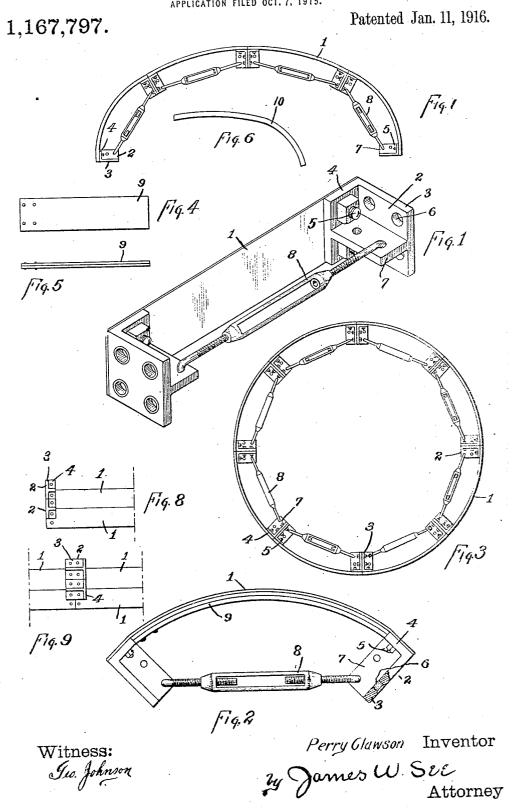
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MOLD FORM.
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UNITED STATES PATENT OFFICE.

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MOLD-FORM.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, Perry Clawson, a citizen of the United States, residing at Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Mold-Forms, of which the follow-

ing is a specification.

The present invention has reference to the construction of mold-forms adapted for use 10 in giving form to bent woodwork or molded concrete, or to arches or curved structures built of separate units. As mere examples of utility, I call attention to a certain modern system of silo construction in which 15 thick hoops of proper diameter for the silo, have vertical boarding secured to their outer and inner surfaces, forming a double walled silo with an air space between the walls. My improved mold-form is of high utility in the 20 formation of these hoops and permits of ready adjustment for diameter of the hoops. Again, assume that a cement or concrete structure is to be molded upon a cylindrical core. My improved mold-form offers spe-25 cial facilities for building up such a core and for providing for its selected diameter. Again, assume that a concrete arch is to be built over a centering form. My mold-form provides for the convenient construction of 30 such a centering form for a circular arch of selected radius or for an arch of elliptic or

other form involving a diversity of radii.

My invention will be readily understood from the following description taken in connection with the accompanying drawing in

which:-

Figure 1 is a perspective view of a moldform exemplifying my invention, this view
illustrating the form in normal straight
40 condition. Fig. 2 a plan of the form when
put into curved condition: Fig. 3 a plan of
several of the forms put into curved condition and united to constitute a cylindrical
core: Fig. 4 an elevation of one of the laminated wooden reinforcements: Fig. 5 a plan
of this reinforcement: Fig. 6 a plan of a substantially rigid reinforcement; Fig. 7 an elevation of a number of the forms so united
as to constitute centering for an elliptic or
50 non-circular arch: Fig. 8 an elevation of the
end portions of two of the forms united by

means of their end accessories: and Fig. 9 an elevation of the end portions of four of the forms united by their end accessories.

A diversity of scales is employed in the 55

drawing.

In the drawing: 1, indicates a straight strip of flexible material, preferably of spring-tempered steel: 2, angle-plates firmly secured at each end of one face of the flexi- 60 ble strip: 3, those members of the angleplates which project at right angles from the face of the flexible strip and have a width corresponding with the width of the strip: 4, those members of the angle-plates 65 which lie against the flexible strip: 5, bolts passing through the flexible strip and through the angle-members 4 and serving to rigidly secure the angle-plates to the strip: 6, bolt-holes in the members 3 of the 70 angle-plates: 7, a perforated web formed with and connecting the members 3 and 4 of each angle-plate: and 8, a turnbuckle having its ends engaging the web 7 and serving as a means by which the two angle-plates 75 may be drawn toward each other and a curvature given to the flexible strip.

