J. B. BLAW.

REMOVABLE SUPPORTING FORM FOR CONCRETE.

APPLICATION FILED MAY 15, 1907.

972,802. **Patented Oct. 18, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.

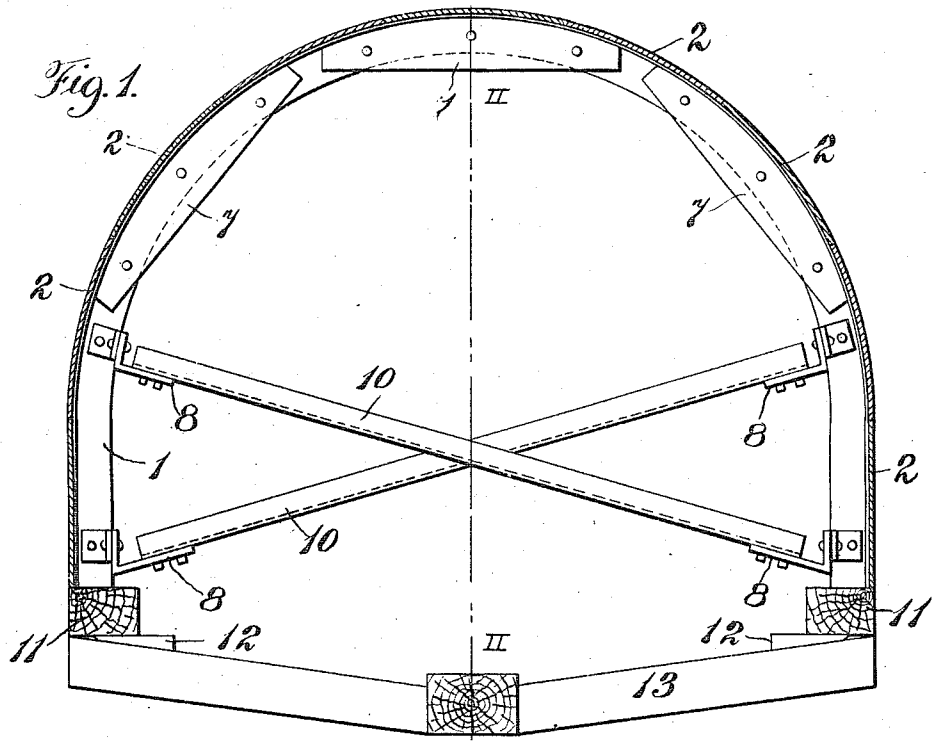


Fig. 3.

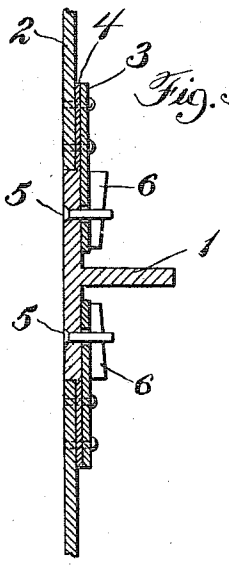
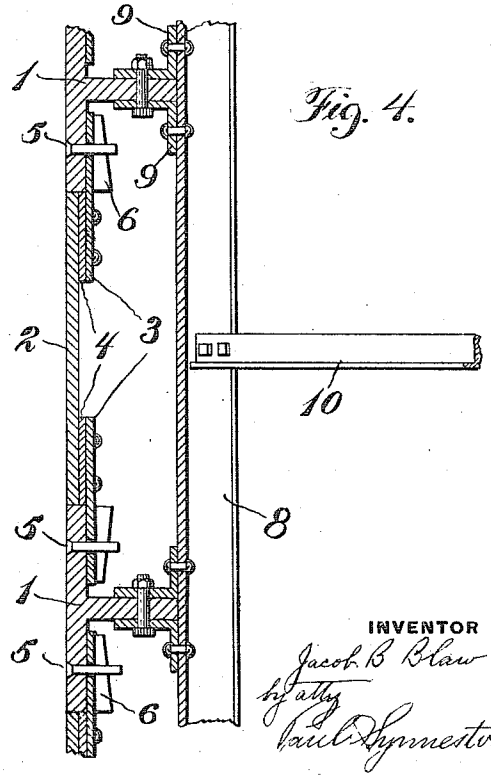


Fig. 4.



