F. S. GRAEF.

FORM FOR CONCRETE CONDUIT CONSTRUCTION.

APPLICATION FILED SEPT. 22, 1909.

963,544. Patented July 5, 1910.

Fig. 2.

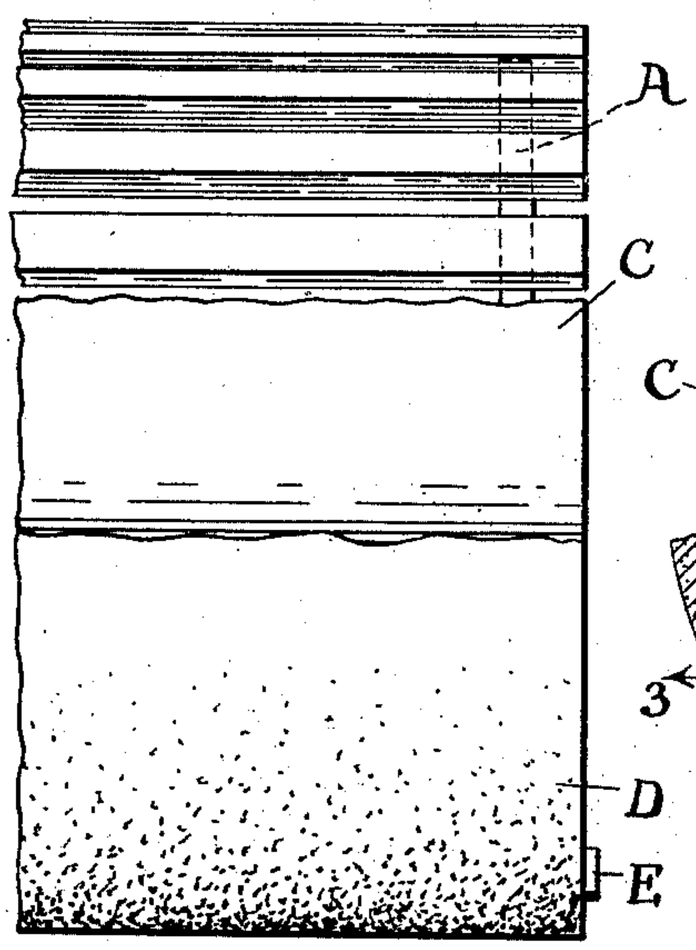


Fig. 1.