The dimensions of the flexible strip will be in accordance with the general dimensions of the work to be produced on the 80 mold-form and there are to be a number of the mold-forms capable of being united, the forms being of similar or dissimilar size. The holes 6 should be the same distance apart vertically as the holes for the bolts 5. 85 Fig. 1 illustrates the angle-plates as having four bolt-holes 6 in the members 3 and the distance between the centers of these bolt-holes, considered horizontally, should equal the distance from the outer face of member 90 3 to the center of the bolts 5. The ends of the rods of the turnbuckle are hooked into apertures in web 7 and are preferably secured in the apertures by nuts on the hooking ends of the turnbuckle rods. 95

the hooking ends of the turnbuckle rods. 95
Normally the mold-form illustrated in
Fig. 1, is straight. Assume that a cylindrical core is wanted, around which are to be constructed laminated wooden hoops for silo purposes, or around which cement or 100 concrete is to be molded. A proper number of the mold-forms may be given a curvature

by operating their turnbuckles, thus producing curved segments, any desired degree of curvature being given to the segments. These segments may then be bolted together 5 endwise by bolts through bolt-holes 6, thus constituting a complete circular form, as indicated in Fig. 3 where eight of the segmental forms are shown in association. As it may be that no selected number of mold-10 forms of a given standard length will build up into the desired complete circle, extra mold-forms of shorter length may be employed, in an obvious manner.

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While it is desirable that the strips 1 15 shall be as flexible as is consistent with their use in having material applied about them without distorting the strips to an undesired degree, it may sometimes happen that the conditions of use of the forms call for a 20 greater degree of stiffness for the strips. provide for this superior stiffness by means of laminated reinforcements 9, as illustrated in Figs. 2, 4 and 5. These reinforcements may consist of two or more layers of flexible 25 wood secured to each other at one of their ends, the ends of these reinforcements abutting against the inner edges of members 4 of the angle-plates. The laminations of these reinforcements being secured to each 30 other at one end only permits of the layers creeping with reference to each other while they are being adjusted to curvature.

In Fig. 7 there is illustrated a built-up form suited for an arch whose curve is struck from a diversity of centers. illustration shows the complete arch form as being composed of four of the improved mold-forms. It is to be noted that two central mold-forms are curved to a certain 40 radius while the two end mold-forms are curved to a lesser radius. When the arch has been molded then the general form can be contracted by decreasing the radius of all or selected ones of the component mold-

45 forms, in an obvious manner.

When a given individual mold-form is taken in hand and its turnbuckle adjusted to curve the flexible strip, that strip will in practice be found to curve to an approxi-50 mately true circular arc. In some cases it may be that the arc represented by an individual mold-form is to have different degrees of curvature at different points in its This cannot be accurately accom-55 plished by the mere curving of the flexible strip, nor can it be accomplished when the laminated flexible reinforcement is employed. But a solid and substantially inflexible reinforcement may be employed, 60 against the inner surface of the flexible strip and this inflexible reinforcement may have a permanent form to control the flexible strip of the mold-form. For instance, 10 illustrates, in plan, a reinforcement which is to

be of rigid material, as metal properly 65 formed and of sufficient stiffness to retain its With such a reinforcement substituted for the laminated reinforcement 9 illustrated in Fig. 2, an individual mold-form may have its flexible strip given a 70 definite curvature having a diversity of radii.

In employing the mold-form when in the condition illustrated in Fig. 1, it is aimed that the mold-forms be bolted together end- 75 wise, and the depth of the mold-form will be equal to the depth of flexible strip 1. For greater depth a number of associate mold-forms may be employed. But in some cases it is desirable that extra width be secured 80 by means of flexible strips secured together edgewise. In such case the plan indicated in Fig. 8 may be followed. The angle-plates 2 are not associated entirely with individual flexible strips 1, but each angle-plate is se- 85 cured to two of the flexible strips. By this means a mold-form similar to Fig. 1, but of any desired depth, may be built up, the circumferential joints coming at the same points precisely as though the mold-forms 90 were not connected widthwise, the bolts through bolt-holes 6 being depended upon to unite the segmental mold-forms. In other cases it may be desired, not only to bind the segments together widthwise by securing the 95 individual mold-forms together by the same system of bolting as is employed in securing the angle-plates to the flexible strips, but also to bind the segments together endwise by the same means. Thus, in Fig. 9, the 100 more extended surfaces 2 of the angle-plates are bolted to the flexible strips and each angle-plate engages a pair of the flexible strips and also the pair of strips adjacent to it in the widthwise direction. 105

It might here be explained that bolts 5, uniting the angle-plates to the flexible strip, have conical heads flush with the exterior surface of the flexible strip, and that as the metal of the flexible strip will generally be 110 too thin to accommodate the depth of the conical head of the bolt, the holes for the bolts are countersunk at the exterior surfaces of the angle-plates, as illustrated at the lefthand end of Fig. 1. 115

It is to be observed that there are two holes in each of the webs of the angle-plates into which the turnbuckle may be hitched. For a certain degree of curvature the turn-buckle may be hooked into the holes far- 120 thest from the flexible strip and the range of adjustment of the turnbuckle may effect the desired degree of curvature of the flexible strip. But, under some circumstances, the range of the turnbuckle may be exhaust- 125 ed before the desired degree of curvature of the flexible strip is effected, in which case the plurality of holes in the webs of the

