Sept. 16, 1947. J. W. MILLER 2,427,413

CHIMNEY HOOD

Filed Feb. 15, 1943 2 Sheets-Sheet 1

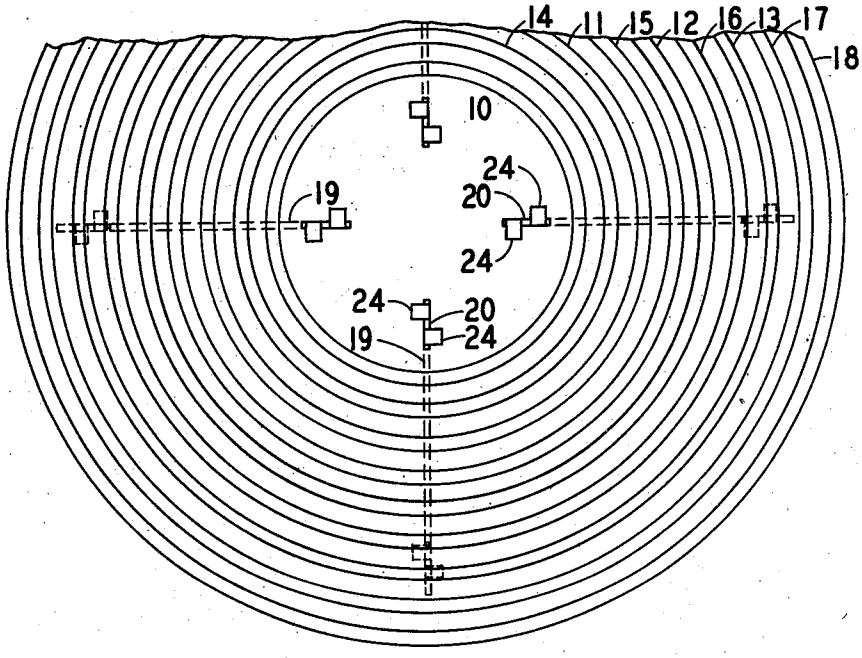


FIG. 1

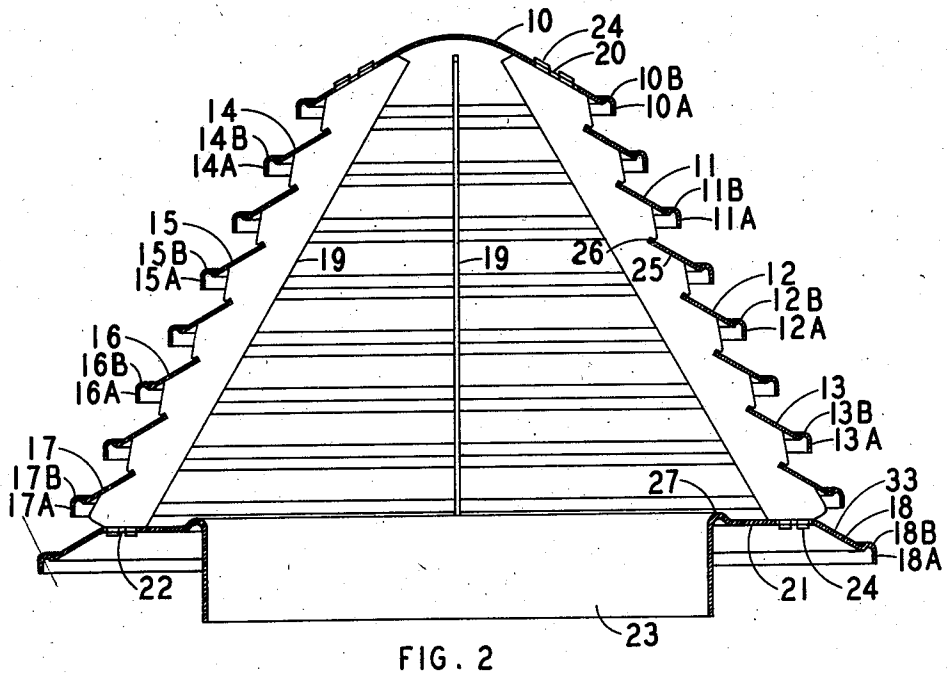


FIG. 2

INVENTOR.
JOHN W. MILLER
BY Carroll R. Baber

Sept. 16, 1947. J. W. MILLER 2,427,413

CHIMNEY HOOD

Filed Feb. 15, 1943 2 Sheets-Sheet 2

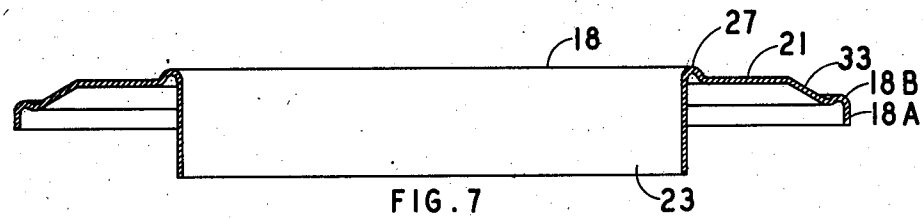


FIG. 7

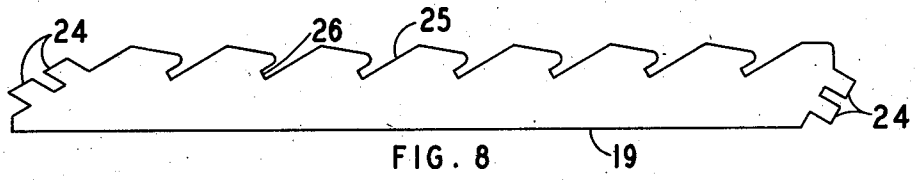


FIG. 8

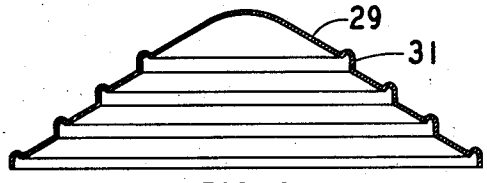


FIG. 3

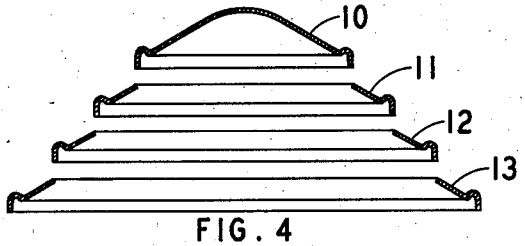


FIG. 4

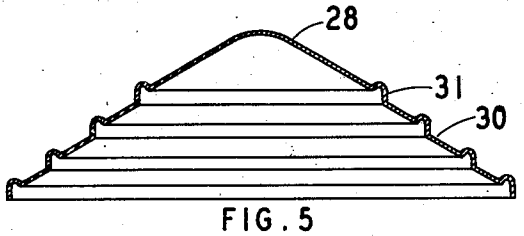


FIG. 5

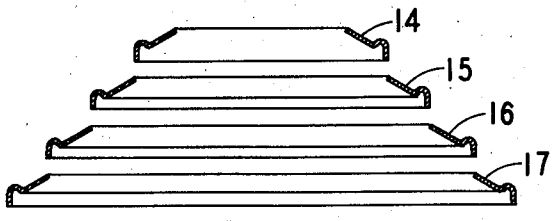


FIG. 6

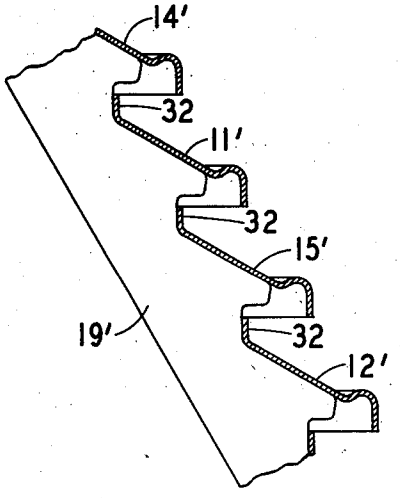


FIG. 9

INVENTOR.
JOHN W. MILLER

BY Carroll R. Taber

Patented Sept. 16, 1947 2,427,413

# UNITED STATES PATENT OFFICE

2,427,413

## CHIMNEY HOOD

John W. Miller, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich., a corporation of Michigan

Application February 15, 1943, Serial No. 475,882

3 Claims. (Cl. 98—81)

1

This invention relates to chimney hoods and to the art of manufacturing the same.

The principal object of the invention is to provide a novel and highly efficient chimney hood capable of minimizing down drafts in the chimney on which it is employed.

Another object is to provide a chimney hood designed to minimize the entrance of rain water.

Another object is to provide a novel chimney hood of simple and inexpensive construction.

A still further object is to provide a simple and economical method of manufacturing a chimney hood.

