

W. M. YEOMANS.
SECTIONAL MOLD.
APPLICATION FILED JAN. 21, 1918.

1,307,470.

Patented June 24, 1919.
4 SHEETS—SHEET 1.

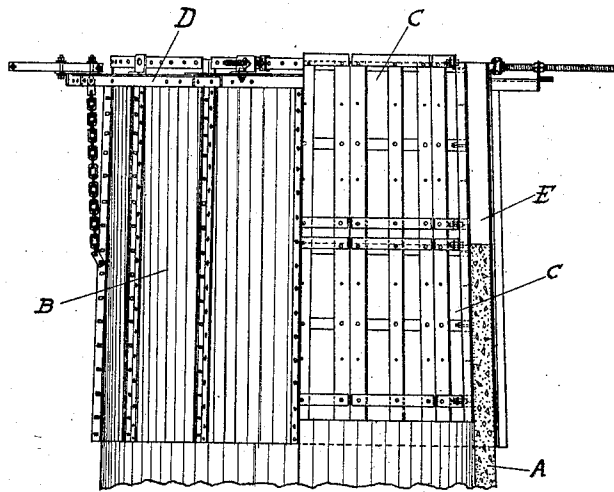


FIG-1.

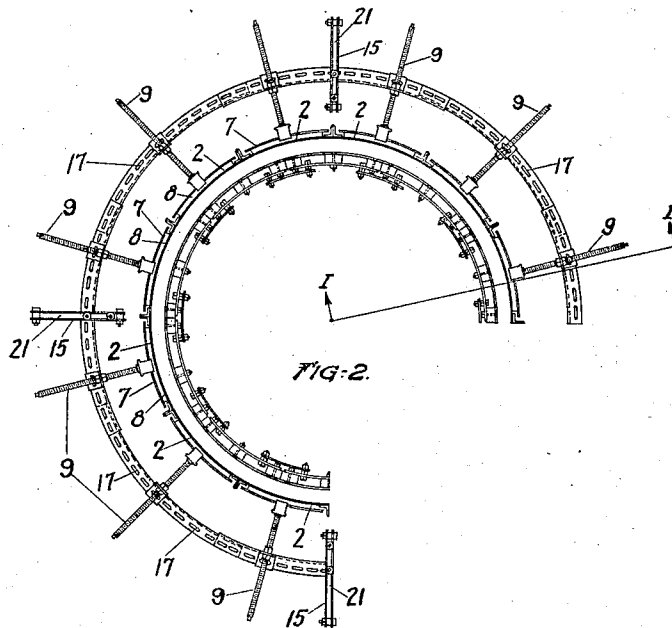


FIG-2.

WITNESSES

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4 SHEETS—SHEET 2.

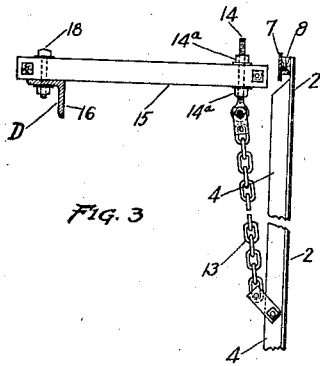


FIG. 3

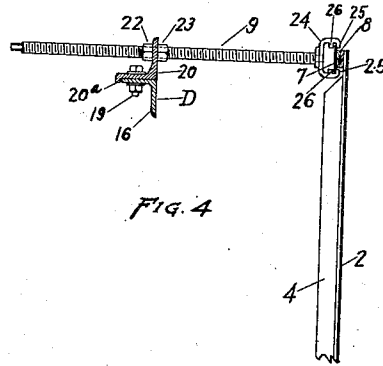


FIG. 4

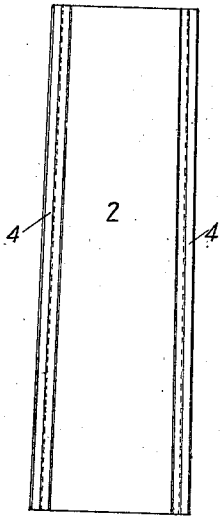


FIG. 5

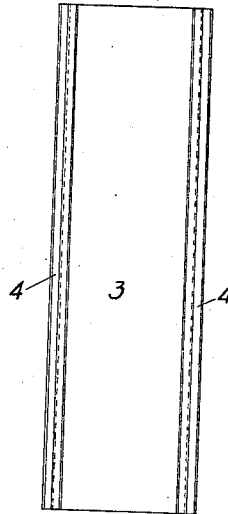


FIG. 6

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4 SHEETS—SHEET 3.

