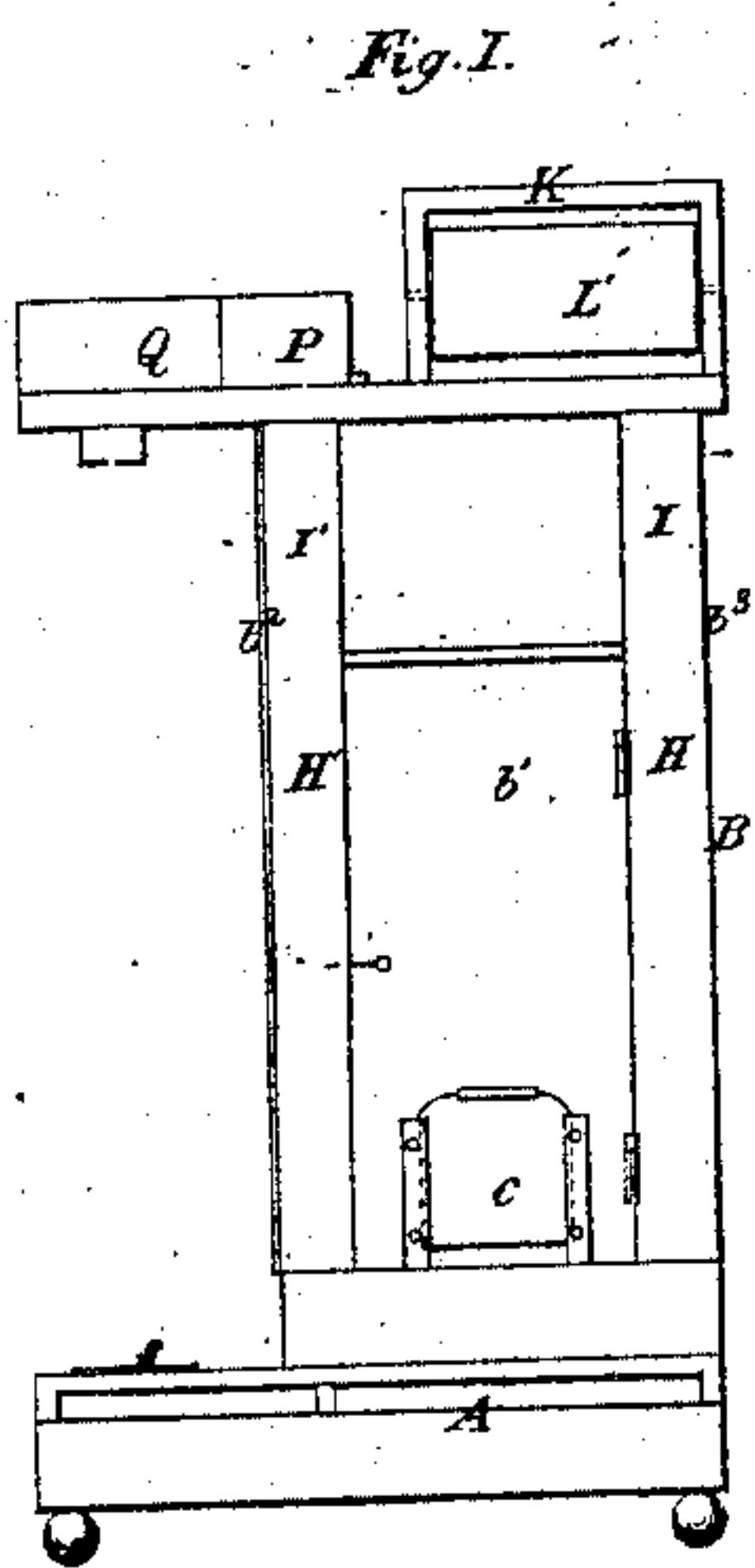


D. Merrill, Car Ventilator.

No 34,898,

Patented Apr. 8, 1862.



Witnesses:
John C. Otis
Wm. Grunleaf

UNITED STATES PATENT OFFICE.

DANIEL MERRILL, OF WORCESTER, MASSACHUSETTS.

VENTILATOR FOR RAILROAD-CARS.

Specification of Letters Patent No. 34,898, dated April 8, 1862.

To all whom it may concern:

Be it known that I, DANIEL MERRILL, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Ventilating Railway-Cars; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1, denotes a front elevation, Fig. 2, a side elevation, Fig. 3, a transverse section, Fig. 4, a longitudinal section, Fig. 5, a top view of my invention, Fig. 6, is a horizontal section taken through the air receiver and the discharger, Fig. 7, is an under side view of my invention.

The object of my invention is to thoroughly ventilate the interior of a car so that during the warm weather the air shall be maintained in a pure and cool state; while in cold weather the air shall not only be kept pure but of an agreeable temperature.

