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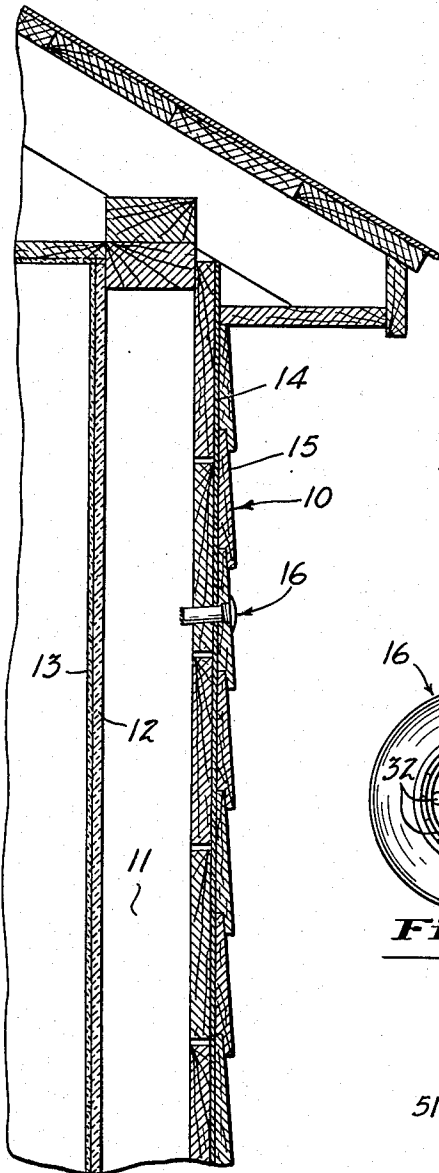


Fig. 1

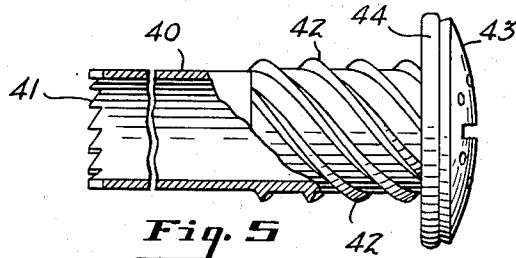


Fig. 5

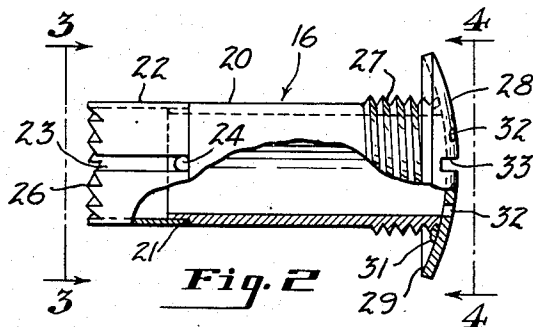


Fig. 2

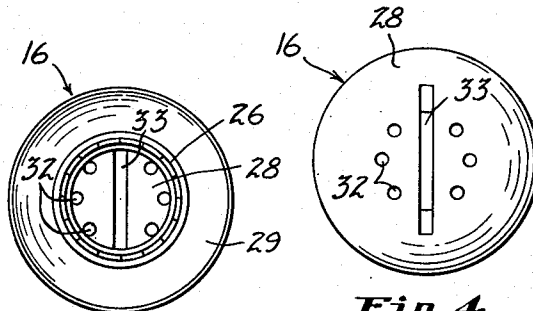


Fig. 3

Fig. 4

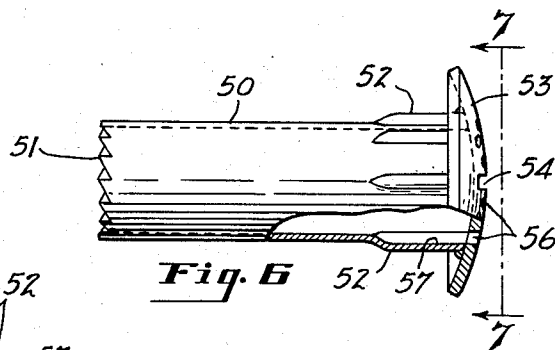


Fig. 6

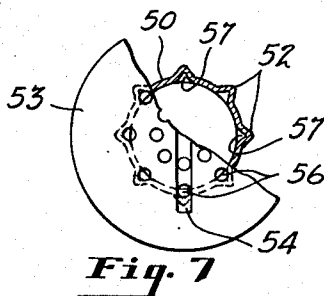


Fig. 7

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This invention relates to vent tubes for insertion into an aperture in the partition or wall of a building or the like for conducting moist air from one side of a wall panel to the other, or from inside a building to the outside thereof.