These objects will more fully appear in the following specification, when read in connection with the accompanying drawings, wherein:

Figure 1 is a fragmentary plan view of a chimney hood embodying the invention;

Figure 2 is a vertical cross-sectional view of the chimney hood;

Figure 3 is a cross-sectional view of a sheet metal stamping from which a portion of the hood is formed;

Figure 4 is a cross-sectional view of the stamping shown in Figure 3 after it has been severed into a plurality of elements;

Figure 5 is a cross-sectional view of the other of the conical sheet metal stampings from which another portion of the hood is formed;

Figure 6 is a cross-sectional view of the stamping of Figure 5 cut into its various elements;

Figure 7 is a cross-sectional view of the bottom or chimney attaching element of the hood;

Figure 8 is a side elevational view of one of the supporting struts for the hood; and

Figure 9 is a fragmentary cross-sectional view similar to Figure 1 showing a modified form of the invention.

Referring now more in detail to the drawings, Figures 1 and 2 thereof show the preferred form of the hood in complete and assembled form. Briefly, the hood consists of a plurality of frusto-conical annular elements numbered 11 to 17, a conical cap element 10, a base element 18, and three or more flat supporting struts 19. All of the various elements forming the chimney hood are sheet metal stampings. The annular elements 11 to 17, the cap element 10 and the base element 18 are assembled in axially spaced coaxial relationship in order of decreasing diameters from the base element to the cap element. This decrease in size is uniform. The elements are equidistant from each other and are held in spaced relationship by means of the struts 19. Thus, a generally conical structure is provided, as will be seen best in Figure 2.

The cap element 10 is substantially conical. At points intermediate the perimeter and the apex are four narrow slits 20. These slits are spaced 90 degrees apart about the cap element and are

2

provided for a purpose which will appear presently. At the outer perimeter of the cap is a depending flange 10*a* and a raised bead 10*b*.

Each of the annular elements 11 to 17 are of generally frusto-conical form. They are provided about their peripheries with narrow depending flanges 11*a* to 17*a* and raised beads 11*b* to 17*b* respectively. The annular elements are all of different, but of uniformly varying diameters so that when arranged in the manner shown in Figure 2 each annular element overlaps the one below it by approximately half of its radial width.

The base element 18 is another annular element, but of different form than the rest of the elements. It is a sheet metal stamping having a frusto-conical annular rim portion 33 of substantially the same angularity as that of the frusto-conical elements 11 to 17. It is provided at its periphery with a depending flange 18*a*. Extending inwardly from the rim portion 33 is a flat substantially imperforate portion 21. The portion 21 is provided with four elongated slits 22 spaced 90 degrees apart and located adjacent the junction between the rim portion 33 and the flat portion 21. A large opening is formed in the center of the element 18. The opening is defined by a cylindrical collar 23. The collar 23 is formed to fit a chimney to which the hood is to be attached. The collar of course telescopes over or into the upper end of the chimney. At the junction of the collar 23 and flat portion 21 is a raised annular bead 27.

The struts 19 are flat strips of metal. They are provided at their extremities with ears or tabs 24. There are two of these tabs at each end of each strut. The radially outer edge of each strut is shaped to what may be called serrated configuration to provide spaced apart inclined edge portions 25 which fit against the under sides of the respective annular elements 11 to 17 to hold them in assembled relation, as shown in Figure 2. The struts are also provided with a plurality of shallow notches 26 which receive the inner peripheries of the respective annular elements. The struts should be as narrow as possible while still providing the requisite strength.

The hood may be readily assembled by holding the struts in approximately the same angular relation to each other as that shown in Figure 2, but somewhat closer together, and dropping the annular elements 11 to 17 over them so that the annular elements rest upon the respective inclined surfaces 25 provided for them. The struts are then separated sufficiently so that the tabs 24 thereon will enter the slits 20 in the cap member 10 and the slits 22 in the bottom member 18. The tabs are bent in opposite directions to securely lock the struts to the cap. When the struts are moved apart the annular elements will

be caused to slide upwardly along the inclined surfaces 25 until the inner peripheries of the annular elements enter the notches 26 provided for them and the entire assembly is then locked together.

