M. STIELER.

CHIMNEY MOLD.

APPLICATION FILED JAN. 25, 1912.

1,041,367.

Patented Oct. 15, 1912.

3 SHEETS--SHEET 1.

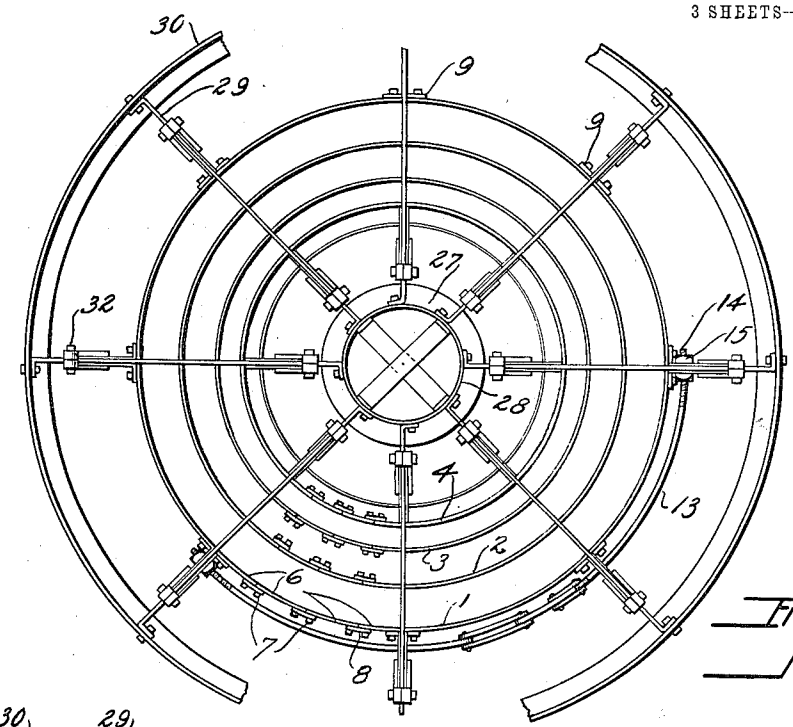

Fig. 2.

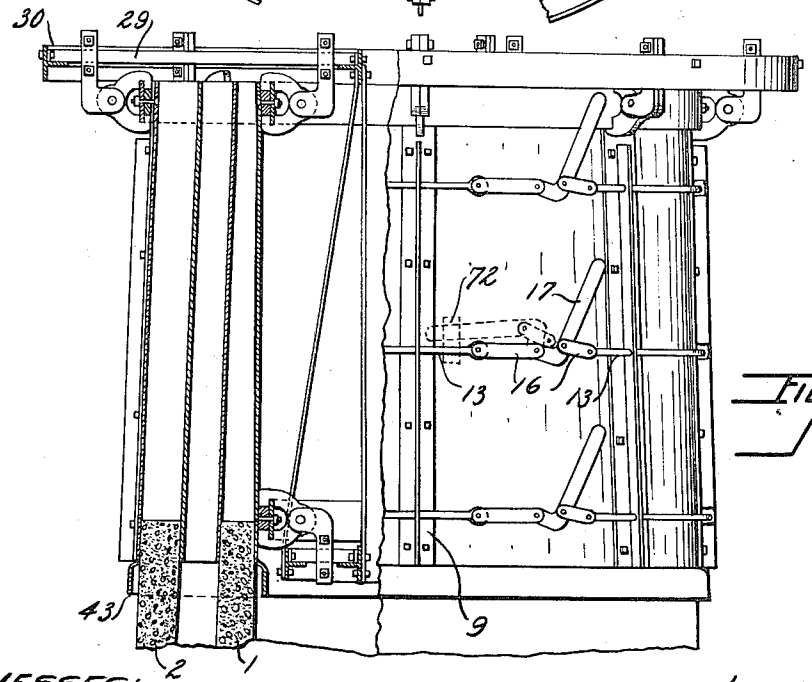

Fig. 1.