It has long been recognized that walls, with panels, partitions, and the like often require openings therethrough for air circulation in order to remove water vapor from regions in which it is likely to condense. Failure to vent structures in this manner has frequently been the cause of undesired dampness and mildewing within or on walls and partitions. The presence of moisture within walls, panels, and partitions has also caused much of the unsightly paint blistering and peeling so common in humid climates and in rooms subjected to steamy air conditions.

While simple openings drilled through the panels, walls, or partitions may be all that is required in many instances to provide the required air circulation, they are often unsightly and permit rain to blow in and insects to enter when employed in exterior walls. As a result, simple openings are sometimes more objectionable than the problems they are intended to solve. Accordingly, it has been common practice to employ vent tubes inserted horizontally in such apertures through outside walls or panels to obstruct the entrance of rain. The entrance of insects has been hindered in various ways, as by disposing screening across the bores of the tubes or inserting loose wool-like material in the tubes.

The prior vent tubes of which I am aware have required the use of a brace and bit or the like to drill the holes therefor. Since the tubes are most often applied at the time of painting, the brace and bit constitutes just one more tool required by painters, and is often awkward to use while standing on a ladder or scaffolding.

These prior tubes have seldom fitted sufficiently tightly because the wood or other wall material around the holes expands and contracts somewhat with changes in the seasons and weather conditions. As a result, the tubes have commonly not remained in place.

These and other defects in prior art vent tubes have rendered their use generally unsatisfactory.

The objects of this invention are primarily to correct the various deficiencies of prior art vent tubes mentioned above. More particularly, the objects of the invention include the provision of a vent tube that will cut its own hole through wood siding, stucco, plasterboard, and other relatively easily penetrated exterior and interior wall

materials; the provision of a vent tube that requires the use of no tool other than the commonly available and easily used screw driver during both the hole drilling and tube inserting operations; the provision of a vent tube that will remain firmly in place after installation in any kind of wall structure; the provision of a vent tube that is less conspicuous and unsightly when installed than prior art vent tubes; and the accomplishment of the foregoing objectives at a sufficiently low cost of production of the vent tubes to render their use economically practical and competitive with prior art vent tubes.

I have accomplished the foregoing objectives by providing a tubular body having a cutting edge on one end, an apertured cap on the opposite end that projects radially to form an annular flange for engaging a wall surface around the tube, and protuberances projecting radially outwardly around the tube body adjacent the cap for engaging and gripping the wall of the hole in which the tube is inserted. The aperture or apertures in the cap may be sufficiently small to prevent the entrance of any but the smallest insects, and, in the particular embodiments disclosed herein, an aperture shaped to receive a screw driver is provided to facilitate manipulating the tube during cutting of a hole in a wall and seating the tube firmly therein.

The various objects, features, and advantages of the invention will be more clearly understood from the following detailed description of certain illustrative embodiments, and from the accompanying drawing, in which:

Figure 1 is a vertical sectional view through the wall of a frame building having ship-lap exterior siding, and showing a typical installation of a vent tube embodying the invention;

Fig. 2 is an enlarged plan view, partly broken away, showing a vent tube particularly adapted for use in the type of installation illustrated in Fig. 1;

Fig. 3 is an end elevation of the device of Fig. 2 in its normal position as installed, the view being taken as indicated by the line 3—3 in Fig. 2;

Fig. 4 is another end elevation of the device of Fig. 2 in its normal position as installed, the view being taken as indicated by the line 4—4 in Fig. 2;

Fig. 5 is a view similar to Fig. 2 of a modified vent tube particularly adapted for insertion through stucco, plaster, or similar wall material;

Fig. 6 is a view similar to Fig. 2 of still another modified vent tube adapted for any of the uses mentioned above; and

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Fig. 7 is an end view of the device of Fig. 6, partly broken away, the view being taken as indicated by the line 7—7 in Fig. 6.

Referring first to Fig. 1, there is shown, in vertical section, a conventional frame dwelling wall structure 10 comprising horizontally spaced, vertical studs 11 (only one being shown), interior wall sheathing and surfacing materials 12 and 13, respectively, exterior moisture resistant paper sheathing 14, and ship-lap wood siding 15. The vent tubes 16 (only one being shown) are preferably positioned between pairs of studs near the top of the wall under the eaves, as shown in Fig. 1, and in other strategic places, such as below window casings, where moist air may be trapped if circulation is not promoted. The vent tubes are inserted into holes formed through the siding 15 and paper sheathing 14 so their inner ends project into the space bounded laterally by a pair of studs 11 and the inside and outside sheathing materials 12 and 14.