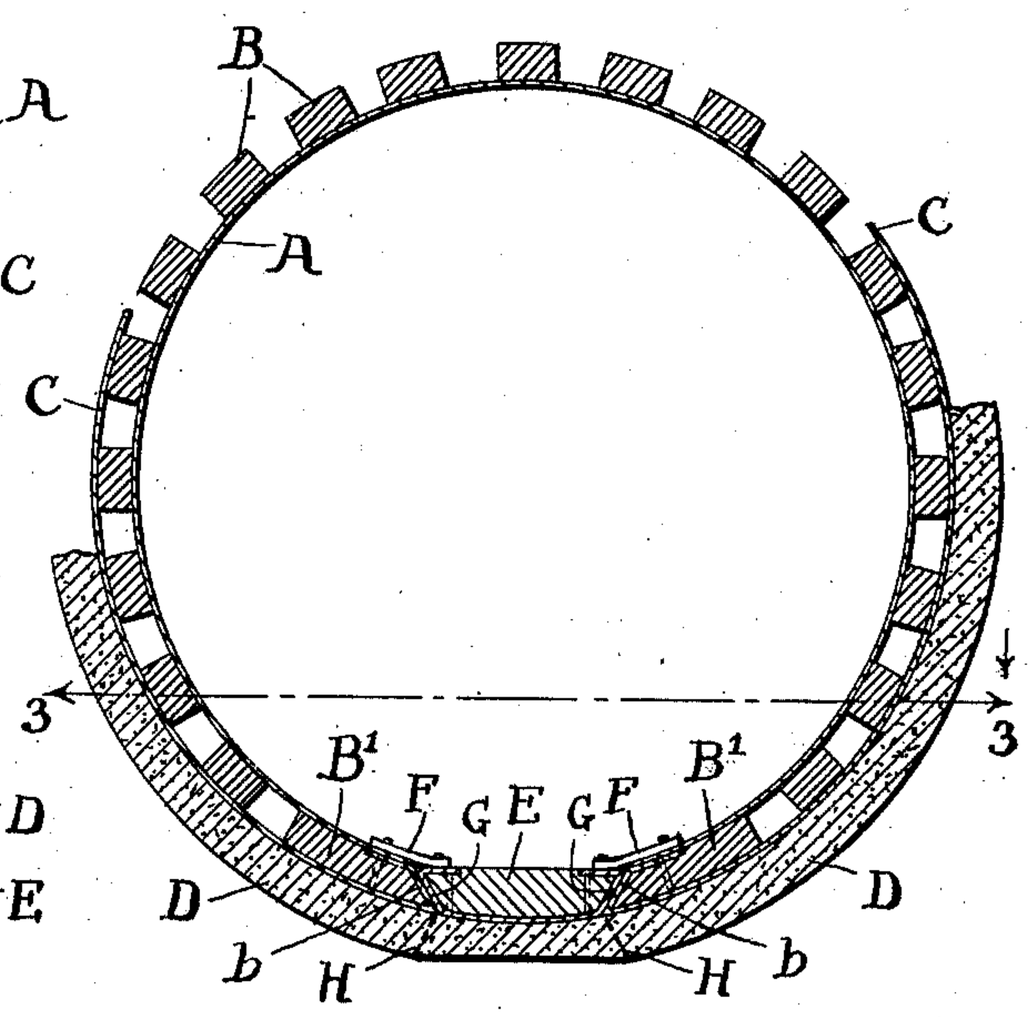


Fig. 4.

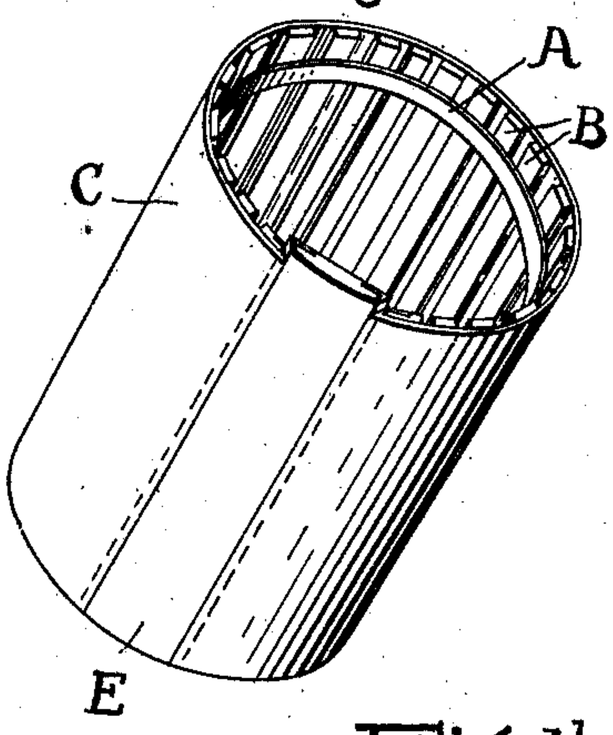


Fig. 3.