WITNESSES:

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Geo. A. Shafer

INVENTOR

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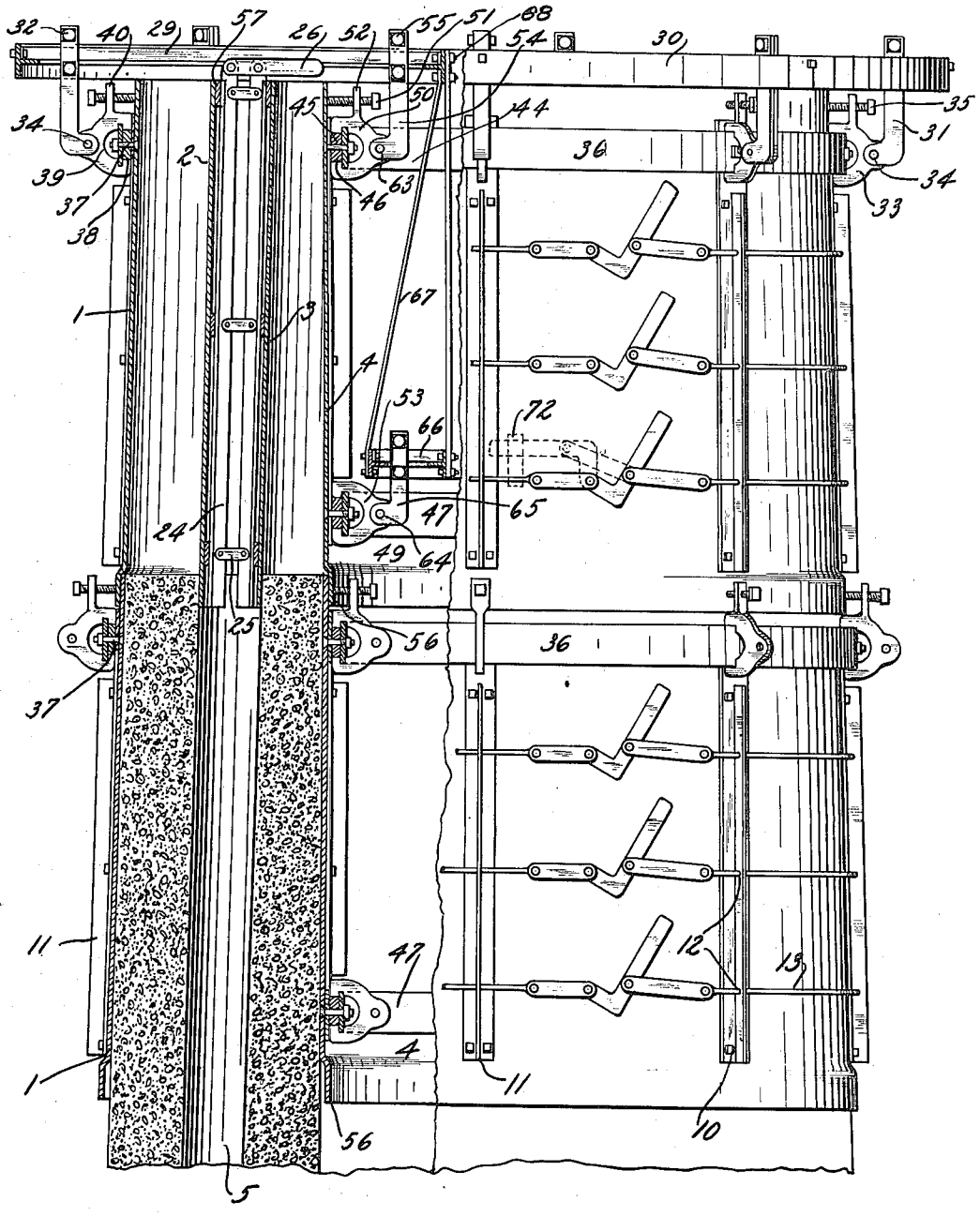

FIG. 3.