Referring now to Figs. 2 and 4, the vent tube comprises a tubular body 20 that may be made of soft iron or the like with one end of the tube reduced in diameter for a short distance to provide an axially facing, annular shoulder 21. A short length of strip material 22, preferably of tool steel, may be wrapped snugly around the portion of the tube 20 of reduced diameter so as to encircle it except for a small gap 23 between the ends of the strip material. While held tightly in place, the strip material 22 may be spot welded to the tube 21 at a single point 24 with sufficient strength at the weld to retain the strip 22 in place under the conditions of use. One edge of the strip 22 preferably abuts the annular shoulder 21, and the opposite edge of the strip is serrated to form saw teeth or a similar cutting edge 26.

The strip material 22 may most conveniently be obtained by cutting a standard band saw blade or the like into short lengths. Though not essential, the radial depth of the shoulder 21 is preferably substantially the same as the thickness of the strip material 22 to provide a neat appearance.

The opposite end of the tube 20 is of slightly greater diameter than the intermediate body portion for a minor portion of the length of the tube and is provided with external screw threads 27 of conventional form over the length of the largest diameter portion thereof. This end of the tube is partially closed by a cap or transverse partition 28. The cap 28 is preferably in the form of a dished, circular plate of greater diameter than the maximum diameter of the tubular body 20 to provide a radially extending annular or circumferential flange 29. The concave side of the cap 28 may be tack welded to the adjacent end of the tube 20 at points 31 (only one being shown) about the circumference of the tube.

The cap 28 is provided with one or more apertures therethrough, such as round apertures 32, and an elongated, diametrically disposed slot or recess 33, the latter being adapted to receive the tip of a screw driver. Instead of a hole passing completely through the cap 28, the recess 33 may extend only partially through the cap to receive the tip of a screw driver or similar tool, whereby a recess 33 of substantial dimensions may be provided without forming too wide an opening through the cap that would admit small bugs or insects. The slot 33 may, of course, be of any non-circular shape to receive the end of a tool of similar shape.

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The device shown in detail in Figures 2 to 4 is inserted through the outer sheathing materials of the wall structure shown in Fig. 1 by placing the cutting edge 26 of the device against the outer surface of the ship-lap siding 15 and manually oscillating the device about its longitudinal axis until the cutting edge 26 has cut a circular groove into the surface of the siding to a depth sufficient to retain this end of the device during the remainder of the hole cutting operation. The device is then manually rotated clockwise about its axis, while pressing it toward the siding to cause the cutting end 26 of the tube to cut its way through the siding 15 and paper sheathing 14. If the device tends to bind to a degree rendering its manual rotation difficult, the end of a screw driver or other suitable tool may be inserted into the slot or recess 33 in the cap 28, and the device may be rotated by means of the tool during the remainder of the cutting operation.

When the device has cut its way completely through the siding 15 and paper sheathing 14, the cylindrical plugs of the siding and sheathing materials will frequently fall out of the inner open end of the device. If they do not, however, they may easily be poked out of the device by inserting a wire through any one of the apertures 32 or 33 in the cap 28.

After the hole has been cut for the device in the manner described, the device is pressed further into the hole in the same direction until the threads 27 firmly engage the siding. Continued rotation of the device in a clockwise direction by means of a screw driver or the like will then cause the threads 27 to engage and bite into the periphery of the hole and draw the device further into the hole until the outer edge of the cap is firmly engaged against the outer surface of the siding 15. Rotation of the device is preferably stopped with the slot 33 extending vertically, in which position it is less likely to permit water running down the outer side of the building wall 10 from flowing through the slot 33 and tube 20 into the interior of the building wall. Also, any water getting into the tube is free to run out of the outer end thereof at the lower end of the slot 33.

The edge of the cap 28 seals tightly against the outer surface of the siding, the device being driven home sufficiently to cause the edge of the cap to bite slightly into the outer surface of the siding for this purpose. When driven home in this manner, the device is firmly held in the hole that it has cut for itself, and the cap 28 is sufficiently flat and tight against the outer surface of the siding to be hardly visible from a short distance if painted the same color as the siding. When the device is applied in connection with the original painting or staining of the outer wall, or subsequent painting or staining, it is preferably inserted before the painting or staining operation so that the cap 28 may receive the same finish coat as the siding material.

Referring next to the device of Fig. 5, a tubular body 40 is shown with one end of the tube serrated to provide a cutting edge 41 directly thereon. In this construction, the tube is preferably formed of sufficiently hard steel for the cutting edge to be effective in cutting through stucco, mortar, brick, and the like.

At the opposite end of the tube body 40 are a number of thread-like protuberances 42 extending helically about the tube. These protuberances

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are preferably spaced circumferentially by two or three times the width of each protuberance, and their helical form preferably has a lead about three times the diameter of the tube, more or less. Such protuberances are ideally suited for working into relatively hard, frangible material for performing the same general purpose as the conventional screw threads 27 on the device of Figs. 2 to 4. A somewhat longer threaded portion is desirable for working into and gripping masonry materials, cement mortars, etc.

