

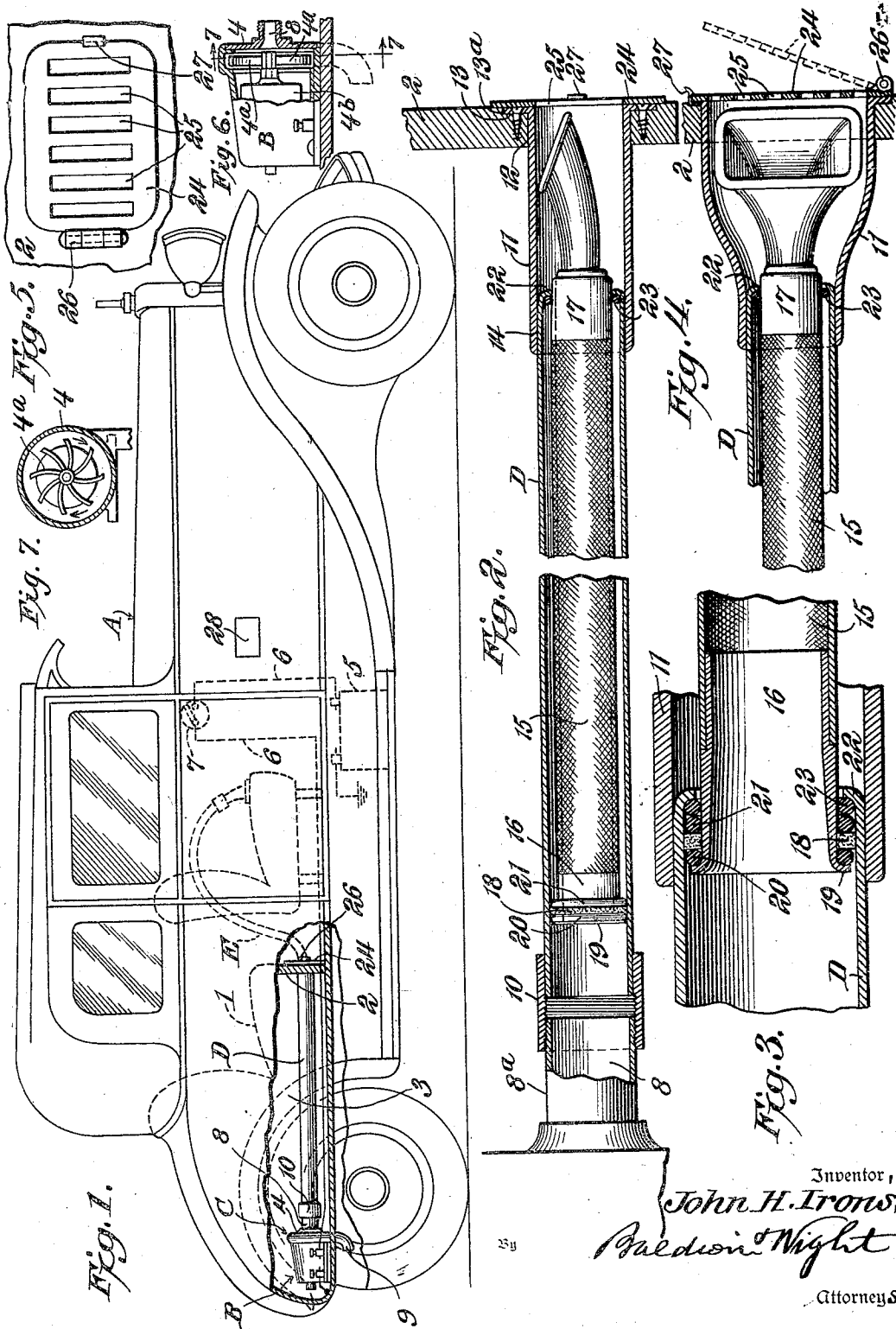
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AIR EXHAUSTING APPARATUS

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UNITED STATES PATENT OFFICE

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AIR EXHAUSTING APPARATUS

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My invention relates to air exhausting apparatus, and more particularly to suction tubes which are used in connection with such apparatus.

