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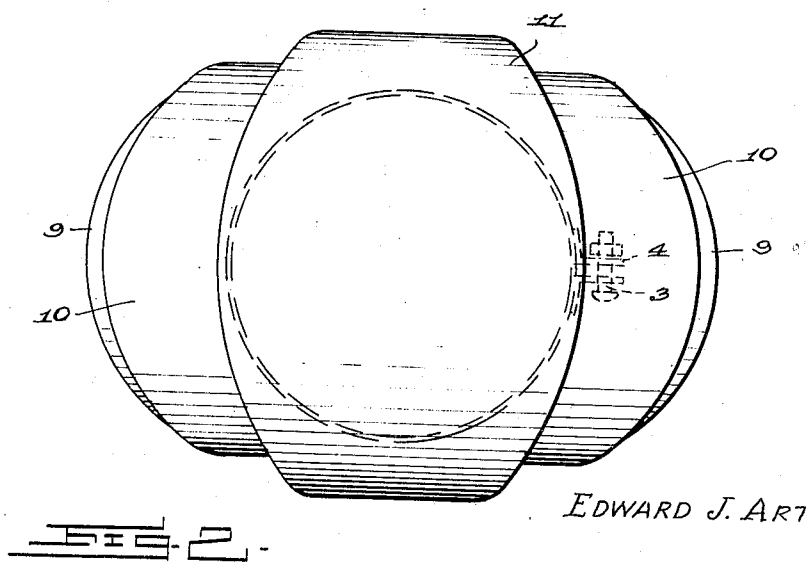
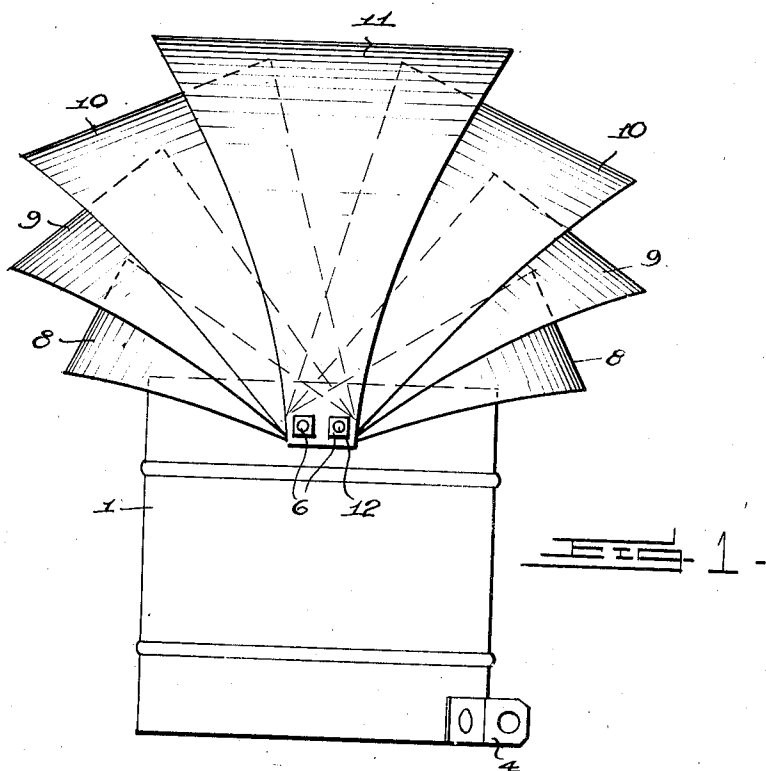
E. J. ARTIS