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angle-plates permits of the substitution of a shorter turnbuckle to increase the curvature of the strip, or to act as a fixed link in maintaining the curvature of the strip when the first turnbuckle is removed. Again. regardless of the employment of the turnbuckle as a specific means for curving the flexible strip, the flexible strip may be given its curvature by any suitable means adapted 10 to move the angle-plates toward each other, and the curvature may be fixed, at any desired degree, by means of links or connectors of suitable fixed length extending from one angle-plate to the other. Again, while the 15 natural tendency of the flexible strip, under the influence of the turnbuckle or equivalent means for drawing the angleplates toward each other, is to curve in a substantially circular arc, and while a rigid 20 reinforcement, such as is illustrated in Fig. 6, may be employed in giving to the flexible strip a curvature representing a diversity of radii, a diversity of radii may be produced without the reinforcement. For in-25 stance, looking at Fig. 1, if the right-hand end of the turnbuckle, before the turnbuckle is operated, be hooked into the hole nearer the flexible strip, the strip, instead of curving on a substantially circular arc, will have 30 its curvature more decided at its lefthand end. Such variation in the curvature of the flexible strip is not under such perfect control as would be the case if a rigid reinforcement, such as is illustrated in Fig. 6, were 35 employed, but it will be found useful and adequate in many cases of employment of the mold-form. And this consideration applies quite regardless of whether or not the turnbuckle be employed as the means for 40 drawing the angle-plates toward each other. For instance, assume that the flexible strip be irregularly flexed by means of the turnbuckle engaging the outer hole in one of the webs and the inner hole in the other-45 web, or assume that the flexible strip has been put into this condition of irregular flexation by any means whatever, if a link of proper fixed length has one of its ends hooked into the inner hole of one of the 50 webs and its opposite end hooked into the outer hole of the other web, the flexible strip will become fixed at the proper irregular degree of curvature.

1. A mold-form comprising, a straight strip of flexible material, angle-plates bolted to the opposite ends of one surface of said strip having a flange projecting at right angles therefrom and provided with bolt60 holes to permit the employment of bolts for securing the angle-plate at one end of said strip to a similar angle-plate on the end of a similar strip, and means connected with said angle-plates and adapted to serve

in drawing the angle-plates toward each 65 other and curving said flexible strip, combined substantially as set forth.

2. A mold-form comprising, a straight strip of flexible material, angle-plates bolted to the opposite ends of one surface of said 70 strip having a flange projecting at right angles therefrom and provided with boltholes to permit the employment of bolts for securing the angle-plate at one end of said strip to a similar angle-plate on the 75 end of a similar strip, and a turnbuckle having its opposite ends connected with said angle-plates and adapted to serve in drawing the angle-plates toward each other and curving said flexible strip, combined sub- 80 stantially as set forth.

3. A mold-form comprising, a straight strip of flexible material, angle-plates bolted to the opposite ends of one surface of said strip having a flange projecting at right 85 angles therefrom and provided with boltholes to permit the employment of bolts for securing the angle-plate at one end of said strip to a similar angle-plate on the end of a similar strip, a reinforcing strip separate 90 from said flexible strip disposed against the surface of the flexible strip bearing that angle-plates, abutments carried by the flexible strip and adapted to engage the ends of said reinforcement, and means connected 95 with said angle-plates and adapted to serve in drawing the angle-plates toward each other and curving said flexible strip, combined substantially as set forth.

4. A mold-form comprising, a straight 100 strip of flexible material, angle-plates bolted to the opposite ends of one surface of said strip having a flange projecting at right angles therefrom and provided with boltholes to permit the employment of bolts for 105 securing the angle-plate at one end of said strip to a similar angle-plate on the end of a similar strip, a laminated reinforcing strip separate from said flexible strip disposed against the surface of the flexible 110 strip bearing the angle-plates, abutments carried by the flexible strip and adapted to engage the ends of said reinforcement, and means connected with said angle-plates and adapted to serve in drawing the angle-plates 115 toward each other and curving said flexible strip, combined substantially as set forth.