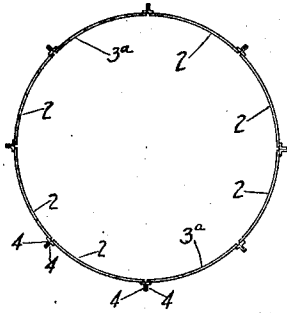


FIG. 7

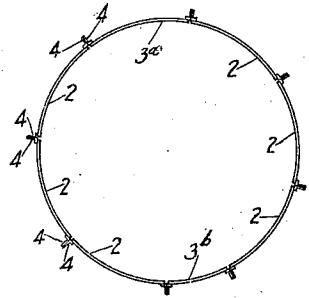


FIG. 8

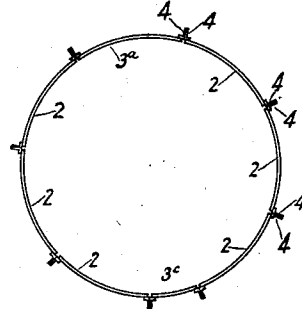


FIG. 9

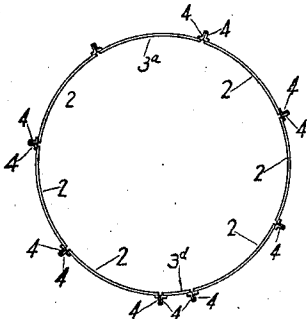


FIG. 10

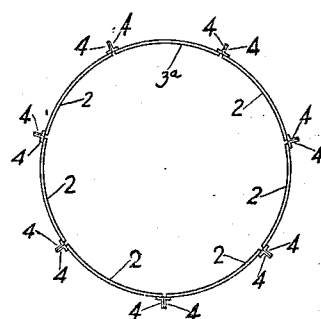


FIG. 11

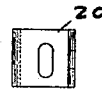


FIG. 19

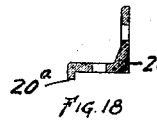


FIG. 18

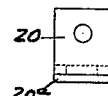


FIG. 20

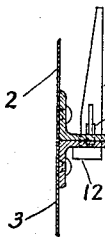


FIG. 17

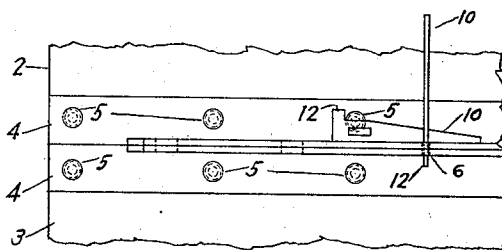


FIG. 15

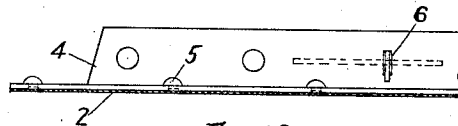


FIG. 16

WITNESSES

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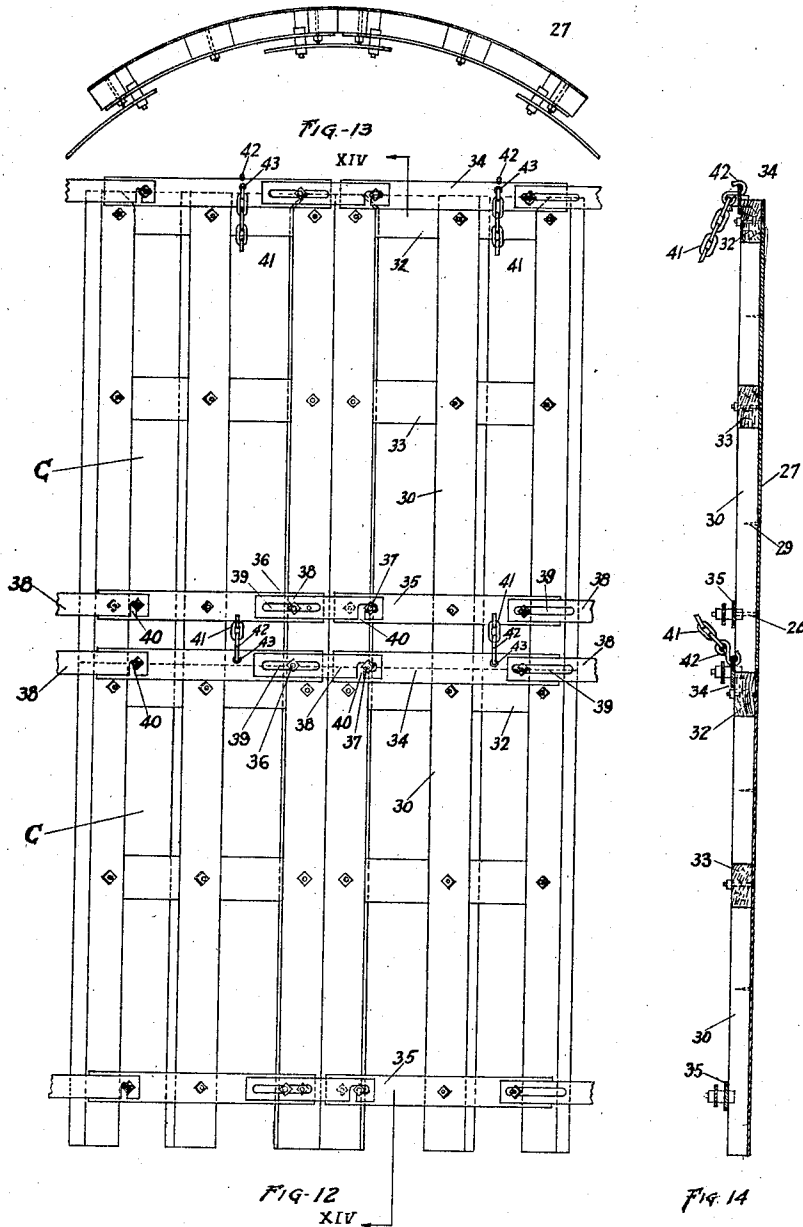
INVENTOR

Wm. Melvin Yeomans

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4 SHEETS—SHEET 4.



WITNESSES

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R. Little

INVENTOR

Walter Melvin Yeomans

UNITED STATES PATENT OFFICE.

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SECTIONAL MOLD.

1,307,470.

Specification of Letters Patent.

Patented June 24, 1919.

Application filed January 21, 1918. Serial No. 212,927.

To all whom it may concern:

Be it known that I, WARNER MELVIN YEOMANS, a citizen of the United States, and resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Sectional Molds, of which the following is a specification.

My invention relates to the class of molds used in building tapering concrete chimneys and similar monolithic concrete structures of annular or circular cross-section.

One object of my invention is to provide a novel mold of circular cross-section having tapering sides and having improved means whereby the diameter of the mold is lessened or increased without change in the cross-sectional outline of the mold or variation in the taper of its sides.

Another object of this invention is to provide a tapering sectional mold having a novel combination and arrangement of mold sections whereby the mold is made applicable for use in building the successively formed sections of a tapering concrete chimney or similar structure.