This end of the tube body 40 has a cap 43 spot welded or otherwise secured thereto, or formed thereon. The cap 43 may be identical with the cap 28 on the device of Figs. 2 to 4.

When the device of Fig. 5 is to be applied in wall material having a rough, or irregular, hard surface, as when the hole for the tube passes through a depressed mortar joint between bricks, a deformable washer or gasket 44 is preferably employed around the tube 40 adjacent the cap 43 to effect a good seal between the cap and the irregular brick and mortar surface of the wall. The washer or gasket 44 may be made of rubber, graphite or rubber impregnated cord of fabric, or any similar or equivalent material.

Except when very hard wall materials must be penetrated, the device of Fig. 5 may be used in the same manner as the device of Figs. 2 to 4 to cut its own hole and seat itself in firm gripping engagement with the wall of the hole. If the building material is too hard for the device to be used to cut its own hole, the hole must be preformed with other tools, and the cutting edge 41 is unnecessary and may be eliminated. The protuberances 42, however, are still capable of performing their normal function, and the device will still perform perfectly when installed.

Referring finally to the device of Figs. 6 and 7, a tubular body 50 is shown with one end of the tube serrated to provide a cutting edge 51 directly thereon. The opposite end of the tube body 50 is deformed outwardly, as shown, to form a plurality of longitudinally extending protuberances 52 spaced around the circumference of the tube. A relatively thin walled tube is best adapted to be deformed in this manner.

A cap 53, of somewhat thicker material than the caps of the devices previously described, is suitably secured to or formed on the deformed end of the tube 50. As permitted by the thicker cap 53, a slot 54, deep enough to receive securely the end of a screw driver or the like, is formed therein without completely penetrating the cap. To provide ample ventilation, therefore, a larger number of apertures 56 is preferably provided in the cap in this case, and some of the holes may be formed in the bottom of the slot as shown. Preferably, an outer, circular array of apertures 56 is disposed so that these apertures are substantially in alignment with interior channels 57 formed by the deformation of the tube. This insures excellent drainage of water from the tube, which should be disposed in a wall with a protuberance 52 and aligned aperture 56 disposed on a vertical diametrical plane of the device.

The device of Figs. 6 and 7 may be employed in precisely the same manner as the device of

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Figs. 2 to 4. Alternatively, the cap 53 of this device may be forced home, after it has cut its own hole, by driving it with a hammer. Also, as should be apparent, the serrated cutting edge 26 or 51 of the device of Figs. 2-4 or 6-7 may be dispensed with in preference for preforming the hole for the tube with other tools, or where the holes are already in existence and the device is being employed as a replacement for prior art tubes having no means for locking them in place. In the event the cutting edge is eliminated, the device need not be made of such hard and strong material as iron or steel and is suitably made of plastics, such as polystyrene or the like, or of soft easily drawn metals, such as aluminum.

As will be appreciated by those skilled in the art, the features of each of the illustrative forms of the invention shown and described herein may be interchanged in various ways with corresponding features of the other forms disclosed. It will also be apparent that numerous variations may be made in the details of the devices shown and described without departing from the true scope of the invention as defined by the appended claims.

Having described my invention, I claim:

1. A vent tube for building walls, comprising a tubular body having a cylindrical outer contour, one end of said body being open and the opposite end being partially closed by a sharp edged, generally circular, plate of greater diameter than said tubular body to provide a radial flange thereon, said plate being dishd outwardly in an axial direction to provide a smooth convex outer surface and having a narrow diametrically extending breather slot therethrough, whereby, when said tube is inserted in an aperture in a building wall with the sharp edge of said flange snugly engaging the outer surface thereof and said slot extending in a vertical direction, the convex outer surface of the plate tends to direct water flowing down the outer surface of the wall away from said slot and said aperture.

2. A vent tube according to claim 1 having radially projecting protuberances about the tubular body adjacent the partially closed end thereof for gripping the inner surface of said aperture and holding said radial flange snugly against the outer surface of the building wall.

3. A vent tube according to claim 1 having the open end of the tubular body serrated to provide a circular array of cutting teeth for cutting a cylindrical aperture substantially the diameter of the tubular body for receiving the same.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
141,465	Rummer	Aug. 5, 1873
929,928	Fink	Aug. 3, 1909
1,549,240	West	Aug. 11, 1925
2,513,056	Scallon	June 27, 1950

FOREIGN PATENTS

Number	Country	Date
446,020	Great Britain	Apr. 23, 1936