2,191,948

VACUUM CAP FOR CHIMNEYS

Filed Sept. 29, 1938

2 Sheets-Sheet 1



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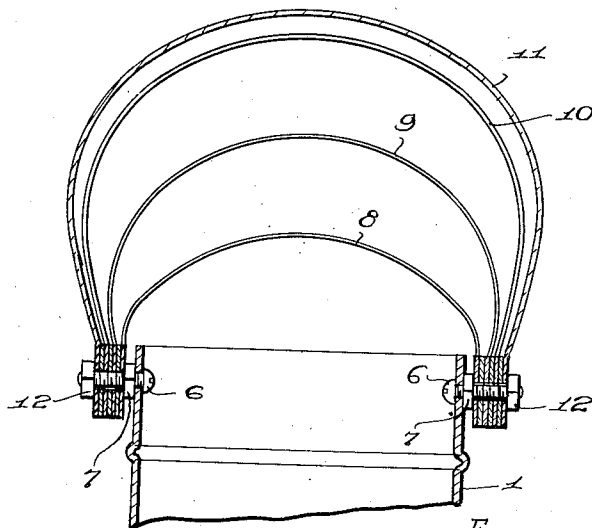
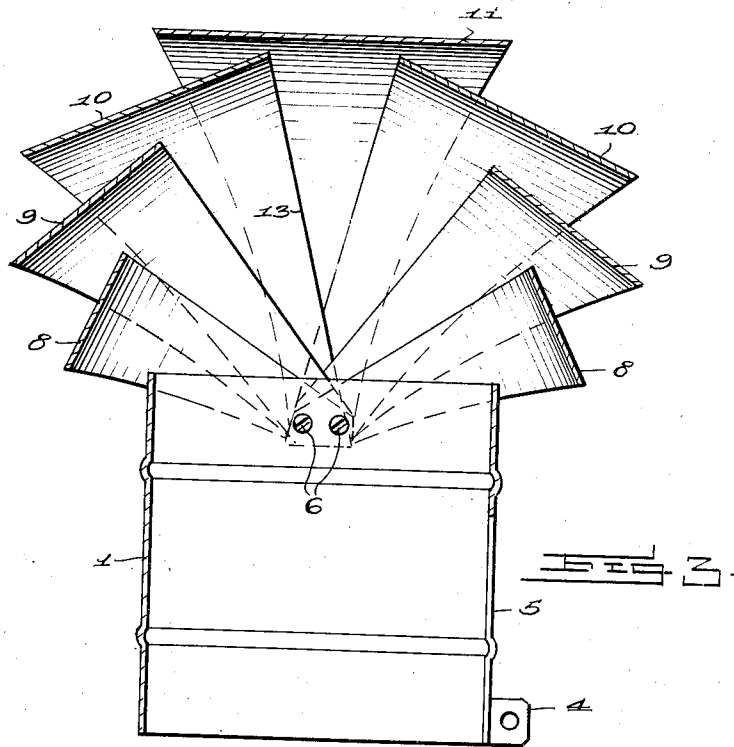
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UNITED STATES PATENT OFFICE

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VACUUM CAP FOR CHIMNEYS

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2 Claims. (Cl. 98-78)

This invention relates to a vacuum cap for chimneys, the general object of the invention being to provide a cap which is so constructed and arranged that it will increase the chimney draft even though there is but a slight atmospheric air movement from any direction and it will prevent back draft and when there is no movement of the atmospheric air the resistance offered by the cap is practically nil. While the device is mainly intended for use with oil or gas heaters it is to be understood that it can be used in other situations where it is desired to provide a vacuum in a chimney or flue by the velocity of the atmospheric air.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is an elevation of the device.

Figure 2 is a top plan view thereof.

Figure 3 is a longitudinal sectional view through the device.

Figure 4 is a fragmentary vertical sectional view through Figure 3.

In these drawings the numeral 1 indicates a cylinder which may be formed from a flat strip of material bent into cylindrical shape and having its end edges overlapping with the edges at the upper portion of the cylinder connected together by a rivet or the like and with the lower portion of said edges adjustably connected together by a bolt 3 passing through perforated ears 4 suitably connected with the lower part of the cylinder one at each side of the split or slot 5 therein. A pair of holes is formed in the upper portion of the cylinder, the holes being slightly spaced apart and a second pair of holes is formed in the cylinder diametrically opposite the first pair and bolts 6 pass through these holes. Each bolt has a nut 7 threaded thereon to hold the bolt in place, this nut acting with the head of the bolt to hold the bolt in the hole.

Two sets of substantially U-shaped members or gores are used with the device, the members of each set being indicated by the numerals 8, 9 and 10 and a large substantially U-shaped member or gore 11 is also used with the device. Each of these members has a pair of holes in each end thereof through which the bolts 6 pass

and they are held on the bolts by the nuts 12, said ends of the members overlapping each other as shown in Figure 4. Each of the members 8, 9 and 10 is formed with an upper or inner straight edge 13 but its lower edge slopes outwardly from its ends to the transverse center of the member and said members 8, 9 and 10 are made of progressively increased lengths so that a space is left between them. As shown one of the members 8 is first put in place on the bolts then the other member 9 is put in place. Then one of the members 9 is put in place and then the opposite member 9. Then a member 10 is put in place and then the opposite member 10 is put in place and finally the member 11 is put in place and the members are held on the bolts by the nuts 12, this member 11 being of greater length than the members 10 so that it is spaced from the inner portions of the two members 10 as shown in Figure 3 with said members 10 extending outwardly beyond the side edges of the member 11, the members 9 extending outwardly beyond the outer side edges of the members 10 and the members 8 extending outwardly beyond the outer side edges of the members 9. As all the members are spaced apart as shown in Figure 3 the atmospheric air can pass between the members and this passage of the air will create a vacuum or suction in the cylinder 1 and the chimney or flue to which the cylinder is connected and thus increase the draft of the chimney or flue. As shown the member 11 tapers from its transverse center toward its end and the side edges of the member 11 will slightly curve as shown and the outer edges of the members 8, 9 and 10 are also curved as shown in Figure 2.