A further object of the invention is to provide a sectional and flexible or pliant mold having novel means whereby the mold sections are adjusted and held in adjusted position in building a circular concrete structure.

A further object of the invention is to provide a sectional mold having novel means whereby the mold sections are detachably fastened in assembled position.

A further object of my invention is to provide improved means whereby the sectional outer mold is suspended in supporting the assembled mold in operative position.

A further object of the invention is the provision of improved means for connecting the top and bottom sections of the inner mold, when assembled in operative position.

A still further object of my invention is the provision of a tapering sectional mold having the novel constructions, combinations and arrangement of parts shown in the drawings, to be described in detail hereinafter and to be particularly pointed out in the appended claims.

Referring now to the drawings, forming part of this specification, Figure 1 is an ele-

vation partly in section, the section being taken on the line I—I of Fig. 2, showing a tapering sectional mold embodying the novel features of my invention.

Fig. 2 is a plan, partly broken away, of the mold construction shown in Fig. 1.

Fig. 3 is a sectional elevation showing details in the construction and arrangement of the means employed in suspending the mold sections in assembling the mold in operative position.

Fig. 4 is a sectional elevation showing details in the construction and arrangement of the means employed in adjusting the mold sections in alining the mold with the axis of the chimney or other structure being built.

Fig. 5 is a plan showing details in the construction of the tapered mold sections forming part of my improved mold.

Fig. 6 is a plan showing details in the construction of the parallel sided mold sections forming part of my improved mold.