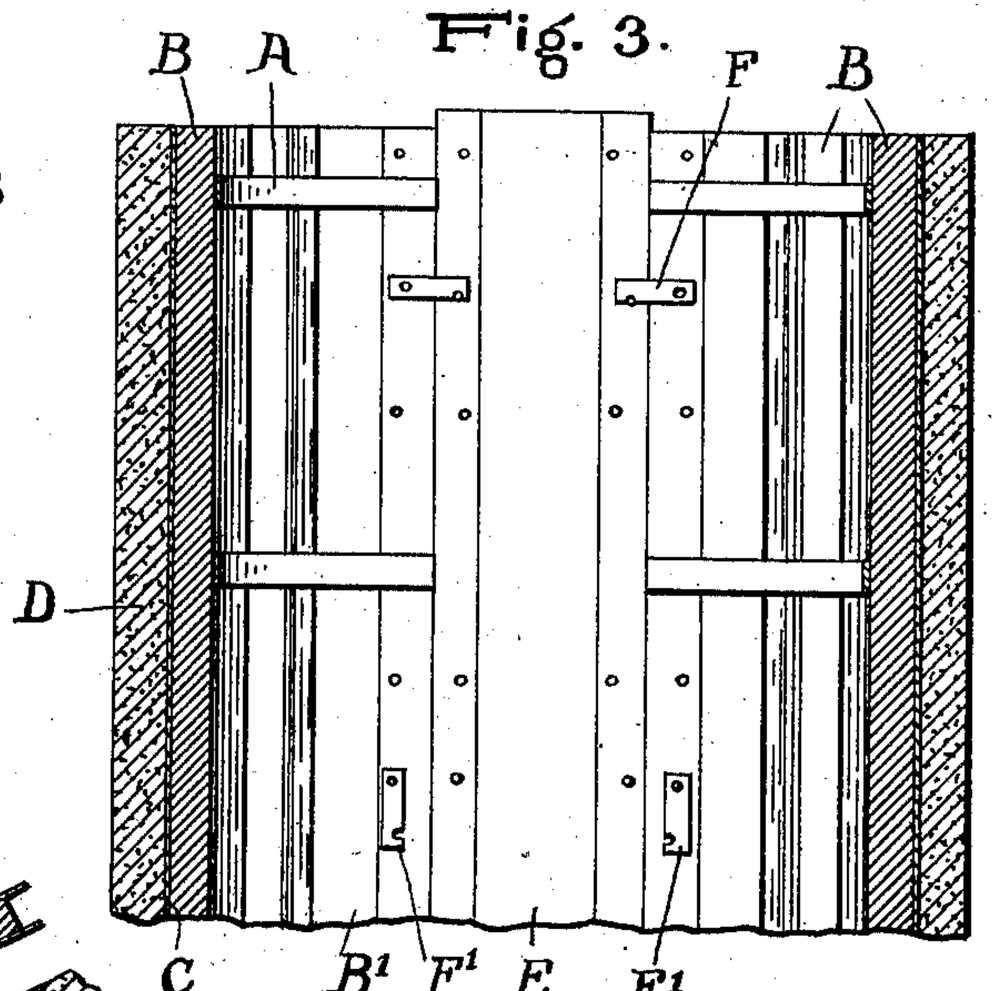
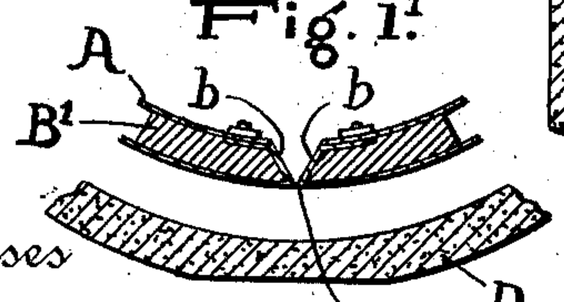


Fig. 1¹.



Witnesses

Stuart Hilder.

J. M. Anderson

Inventor

Francis S. Graef

by E. W. Anderson & Son

his Attorneys

UNITED STATES PATENT OFFICE.

FRANCIS SAVIER GRAEF, OF NEW YORK, N. Y.

FORM FOR CONCRETE CONDUIT CONSTRUCTION.

963,544. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed September 22, 1909. Serial No. 519,063.

To all whom it may concern:

Be it known that I, FRANCIS SAVIER GRAEF, a citizen of the United States, residing in the city, county, and State of New York, have invented new and useful Improvements in Forms for Concrete Conduit Construction, of which the following is a specification.

My invention relates to improvements in interior forms for molding tubular constructions of cement concrete, or similar plastic materials.

This invention has for its object cheaper and more expeditious construction, by providing facilities for molding a complete circuit in one pouring of the concrete, with a minimum of labor in the setting up and withdrawing of the forms. These objects are attained by my invention, as hereinafter specified and as illustrated in the accompanying drawings forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1, is an elevation of an end of my form in readiness for the molding process. Fig. 1′, indicates the modification in the bottom of the form when collapsed into position for withdrawing it from the molded concrete. Fig. 2, is an elevation of a portion of the longitudinal side of the form. Fig. 3, is a sectional plan on the line X, X, in Fig. 1, showing the bottom of the set-up form. Fig. 4, is a perspective of the form reduced.

The basis of the structure of the form consists in elastic ribs (preferably of a good quality of spring steel) indicated by A, in the drawings. These ribs are formed to coincide in contour with the shape designed for the interior of the conduit, transversely through the same. Upon these transverse ribs are fastened parallel longitudinal strips, similar to B, in the drawings; these strips being placed at intervals around the ribs in circumferential series completing the skeleton of the form (as shown in the upper portion of Fig. 1) over which is stretched a covering of sheet metal, shown in part at C in the drawing, constituting the outer surface of the form, upon and around which the concrete is molded, as shown in part by the portion indicated by D in the drawings.