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3 SHEETS—SHEET 3.

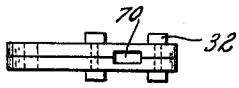

Fig. 8.

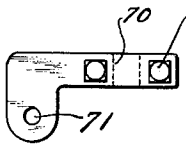

Fig. 7.

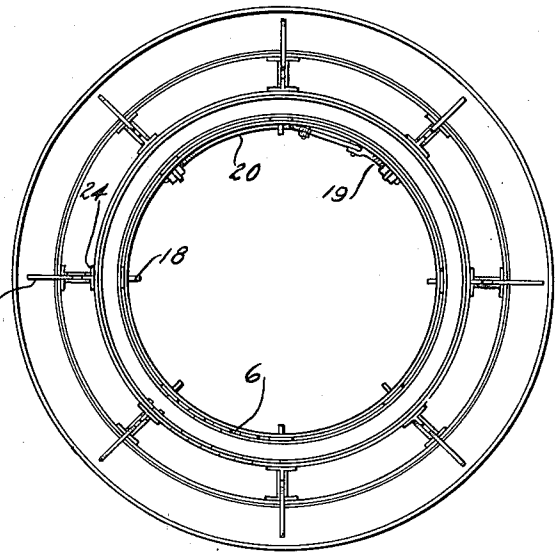

Fig. 5.

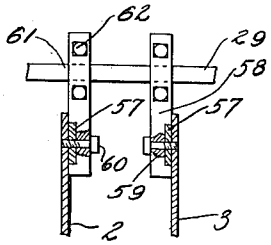

Fig. 12.

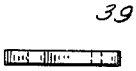

Fig. 11.

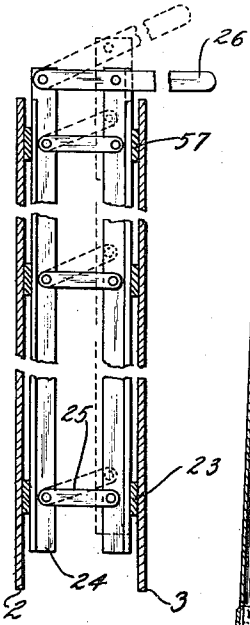

Fig. 6.

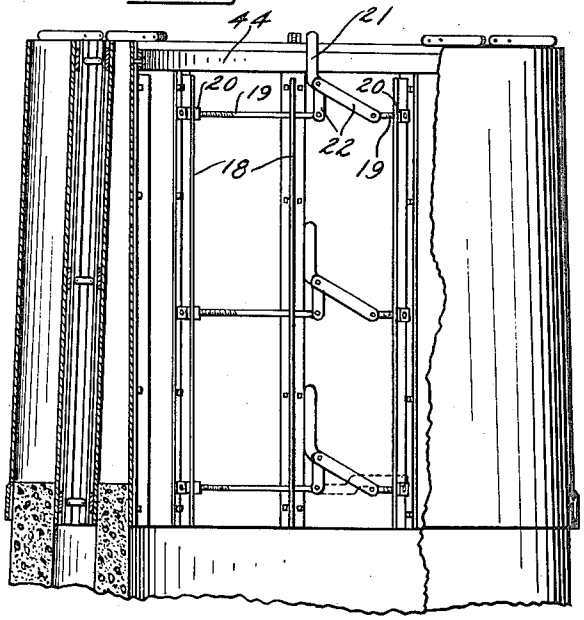

Fig. 4.

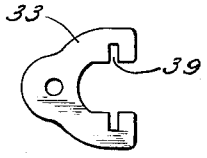

Fig. 10.

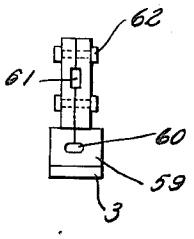

Fig. 9.