Fig. 7 is a diagrammatic plan showing one combination of mold sections used in the application of my improved mold.

Fig. 8 is a plan similar to that of Fig. 7 showing the combination of mold sections next used after that of Fig. 7.

Fig. 9 is a plan similar to that of Figs. 7 and 8 showing the combination of mold sections next used after that of Fig. 8.

Fig. 10 is a plan similar to that of Fig. 9 showing the combination of mold sections next used after that of Fig. 9.

Fig. 11 is a plan like that of Fig. 10 showing the combination of mold sections used after that of Fig. 10.

Fig. 12 is a plan showing details in the construction of a preferred form of sectional core used in conjunction with my improved tapering sectional mold in building concrete chimneys.

Fig. 13 is an end elevation of the core shown in Fig. 12.

Fig. 14 is a sectional side elevation on the line XIV—XIV of Fig. 12.

Fig. 15 is a fragmentary plan showing details in the construction of the splice joints by which the mold sections are fastened together.

Fig. 16 is a sectional end elevation of the splice joint of Fig. 15.

Fig. 17 is a sectional side elevation of the joint of Figs. 15 and 16.

Fig. 18 is a sectional side elevation of the improved angle clips forming part of the mold adjusting mechanism.

Fig. 19 is a plan of the angle clip of Fig. 18.

Fig. 20 is an end elevation of the angle clip of Figs. 18 and 19.

In the accompanying drawings, the letter A designates the completed portion of a circular, lengthwise tapering concrete chimney or similar annular structure, and assembled above or on top of the completed portion of the chimney A is a flexible or pliant, sectional tapering metal mold B and a segmental, annular core C, the mold and core being constructed and arranged in accordance with my invention and in readiness for pouring the concrete used in molding the next formed portion of the chimney A. The sectional mold B, when in use, is suspended from an annular adjusting ring D, which is made in sections, and when in operative position, the ring D is adjustably suspended or hung by suitable tackle such as a block and fall from a scaffold or arms on the upper end of the scaffold.

The scaffold, which may be of any of the several old and well known constructions and which is not shown, will be built on the inside of the chimney A and will extend through the annular core C to a point somewhat above the completed portion of the chimney, the scaffold being lengthened from time to time in keeping its upper end above the finished part of the chimney A and mold B so as to enable the mold B to be lifted and reassembled above the upper end of the formed part of the chimney.

The mold B, which, when assembled in position, in the frustum of a cone, as is shown in Fig. 1, is formed of a series of sections 2 and sections 3, which are made of thin rolled metal plates. The mold sections 2, which are duplicates, taper lengthwise and have a "double taper", *i. e.*, the longitudinal edges defining the width of the sections 2 taper oppositely in respect to a medial line. The sections 3 of the mold do not taper lengthwise, the longitudinal edges defining the width of these mold sections being parallel. The straight or parallel sided mold sections 3 are made of varying widths, one of these sections or a combination of these sections being used with a series of the tapering sections 2 to vary the diameters of the mold without changing its taper in constructing the molds in accordance with my invention.

In determining the dimensions of the mold sections forming the mold B, the mold being adjustable to varying diameters or cross-sectional dimensions, the length and top and bottom diameters of the tapering chimneys or other structures to be built will be known and taken into consideration. The

length and width of the mold sections will be governed by the size of the chimneys and by the greatest length or weight in a mold section that can be easily and quickly handled with the equipment at hand, in shifting the parts when assembling the mold.

The mold sections 2 and 3 are made of thin, rolled metal plates, each plate being permanently bent or curved transversely to the approximate contour of the assembled frusto-conical mold. The metal plates being elastic, the individual sections can be sprung, or flexed, sufficiently to vary the radii of the transversely curved sections to the slight extent necessary to make the flexible or pliable mold B substantially circular without imparting a permanent set to the thin plates 2 and 3.

The difference between the diameter at the top and that at the bottom of the frusto-conical mold B, or what is the same thing, the taper of the mold is determined by the amount of taper in the series of mold sections 2; and the change in the diameter of the mold, necessary in making the successively formed portions of a tapering concrete chimney, is determined by the relative width of the series of parallel sided mold sections 3^a, 3^b, 3^c and 3^d.