In carrying out my invention I make use of an air chamber (provided with two shallow water cisterns or boxes, between which is disposed a series of shrouds or strainers) having air passages leading to and from it and through which currents of air while the car may be in motion in either direction are caused to pass, and also through the moistened strainers arranged in such chamber, whereby such air is not only deprived of dust etc. but is rendered cool, before being discharged into the car. I also combine therewith a means of carrying off the impure air from the car. Furthermore in connection with the said air purifying apparatus I so construct the air chamber that a stove or other heating device may be applied to said chamber to heat the purified air during the cold season, so that it may enter the car in a warm state.

In the drawings A, denotes the top floor of a car on which is erected a rectangular box or frame B, which is intended to occupy the space of one seat in a car and extend up to the top of the car. C, is the lower water vessel which is arranged in the lower part of the frame B. This box is provided with a register waste pipe a , which allows the water after reaching its top surface to be conveyed off and discharged under the bottom of the car.

D, is the air purifying chamber of which b' , b^2 , b^3 , b^4 , are the sides, b' being the door

which also is provided with a small door or sliding valve c , in its lower part, there being also another small door in the side b^2 .

In the top part of the air chamber I arrange the upper water vessel E. This I usually construct of metal and of a size in horizontal section sufficient to cover the top of the said air chamber. The said box I place in a distributor F, which is supported on ledges or flanges. The lower surface of such distributor is foraminous or pierced with numerous holes. The said water box is provided with a register pipe d , by which the water after reaching its proper height is allowed to run into the distributor F. Moreover the said water box is provided with a valve opening i , and a weighted valve e , to which a rod or wire f , is connected and extends upward to a slide rod g , which is arranged on the outside of the air chamber as shown in Fig. 2. By simply raising or lowering the rod, the valve e , is raised or lowered from its seat as circumstances may require for either supplying the distributor with water or shutting off the same. The said water box is provided with a filling tube B', which extends up into the air supplying box K. Within the said air chamber I dispose what I term the air cooler and screener which consists of two rectangular frames G, G', the lower of which rests on the lower water vessel while the other is suspended directly underneath the distributor F, by means of elastic bands or in any other proper manner.

On a series of rods and extending across the two frames I arrange a series of cloths t , t , etc. extending vertically between the two as seen in Fig. 4. The cloths are kept moist by the water flowing from the disseminator or distributor F.

H, H', are two hollow columns extending up from the said air chamber to the ceiling or roof of the car. Each of the said columns contains an air flue I, I'—I being the induction pipe or that which conveys the air into the air chamber, while I', is the one which leads it therefrom. On the top of the said car I dispose a long rectangular box or air collecting and supplying tube K, each end of which is open and provided with a semibalanced valve L, L' which opens inward and is pivoted to the sides of the tube K, as seen in Fig. 5. These valves are not hung in their centers but so that their lower edges shall rest on the bottom

of the tube and at an angle of about 50° with such bottom, both of these valves being so hung that a gentle wind will move them, and moreover their arrangement is such that whatever direction the car may be moving one of such valves will remain closed while the other is open.

If desirable the ends of the supply tube K, may be supplied with a hinged guard or deflector Z, so arranged and hinged to such ends that the amount of air received may be increased or diminished at pleasure, the bottom of the said tube K, may be furnished with guards Z', Z', arranged at right angles to each and having a small space between the two, these being for the purpose of deflecting any dirt or snow which may be driven toward the entrance of the tube K. Within the said air receiver I dispose two wire screens M, M, on each side of the orifice N, which opens into the induction flue I, the same being hinged to the side of the receiver and so as to open inward. The said screens are arranged across the opening of the receiver at an angle of about 45° with its side and each has an elastic band or spring attached to it and the side of the receiver, so that when cinders or snow may lodge in the meshes of the screen the action of the wind on the screen will cause it to vibrate and thus free it of such obstructions while the spring will return the screen again to its normal position. The said supply tube has its side opposite to the induction tube N, contracted so as to form an obtuse angle, the same being as shown in Fig. 6. In each side of the said contracted part a door or valve O⁴, is arranged the same being hinged and opening outward and having a weight s', attached to it and extending over a pulley or eye disposed on a standard g. These weights are sufficient to keep the valves closed when the wind is of ordinary force and with the cars running at common speed, but should the force of the wind be increased either by the increased velocity of the cars or by a "head wind" the valves will open and allow the surplus air to escape.

P, denotes a frusto pyramidal, or other proper shaped box which is arranged on the top of the column H, and directly over the eduction flue I', one side of the said box being open and communicating with the distribution chamber Q, which consists of a long rectangular box arranged on the top of the car and directly over the passage way between the seats. This distributor opens directly into the interior of the car, through any suitable number of valve boxes R, the same being provided with turning valves by which the amount of air entering the car may be regulated. The eduction pipe I' leading from the said chamber is divided into three vertical sections h, h', h'', as seen in Fig. 8,

which is a longitudinal section of the said flue. R', is a damper which is arranged in the said flue I', and so as to cover the said sections and cause the air or part thereof to be forced backward and escape through the doorway or opening o, in which case the small door is to be removed and a metallic curved distributor arranged on the side b², so as to distribute the heated air in the cold season longitudinally near the floor of the car.

