

Aug. 18, 1925.

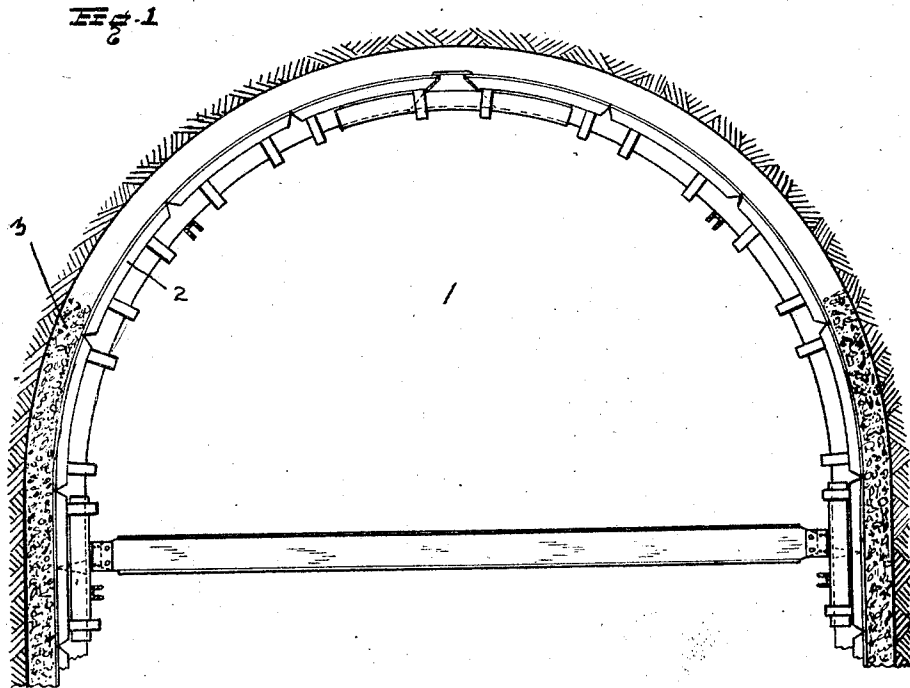
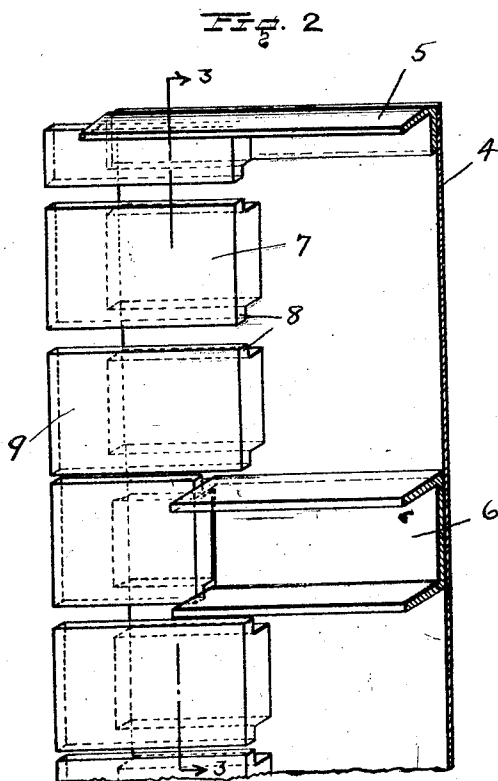
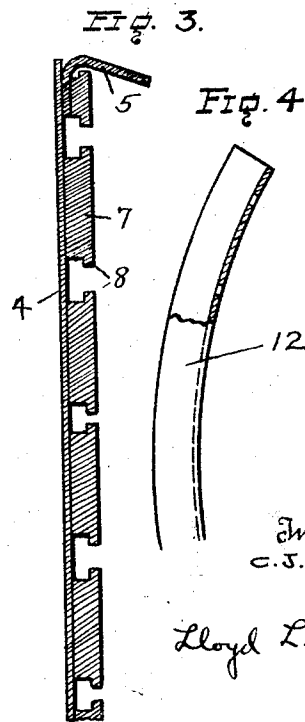
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C. J. ABBOTT

