

No. 749,735.

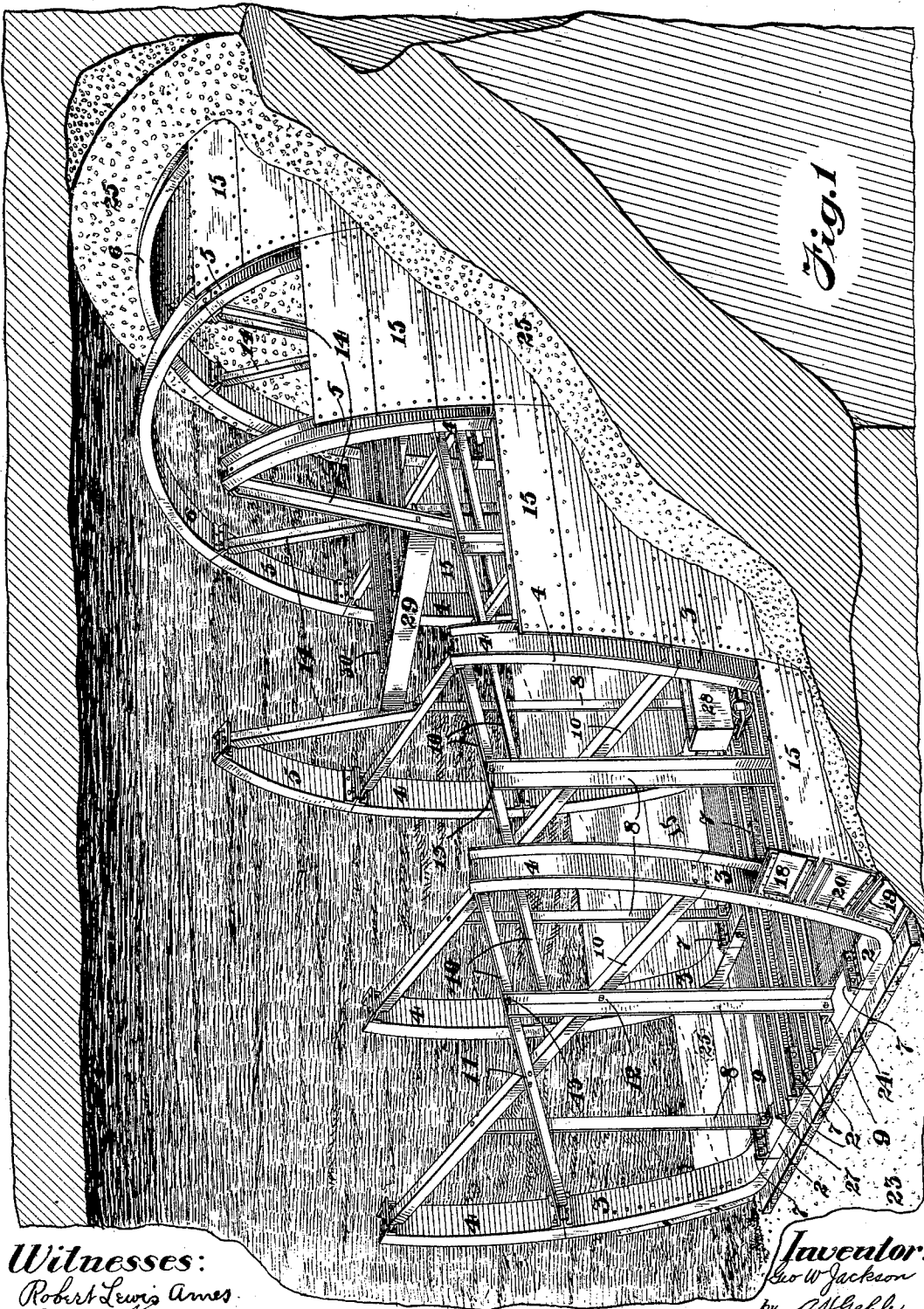
PATENTED JAN. 19, 1904.