The ribs, A, do not consist of complete, unbroken bands, but their disconnected ends normally nearly meet to comprise a complete circuit, bringing the bottom edges of the form together as shown at O, in Fig. 1′. In this view it will be seen that the ends of the rib are respectively secured to the longitudinal strips B′, at the margins of the skeleton form, these end strips having their marginal edges *b*, beveled inward as indicated, in such wise that the opening between these strips widens inward. While this is the normal position of the disengaged form, the flexibility of the structural ribs, A, makes it practicable to expand it very considerably, and to allow of the insertion of a spreader, E, which comprises in its outer contour the arc necessary to the completion of a circuit of larger dimensions than that of the form in its normal condition, and fixes conjointly with the form proper the dimensions and contour of the interior of a tube molded therewith.

The spreader, E, is held in position by the turn-buttons, F F, shown connected to the edge strips Fig. 1, and has chamfered edges fitted to the edges of and adapted to easy removal from the mold proper. These edges are indicated by G G, and the spreader is therefore wider on its inner than on its outer surface.

After the concrete has hardened the spreader is removed by releasing the buttons, F F, and lifting it out of its position in the form. The form may then be collapsed into its normal position as indicated in Fig. 1′, in which the space between the outer covering, C C, of the portion of the form shown, and the inner part of the portion of concrete, D D, indicates the consequent shrinkage in the circumference of the form whereby its easy removal from the construction is provided for.

In Fig. 3 the bottom of the form is shown. The spreader, E, is extended out beyond the end of the form to facilitate the handling of it. The turn-buttons are shown locked at F F, and unlocked at F′ F′, Fig. 3.

While conduit construction is illustrated only in circular form in the drawings, it is obvious that my invention is likewise adaptable to oval, elliptical and other curvilinear forms.

To facilitate the setting up of the forms and to insure a perfect bottom (which is reached with difficulty, and hence not easily molded, by use of the tamping iron) it is desirable to construct a bed of concrete (as indicated between the dotted lines H H, in

Fig. 1,) and allow this to harden before setting up the form.

Having thus described my invention, I claim:

1. An expansible core-form for molding tubular structures, consisting of a series of transverse expansible flexible ribs having the proper contour, a series of separated longitudinal strips secured to said flexible ribs and having end strips provided with inward beveled edges, a bevel-edge removable spreader widening inward to correspond with the end strips, fastening turn-buttons attached to the end strips, and a sheet metal covering on the longitudinal strips constituting the outside of the form.

2. In an expansible core-form for molding tubular structures, the combination with a longitudinal series of circumferential automatically contracting elastic contour ribs having separate ends, of a series of parallel longitudinal strips separated by intervals, and permanently secured to said ribs, marginal strips secured to the rib ends, an inward-movable spreader member, and releasing fastenings.

3. In an expansible core-form for molding concrete structures, the combination with a circumferential series of parallel longitudinal strips separated from each other by intervals, of a longitudinal series of automatically contracting elastic contour ribs having unconnected ends and permanently secured to the inner surfaces of said strips, marginal strips secured to the rib ends, an outer covering of thin sheet metal, an inward movable spreading member, and releasing fastenings.

4. An expansible core-form for molding concrete, consisting of a longitudinal series of automatically contracting elastic contour ribs having unconnected and separated ends, a circumferential series of parallel longitudinal strips separated from each other by intervals and secured to the outside of said ribs, longitudinal edge strips secured to the ends of said ribs, a longitudinal lifting spreader, an outside covering of thin sheet metal, and means for securing the spreader device between said edge strips.

5. In an expansible core-form for molding concrete, an automatically contracting skeleton form, consisting of a longitudinal series of elastic contour ribs having separated ends, and a circumferential series of parallel longitudinal strips separated by intervals, the latter series having edge strips secured to the ends of said ribs, and disconnected from each other, a longitudinal parallel side lifting spreader, and means for securing the spreader between said edge strips.

6. In an expansible core-form for molding concrete, an automatically contracting skeleton form consisting of a longitudinal series of elastic contour ribs having unconnected ends, a circumferential series of longitudinal strips fastened to said ribs to form a unitary structure, marginal strips fastened to the rib ends, a removable longitudinal spreader adapted to be seated between said marginal strips, and releasing fastenings in connection therewith.

FRANCIS SAVIER GRAEF.

Witnesses:

INDA G. GRAEF,

ADA GASCOYNE GRAEF.