In operation the hood is attached to the upper end of the chimney by telescoping the collar 23 into or over the upper end of the chimney. All products of combustion issuing from the chimney will be deflected radially and issue through the annular openings formed between the cap and base elements and the annular elements 11 to 17. Since the cap member 10 overlaps the annular element 14 and each annular element overlaps the one below it, air currents cannot flow downwardly into the chimney in a vertical direction or in a direction slightly inclined to the vertical. Neither can air currents enter the hood and chimney in a vertical upward direction because the entire area between the collar 23 and the rim portion 33 of the bottom member 18 is closed off by the flat portion 21. Also, the bottom member 18 extends radially outwardly beyond the outer periphery of element 17, as does the outer periphery of each of the annular elements extend beyond the periphery of the one above it. Thus, the only way for air to enter the hood at all is in a substantially radial direction and when that occurs the air currents go right on through the hood carrying with them the products of combustion. Accordingly, all down drafts normally caused by air currents from any direction relative to the hood are effectively prevented.

The spacing of the elements 10 to 18 is such that when they are assembled as shown in Figures 1 and 2 the total area of the openings between the elements is at least twice the area of the opening defined by collar 23 on the base element 18. Thus, when a wind is blowing from the side there is plenty of space at the leeward half of the hood for the products of combustion issuing from the chimney to escape.

From actual experience it has been found that a hood of the proportions shown in Figures 1 and 2 will give best results. The hood shown is designed for a chimney eight inches in diameter, and there are eight annular spaces between the base and the cap. The elements are spaced apart about one half inch measured perpendicular to the inclined surfaces.

If a hood is desired for a chimney of different diameter the spacing of the elements and inclination thereof preferably remain the same, but a smaller base and fewer frusto-conical elements are employed. Thus for a six inch chimney only the top five frusto-conical elements are used, thereby providing six spaces for gases to issue. It will be seen that with this spacing of the elements, there should be one annular space for each inch of diameter of the chimney, making it easy to design hoods for various chimneys.

The angle of the inclined surfaces of the elements is not especially critical. They should not be inclined so sharply, however, as to deflect air upward to impinge against the under side of the cap or any of the other elements, as down drafts are thus created. On the other hand, a nearly horizontal inclination will tend to create eddy currents and cause down drafts. An inclination of about 30° to the horizontal has been found to be very efficient.

The raised beads 10*b* to 17*b* about the outer peripheries of the cap and frusto-conical elements, and the bead 27 on the base element tend to stiffen the elements, but are principally to prevent entrance of rain water. Any water running down the inclined surfaces piles up against the beads, and if the wind is strong enough the water is blown around to the leeward side of the hood where it drips off without entering the chimney. If the wind is not strong enough to blow the water around to the leeward side, it does not have enough force to blow it into the openings on the windward side.

The depending flanges 10*a* to 17*a* on the elements also tend to stiffen them and make it easier to fabricate the hood, as will be more readily apparent later.

The method of making the hood is illustrated in Figures 3 to 8. To form the hood two conical sheet metal stampings 29 and 30, shown in Figures 3 and 5, are provided. The stampings are similar, that is, the inclination of their sides is the same, but the altitude of stamping 30, and consequently its base diameter, is slightly greater than those of the stamping 29. Stamping 29 is formed to provide a cap portion 10 and three frusto-conical annular portions 11, 12, and 13 respectively. Stamping 30 is formed to provide a cap portion 28, later discarded, somewhat smaller than cap portion 10 and four frusto-conical portions 14, 15, 16 and 17. The line of demarcation between the cap portions and the frusto-conical portions in both stampings is formed by providing annular shoulders 31 which later form the flanges 10*a* to 17*a* and beads 10*b* to 17*b* inclusive. As pointed out above, the flanges stiffen the finished elements. Also they facilitate forming the cones 29 and 30. It is very difficult to draw a smooth cone from sheet metal. By forming the shoulders 31 the necessary deep drawing of the metal can be readily accomplished. The various portions of each of the two stampings are sheared on a line at the junction between each frusto-conical portion and the lower edge of the shoulder thereabove after the metal has been drawn to shape.

The bottom element 18 is a one piece sheet metal stamping formed in a suitable press to the configuration shown in Figure 7 and previously described.

The struts 19 are flat sheet metal stampings shown in Figure 8 and formed to the configuration previously described.

In assembling the various elements the cap portion 28 of stamping 30 is discarded, because only one cap is used on each hood. This constitutes the only metal wasted in manufacturing the hood. The annular elements 11, 12 and 13 formed from stamping 29 are arranged between the respective annular elements 14, 15, 16 and 17 formed from stamping 30 so that a relatively large overlapping of all of the elements is provided. The cap member 10 of stamping 29 forms the cap for the chimney hood. Further assembly of the device has been previously described.