WITNESSES:

INVENTOR

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BY Robt. Klotz

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UNITED STATES PATENT OFFICE.

MARTIN STIELER, OF CHICAGO, ILLINOIS.

CHIMNEY-MOLD.

1,041,367. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed January 25, 1912. Serial No. 673,304.

To all whom it may concern:

Be it known that I, MARTIN STIELER, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Chimney-Mold, of which the following is a specification.

This invention has for its object to provide a mold to be used for the purpose of making tapering concrete chimneys.

A chimney of the type which will be constructed by the use of the herein-described invention, will be provided with inner and outer walls separated by an air space, and both the outer and inner walls will taper gradually toward the top. The chimney is adapted to be built in sections or units and the top of each unit will be slightly less in diameter than the bottom. The central flue may or may not taper, though it is preferable, of course, that the flue be tapered as well as the exterior.

In the drawings, Figure 1 is a view of the mold partly in elevation and partly in section; Fig. 2 is a top plan view thereof, showing the spider or framework by which the shell or casings are supported and adjusted; Fig. 3 is a view similar to Fig. 1, showing two molds as the same are used for making two adjoining units or sections of the chimney; Fig. 4 is a view similar to Fig. 1, the outer parts being broken away so as to show the innermost part of the mold; Fig. 5 is a top plan view of the casings, the spider being removed; Fig. 6 is a sectional view of the devices placed between the casings which form the air space; and Figs. 7, 8, 9, 10, 11, and 12 are detail views of sundry features of the invention.

The walls of the chimney are formed by pouring cement or concrete into the spaces between the outer shell or casing 1 and the inner casing 2, thus forming the outer wall of the chimney; and by pouring cement between the outer casing 3 and the inner casing 4 to form the inner wall of the chimney. The air space 5 is the space between the members 2 and 3. The exterior surface of the chimney is that surface which directly comes into contact with the outer form or casing 1, while the inner surface of the flue is the surface which directly engages the form 4. Each of said members 1, 2, 3, and 4, when ready for use, is in the shape of a truncated cone and the four casing members are assembled together so that they have a common axis. Inasmuch as the degree of taper desired in any chimney is usually very slight, the members 1, 2, 3, and 4, strictly speaking, are each conical, but they approach very closely to being cylindrical in shape. The construction of certain features of the casing member 1 will be described somewhat in detail, but it should be understood that each of the other casings 2, 3, and 4, is the same as the outer member 1, so far as concerns the construction described in the next succeeding paragraph hereof.

Said casing 1 is formed of sheet metal of suitable thickness and is of approximately the same height as each section or unit of the chimney to be built. Said casing 1 preferably comprises a single piece of metal which extends uninterruptedly throughout the greater part of the circumference of the chimney to be formed, but since the chimney is to be tapering, it is obvious that any casing 1 must be larger in diameter when it is used to form the bottom section of the chimney than when it is used to form the top section. The casing 1 is provided with a plurality of removable sections 6 which are secured by bolts 7 and straps 8 to the main part of the casing 1 or to each other, and by removing or inserting a section or sections 6, the circumference of the entire member 1 can be altered as desired, within certain limits. Each of said members 6 is slightly wider at the bottom than at the top. The casings 2, 3, and 4, are provided with similar removable sections as clearly shown in Figs. 2 and 5 of the drawings.