5 When an apparatus of the class described is used as a vacuum or suction cleaner, it is often desirable that the fan or other suction device be provided with a detachable flexible suction hose in order that the operator
10 may be enabled to use the apparatus for cleaning remote corners or crevices which could not be easily reached by the main suction nozzle of the cleaner.

Although such a detachable flexible tube
15 fills a number of needs, there are some uses to which it is not readily applicable for the reason that it is not always convenient to completely detach the tube from the fan when its use is temporarily discontinued.
20 Another disadvantage is that, since the tubes heretofore used have been of fixed length and have been rigidly connected at one end to the suction fan casing, the moving of the nozzle end of the tube over areas near the
25 fan, as well as over areas somewhat removed therefrom, resulted in some kinking and twisting of the tube.

The main object of my invention is to overcome these disadvantages by the provision
30 of a housing fixed to a suction fan casing, in which housing a flexible suction tube is telescopically mounted and adapted to be extended to any degree within the limits imposed by the length of the tube, for convenient
35 use at points at various distances from the fan.

A more particular object of my invention is to provide a device of the general character described above which may be applied
40 to an automobile or other vehicle in such a way that the flexible tube may be either extended and used as a vacuum cleaner for cleaning the interior of the vehicle, or conveniently stowed in the housing so as not
45 to interfere with the occupants of the vehicle when the tube is not in use, and which is so arranged that when the tube is stowed away the apparatus may be used as a means
50 for exhausting the air from the interior of

the vehicle to improve the ventilation thereof.

With these and other objects in view, the nature of which will become apparent as the description proceeds, my invention will be more completely understood from a reading of the following description, the appended claim, and the several views illustrated in the drawings, in which:

Figure 1 is a side elevation of an automobile with a part of the body thereof broken
60 away to better illustrate the application of my invention;

Figure 2 is a longitudinal sectional view on an enlarged scale of a portion of a seat
65 riser, a tube housing attached thereto, and a flexible tube mounted within the housing, the tube being shown in elevation;

Figure 3 is a fragmentary vertical sectional view on an enlarged scale of the housing,
70 and the inner end of the flexible tube, showing in detail connections between the tube and the housing;

Figure 4 is a fragmentary sectional view of the outer end of the housing showing an
75 enlarged portion for receiving a suction appliance on the outer end of the flexible tube;

Figure 5 is a detail end elevation of a door for closing the housing;

Figure 6 is a longitudinal sectional view
80 of a motor and fan casing; and

Figure 7 is a transverse vertical sectional view taken on the line 7—7 of Figure 6.

Like numerals designate corresponding parts in the several views illustrated.

In the drawings, there is shown a vehicle A including a back seat 1 having a riser 2 and forming with the body of the vehicle a compartment 3 under the seat, in which compartment is mounted my improved air
85 exhausting apparatus generally designated B.

The apparatus includes an exhauster C having a casing 4 and a multi-blade fan 4^a of a well-known construction mounted therein and driven by a motor 4^b also mounted
90 in the fan casing, the motor receiving its power from a battery 5. One of the motor terminals is grounded to the body of the vehicle, and the other is connected to the non-grounded terminal of the battery 5.
95 100

by means of wires 6—6; and a switch 7 is interposed between said wires for controlling the motor circuit.

The casing is provided with an inlet opening 8 and an exhaust opening 9, the latter being arranged to exhaust air exteriorally of the vehicle body. The inlet opening 8 is formed in a forwardly extending pipe 8a, which pipe is threaded at its outer end to receive an internally threaded coupling 10, the inner wall of the other end of the coupling being smooth and of a size to closely embrace the inner or rear end of a rigid tubular housing D, the outer end of the housing being supported by the seat riser in a manner to be hereinafter more particularly described.

The outer end of the housing is provided with an enlarged portion 11, the inner wall of the necked-in inner end of which is preferably detachably connected to the tubular housing and serves as a support for the latter. The enlarged portion 11 extends through an aperture 12 in the riser 2 and is provided at its outer end with a flange 13 which is preferably positioned in a seat 13a in the front face of the seat riser. It will thus be seen that the housing D and the enlarged portion 11 which forms a part thereof are rigidly supported at the inner end on the fan casing and at the outer end by the seat riser which for this purpose is, in effect, a support. It is also apparent that the housing communicates at its inner end with the intake opening 8 of the fan casing and is in open communication at its outer end with the interior of the vehicle.