G. W. JACKSON.
TEMPORARY SUPPORTING FORM FOR MASONRY STRUCTURES.

APPLICATION FILED JULY 28, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
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Inventor:
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Fig. 2

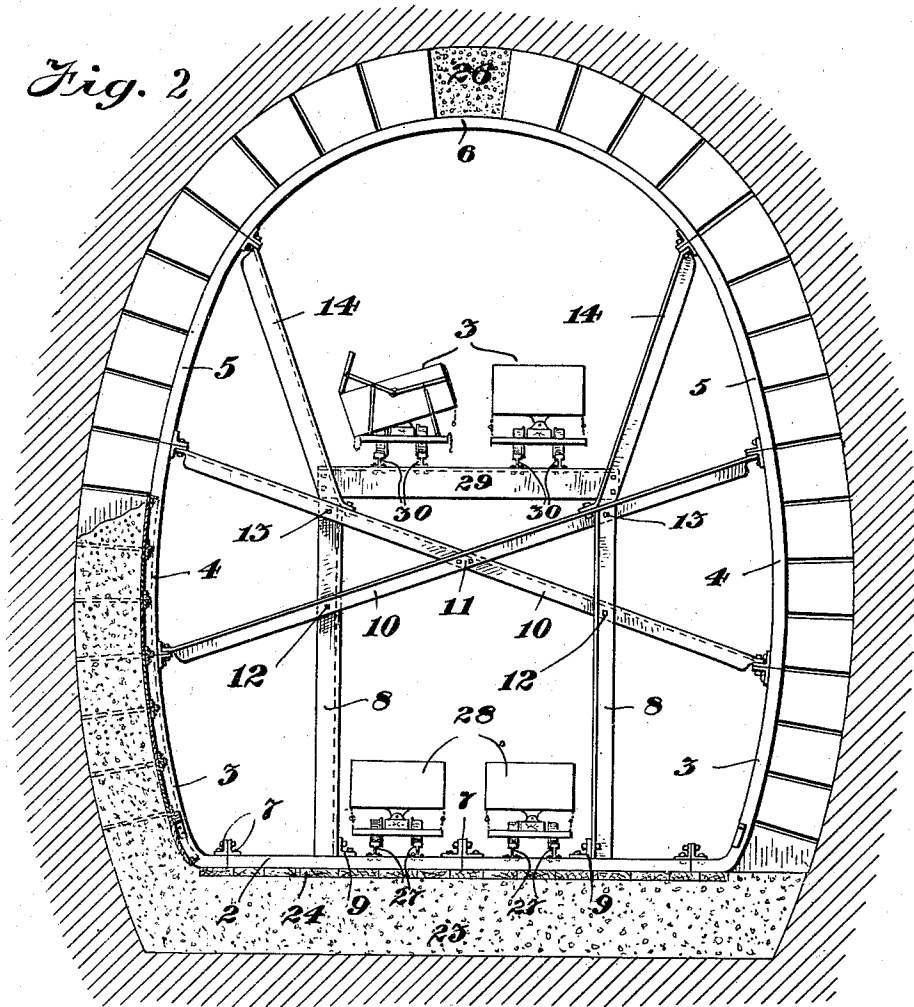


Fig. 7

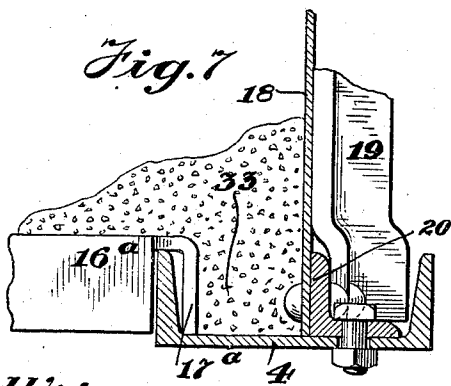
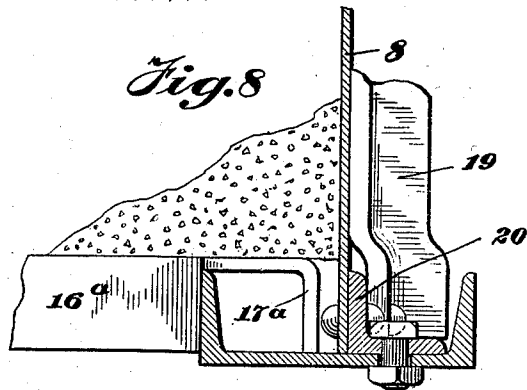