5. A mold-form comprising, a straight strip of flexible material, angle-plates bolted to the opposite ends of one surface 120 of said strip having a flange projecting at right angles therefrom and provided with bolt-holes to permit the employment of bolts for securing the angle-plate at one end of said strip to a similar angle-plate on the end 125 of a similar strip, a laminated reinforcing strip separate from said flexible strip disposed against the surface of the flexible strip

bearing the angle-plates, abutments carried by the flexible strip and adapted to engage the ends of said reinforcement, and means connected with said angle-plates and adapted to serve in drawing the angle-plates to-ward each other and curving said flexible strip, the laminations of said laminated strip being secured to each other at a point and left free to crawl with reference to each 10 other at other points, combined substantially as set forth

6. A mold-form comprising, a straight strip of flexible material provided at each of its ends with a bolt-hole above and a 15 bolt-hole below the center of width of the strip, the distance between said bolt-holes in the strip being double the distance between one of the bolt-holes and the edge of the strip, an angle-plate secured against 20 one face of each end of the strip by bolts engaging the holes in the strip and corresponding holes in the angle-plates, whereby the angle-plates may be secured to a single one of said flexible strips or to a pair of said. 25 strips placed edgewise together, and means connected with said angle-plates and adapted to serve in drawing the angle-plates toward each other and curving the flexible strip, combined substantially as set forth.

7. A mold-form comprising, a straight strip of flexible material, angle-plates bolted to the opposite ends of one surface of said strip having a flange projecting at right angles therefrom and provided with bolt-35 holes to permit the employment of bolts for securing the angle-plate at one end of said strip to a similar angle-plate on the end of a similar strip, said angle-plates being secured to said flexible strip by bolts whose 40 centers are the same distance apart as the bolt-holes employed in bolting the angleplates together when such distance is considered widthwise of the strip, and means connected with said angle-plates and adapt-45 ed to serve in drawing the angle-plates toward each other and curving said flexible strip, combined substantially as set forth.

8. A mold-form comprising, a straight strip of flexible material, angle-plates bolted 50 to the opposite ends of one surface of said strip and having each a flange projecting at right angles to the strip and adapted to be bolted to the angle-plate at one end of a similar strip, a perforated web joining said 55 two members of each angle-plate and disposed at right angles to said members and to said flexible strip, and means connected with said webs and adapted to serve in drawing the angle-plates toward each other

strip of flexible material, an angle-plate having a member seated against a surface of

said flexible strip and provided with a bolt- 65 hole at each side of the center of width of the strip, a second member of the angleplate having a pair of bolt-holes in a plane above the center of width of the strip corresponding with that of the bolt-holes em- 70 ployed in uniting the first member of the angle-plate to the strip and having a second pair of bolt-holes in the plane of the second bolt-hole employed in uniting the angleplate to the strip, the distance from the 75 outer face of the first member of the angleplate to the bolt-holes nearer said face being the same as the distance from the outer face of the second member to the bolt-holes employed in uniting the angle-plates to the 80 flexible strip and the horizontal distance between the bolt-holes in the second member. of the angle-plate being twice the distance from the bolt-hole nearest the flexible strip and the strip, bolts uniting the first member 85 of the angle-plates to the flexible strip, bolts adapted to unite the second members of the angle-plates to similar angle-plates on similar flexible strips, and adjustable means connected with the two engle-plates at the ends 90 of the flexible strip to serve in drawing the angle-plates toward each other and curving the flexible strip, combined substantially as set forth.

10. A mold form comprising, a strip of 95. flexible material, a perforated web secured to one surface of the strip at each of its ends and projecting therefrom parallel with the edges of the strip, each of the webs being provided with a plurelity of perforations at 100 differing distances from the strip, and a connection provided its ends with hooks adapted to engage perforations in the webs and hold the ends of the strip in position when the strip is flexed, combined substan-

tially as set forth.

11. A mold form comprising, a straight strip of flexible material, angle-plates bolted to the opposite ends of one surface of said strip and having each a flange projecting at 110 right angles to the strip and adapted to be bolted to the angle-plate at one end of a similar strip, a perforated web integral with and joining the two members of each angleplate and disposed at right angles to said 115 members and to said flexible strip, each perforated web being provided with a plurality of perforations at differing distances from the strip, and means adapted for connection with selected perforations in the webs and 120 to serve in drawing the angle-plates toward each other and curving the flexible strip, combined substantially as set forth.

60 and curving the flexible strip, combined substantially as set forth.

9. A mold-form comprising, a straight to the opposite ends of one surface of said 12. A mold-form comprising, a straight strip of flexible material, angle-plates bolted 125 strip and having each a flange projecting at right angles to the strip and adapted to be

bolted to the angle-plate at one end of a similar strip, a web joining said two members of each angle-plate and disposed at ble strip, combined substantially as set forth. right angles to said members and to said 5 flexible strip and provided with attaching means at a diversity of distances from the strip, and means adapted for connection with the attaching means of said webs to

each other and irregularly curving the flexi- 10

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."