One leg of a rolled steel angle 4 is fastened to each longitudinal edge of the mold sections 2 and 3 by rivets 5, the rivet heads on the inside of the mold sections preferably being countersunk. The outstanding legs of the angles 4 have a series of openings, or holes, 6 therein which, preferably, are rectangular in outline, as shown, the holes 6 in the abutting legs of the angles 4 being in register when the mold sections are assembled in mold-forming position.

A metal bar 7 of rectangular cross-section and a block or series of blocks of wood 8, shaped to the desired curvature and of less width than the metal bar 7, are fastened by bolts or other suitable manner to the upper end of each section 2 and 3 of the mold to provide means for adjustably securing the mold sections to the radial adjusting screws 9 on the adjusting ring D.

Tapering keys 10 are provided for insertion in the registering holes 6 of the angles 4 in fastening the mold sections in assembled position and the keys 10 have a transverse opening, or hole 11, therein in which the tapering end of a similar key 10 is driven to wedge the abutting faces of the angles 4 into close engagement. The keys 10 have a head 12 on one end which engages with one of the angles 4 when in use. (See Figs. 15, 16 and 17).

One end of a chain or other flexible connection 13 is secured to each section 2 and 3 of the mold B at an intermediate point in the length of the mold sections, and the other end of each chain 13 has an eye-bolt

14 thereon by which the mold sections 2 and 3 are suspended from the radial arms 15 on the adjusting ring D and are adjusted vertically relative to the ring D. Nuts 14^a, 14^b serve to lock the eye-bolts in adjusted position on the ring D.

The ring D is formed of a series of sections of heavy rolled steel angles 16 which are curved to the necessary radius to form segments of a circle and the ends of the segments 16 overlap in constructing the ring D, the overlapping ends being bolted together. (See Fig. 2.) The amount the ends of the segments are overlapped differs from time to time to vary the size or diameter of the ring D. The horizontal leg of the angles or segments 16, forming the ring D, is provided with a series of elongated holes 17 to receive the bolts 18 and 19 used in rigidly fastening the lengthwise radial arms 15 and the angle clips 20 for the adjusting screws 9, on the adjusting ring D.

The radial arms 15 are slotted, and the bolts 18 extend through the holes 17 and the slot 21 in adjustably securing the arms on the ring D. The eye-bolts 14 on the chains 13 also extend through the slots 21 in the arms 15.

The horizontal leg of the angle clips 20 is provided with a lip or projection 20^a, which engages with the outer edge of the horizontal leg of the angles 16, forming the segments of the adjusting ring D to prevent swiveling of the clips on the adjusting ring. (See Fig. 4 and Figs. 18, 19, and 20.) The vertically extending leg of each clip 20 has a hole therein through which the adjusting screws 9 extend loosely, nuts 22 and 23 on the adjusting screws 9 engaging with the opposite faces of the vertical leg of the angle clips to lock the screws in adjusted position. (See Fig. 4.)

Each of the adjusting screws 9 is provided on one end with a fork 24, having lips or projections 25 and 26 on the tines of the fork by which the adjusting screws are attached to the bars 7 on the upper end of the mold sections 2 and 3. (See Figs. 2 and 4.)

The hollow core C, used in conjunction with the mold B in molding concrete chimneys and similar structures of annular cross-section, is made in radially divided segments, the segments being duplicates. Each segment comprises a thin rolled metal plate 27, which is fastened by bolts 28 and wood screws 29 to the outer surface of a wooden frame and the frame is made of vertical members 30 and 31 and curved transverse members 32, 33, the members of the frame being mortised to form a rigid structure. Flat metal bars 34 and 35 on the inside of each core segment connect the inner surfaces of the vertical members 30, 31, and the bar 34 on the upper end of each segment pro-

jects above the upper end of the transverse member 32 of the frame to form a guide by which the uppermost section of the core is centered on the other section. Rigidly secured on the bars 34 and 35, adjacent to the ends thereof, are bolts 36 and 37, and adjustably fastened on each of the bolts 36 is a latch-bar 38, these latch-bars having an elongated hole or slot 39, through which the bolts 36 extend and having a second slot 40 by which the bars 38 are latched on the bolts 37 in fastening the core segments together in adjusted position.

The length of each transversely divided part or section of the core C is slightly less than one-half the height of the frusto-conical mold B, as will be seen in Fig. 1, which shows the mold B and the two transversely divided sections of the core C in assembled position at the top of the formed part of a tapering chimney A.