Fig. 8



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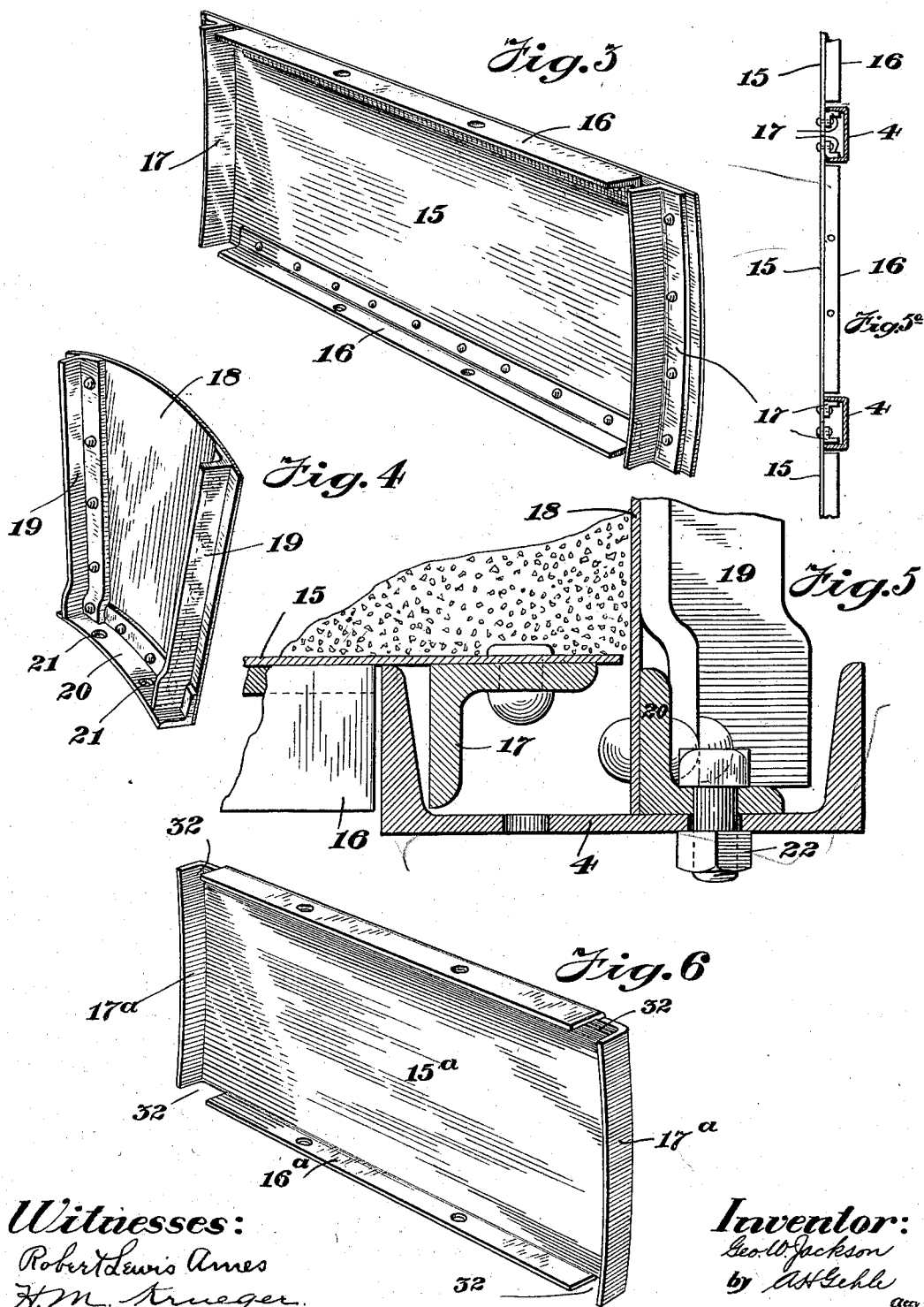
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3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE W. JACKSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO JACKSON & CORBETT BRIDGE AND STEEL WORKS, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TEMPORARY SUPPORTING-FORM FOR MASONRY STRUCTURES.

SPECIFICATION forming part of Letters Patent No. 749,735, dated January 19, 1904.

Application filed July 28, 1902. Serial No. 117,310. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. JACKSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Temporary Supporting-Forms for Concrete and other Masonry Structures, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in temporary supporting-forms for concrete and other masonry structures—such as tunnel-linings, bridges, arches of all kinds, and the like—and has for its objects to provide such a form, of iron or steel, that may be quickly put up and taken down and the parts easily handled, thus saving time and labor; that is interlocking throughout and in which every section helps to support the others, thus securing a maximum of strength; that will not become water-soaked, thus avoiding excessive weight and also disintegration from expansion and contraction, and will thus last indefinitely; that has perfect alinement and gives a smooth inner surface to the structure and one that takes up but little room either in its “knock-down” condition or when put up, whereby it is particularly useful in constructing tunnels or like structures in which all work must be carried on from within the same. In accordance with my invention, therefore, I provide a form consisting, preferably, of a plurality of longitudinal interlocking lengths made up of ribs and lagging and so constructed and arranged as to be built up in sections, whereby the wall of the structure may be readily filled in behind and back of each section and over the roof thereof as it is built up, and thus a simple, convenient, and rapid method of construction is obtained.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the form as used in constructing a tunnel. Fig. 2 is an end view. Fig. 3 is a perspective view of one of the lagging-plates. Fig. 4 is a similar

