June 13, 1933. J. S. MILLER 1,914,033

CONCRETE FORM

Filed Nov. 9, 1931 2 Sheets-Sheet 1

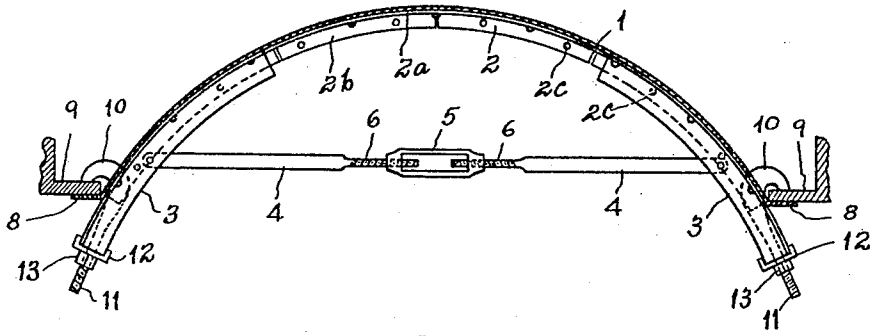


Fig. II

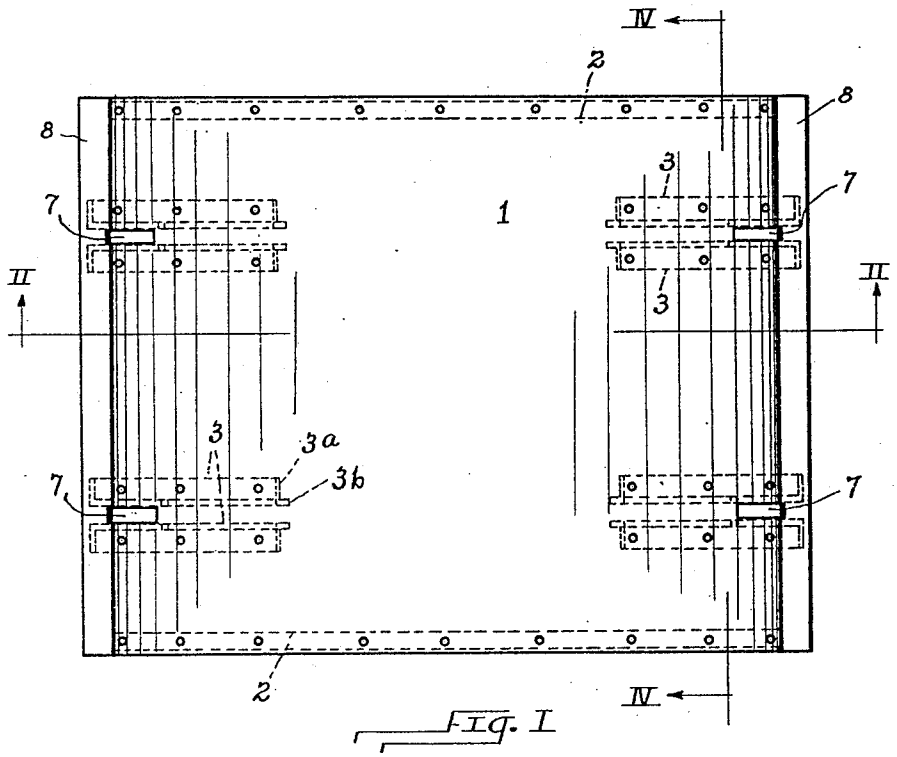


Fig. I

INVENTOR

James S. Miller

by Christy Christy and Wharton

his attorneys

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CONCRETE FORM

Filed Nov. 9, 1931 2 Sheets-Sheet 2

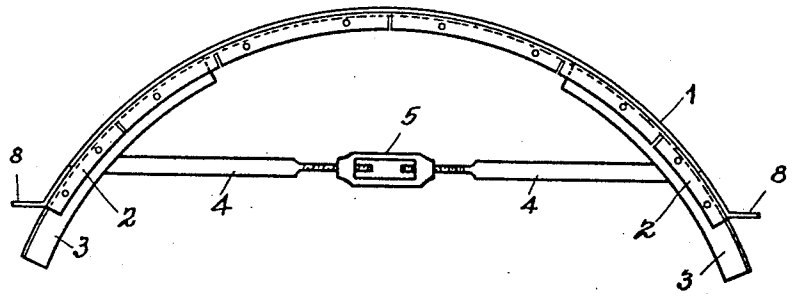


Fig. III

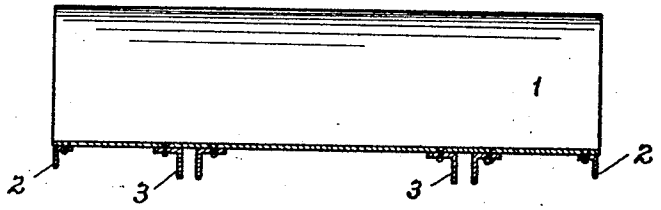


Fig. IV

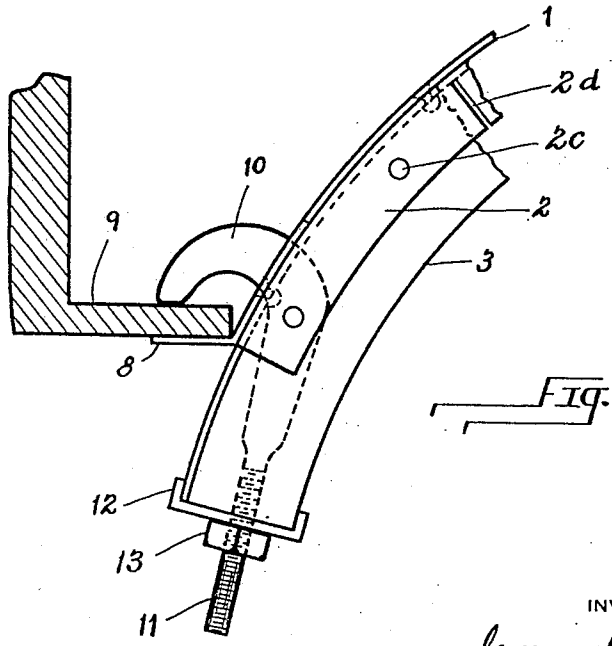


Fig. V

INVENTOR

James S Miller

by Christy Christy and Wharton

his attorneys

Patented June 13, 1933 1,914,033

UNITED STATES PATENT OFFICE

JAMES S. MILLER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO THE DRAVO CONTRACTING COMPANY, A CORPORATION OF PENNSYLVANIA

CONCRETE FORM

Application filed November 9, 1931. Serial No. 573,773.

This invention relates to an arch form for concrete work.

One object of the invention is to provide an arch form in which a plate of relatively light material, constituting the span of the form, is so reinforced as to provide a form of relatively great strength.

Another object of the invention is to provide means for regulating the span of the form to the position of the members on which it is to be supported.

Another object of the invention is to provide simple and effective means for supporting the arch form and the load carried thereby in suspended position, and which provide for rapid and easy mounting and demounting of the form.

In the accompanying drawings Figure I is a plan view of the arch form; Figure II is a vertical section through the form on the line II—II of Figure I; Figure III is an edge elevation of the form; Figure IV is a cross sectional view through the plate or body of the form taken on the lines IV—IV of Figure I; and Figure V is a detail elevation illustrating the supporting means of the form.