WITNESSES

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2 SHEETS—SHEET 2.

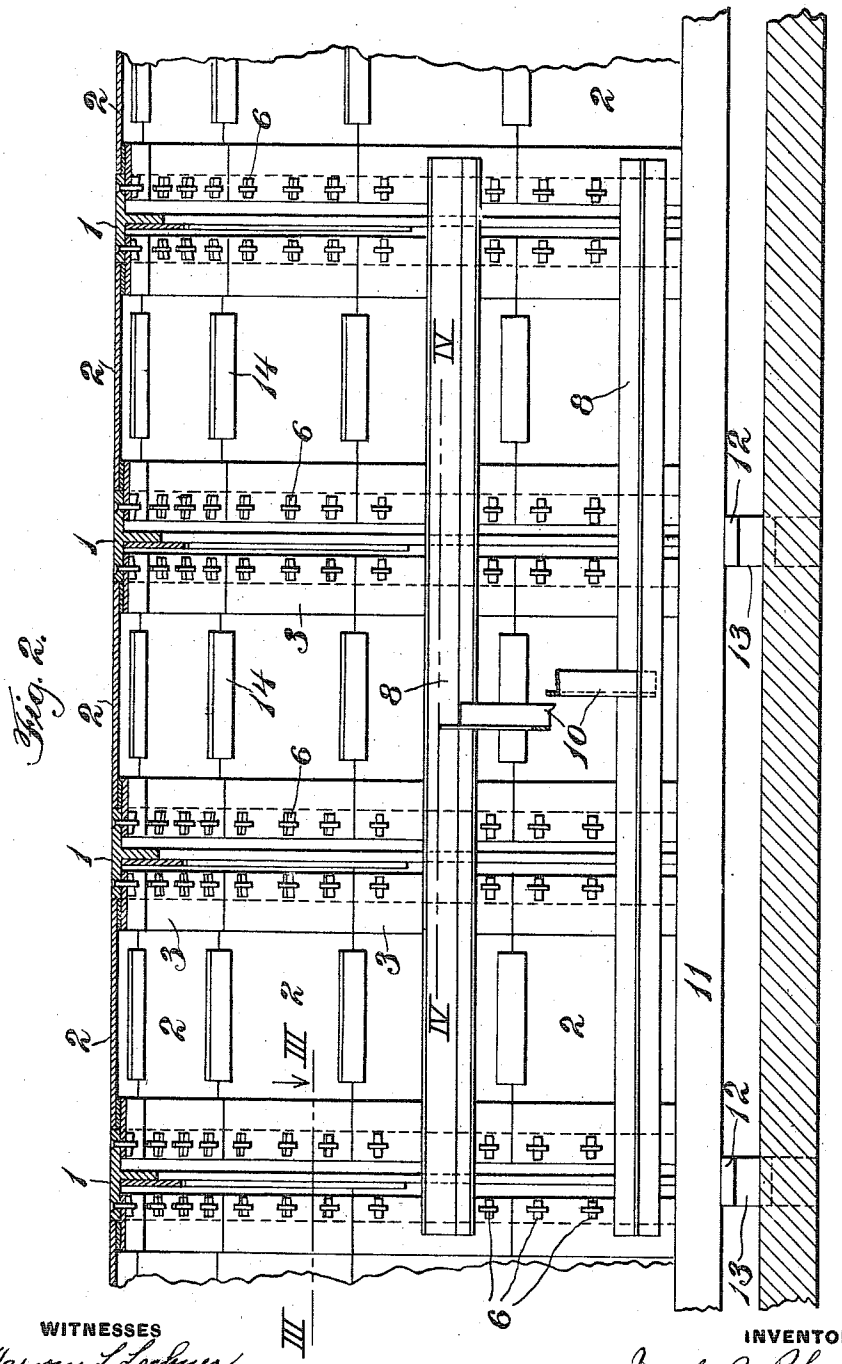

Fig. 2.