view of one of the end flights. Fig. 5 is a detail view of the interlocking joint of the lagging, rib, and end flight. Fig. 5^a is a similar view of the interlocking joint of the ribs and lagging. Fig. 6 is a perspective view of a modified form of lagging-plate. Fig. 7 is a view similar to Fig. 5, but showing the modified form of lagging; and Fig. 8 is a similar view of a slightly-modified form.

Like characters of reference indicate like parts throughout.

The form comprises the transverse ribs or channel-iron, each consisting of the bottom members 2 2, the lower side members 3 3, the middle side members 4 4, the upper side members 5 5, and the top member 6, which serves to unite the sides of the ribs and complete the arch-ring. The joints between these members consist of the angle-plates bolted or otherwise secured to the opposite ends of the rib members, the opposed flanges of which are in turn bolted together to secure the parts of the rib together. Upright braces 8 8, preferably of angle-iron, are bolted at their lower ends to the plates 9 9, carried by the bottom members 2 2, and at their upper ends to the diagonal braces 10 10, which extend diametrically across the rib and are bolted at their lower ends to the joints between the lower and middle side sections of the rib and at their upper ends to the joints between the middle and upper side sections on the opposite side of the rib. The braces may be bolted together at 11, where they cross, and the upright posts 8 are bolted to lower parts of the diagonal braces at 12, where they cross them, and to the upper parts at their upper ends, as shown at 13. Additional braces 14 extend from the diagonal braces at points adjacent to the upper ends of braces 8, where they are bolted, to the joints between the upper side sections and the top section of the rib. The rib thus constructed of channel-iron with the flanges outwardly turned is staunch and strong and permits being built up in sections, as hereinafter explained.

The lagging consists of the plate 15 (shown more clearly in Fig. 3) which is curved trans-

versely slightly to make them conform to the curvature of the ribs, and are provided with angle-iron strips 16 16, riveted to their upper and lower edges, and similar strips 17 17 at the ends, as shown. These plates are adapted to be placed outside the ribs one above the other and so as to be supported thereby, as shown in Fig. 1, whereby the cement, concrete, or like material may be tamped in back of the same and against them to form the wall. The manner of supporting these plates is indicated in Figs. 5 and 5^a, in which a section of one of the ribs—say section 4—is shown, the lagging-plate 15 being in position with the end of the flange of the angle-iron 16 just outside the flange of the channel-bars 4 4, while the flange of the end angle 17 fits inside the flange of the channel-iron. The plate 15 projects substantially to the center of the channel-rib, whereby at an intermediate rib, as shown in Fig. 5^a, the opposite ends of the lagging approach closely, so that a smooth and finished wall upon the interior of the structure is formed.

In order to sustain the concrete, mortar, or other material at the end rib, as shown at the front in Fig. 1, end flights of the type shown in Fig. 4 are provided, these end flights consisting each of a segmental plate 18, reinforced at the radial edges by angle-plates 19 and at the inner edge by a similar angle-iron 20, curved to conform to the curve of the channel-bar ribs and provided with apertures 21, through which suitable bolts 22, Fig. 5, pass to securely bolt the flight to the web of the end rib to support the concrete at this end. These end flights, it will be observed from Fig. 5, have their inner faces substantially flush with the ends of the lagging-plates 15, so that the next section of the tunnel or other structure, if it be a continuous structure, can be built on without inconvenience or removal of the rib.

In the use of the device for the purpose shown—that is, in the construction of a tunnel and after the bore is made—a floor 23, Fig. 2, of concrete, is first laid, a suitable flooring 24, of plank, is then preferably laid, as shown in Figs. 1 and 2, and upon this the bottom sections 2 2 and the two lower side sections 3 3 of the ribs are placed and bolted together, as shown in Figs. 1 and 2. The uprights 8 8, the diagonal braces 10 10, and also, if desired, the middle side sections 4 4 of the rib are then placed and firmly bolted in position. The lower plates 15 of the lagging are then placed in position, as many as desired for convenient working, and the concrete is thrown back of the said plates and firmly tamped in place, thus filling the space between the lagging and the earth. When this much is filled, more plates may be added and the process continued until it is found necessary to add the upper side sections 5 5 of the ribs and the braces 14 14. When the