At various intervals upon the outer surface of the casing 1, I beams are riveted, which said I beams are disposed vertically of said casing and serve to brace said members 1 and prevent bending or yielding thereof. Said I beams 9 are secured by bolts 10 to the casing 1 and the outwardly projecting flange 11 of each I beam is perforated at 12, through which perforations the clamping rods 13 are adapted to pass. Said rods are screw-threaded at their ends 14, which ends are screwed within nuts 15 secured to the outer surface of the member 1 and preferably to the main body portion thereof; hence, if the right-hand rod 13 be drawn toward the left-hand rod 13 (Fig. 1), the circumference of the outer casing 1 will be decreased and the various members comprising the same pressed tightly together, whereas if the rod 13 be permitted to move

in the reverse direction, the circumference of said casing 1 can be increased and the casing loosened. Each of the rods 13 carries a link 16 pivoted at the end of the rod and the links 16 of each pair are connected together by a lever 17 pivoted to each link 16. When said levers 17 are moved from the position shown in full lines in Figs. 1 and 3 to the position shown in dotted lines in said figures, it is obvious that the rods 13 are drawn together and the casing 1 tightened accordingly, just as driving or drawing a hoop tightens a barrel.

The shell or casing 4 carries I beams 18 which are vertically disposed and fixed upon the inner surface of said casing 4. Said I beams 18 are perforated and rods 19 secured by nuts 20 to said beams 18 pass through the perforations. The rods 18 can be moved by the operation of levers 21 and links 22, and when said levers 21 and links 22 are moved to the position shown by the dotted lines in Fig. 4, the circumference of the casing 4 can be increased, whereas when said levers and links are in the full line position, the parts comprising the casing 4 are tightly bound and clamped together.

Upon the outer surface of casing 3 and upon the inner surface of casing 2, hoop-like bands or braces 23 are provided (see Fig. 6). Sliding beams 24 connected by links 25 and levers 26 are placed in the space between said members 2 and 3 and bear against the hoop-like braces 23 and when these parts are in the position shown in full lines, Fig. 6, the casings 2 and 3 are pushed apart and braced against each other (see Figs. 4 and 5). The apparatus is so constructed that each band 23 upon the casing 2 is opposite to a band 23 upon the casing 3, and the links 25 will be in alinement with the respective bands; and in this way the bracing effect of the links 25 is in a direct horizontal line. When the cement or concrete is being poured to form the chimney, it will, obviously, engage the right-hand surface of the casing 3 and the left-hand surface of the casing 2 (Fig. 6) and tend to force said casings together, but said two casings will be braced apart by the action of the parts 24, 25, and 26 and thus the air space 5 will be left between the casings 2 and 3.

A spider or diaphragm is provided (see Fig. 2) containing a central member 27, preferably circular in shape, which carries an upright flange 28, to which flange 28 rods 29 are fixed, the outer ends of said rods being firmly united together by a circular member 30. Each rod 29 carries hangers 31 which depend downwardly and can be clamped at any desired point by bolts 32. A yoke 33 is pivotally connected by bolt 34 to each hanger 31 and a screw 35 passes through each member 33 and is adapted to bear against the outer surface of casing 1. The outer casing 1, adjacent its upper end, carries a hoop or band 36 which is secured to the said casing 1 by bolts 37, the heads of which are countersunk on the inner surface of the casing. Blocks 38 through which said bolts pass keep the hoop 36 spaced apart from the outer surface of the casing. The yokes 33 are provided with notches or recesses 39 in which said band 36 is received (see Fig. 10) and the screws 35 pass through the lugs 40, which are integral with said members 33. The upper ends of the I beams 9 have the outwardly-extending flanges 11 removed and the blocks 39 rest against the flat surface of the I beams. When the cement is being poured to form the chimney, all of the casings 1, 2, 3 and 4 are suspended from the spider composed of the members 27, 28, 29, and 30. The various hangers 31 which slide back and forth upon arms 29, are fixed so as to cause the yokes 33 to hold the hoop or band 36 in such position that the top of casing 1 forms a true circle. At its bottom the casing 1 is flanged at 43, the flange 43 being adapted to overlap the top of the casing 1 which is forming the section immediately below.