TUNNEL FORM

Filed Oct. 6, 1921

2 Sheets-Sheet 1



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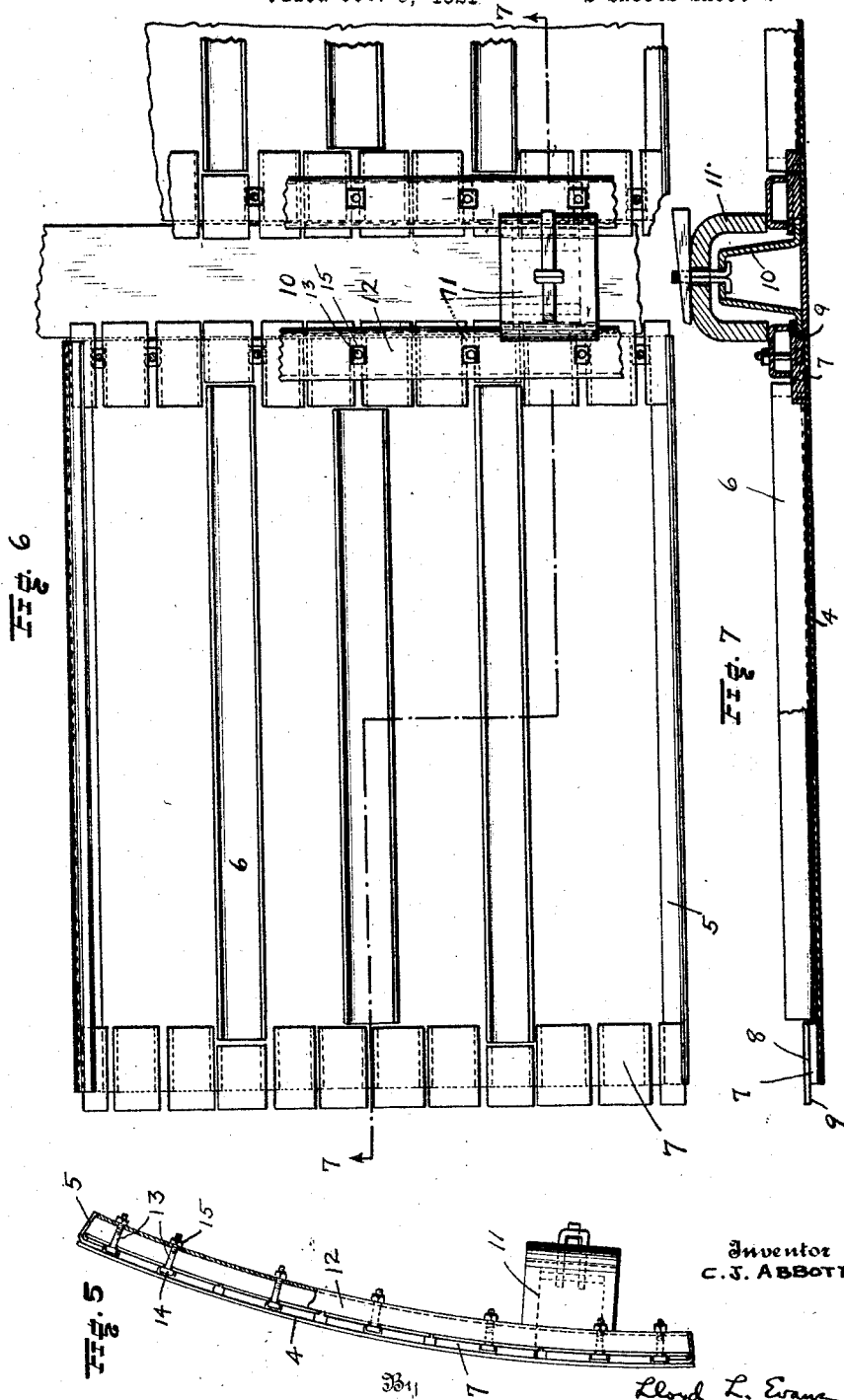
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

CORNELIUS J. ABBOTT, OF CLEVELAND, OHIO, ASSIGNOR TO THE HYDRAULIC STEEL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

TUNNEL FORM.

Application filed October 6, 1921. Serial No. 505,880.

To all whom it may concern:

Be it known that I, CORNELIUS J. ABBOTT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Tunnel Forms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to forms for concrete work and more particularly to forms for molding from the inside or outside, curved concrete work such as tunnels, sewers, or other shapes in which the inner or outer surfaces have curvatures requiring form units, some of which have a radius of one length and others having a radius of another length, or even surfaces having shapes requiring individual form units of more than one curvature or shape.

An object of this invention is to provide a concrete form which is adapted to be adjusted to mold surfaces having curvatures requiring a number of form units, some of which are adjusted to mold curves of one radius and others adjusted to mold curves of a different radius.

A further object of my invention is the provision of a form unit which may be adjusted so that a single stock unit may mold an irregular or compound curve or shape, or a uniform curve of any radius. For molding most concrete work it is only necessary to have a limited number of different kinds or shapes of form units and a relatively large number of each kind or shape of unit. My invention makes it possible, however, to adjust individual form units to any shape or curvature desired whether it be a uniform simple curve, a compound curve or other shape.