walls behind these plates are filled in, the top section 6 is placed in position, when the roof of the arch may be formed in similar manner. The end flights 18 are added from time to time, as necessary, so that the concrete or other material is sustained at the end. As shown in Fig. 2, the last end flight at the crown is omitted to permit finishing the roof. It will be observed that the lagging-plates interlock with the ribs in such manner that the latter cannot tip over, whereby the whole is braced in all directions and is rendered staunch and firm. As soon as the bottom sections are placed in position the tracks 27 may be laid, upon which suitable cars or trucks 28 28 may run to carry building material in and waste material out. If desired, additional tracks 30 30 may be laid upon horizontal braces 29, which may be secured to the framework in any desirable manner. Besides this adding to the haulage capacity of the tunnel a further advantage would result in delivering concrete, &c., at a higher elevation for the upper parts of the side walls and the roof. Again, one set of tracks can be used for one purpose and the other for another purpose with advantage during certain stages of the work. Fig. 1 is intended to show these various steps in the process, the length in the foreground having only a few lagging-plates behind which the concrete has been placed, while the successive lengths are built up higher, the complete ring being shown at the far end and representing a completed section of the tunnel. When the material of the arch has sufficiently set, the form may be taken down in the inverse order, the top section 6 being first unbolted and removed, the lagging being lifted up over the ends of the other sections. When taken apart or "knocked down," very little room is required, and the parts are comparatively light and easy to handle. The heavy, water-soaked, and cumbersome timber form is thus avoided and a light, airy, skeleton structure substituted.

Fig. 6 shows a modification in which the lagging-plate 15^a is provided with integral flanges 16^a and 17^a, formed by bending the edges of the sheet over after cutting away the corners at 32. As shown in Fig. 8, if the plates are made long the opposite ends substantially abut, so that a smooth wall will result, but if shortened, as in Fig. 7, a rib 33, of concrete, results at each rib of the temporary form.

It will be apparent that various changes, alterations and modifications may be made in the details of my invention without departing from the scope or principle thereof, and I do not, therefore, wish to be limited to the precise details shown and described. One such alteration is to use T-rails instead of channel-irons for the ribs, and although the advantages of the interlocking feature would be sacrificed thereby it is apparent that a serv-

iceable structure may thus be provided. This modification is a part of this invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A temporary supporting-form comprising ribs and lagging, means for interlocking the said ribs and lagging the one with the other, end flights adapted to be attached to the said ribs at an angle thereto, and means for so attaching the said end flights, substantially as described.

2. A temporary supporting-form comprising ribs and lagging, means for interlocking said ribs and lagging the one with the other, braces for strengthening said ribs, said braces being arranged to provide one or more spaces for the passage of dump-cars, substantially as described.

3. A temporary supporting-form comprising sectional ribs and lagging, means for fastening together the different sections of said ribs, means for interlocking said ribs and lagging the one with the other, braces for strengthening said ribs, and one or more car-tracks supported by said braces above the base of said supporting-form, substantially as described.

4. A temporary supporting-form comprising sectional ribs and lagging, means for attaching together the different sections of said ribs, means for interlocking said ribs and lagging the one with the other, diametrical braces attached to the said ribs, one or more upper and one or more lower car-tracks, substantially as described.

5. A sustaining-rib for temporary supporting-forms comprising curved sectional chan-

nel-bars, means for attaching the different sections together, means for engaging lagging-plates, and means for attaching end flights, substantially as described.

6. A sustaining-rib for temporary supporting-forms comprising a flanged bar adapted to engage lagging-plates, and means for attaching to said rib end flights at an angle thereto, substantially as described.

7. A sustaining-rib for temporary supporting-forms comprising a metallic bar having one or more flanges and means for attaching end flights, substantially as described.

8. A temporary supporting-form comprising ribs having flanges, and substantially rectangular lagging-plates provided with flanges at their edges, the flanges at the sides of said plates being cut away at each end so as to provide recesses between the ends of said side flanges and the end flanges to receive the flanges of said ribs whereby said lagging-plates are retained in position on said ribs.

9. A temporary supporting-form comprising ribs having flanges, and substantially rectangular lagging-plates having flanges formed integral at the edges thereof, the side flanges of each of said plates being cut away at the ends to provide recesses between the ends of said side flanges and the end flanges of said plates to receive the flanges of said ribs, whereby the lagging-plates are retained in position.

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

GEORGE W. JACKSON.

Witnesses:

KATHERINE CLUXTON,
JOHN McDERMOTT.