The inner casing 4 is provided near its upper end with a band 44, which is supported upon the inner wall of casing 4 by bolts 45 and blocks 46. At its lower end the casing 4 carries band 47, bolt 48, and blocks 49, the arrangement for supporting the bands 44 and 47 being identical with the arrangement for supporting band 36, except for the fact that band 36 is on the outer wall of the outer casing and bands 44 and 47 are on the inner wall of the inner casing. Yokes 50, each provided with a screw 51 passing through lug 52, grasp band 44, while similar yokes 53 grasp yokes 50 and 47, yokes 50 and 53 being of the same shape and construction as yoke 33 (Fig. 10). The yokes 50 are carried upon hangers 54, which can be clamped by bolts 55 to the arm 29, and, in this manner, the inner casing 4 can be moved toward or away from the center of the chimney. The inner casing 3 bears a flange 56 at its lower end similar to the flange 43 upon casing 1.

The casing members 2 and 3 by which the air space between the inner and outer walls is formed, bear reinforcing bands 57 at their upper ends. Hangers 58, provided with perforations 59, can be secured by bolts 60 to members 2 and 3, and said hangers 58 support said casings from the spider. The recesses 61 will receive rod 29 and the hangers 8 can be clamped thereupon by the bolts 62 which, when tightened, will hold the casings 2 and 3 in any desired position upon the spider, said casings 2 and 3 being kept spaced apart by the construction most specifically shown in Fig. 6 of the drawings.

The yokes 53 which grasp the band 47 are bolted at 64 to hangers 65, which said hangers are slidably mounted upon the cross-arms 66 of the triangular bracing-frames 67 which depend from arm 29, being bolted to said arm by balls 68, the object of this construction being to brace the lower part of casing 4 so that same will not bend inwardly under the weight and pressure of the concrete before the same has set.

As will be evident from the foregoing description of parts, the various casing members 1, 2, 3, and 4 are each adapted to be supported from above by the spider composed of the members 27, 28, 29, and 30, and each of the casing walls 1, 2, 3, and 4 can be moved toward or away from the center of said spider according to the position in which the various supporting means are bolted or clamped. When the first or bottom section of the chimney is to be formed, the casing and spider are assembled together and a plumb-bob dropped from the center of the spider which is then adjusted so that said plumb-bob strikes the center of the chimney to be built. The various casing members 1, 2, 3, and 4 are then placed so that the bottom edge of each rests upon the foundation, describing a circle the circumference of which corresponds with the bottom edges of the two practically concentric walls which are to compose the finished chimney. Cement or concrete is then poured into the spaces between the casing members 1 and 2 and 3 and 4, and the inner and outer walls of the first section of the chimney will be formed in this manner. When the concrete comprising the first section has set, the spider or framework composed of the members 27, 28, 29, and 30, is detached from the casing walls by removing all of the bolts 34, 63, and 64, thus freeing each of the yokes 33, 50, and 53 from their respective hangers, and entirely disconnecting the casings 1 and 4 from the spider. By lifting the levers 26 to the dotted line position (Fig. 6) the casings 2 and 3 are released and can easily be lifted out of the air space, either detached from or still attached to the spider, as may be desired. Casings 1 and 4, however, are allowed to remain in place even after the spider and the casings 2 and 3 have been removed, said casings 1 and 4 remaining clamped in position upon the lower section or unit of the chimney until such time as the second section of the chimney has been poured and has had time to set.

In order to prepare for molding the second section or unit of the chimney, casing members 1 and 4, other than those which were used for forming the first section, are secured to the spider and the casing members 2 and 3 are again fastened to the spider but in a slightly different position from the position in which said members were placed when the first section of the chimney was being formed, the change being necessary in order to secure the desired taper in the air space.