It will be seen that the above described method of making a chimney hood is exceptionally simple and economical because the only wasted material is that forming the apex of the conical stamping 28. Relatively few operations are necessary to fabricate the various parts of the hood assembly and after they are fabricated they are easily assembled.

Figure 9 shows a slightly modified form of the invention. The only difference between the hood shown in Figure 9 and the previously described hood is in the formation of upstanding flanges 32 at the inner peripheries of the frusto-conical

elements 11 to 17. The flanges 32 are provided as an added precaution against the entrance of rain water. Any water which is blown up the inclined surfaces of the various elements is dammed up by the flanges and carried to the leeward side of the hood.

The notches in the supporting struts are made slightly wider than those in Figure 8 to accommodate the flanges.

It is possible to save considerable space in shipping the completed hood because all of the parts may be shipped in a knocked down condition, with the various annular elements in nested relationship. The device can be readily assembled by any person when it is to be used.

The scope of the invention is indicated in the appended claims.

I claim:

1. A chimney hood comprising a plurality of frusto-conical annular elements arranged in coaxial spaced relationship, a conical cap located in spaced coaxial relationship with the topmost annular element, and a plurality of relatively thin struts arranged in radial planes within said annular elements, said struts being provided with radially outwardly opening notches in their radially outer edges to receive and support the annular elements, the lower edge of each of said notches being inclined at substantially the same angle as the inclination of said frusto-conical elements and extending a substantial distance beyond the upper edge of the notch to form a supporting surface for one of said annular elements, said struts being inclined upwardly and inwardly toward the center of the hood, said struts having integral tongues at the extremities thereof, said cap and lowermost annular element having openings therein loosely receiving said tongues whereby to hold said parts in assembled relationship.

2. A chimney hood comprising a plurality of frusto-conical annular elements arranged in coaxial spaced relationship, the sides of each of said elements converging in an upward direction, the radially outer periphery of each of said elements being formed to provide an upwardly opening gutter thereon, and means for holding said elements in spaced coaxial relationship.

3. A chimney hood comprising a plurality of frusto-conical annular elements and a substantially imperforate conical cap element for the top of said hood, said elements all being of different diameters, said elements being arranged with the cap element at one axial extremity of the assembly and with the rest of said elements in coaxial spaced relation in order of increasing diameters from the cap element toward the other extremity of the assembly, and a plurality of relatively thin struts arranged in radial planes within said annular elements, said struts having radially outwardly opening notches in their radially outer edges to receive and support the annular elements, the lower edge of each of said notches being inclined at substantially the same angle as the inclination of said frusto-conical elements and extending a substantial distance beyond the upper edge of the notch to form a supporting surface for one of said annular elements, said struts being inclined upwardly and inwardly toward the center of the hood, said struts having means thereon for attachment to the elements at the extremities of the assembly, said last named means on the lower extremities of the struts fitting loosely in openings in the lowermost annular element to permit limited radial movement of the other extremities thereof prior to their attachment to the cap element.



JOHN W. MILLER.


REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 4,487 | Collins | Apr. 25, 1846 |
| 150,711 | Purington | May 11, 1874 |
| 307,653 | Hull | Nov. 4, 1884 |
| 633,780 | Beckwith | Sept. 26, 1899 |
| 1,304,493 | Layne | May 20, 1919 |
| 267,829 | Betts | Nov. 21, 1882 |
| 1,310,470 | Calder | July 22, 1919 |
| 1,785,228 | Schmidt | Dec. 16, 1930 |
| 168,961 | Betts | Oct. 19, 1875 |
| 174,237 | Heard | Feb. 29, 1876 |
| 1,611,934 | Merrill | Dec. 28, 1926 |
| 564,368 | Esperson | July 21, 1896 |
| 2,295,669 | Laws | Sept. 15, 1942 |
| 509,947 | Reynolds | Dec. 5, 1893 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 716,368 | France | Oct. 6, 1931 |
| 228,734 | Germany | Nov. 15, 1910 |
| 732,348 | France | June 14, 1932 |
| 3,756 | France | Feb. 20, 1835 |
| 5,312 | Great Britain | Mar. 28, 1889 |
| 22,697 | Great Britain | Nov. 27, 1895 |
| 221,179 | Germany | Apr. 21, 1910 |
| 38,378 | Austria | Aug. 25, 1909 |
| 12,786 | Great Britain | June 1, 1906 |
| 410,760 | France | Mar. 21, 1910 |
| 128,986 | Germany | Mar. 5, 1902 |