G. A. COMPTON.

COLLAPSIBLE ARCH FORM.

APPLICATION FILED NOV. 5, 1917.

1,294,239.

Patented Feb. 11, 1919.

2 SHEETS—SHEET 1.

Fig. 1

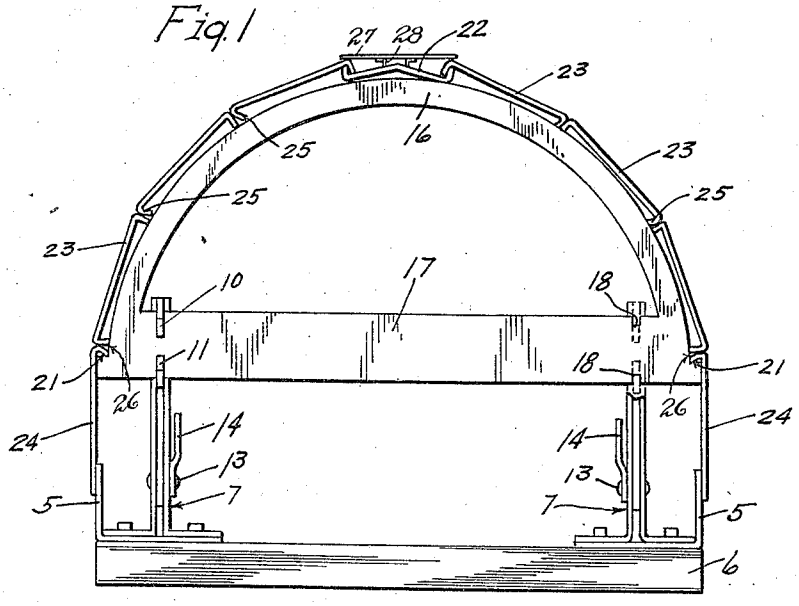
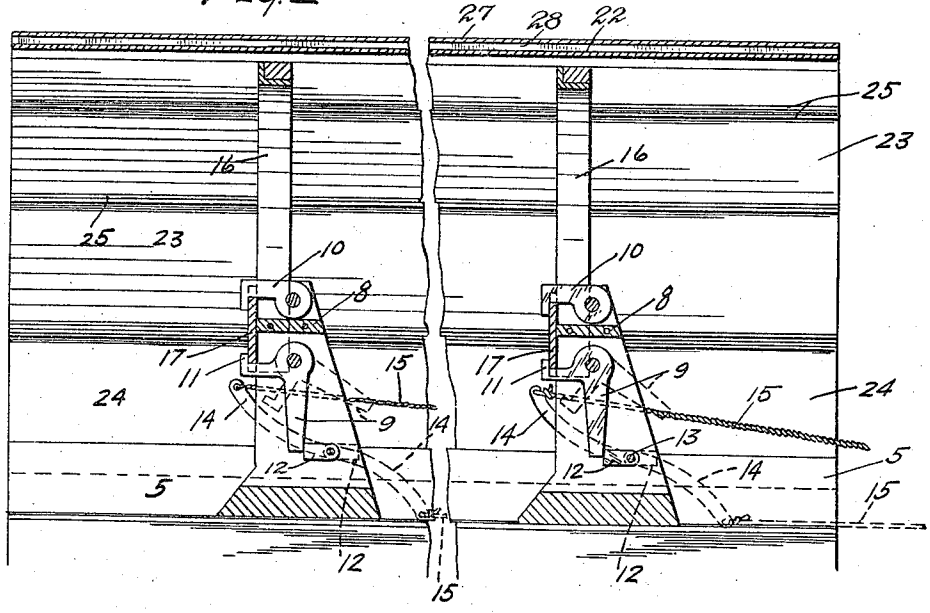


Fig. 2



WITNESSES

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Fig. 4

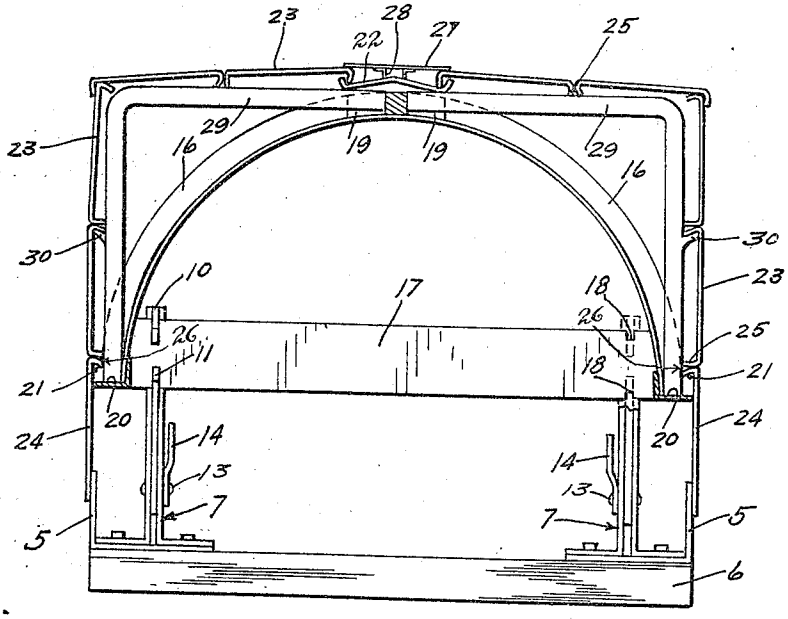
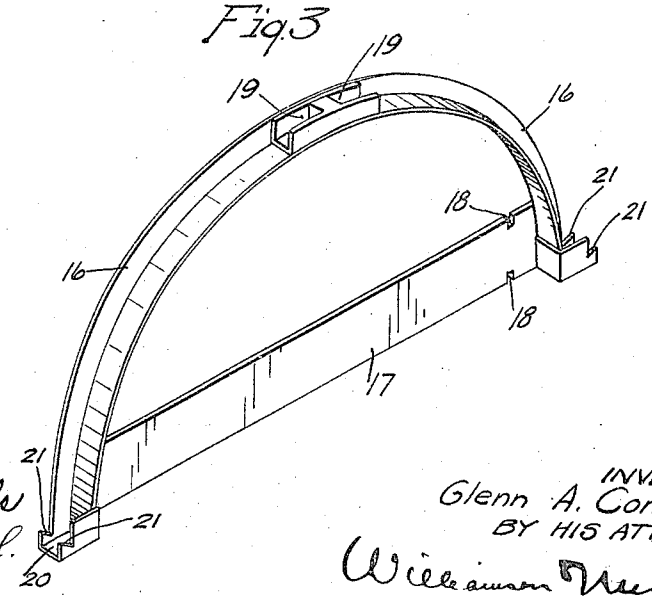