A flexible tube generally designated E comprising a flexible fabric section 15, a tubular metallic coupling 16 connected to the inner end thereof, and a suction nozzle 17 attached to the outer end thereof is telescopically mounted in the housing D and is adapted to be extended from the open end of the housing for the purpose specified.

In order to obtain the most efficient results with my apparatus, the flexible tube, when in any position of adjustment, should have substantially fluid tight connection to the housing. To this end I provide, at the inner end of the tube, a compressible washer 18 extending around the metal coupling 16 and arranged to have sliding contact with the inner wall of the housing. In order that this washer be maintained against longitudinal displacement with respect to the tube, the latter is formed at its extreme inner end with a peripheral flange 19, and interposed between this flange and the compressible washer is a rubber or other elastic washer-retaining ring 20 extending around the tube. A second and similar retaining ring 21 is positioned on the opposite side of the washer and in abutting relation thereto. It will be seen that the two retaining rings

and the compressible washer form an efficient and serviceable sealing means which is simple and readily applied to the flexible tube.

It is further desirable that means be provided for limiting the degree of withdrawal of the flexible tube from the outer end of the housing, so that the tube will not be accidentally completely withdrawn from the housing. For accomplishing this purpose, I provide the outer end of the housing with an abutment which preferably is in the form of an inwardly extending flange 22 which, if desired, may be provided with a rubber cushioning ring 23 positioned within the housing and cemented thereto so as to be seated against the inner wall thereof and the inner face of the flange. It will be observed that the peripheral flange 19 and the inwardly extending flange 22 are disposed in overlapping relation, so that, if the flexible tube is withdrawn from the housing, the washer retaining ring 21 will engage the cushioning washer 23 and further movement of the flexible tube will be prevented.

In order that the nozzle 17 be not unduly in evidence when in its stowed away position, there is preferably provided a reticulated door 24 having openings 25, the door being hinged to the flange 13 on the housing as at 26. A spring catch 27 serves to retain the door in closed position.

When the flexible tube is not in use for cleaning various parts of the interior of the vehicle, the tube may be slid completely into the housing so that the suction nozzle 17 will be encased in the enlarged portion 11 of the housing. If it is desired that, with the tube in this position, the apparatus be used as a means for improving the ventilation of the car, the motor and fan may be driven just as though the apparatus were being used for cleaning purposes. The air will be drawn in through the openings in the door and the suction nozzle and then exhausted through the exhaust opening 9.

When the apparatus is used as a ventilator, in most cases the air which enters the interior of the car through the cracks around the doors and windows will ordinarily be sufficient to replace the air exhausted through the suction tube, but, if desirable, more air may be introduced through a ventilator such as that indicated at 28, such or similar ventilators being standard equipment on most vehicles.

The operation of the apparatus, either as a cleaner or as a ventilator, is obvious from the preceding description and will not be described in detail. It is sufficient to say that the tube may be completely stored in the housing and that the apparatus may remain inoperative, or the fan may be driven when the tube is stored in the housing and

the apparatus then functions as a ventilator, or, if desired, the door may be opened, the tube withdrawn through the aperture in the riser, the fan started, and the suction nozzle
5 then be used to clean various parts of the interior of the car.

It is to be understood that, whenever the conditions under which the air exhauster is used are such that an unusually long flexible tube is necessary in order that surfaces
10 somewhat remote from the fixed housing may be reached by the suction nozzle, the flexible tube may be formed of a number of telescopically arranged sections. The particular arrangement of these sections would
15 be similar to the connection between the single flexible tube E and the fixed housing D shown in the drawings.

I claim:

20 The combination with a support provided with an aperture; of an air exhausting apparatus including a casing having exhaust and intake openings; a tubular housing connected at its inner end to said casing to com-
25 municate with the intake opening, and provided at its outer end with an enlarged portion extending into said aperture and secured to said support; a flexible tube telescopically mounted within said housing in
30 substantially fluid tight relation thereto and adapted to be extended through said aperture; and a suction nozzle on the outer end of the tube adapted to be positioned within the enlarged portion of said housing when
35 the parts are in telescopic relation.

In testimony whereof, I have hereunto subscribed my name.

JOHN H. IRONS.

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