The flange 43 upon that particular casing 1 which forms the second section of the chimney will overlap the upper edge of the casing 1 which formed the first section, which lower casing is left in place while the second section of the chimney is being poured, and the screw 35 is tightened so as to bear against flange 43, and thus produce a thoroughly tight joint at the point where the upper casing 1 and the lower casing 1 come together. Similarly, the flange 56 upon the upper casing 4 overlaps the upper edge of the lower casing 4 and a tight joint is produced between those members by the screw 51. The position of the respective parts, when the mold is arranged after pouring the second section of the chimney after the first section has been completed, is clearly shown in Fig. 3 of the drawings. Cement is now poured into the space between the upper casings 1 and 2, and 3 and 4, *i. e.*, into the space shown to be vacant in said Fig. 3, and thus the second section of the chimney is formed. In order to remove those casings 1 and 4, which must be left in place upon the lower section while the second section is being formed, the screws 51 and 36 are loosened, the levers 17 and 21 are thrown from the position shown in dotted lines in Figs. 1, 3, and 4 to the positions shown in full lines in said figures, and in this manner the casing walls 1 and 4 are loosened so that some of the removable sections 6 can be unbolted and the lower casing walls 1 and 4 removed, or the casing 1 be expanded and the casing 4 be contracted sufficiently to pass over or inside of the casings still left upon the second or upper section of the chimney. A new section or sections 6 of the proper size can then be substituted and the particular members 1 and 4, which were first used for forming the lowest section, can then be set above the particular members 1 and 4 which were used for forming the second section, and those particular members 1 and 4, which formed the first section, can be used for forming the third section. The casings which are used to form the second section are allowed to remain in place while the third section is being formed and then are removed and used to form the fourth section, and so on until the chimney is completed.

Each of the hangers 31, 54, and 65 is constructed as shown in Figs. 7 and 8, *i. e.*, made of two pieces secured together by bolts 32 which clamp the hanger tightly to the arm 29 (or 66) which is secured within perforation 70, the bolts which secure said hangers to their respective yokes being passed through perforation 71. Locking de-

vices 72 are employed to hold the levers 17 in place when the casing is tightened.

Many changes in details of the construction can be made without departing from the scope of the claims.

I claim as my invention:

1. In a device of the character described, the combination of a shell or casing, a band or hoop secured thereto and spaced apart therefrom, means adapted to engage said band, and means adapted to engage said last-mentioned means, thereby to support the casing.

2. In a device of the character described, the combination of a casing, a hoop-like member secured thereto and spaced apart therefrom, a yoke engaging said hoop-like member and adapted to grasp the same, and means adapted to engage said yoke, thereby to support the casing.

3. In a device of the character described, the combination of a casing and band secured thereto and spaced apart therefrom, a yoke engaging and clamping said band, a spider from which the casing can be suspended, and means connecting said yoke to said spider.

4. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, a yoke engaging said band, a spider adapted to support the casing, a hanger supported by said spider, and bolts connecting said hanger to said yoke.

5. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, yokes which grasp the said band, a plurality of hangers, bolts securing said hangers to said yokes, a spider, and means connecting said hangers to said spider.

6. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, yokes which grasp the said band, a plurality of hangers, bolts securing said hangers to said yokes, a spider provided with radial arms, and means slidably mounted upon said arms, said means being connected to said hangers.

7. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, yokes which grasp the said band, a plurality of hangers, bolts securing said hangers to said yokes, a spider provided with radial arms, and means securing said hangers dependingly upon said arms.

8. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, yokes which grasp the said band, a plurality of hangers, bolts securing said hangers to said yokes, a spider comprising a central member and an outer member, and radial arms intermediate said central member, said hangers being slidably mounted upon said arms.

9. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, yokes which grasp the said band, a plurality of hangers, bolts securing said hangers to said yokes, a spider comprising a central member and an outer member, and radial arms intermediate said central member, said hangers being slidably mounted upon said arms, bolts being provided to clamp said hangers upon said arms.

10. In a device of the character described, the combination of a casing, a band secured thereto and spaced apart therefrom, a yoke which grasps said band, and a screw which projects from said yoke toward said casing.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

MARTIN STIELER.

Witnesses:

JOSEPH SCHLENKER,

ROBT. KLOTZ.