The body of the form comprises a relatively light metallic plate 1, which is bent to the desired radius to serve as a form for an arch or a tunnel roof. Along each side edge of the plate are angles 2 having their lateral flanges 2*a* riveted to the plate 1, and their depending flanges inset very slightly from the extreme edge of the plate. The depending flange 2*b* of each of these angles is provided with a plurality of bolt holes 2*c* by means of which adjacent forms may be interconnected to provide a tunnel roof structure. These edge angles 2 serve to stiffen the form structure as well as constituting interconnecting means for adjacent forms.

At opposite end regions of the plate are spaced and aligned pairs of angles 3, having their lateral flanges 3*a* underlying and riveted to the plate, and their depending flanges 3*b* mutually spaced to form a channel. Between opposed pairs of flanges a turnbuckle structure lies, having its solid members bolted between the opposed pairs of depending flanges 3*b* and its clevis 5 engaging the threaded ends 6 of the members 4. It will be noted that the angles 3 are of relatively great longitudinal extent, so that they serve as stiffening means for the plate, as well as providing connection for the turnbuckle. As shown in Figure I, two pairs of angles 3 are mounted adjacent each end of the plate, but this number may obviously be reduced or increased in accordance with the width of the plate 1 constituting the span of the form.

This pan is adjusted to change its radius, or to adjust it to supporting means at the end edges of the form, by means of the turnbuckles which may be taken up to flex the plate 1 to a greater or lesser extent. To facilitate this adjustment, the flanges 2*b* of the edge angles 2 are provided with a plurality of transverse slots 2*d*.

The means for supporting the form are simple and efficient. Intermediate each pair of angles 3 plate 1 is cut away to provide an opening 7, and adjacent the outer end of this opening 7 the plate is bent sharply along its edge to provide an angularly extending foot 8. These feet may underlie, and closely contact beams 9 serving as mounting means for the form. Angles 3 are continued beyond the end edges of the plate, and rest in members supported from the beams 9.