A flexible connection such as a chain 41 having a hook 42 on each end is employed to detachably fasten each lower segment of the core C to the segment immediately above it, (see Fig. 14) holes 43 of a suitable size being provided in the bars 34 on the core segments to receive the detachable hooks 42. The chains 41, in addition to providing a safety support which prevents the lower series of core segments from falling when these lowermost segments are loosened preparatory to being lifted and assembled on top of the other core section, form a convenient means for attachment of the hoisting mechanism used in lifting the core segments.

In building chimneys with my improved apparatus, a suitable foundation or base will be provided. A section of the segmental core C will then be assembled on the chimney base in axial alinement with the vertical center of the chimney.

A scaffold which will extend for some distance above the upper end of the mold B will be erected within the annular core C, and the annular adjusting ring D will be suspended or hung from the upper end of the scaffold so as to be vertically adjustable by means of blocks and falls.

The sectional mold B will then be assembled around the erected section of the core C in axial alinement therewith so as to form an annular space between the opposite surfaces of the mold B and core C. In assembling the mold in this position, to form the first molded portion of the stack, a series of six of the taper mold sections 2 and two of the "full plates" or straight sections 3^a will be used, (as is shown in Fig. 7) this arrangement forming a taper mold of the diameter required to form the bottom section of the chimney.

The chains, or other flexible connections 13, on the mold sections 2 and 3 are then se-

cured to the inner ends of the converging arms 15 by means of the eye-bolts 14, the arms 15 first being adjustably fastened on the annular adjusting ring D. The adjusting screws 9, on the ring D, after being secured to the upper end of the mold sections 2 and 3, will be adjusted lengthwise to move the upper end of the mold into alinement with the vertical axis of the chimney and maintain the mold in adjusted position.

A quantity of plastic concrete will then be poured into the annular space between the assembled mold B and core C so as to fill this annular space and form the first molded section of the chimney. In pouring this concrete, the container will be lowered within the mold B until it is in a tipping position in proximity to the upper end of the core C so as to lessen the distance through which the concrete falls in the pouring operation.

The second section of the segmental core C is then positioned on top of the other or first assembled section, being automatically centered thereon by engagement with the guide-bars 34 projecting above the upper end of the lowermost core section. The chains 41 will then be applied to connect each segment in the lower section to the segment above it in the upper section of the core C. The annular space between the mold B and upper section of the core C is then filled with plastic concrete. The molded part of the chimney is then allowed to dry sufficiently to become set before disturbing the mold and core.

After the molded concrete has become set, the lower one of the two core sections C is taken apart, and is reassembled on top of the other section of the core, this other and now lowermost section being supported with in the chimney by frictional engagement with the inner surface of the chimney, and the chains 41 being used preferably in lifting the core segments in reassembling the core section.

The keys 7, used in detachably fastening the sections of the mold B in assembled position, will be removed to release one of the "full plates" or sections 3^a of the mold. The mold is then lifted by hoisting the adjusting ring D on the scaffold until its lower end overlaps the upper end of the molded part of the chimney to but a small extent. The released mold section 3^a is then replaced by a "three-quarter plate" or section 3^b and the wedging keys 7 are put into position to fasten the section 3^b to the other sections of the mold. This arrangement of mold sections employs six of the sections 2, one section 3^a and one section 3^b, arranged as shown in Fig. 8.

The diameter of the large, or lower, end of the mold B, when assembled as shown in Fig. 8, is substantially the same as the diameter of the upper, or small, end of the

mold when assembled as shown in Fig. 7. The mold B being flexible or pliable, its lower end is caused to assume the outline, or circular cross-section of the upper end of the formed part of the chimney, with which it is in overlapping engagement. The adjusting screws 9 are then manipulated to adjust the upper end of the again assembled mold and aline it with the axis of the chimney.

More concrete is then poured into the mold, the container being lowered within the mold into proximity to the upper end of the core in emptying the concrete into the mold, in the manner heretofore described.

After the added concrete has become set, the lowermost section of the core is placed in centered position on top of the other section. When this lower section is loosened it will no longer be held or supported in place by frictional engagement with the inside surface of the formed part of the chimney. The safety chains 41, however, will support each segment from the assembled section of the core and in this way prevent any of the segments falling and causing injury or other damage. When both sections of the core are again assembled, the chains 41 will be again connected to the core to fasten each segment of the lower section to a segment of the upper section of the core. The mold B, core C and adjusting ring D will then be positioned in relation to the molded part of the chimney A as is shown in Fig. 1.