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UNITED STATES PATENT OFFICE.

JACOB B. BLAW, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO BLAW COLLAPSIBLE STEEL CENTERING COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

REMOVABLE SUPPORTING-FORM FOR CONCRETE.

972,802. Specification of Letters Patent. Patented Oct. 18, 1910.

Application filed May 15, 1907. Serial No. 373,732.

To all whom it may concern:

Be it known that I, JACOB B. BLAW, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Removable Supporting-Forms for Concrete, of which the following is a specification.

My invention relates to collapsible forms for use in the construction of concrete sewers, subways, and the like, and has for its objects; to provide a form which can be more conveniently handled and operated than those heretofore employed; to provide a collapsible form wherein the circumferential stiffening members form a portion of the outer surface of the form, and are flush with the outer surfaces of the intermediate plates, and, to provide a knock-down form wherein the plates may be detached from the stiffening members, and removed after the concrete has set without altering the position of the stiffening members. One form of the apparatus is shown in the accompanying drawings, wherein:—

Figure 1 is a transverse section through a complete form,

Figure 2 is a longitudinal section through the form on the line II—II of Figure 1,

Figure 3 is an enlarged detail section on the line III—III of Figure 2, wherein the method of securing the plates to the stiffening members is illustrated, and

Figure 4 is an enlarged detail section on the line IV—IV of Figure 2, which section shows the method of securing the plates to the stiffening members, and the means for attaching the braces to the stiffening members.

The mold in its preferred form, comprises a series of circumferential T members or sections spaced apart longitudinally the length of the plates to be used intermediate the T sections, which plates abut against the T ribs at their ends and are detachably secured thereto, so that after the concrete has set about the form or mold the plates may be detached from the T sections, after which the T sections themselves may be detached from the concrete. In operation, the T sections are placed in position and the plates gradually built up commencing at the bottom and filling in behind the plates as they are placed in position.

Referring to the drawings, 1 are the circumferential T sections, which as indicated in Figure 2, are spaced apart a distance equal to the length of the sectional plates, 2 are the plates interposed between the T sections 1, which plates are bent to the desired radius to fit the curve of the T sections, 3 are the plates for overlapping the inside edges of the T sections as indicated in Figure 3, which plates are bolted along the vertical edges of the plates 2 and are spaced away therefrom such a distance as is necessary to make the outer surface of the plates flush with the outer surface of the T sections by means of the liners 4, 5 are staples secured along the edges of the T sections 1, and projecting through slots in the edges of the plates 3, 6 are wedges which are driven through the staples or loops 5 for clamping the plates 3 to the edges of the T sections, 7 are stiffening plates which are bolted along the inwardly projecting flanges of the T sections when the forms are of large diameter, 8 are longitudinally extending angle sections bolted to a plurality of the inwardly projecting flanges of the T members by means of the angle clips 9 (see Figure 4), 10 are cross braces preferably of angular cross section, which braces are applied intermediate the ends of the longitudinal angle members 8 as indicated in Figures 2 and 4, 11 are longitudinal extending timbers upon which the weight of the form is carried, 12 are the wedges whose removal after the cement has set permits the timbers 11 to drop slightly thereby freeing the stiffening members 1, and 13 are the cross members upon the floor of the sewer for bracing the timbers 11, and holding the various parts in their proper position. In order that the horizontal edges of the plates 2 may be flush and even the overlapping strips

14 are employed (Figure 2) which strips are riveted to the edge of one member and adapted to overlap the edge of the opposing plate and thereby hold the plates in alinement.

