(No Model.)

# W. P. BENDING.

## CAR HEATER.

No. 382,507. Patented May 8, 1888.

Fig. 1.

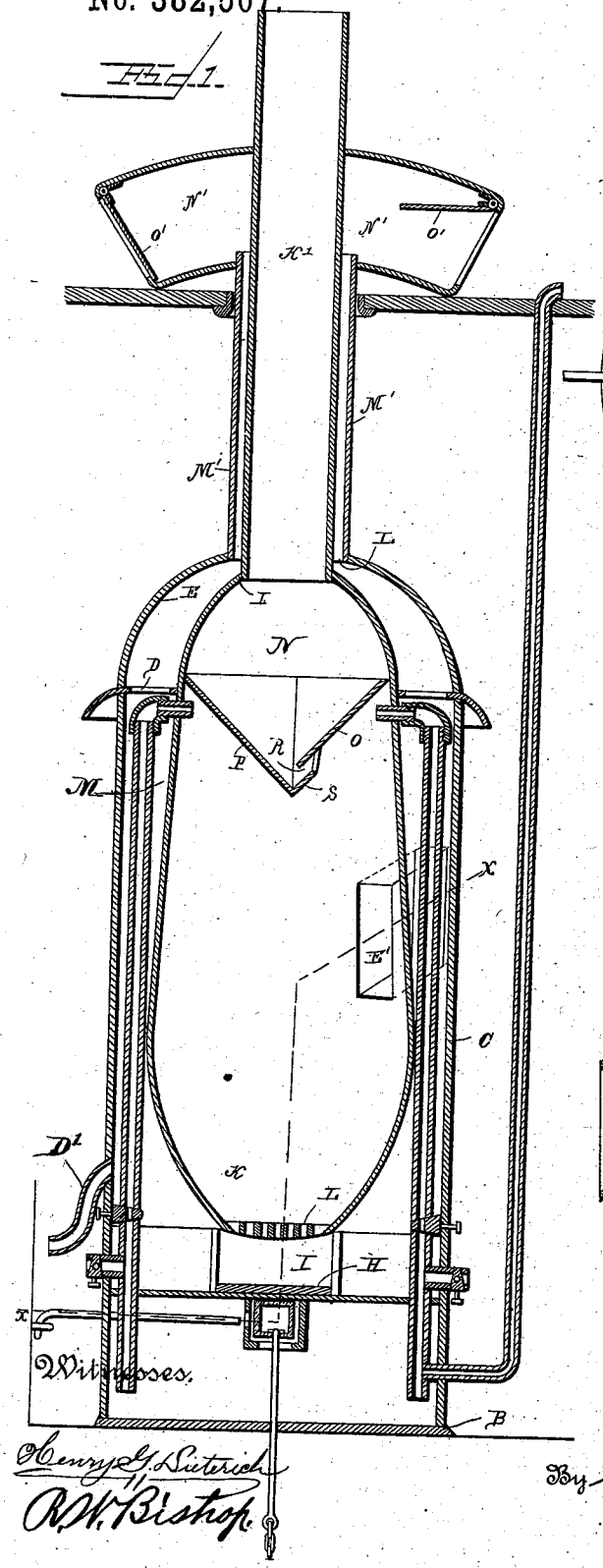



Fig. 2.

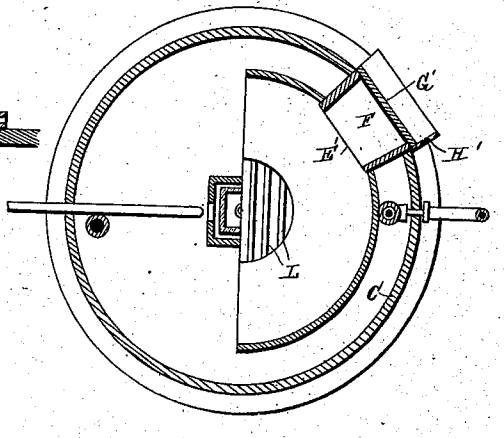
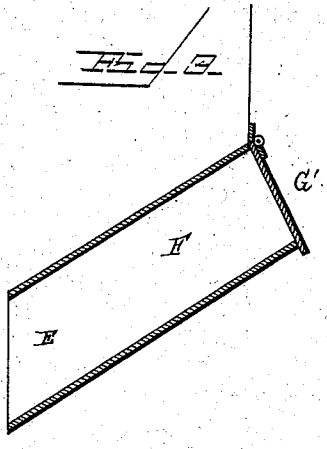



Fig. 3.




Witnesses.

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# UNITED STATES PATENT OFFICE.

WILLIAM P. BENDING, OF COLUMBUS, OHIO, ASSIGNOR OF ONE-HALF TO VAN S. SELTZER, OF SAME PLACE.

## CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 382,507, dated May 8, 1888.

Application filed September 2, 1887. Serial No. 248,605. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. BENDING, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Improvement in Car-Heaters, of which the following is a specification.

My invention relates to an improvement in car-heaters; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical central sectional view of a car-heater embodying my improvements. Fig. 2 is a horizontal sectional view of the same, taken on the line *x x* of Fig. 1. Fig. 3 is a detail view of the chute.

A represents the base of the heater, which is adapted to be bolted to the floor of the car in one corner thereof, in the usual manner. This base is provided near its edge, on its upper side, with a circular flange, B.