The annular space E is then filled with concrete and after the concrete becomes set, the lowermost section of the core C is put on top of the other section, the core being held in place by frictional engagement of the lower section with the surface of the concrete chimney.

The section 3^b is then disconnected from the other sections of the mold B by removing the keys 7. The adjusting ring D is then hoisted on the scaffold to lift the mold B until its lower end is overlapping the upper end of the completed part of the chimney by an amount about equal to the difference in the length of the mold from the combined length of the two sections of the core C. (See Fig. 1.)

The "three-quarter plate", or section 3^b, of the mold is then replaced by a "one-half plate", or section 3^c, and the mold sections are then secured in assembled position by means of the wedging keys 7. The mold will now have the combination of six "taper plates" or sections 2, one "full plate" or section 3^a, and one "half plate" or section 3^c, or the combination of mold sections shown in Fig. 9. The upper end of the mold B is then moved into axial alinement with the center of the chimney by means of the adjusting screws 9 on the adjusting ring D.

Concrete is then poured into the annular

space between the upper section of the core C in opposite surface of the mold B, after which the bottom section of the core is moved to its centered position on top of the other core section in the same way as has been described. Sufficient concrete is then put into the annular space between the mold and core in the same manner as has been hereinbefore described.

The mold B is again lifted by hoisting the adjusting ring D on the scaffold until the lower end of the mold is in overlapping position with respect to the upper end of the concrete chimney, the "half plate" or section 3^c being loosened by the removal of the keys 7, to release the mold from the chimney preparatory to lifting the mold. The "half plate" or section 3^c is replaced by a "one-quarter plate" or section 3^d in removing the mold into its new position, in which the mold will have the combination of six "taper plates" or mold sections 2, one "full plate" or section 3^a and one "one-quarter plate" or section 3^d, as shown in Fig. 10.

After the upper end of the reassembled mold B is centered by means of the adjusting screws 9, concrete will be put into the mold up to the level of the top of the uppermost core section, and after this concrete becomes set, the lowermost core section is put on top of the other and centered thereon, after which the mold is filled with concrete to the level of its upper end in the same manner as has been described.

The lowermost core section is then shifted to the top of the other section and the keys 7, fastening the "quarter plate" 3^d are removed, after which the mold is lifted to bring its lower end into overlapping engagement with the upper end of the chimney. The "quarter plate" 3^d will be removed and the mold sections will be connected together in assembled position by means of the keys 7. As reassembled, the mold will have the combination of six "taper plates" or sections 2 and one "full plate" or section 3^a shown in Fig. 11.

It will be understood that the scaffold will be lengthened as often as is necessary in order to maintain its upper end at such working distance above the adjusting ring D as is necessary to handle the mold and core in shifting the position thereof and is necessary to pour the concrete.

After the mold as now positioned, is filled with concrete, to the top of the uppermost section of the core, in the same manner as heretofore described, the lower core section is put on top of the other section, enough concrete is placed in the mold to fill it, and after the concrete has become set, the lowermost section of the core is put on top of the other section and the mold B is again lifted so as to extend above the completed portion of the chimney with its lower end in over-

lapping engagement with the upper end of the chimney.

In lifting the mold B into this new position, the "full plate" 3^a will be loosened by removing the keys fastening it to the adjoining mold sections and will be replaced by a "three-quarter plate" 3^b to further reduce the diameter of the mold without changing its taper. In making further additions to the height of the chimney, the "three-quarter plate" 3^b will be replaced by a "one-half plate" 3^c and the "half plate" 3^c by a "quarter plate" 3^d in the same manner as has been described, the sections of the core C also being shifted in the manner heretofore described, as will be readily understood.

The advantages of my invention will be apparent to those skilled in the art. By using a mold and core embodying the novel features of my invention, the successively formed portions of the concrete chimneys are built with a minimum amount of labor in handling the mold and core. The safety chains used in connection with the core afford convenient means for lifting the core segments and prevent accidental dropping of one or more core segments when transferring a core section from one position to a higher position.

A sectional mold made in accordance with my invention is adapted for use in building chimneys of varying diameters and height, so long as the taper or "batter" of the chimneys remains constant.

The apparatus is simple and is easily constructed and assembled in operative position.

Modifications in the construction and arrangement of the apparatus forming this invention may be made without departing from the invention as defined in the appended claims.