The operation in using the form is as follows. A layer of concrete is first laid for the floor and the timbers 11 and 13 positioned thereon, after which the T sections 1 are placed in position at proper intervals and secured by means of the longitudinal connecting angles 8 and the cross braces 10. The lowermost plates 2 are then put in position with their inner edges abutting against the edges of the T sections, and the plates 3 overlapping the inside edges of the T sections with their perforations engaging the loops 5, after which the wedges are driven into position thus tightly clamping the edges of the plates 2 in the position shown in Figures 3 and 4. Concrete is now filled in behind this lower row of plates until it approaches the upper edges thereof, when another series of plates are added and the filling-up operation continued. This operation is continued until the plates are all in position and all covered with concrete. The operation will be carried on simultaneously with as many lengths of plates as can be conveniently handled. After the concrete has set about the form, the plates 2 are released from the stiffening sections 1 by removing the wedges 6 whereupon the plates can be pulled away from the concrete. After the plates have been removed from the stiffening sections 1, such sections can be freed from the concrete by removing the wedges 12 thus permitting the timber 11 to fall down and provides room for the freeing of the stiffening sections.

It will be apparent from the foregoing description that the plates 2 are held securely with their outer surfaces flush with the outer surfaces of the stiffening sections 1, and that the outer surfaces of the stiffening sections constitute a portion of the outer surface of the form thus reducing the cost of the mold or form to a figure less than where the stiffening sections act merely as ribs, and in which the covering plates come together at the rear of the stiffening sections. Furthermore it will be apparent that by having the plates set to abut against the edges of the stiffening sections 1, such plates 2 may be removed gradually and safely without moving the sections 1, which result cannot be attained where the plates overlap the outside of the members 1 in the old type of molds, and wherein it is necessary to remove the supporting sections before any of the plates can be detached from the concrete. In other words in the old type of mold the removal of the supporting ribs meant the freeing of all the plates carried thereby simultaneously, which condition obviously endangered the workmen because of their inability to attend to all of the plates freed and the danger of accidental falling of a part of the plates while other of the plates were being loosened from the concrete. It will be seen that this danger is overcome in my construction, and that the plates may be removed gradually one at a time. It will be apparent that the stiffening T sections need not necessarily be integral commercial T's but may, if desired, be T's built up from angles, and the term T section as used in the claims is intended to cover the T structure broadly.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is the following:—

1. A mold or form comprising alternate circumferential stiffening members with inwardly projecting flanges and plates interposed therebetween, strips extending along the vertical edges thereof, and means for detachably securing the strips to the webs of the stiffening members with the outer surfaces of the plates in alinement with the outer surfaces of the webs of the stiffening members.

2. A form or mold comprising spaced T sections with inwardly projecting flanges and a plurality of plates extending between the edges of the webs of the T sections, strips extending along the edges of said plates overlapping the webs of the T sections, and means for detachably clamping the edges of the strips to the webs of the T sections so that the outer surfaces of the plates and the T sections are flush.

3. A form or mold comprising spaced T sections and a plurality of plates extending between the edges of the T sections, and strips extending the width of the plates for detachably securing the plates to the inner edges of the T sections with the edges of such plates abutting the edges of the T sections and their outer surfaces flush with the outer surfaces of the T sections.

4. A removable form or mold comprising spaced stiffening members, each formed of commercial sections with one flange projecting inwardly and the other flange constituting a portion of the outer surface of the form, and a shell comprising a plurality of plates with their edges abutting the edges of the last mentioned flanges, overlapping strips 3 and spacing strips 4 secured to the plates, and means for detachably securing the overlapping strips to such flanges.

5. The combination in a form or mold, of T sections spaced apart and intermediate plates abutting the edges of the T sections

and provided with perforated plates for engaging the inner sides of the T flanges, staples on the T sections extending through the perforations in the plates, and wedges for engaging the staples.

6. The combination in a form or mold, of stiffening sections arranged with one flange projecting inwardly a longitudinal section engaging a plurality of the inwardly projecting flanges and a brace secured to such longitudinal member and extending to the opposite side of the mold.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

JACOB B. BLAW.

Witnesses:
J. C. BRADLEY,
ARCHWORTH MARTIN.