A further object of my invention is to provide a concrete form which may be adjusted on the job where the concrete is to be molded, it being possible to use the same unit several times with different rib members for different curvatures or shapes.

Up to the present time concrete forms for work of this character have been made up at the factory, each having a fixed curvature or shape so that it was necessary to keep a large number of these forms on hand at the job in order to have sufficient units of the proper curvature to proceed expeditiously with the erection of the forms and molding

operations. With forms made in accordance with my invention it is necessary to stock only a relatively few molding units, as each may be adjusted to mold walls having a number of different curvatures.

In the accompanying drawings forming a part of this specification,

Figure 1 is a cross section of the tunnel showing diagrammatically my forms in position.

Fig. 2 is a rear elevation partly in section of one of the adjustable molding plates or units.

Fig. 3 is a vertical section on the line 3—3, Fig. 2.

Fig. 4 shows the curved member to which the adjustable form is attached.

Fig. 5 shows one of the curved adjustable forms.

Fig. 6 shows an elevation of the adjustable form in position.

Fig. 7 shows a section on line 7—7 of Fig. 6.

The tunnel in general is indicated at 1. Concrete forms 2 are shown forming a continuous arch around which the concrete 3 is poured or placed. Each form 2 consists of a molding plate or unit 4 having suitable reinforcing members 5 at the top and bottom edges, and additional suitable reinforcing members 6 across the back. It will be noted that these reinforcing members stiffen the unit in one major dimension but permit it to bend in the other major dimension. At each of the side edges are secured in any suitable manner, preferably by spot welding, members 7 having side flanges 8 which overlie the back of the form. These members 7 also project beyond the edge of the form as shown at 9 by which several plates are secured together in position by curved channel members 10 and clamps 11, as shown in Figs. 6 and 7. The construction of the channel members 10 and clamps 11 shown in Figs. 6 and 7 to hold the various form units in position is not a part of this invention, this being covered by other patents and applications.

It is only necessary so far as this invention is concerned that some suitable means be devised to hold in molding position these various form units when assembled with their stiffening rib members. The rib members 12, Fig. 4, which may be channels or other suitable configuration, are formed of

any desired curvature or shape and these ribs determine the curvature or shape of the molding plate. The units 4 are secured to the ribs by means of a number of bolts 13 having heads 14 which underlie the flanges 8 of members 7. The bolts project between the members 7 and thru the perforations 12' in members 12 and are fitted with nuts 15. By tightening these nuts the form unit which is flexible in the direction of a major dimension, that is—its length or width, is drawn precisely to the shape of the preformed rib member 12. As many of these bolts may be used as are desirable or necessary to draw the molding plate uniformly to conform to the shape of the rib member. This unit may now be placed in molding position and secured by any suitable means, one such means being illustrated in Figs. 6 and 7.

As soon as the molding forms have been positioned and the concrete body molded and allowed to stand the necessary length of time the forms are taken down and the units may be either removed from the rib members 12 to be attached to other ribs to mold other surfaces having another shape or curvature, or they may be left attached to such ribs to mold further surfaces of the same shape.

It will thus be seen that it is only necessary when erecting forms on a job to have a stock of rib members 12 already formed with the various curvatures or shapes necessary to mold the surface in accordance with the specifications of the designer, and also to have a relatively large number of form units. As these units are adjustable to any one of the preformed rib members it follows that such units may be used over and over again to mold different shapes, and that it is unnecessary to ship and have a large stock of form units of each kind of shape

on a particular job as is now customary when surfaces of varying curvatures are to be molded.

Furthermore, my form units may be shipped flat to the job, thus reducing freight charges and consequently the cost of the forms for a particular job.

My forms permit the molding of uniform or different curved surfaces with equal facility and with less cost than formerly known.

Having described my invention what I claim is:

1. A concrete form for tunnels comprising a molding unit carrying means thereon to hold the head of a bolt, a perforated rib member curved to the desired shape and bolts to secure said unit and member together so that the unit conforms to the curvature of the rib member.

2. A tunnel form comprising a molding unit having members secured thereon, said members having overhanging flanges to receive the head of a bolt, a perforated rib member curved to the desired shape and bolts having heads underlying said overhanging flanges and securing said unit and member together so that the unit conforms to the curvature of the rib member.

3. A tunnel form comprising a molding unit having members secured thereon, said members having overhanging flanges to receive the head of a bolt, a perforated rib member curved to the desired shape, bolts having heads underlying said overhanging flanges and securing said unit and member together so that the unit conforms to the curvature of the rib member, and suitable reinforcing members secured to the molding plate.

In testimony whereof, I hereunto affix my signature.

CORNELIUS J. ABBOTT.