I claim:—

1. A sectional, frusto-conical mold comprising a series of transversely curved, flexible sections having lengthwise tapering sides adapted to fix and maintain the taper of the mold, and a series of transversely curved, flexible sections having lengthwise parallel sides, the parallel sided sections being of varying widths adapted to change the mold to predetermined diameters without change in the taper thereof by substitution of one section for another, fastening means for holding the abutting edges of the mold sections in mold forming position and adjusting means for flexing the assembled mold sections to correct the curvature of the mold.

2. A sectional, frusto-conical mold comprising a series of flexible sections having lengthwise tapering sides adapted to fix and maintain the taper of the mold, and a series of flexible sections having lengthwise parallel sides, the parallel sided sections being of varying widths adapted to change the mold to predetermined diameters without change

in the taper thereof by substitution of one section for another, and means for fastening the mold sections in mold forming position.

3. A sectional, frusto-conical mold comprising a series of sections having lengthwise tapering sides adapted to fix and maintain the taper of the mold, and a series of sections having lengthwise parallel sides, the sections having parallel sides being of varying widths adapted to change the mold to predetermined diameters without change in the taper thereof by the substitution of one section for another, and means for connecting the abutting edges of the mold sections.

4. In a concrete chimney mold, the combination of a sectional frusto-conical outer mold form and a pair of duplicate, segmental, annular cores, said cores having a length substantially half of that of said outer mold form and said cores being adapted to alternately engage frictionally with the inner surface of the completed portion of a chimney to support the other core in operative position above said formed portion of said chimney, and means for detachably securing the core segments in assembled position.

5. In a concrete chimney mold, the combination of a sectional frusto-conical outer mold form and a pair of segmental, annular cores, said cores having a length substantially half of that of said outer mold forms and said cores being adapted to alternately engage frictionally with the inner surface of the completed portion of a chimney to support the other core in operative position above the formed portion of said chimney, and means on one end of the cores for centering the uppermost core on the other.

6. In a concrete chimney mold, the combination with a flexible, sectional mold and means for fastening the abutting edges of adjacent mold sections in securing the mold in assembled position, of an annular adjusting ring, means for suspending the mold sections from said ring, and a series of radial adjusting screws rigidly mounted on said ring and pivotally connected to the upper end of the sectional mold, said adjusting screws being adapted to flex the mold sections in fixing the curvature of the assembled mold.

7. In a concrete chimney mold, the combination with a sectional mold, said mold being formed of transversely curved flexible sections, and means for fastening the abutting edges of adjacent mold sections in securing the mold in assembled position, of an annular adjusting ring, means for suspending the mold sections from said ring, and radial adjusting screws adjustably

mounted on said ring and rigidly fastened in adjusted position thereon, said adjusting screws being pivotally fastened to the upper end of said mold sections and being adapted to flex the mold sections in adjusting the mold to the desired curvature.

8. In a concrete chimney mold, the combination with a sectional mold and means for fastening the adjacent edges of abutting mold sections in securing the mold in assembled position, of an annular adjusting ring, means for suspending the mold sections from said ring, said means being adjustably secured to the ring, and a series of radial adjusting screws rigidly mounted on said ring and pivotally connected to the upper end of said mold sections said adjusting screws being adapted to flex the mold sections in adjusting the assembled mold to the desired curvature.

9. In a concrete chimney mold, the combination with a sectional mold and means for fastening the mold sections in assembled position, of an annular adjusting ring, means for suspending the mold sections from said ring, said means being secured to the mold sections at an intermediate point in the length of said sections, and a series of radial adjusting screws rigidly mounted on said ring and pivotally connected to the upper end of said mold sections.

10. In a concrete chimney mold, the combination of a sectional frusto-conical outer mold form and segmental, annular cores, said cores having a length substantially half of that of said outer mold form and being adapted to alternately engage frictionally with the inner surface of the completed portion of a chimney to support the cores in operative position, means for detachably securing the core segments in assembled position and flexible means for detachably connecting the segments in one section to the segments in the other section of said core.

11. In a concrete chimney mold, the combination of a sectional frusto-conical outer mold form and segmental, annular cores, said cores having a length substantially half of that of said outer mold form and being adapted to alternately engage frictionally with the inner surface of the completed portion of a chimney to support the cores in operative position, means for detachably securing the core segments in assembled position, and flexible means for connecting each segment of the lower core section to the superposed segment of the upper section of said core.

In testimony whereof I have hereunto set my hand.

WARNER MELVIN YEOMANS.