The supporting means proper comprise hooks 10, adapted to be extended through slots 7 and to engage the upper faces of beams 9. Each of the hooks 10 has a threaded shank 11, which is surrounded by a perforated trough-shaped plate 12. Plate 12 in the assembly rests on a nut 13 carried by the threaded shank 11 of the hook.

In mounting the form, the curvature of plate 1, and consequently the span of the form, is adjusted to the positioning of beams 9 by means of the turnbuckles. Feet 8 along the end edges of the plate 1 are inserted beneath beams 9, and hooks 10 are inserted through the slots 7, with the ends of flanges 3 resting in plates 12. When hooks 10 are caused to engage the upper surface of the beams 9, the beams are thus embraced between the hooks and the feet 8 along the end edges of plate 1 to firmly engage the form in supported position.

In demounting the form, after it has been

used for a concrete arch or roof, the nut 13 on hook shank 11 is loosened. The hook proper 10, being free, may then readily be loosened in the concrete, and withdrawn through the slot 7. The form support is demounted, as well as mounted, by simple manipulation of the supporting hooks.

It will be noted that the form is simple, dispensing with complicated means for adjusting, positioning, and supporting it. It is of sufficient flexibility to permit adjustment, while being so reinforced as to provide sufficient stiffness for the load of concrete carried by it. No special means or members exterior to the form are required for mounting it in position for use.

I claim as my invention:

1. An arch or roof form for concrete work comprising a body plate, angle members spaced in mutual alignment on opposite sides of the transverse center line of the plate and attached to the under face thereof to provide aligned depending flanges, a turnbuckle structure attached to mutually aligned flanges to act on the plate for adjusting the curvature thereof, said plate slotted in the region of said angle members and adjacent the end edges of the plate, said angles continued onwardly beyond the end edges of the plate, free supporting hooks extending upwardly through the slots of the plate, and members on said hooks underlying the plate contacting the said angle members and carrying the plate.

2. An arch or roof form for concrete work comprising a body plate, angle members spaced in mutual alignment on opposite sides of the transverse center line of the plate and attached to the under side thereof to provide depending flanges, a turnbuckle structure attached to mutually aligned flanges to act on the plate for adjusting the curvature thereof, said plate slotted in the region of said angle members and adjacent the end edges of the plate, free supporting hooks extending upwardly through the slots of the plate, members on said hooks underlying the plate contacting the said angle members and carrying the plate, and feet co-operative with said hooks formed by bending the plate along lines parallel to its end edges.

3. An arch or roof form for concrete work comprising a body plate, free supporting hooks adjacent the end edges of the plate and extending upwardly therebeyond, and supporting members mounted directly on said hooks underlying the end edges of the body plate and providing a supporting cradle for the body plate.

4. An arch or roof form for concrete work comprising a body plate, free supporting hooks adjacent the end edges of the plate and extending upwardly therebeyond, supporting members mounted directly on said hooks underlying the end edges of the body plate and providing a supporting cradle for the body plate and feet co-operative with said hooks formed by bending the plate along lines parallel to its end edges.

5. An arch or roof form for concrete work comprising a body plate, free supporting hooks adjacent the end edges of the plate and extending upwardly therebeyond, frame members attached to the under side of said plate in the region of said hooks, and supporting members mounted directly on said hooks underlying the plate for contacting said frame members and providing a supporting cradle for the plate.

6. An arch or roof form for concrete work comprising a body plate, free supporting hooks adjacent the end edges of the plate and extending upwardly therebeyond, frame members attached to the under side of said plate in the region of said hooks and extending onwardly beyond the body plate, supporting members mounted directly on said hooks underlying the plate contacting the said frame members and providing a supporting cradle for the plate, and feet co-operative with said hooks formed by bending the plate along lines parallel to its end edges.

7. An arch or roof form for concrete work comprising a single flexible body plate, depending flanges extending along the side edges of the plate and slotted upwardly from their lower edges for increasing the load carrying capacity of the plate while permitting flexing adjustment of the arch formed by the plate, and means attached to the under face of the plate for exerting a flexing force on the plate.

8. An arch or roof form for concrete work comprising a single flexible body plate, depending flanges extending along the side edges of the plate and slotted upwardly from their lower edges for increasing the load carrying capacity of the plate while permitting flexing adjustment of the arch formed by the plate, angle members spaced in alignment with each other on opposite sides of the transverse center line of the plate and attached to the under face thereof to provide aligned depending flanges, and a turnbuckle structure attached to the aligned flanges to act on the plate for adjusting the curvature thereof.

In testimony whereof I have hereunto set my hand.

JAMES S. MILLER.