As will be seen the spaces between the members are segments of an oval and the width of member 8 at its center is one-third the diameter of cylinder 1 and, as before stated, the outer edge of the member is cut on a curve as are the other members. This is important because if they were not cut on a curve when the members were assembled the air coming out of the device would have to pass over so much more material that the resistance would be too great. Each member 8 is so set that the space between it and the cylinder 1 is at its widest point equal to one-fifth the diameter of cylinder 1. The other members are set the same distance from the preceding one. This arrangement makes the combined area of the spaces between the members 45 percent greater than the area of the cylinder and this is necessary so that the air in the chimney or flue can pass through the spaces at a

very low velocity when there is no wind movement. In other words, this cuts down resistance. If the spaces between the members were increased then when the air strikes the members too great a percentage would slide or pass through and this would lessen the vacuum power of the cap. The greatest width of member 9 is one-third larger than that of member 8 and the greatest width of member 10 is one-third larger than that of member 9. The reason for the difference in widths is due to the fact that the members must be wider in order to make the cap water-tight and by holding this difference in widths when the members are set in place their inside edges all point in such a manner that the air coming up the stack or chimney is directly deflected out the opposite side. This keeps the air from striking against the top member and encountering resistance which would be the case if only three members were used. The top member 11 has its greatest width as wide as the diameter of the pipe or cylinder 1 and it is so placed that the free area between it and the members 10 is equal to that between the members 8 and 9.

The holes for the bolts are so set that the members are properly positioned when the bolts pass through the holes of the members.

This device is especially useful on chimneys or flues of oil burners, the products of combustion of which are carbon dioxide and water. If carbon dioxide cools extensively in the chimney it becomes heavy and clings to the side of the chimney as it becomes moist at the same time since the water vapor condenses as it cools along with the dioxide. Thus it is impossible to increase the draft of a chimney of an oil burner by increasing the height of the chimney with iron smoke stacks or the like because the iron allows the gas of combustion to cool too quickly. Thus it is important to increase the draft with a small movement of air and by a device which does not have to be placed high above the chimney.

There are on the market many chimney tops or ventilator heads, all using the velocity of the air to create a suction in the chimney but the ones that stop back drafts cut down the draft when there is no wind movement due to their designs. Other designs do not cut down the draft but they do not materially increase the draft with slight movements of air.

This device, however, will increase draft with a slight air movement from any direction; it nullifies any danger of a back draft and when air is absolutely still the resistance through the cap is practically nil and these advantages are secured by the specific construction and arrangement of the gores or members 8, 9, 10 and 11.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts provided

that such changes fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A chimney cap of the class described comprising a tubular body, means for contracting the lower end of the body about a chimney part, two sets of substantially U-shaped members having their ends connected with opposite sides of the upper portion of the body, one set being located to one side of the axis of the body and the other set at the opposite side, and a centrally arranged substantially U-shaped member connected with said opposite sides of the body, each of first-mentioned members tapering from its center to its ends with the inner edge straight and its outer edge curved, and the center member having its edges curving downwardly and inwardly from its transverse center, the spaces between all the members being each of a segment of an oval, the means for connecting all the members to the body including a pair of spaced holes at each of said opposite sides of the upper portion of the body, bolts passing through the holes and through the ends of all the U-shaped members and a pair of nuts on each bolt, said nuts receiving the end parts of the U-shaped members between them.

2. A device of the class described comprising a cylindrical body, having a pair of slightly spaced holes in the top portion of one side thereof and a second pair of holes diametrically opposite the first pair, bolts passing through the holes, two sets of substantially U-shaped members having a pair of holes in each end thereof through which the bolts pass, a centrally arranged substantially U-shaped member having a pair of holes in each end thereof for receiving the bolts, nuts on the bolts for holding the members thereon, the members of the sets gradually increasing in length and the central member being of greater length than the longest members of the set, one set being arranged to one side of the axis of the cylinder and the other set to the opposite side thereof and the spaces between all the members being each of a segment of an oval and each member of each set having a straight inner edge and an outer edge which curves downwardly and inwardly from the transverse center to the ends, the central member having both side edges curving inwardly and downwardly from its transverse center to its ends and each member having a part extending beyond the outer edge of the member next above it, each lower member having its greatest width one-third the diameter of the cylinder and the space between each lower member and the cylinder being at its widest point equal to one-fifth the diameter of the cylinder, the other members of each set having their greatest width one-third larger than the greatest width than the member over which it is placed and the central member having its greatest width substantially equal to the diameter of the cylinder, the combined area of the spaces between all the members being 45 percent greater than the area of the cylinder.

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