If the car is constructed with only one floor above its timbers, I arrange within the same and through the center of the passage way, any suitable number of register or air exit openings s, which communicate with boxes or tubes extending through the bottom of the car, and are provided with vane valve caps o³, in their lower ends. Each of the said register openings is provided with a valve by which the openings may be closed if desirable during the winter season. If the car is provided with two floors above the timbers, the air in the winter season is caused to flow between the two floors and warm the space underneath the feet of the passengers, and finally by means of suitable registers o, o, o, arranged in the second flooring and over a pipe or passage which communicates with the atmosphere under the car escapes. The registers may be arranged near the middle of the car, or in any other suitable position, and may be more or less closed in winter as circumstances may require.

In adapting my apparatus to winter use I first take out the upper water box and remove the air strainer and cooler, next I place the partition T, in the side of the air chamber and so as to make a part of the induction flue, causing such flue T, to extend down to or nearly to the top surface of the lower water box. Next I place the partition T', in the other side of the air chamber (so as to complete the egress flue) such partition extending to within a short distance of the bottom of the said water box. On the top of the said water box I place a foraminous plate D', which serves as a stand for a stove. The said foraminous stand in summer is to be placed in the side of the air chamber so as to form one side of the egress flue. The object of placing this in the said flue is to check the flow of the current of air through the upper portions of the air strainers or wet cloths, while a free unobstructed space is left to the lower part of the flue so that a more even circulation of the air through the moistened cloths may be attained. This stove may be one of Littlefield's coal-burners, which will warm the air as it passes through said air chamber, and moreover the said air chamber is provided with two openings k, k, shown in Fig. 9, which is a side view of the eduction

flue H', and valves *i, i*, near its top which in summer may be closed, but which in winter are to be thrown back so as to serve as dampers to the outer divisions *h h'* of the education flue I'.

Having described the construction of my apparatus, I will now describe its operation during the summer season.

The air entering the supply tube K, on the top of the car opens the valve, in the direction in which the car is moving, and closes that in the opposite direction whereby such air is caused to pass down into the induction flue I, the wire screen separating all cinders &c. therefrom. Should the air be too strong or more than is required, it will cause the valves *o⁴, o⁴*, to open and such surplus air to escape. The air next passes down the induction flue I, into the air chamber D, and through the series of strainers or wet cloths, which not only deprives it of dust &c. but cools it. From the said air chamber the cooled and purified air passes up the education flue I', through the box P, and into the distribution chamber Q, from whence it is distributed in the interior of the car, and above the heads of the passengers by means of the valve openings hereinbefore described, the amount of air thus admitted being regulated by the damper R', the cool air being continually passing into the top of the car will force the impure air out through the register openings in the bottom of the car, a downward draft being created by the motion of the car. Its operation during the winter season is as follows. The parts being arranged as described for such season, the stove being placed in the air chamber, the air on being introduced into the air chamber at its lower part, coming in contact with the water in the water box is deprived of its dust &c. after which it flows up through the foraminous stand against the stove and is heated thereby and rising escapes through the valve openings *k, k*, the valve being raised upward so as to close the flue sections *h', h''*, causes the air to descend such flues, and by removing the slide in the side *b*, a part of the heated air will be forced out of such opening or orifice into the distributor *o²*, whence it will pass along near the floor of the car to warm the feet and lower extremities of those in the car, while the remaining portion will be carried up the middle section *h'*, of the education flue into the dis-

tribution chamber Q, from whence it will be distributed through the valve openings hereinbefore mentioned. By simply turning down the damper R, all the heat may be carried to enter the car through the lower distributor *o²*, and if desirable the lower exit passage under the car may be nearly closed so as to retain the heat under the floor of the car.

Having described my invention I claim—

1. The above specified combination and arrangement of devices by which the car is supplied with currents of pure air, the same consisting of the tube or duct K, (provided with screens M, M, and valves L, L', as set forth) the induction pipe I, the air chamber D, (furnished with dust separators and coolers as described) the education flue I', and the distributor pipe Q, (having valves applied to it as specified) the whole operating together substantially as set forth.

2. I also claim the above described peculiar arrangement or application of the screens M, M, to the air supply box K, whereby the same not only separates the cinders &c. from the air but are rendered self cleaning as set forth.

3. I also claim the construction and arrangement of devices by which the supply of air to the air chamber D, is regulated, the same consisting of the weighted valves *o⁴, o⁴*, and operating in a manner as set forth.

4. I also claim the combination and arrangement of the two water boxes C, E, and disseminator F, with the air purifier and cooler, the whole being disposed within the air chamber D, and so as to operate as set forth.

5. I also claim the above described arrangement of the distribution chamber Q, provided with valves as set forth, whereby the purified air is equally distributed throughout the car the same being substantially as specified.

6. I also claim the arrangement of the registers for the escape of foul air (viz. in the passage way between the seats) so that such air may pass through a pipe directly under the car into the atmosphere or under the upper floor and warm the same prior to escaping out of the discharge the same being substantially as set forth.

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Witnesses:

JOHN C. OTIS,
WM. GREENLEAF.