C represents an outer cylindrical shell, the lower edge of which fits within the flange B and is supported on the base. To the upper end of the shell is secured a perforated top plate, D, on which is supported a dome, E.

The cylindrical shell C is provided with a diaphragm, F, at a suitable distance above its lower end, thus forming a space or chamber which may be filled with water or other fire-extinguishing liquid or compound, as will be readily understood.

Above the diaphragm F is an ash-pit, H, in which is located an ash-pan, I.

K represents the fire-pot of the heater, which is of the form shown in Fig. 1, and has its lower end supported above the ash-pit and provided with a grate, L. The diameter of the fire-pot is considerably less than the diameter of the outer case, C, so that a space or chamber, M, is formed between the said outer case, C, and the fire-pot. The upper end of the fire-pot extends through a central opening in the top plate, D, and up into the dome E. A smoke-burning chamber, N, is formed in the upper end of the fire-pot or inner case, the bottom of the said chamber being formed by a pair of inclined plates, O and P, which are arranged at substantially right angles to each other. An open space, R, is left between the approximate lower edges of the said plates, and the lower edge of the plate P is extended downward beyond the plane of the plate O, and is then bent upward at right angles to form a flange, S, which prevents the products of combustion from ascending directly through the opening R into the chamber N, and causes the said products of combustion to first strike the lower sides of the plates O and P and become deflected downward thereby, thus heating the said plates very intensely, and consequently causing them to radiate an increased amount of heat.

D′ represents a pipe or elbow which extends outward from the case C, near the lower end thereof, and communicates with the chamber M.

In one side of the fire-pot, at a suitable distance from the lower end thereof, is an opening, E′, from which extends an upwardly-inclined chute or way, F′, which extends through the outer case, C, and has its outer edges inclined downward, as shown. On the said outer edges of the chute is supported a hinged door, G′, provided with fastening devices H′, to secure it firmly when closed. The fuel is fed to the fire-pot through the said doorway in the usual manner.

In the upper side of the chamber N is an opening, I′, from which extends a vertical pipe, K′, which passes up through the roof of the car. The upper side of the dome E has a larger opening, L′, which is concentric with the opening I′, and from the said opening L′ extends a vertical pipe, M′, which surrounds the pipe K′, and also passes through the roof of the car, the said pipe M′ being, however, shorter than the pipe K′. On the upper end of the pipe M′ is secured an inductor or hood, N′, the ends of which extend in opposite directions parallel with the length of the car and are bent downward, as shown. In the ends of the said hood are hinged valves O′, which are free to open inwardly, but are prevented from opening outwardly by means of flanges P′ on the lower sides of the ends of the hood. The interior of the hood is in communication with the pipe M′, which surrounds the pipe K′; but the latter, although

it passes through the hood, does not communicate therewith.

The operation of my invention is as follows: The fire-pot or inner case, K, becomes heated by the fire therein, and when the car is in motion the valve O′, which faces in the direction in which the car moves, is open by the pressure of the air against the same, and the said air passes into the hood, down through the pipe M′, surrounding the pipe K′, into the space between the dome E and the chamber N, and from thence passes downward into the chamber or space M, where it becomes thoroughly heated by contact with the case or fire-pot K and by the heat radiated therefrom, thus heating the outer case, C, and causing the same to radiate heat in the car. The heated air escapes from the chamber or space M through the pipe or elbow D′ directly into the car, thereby thoroughly ventilating the same, as well as warming it. As soon as the car stops, the valve O′, which was previously opened, drops by its own gravity, and thereby prevents the escape of the heated air from the interior of the car. The chamber N, located within the dome, serves as an accumulator of heat and causes the same to radiate from the dome, and the plates O and P, which form the bottom of the said chamber, arrest the soot, sparks, cinders, and smoke and cause them to be consumed in the upper portion of the fire-pot, thereby effecting an economy of fuel by obtaining an increased amount of heat therefrom.

It will be observed that the heat is collected in my device so as to act on the incoming air at the point where there is the greatest accumulation thereof—to wit, between the plate D and the hood E. The heat is arrested in its upward progress, as before stated, by the deflectors and caused to pass through the space R. It will be seen that by my device the air is thoroughly, rapidly, and efficiently heated with the consumption of a comparatively small amount of fuel. The heat and products of combustion rising from the fire-pot strike the deflecting-plates O P. The heat striking the deflector P rebounds and is diverted over toward deflector O, from whence it passes out through the passage or space R. The heat striking deflector O rebounds and passes through space R. By this arrangement of deflectors the heat and products of combustion are deflected and diverted and caused to remain in the stove a greater length of time to do the proper service than would be the case were such deflectors not employed. Thus the heat is utilized to the greatest degree.

Having thus described my invention, I claim—

1. The combination of the outer shell, the hood at the upper end thereof, the plate D below said hood, the fire-pot within the outer shell, and the deflectors O P, arranged in the upper end of the fire-pot and in about the same horizontal plane as the plate D, substantially as set forth.

2. The combination of the outer shell, the fire-pot, and the deflectors O P, arranged in the upper end of the fire pot, the lower edge of the deflector P being extended below the deflector O and having the upturned flange S, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM P. BENDING.

Witnesses:

JOHN F. MCFADDEN,

G. A. FAIRBANKS.