Fig. 3



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UNITED STATES PATENT OFFICE.

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COLLAPSIBLE ARCH-FORM.

1,294,239. Specification of Letters Patent. Patented Feb. 11, 1919.

Application filed November 5, 1917. Serial No. 200,228.

To all whom it may concern:

Be it known that I, GLENN A. COMPTON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Collapsible Arch-Forms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in collapsible arch forms, especially adapted for use in the construction of concrete bridges, culverts, conduits, and the like. To the above end, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings,

Figure 1 is an end elevation of the invention;

Fig. 2 is a fragmentary longitudinal central section;

Fig. 3 is a perspective view of one of the arch bars; and

Fig. 4 is a view corresponding to Fig. 1, but illustrating a modified form of arch bar.

The numeral 5 indicates a pair of laterally spaced longitudinal sills, in the form of angle bars, having their horizontal flanges turned inward and their vertical flanges turned upward. These two sills 5 are, as shown, supported on cross sills 6 and have rigidly secured to their horizontal flanges, near the ends thereof, four bearing brackets 7. Each bearing bracket 7 has laterally spaced side walls, which extend parallel to the horizontal flanges of the sills 5 and are rigidly connected by webs 8 near their upper ends.

Pivoted to and between the side walls of each bearing bracket 7, is a tripping abutment 9 and a gravity-held hook-like latch 10 located, the former below the web 8 and the latter above the same. The tripping abutment 9 is in the form of a bell crank with its long arm normally projecting downward and its short arm extending horizontally and provided with an upwardly projecting retaining lug 11, which is located in the same plane with the overlying hook end of the latch 10. It is important to note that the short arms of the tripping abutments 9 and the free ends of the latches 10 all project in the same direction and that they also normally project beyond the adjacent edges of the bearing bracket 7.

Locks 12 are provided for holding the tripping abutments 9 in operative positions and each thereof is arranged to engage the long arm of the respective tripping abutments 9 to prevent downward movement of the short arm thereof. These locks 12 are secured to pivot pins 13, mounted in the side walls of the bearing brackets 7, and which pivot pins have secured to one of their ends normally upwardly projecting arms 14 to the free ends of which are attached cables 15, by which said locks may be operated at a distant point to release the tripping abutments 9. It will be noted that the cables 15 all extend in the same direction, so that they may be simultaneously operated.

Supported from each laterally spaced pair of tripping abutments 9, is a segmental arch bar 16, which extends transversely of the sills 5. The ends of each arch bar 16 are rigidly connected by a flat bar 17 that is set edgewise and secured to one side of said arch bar. The arch bars 16 are of such size as to span the respective pair of bearing brackets 7 with the bars 17 extending outside of said brackets and resting on the short arms of the tripping abutments 9. It will be noted that the latches 10 are turned over the upper edges of the bar 17 and, together with the retaining lugs on the tripping abutments 9, hold said bars 17 against the bearing brackets 7 and in upright positions. Formed in the upper and lower edges of the bars 17, are notches 18, with which the tripping abutments 9 and latches 10 interlock to hold the arch bars 16 properly positioned over the sills 5.

At the crown of each arch bar 16, is formed a pair of oppositely extended seats 19 and, at the lower ends thereof, are seats 20 and beveled shoulders 21. The purpose of these seats 19 and 20 and shoulders 21 will presently appear.

Loosely supported on the crown of the arch bar 16, is a ridge plate 22, having at its longitudinal edges upturned flanges.

This ridge plate 22, at its longitudinal center, is bent upward, so that only its longitudinal edges rest on said arch bars. Removably supported on the arch bar 16, on each side of the ridge plate 22, is a side plate comprising a plurality of slats 23 and a slat 24. Each slat 23 has, at its longitudinal edges, inwardly projecting flanges 25, one of which is bent inwardly to give it a hook shape. On the upper longitudinal edges of the slats 24, are inturned hook-like flanges 26, adapted to engage the beveled shoulders 21 and support said slats therefrom with their lower longitudinal edges overlapping the vertical flanges of the sills 5.

The lowermost opposite pair of slats 23 is supported directly on the flanges 26 of the slats 24 and the other of said slats 23 are supported, the one upon the other with the upper flanges of the uppermost opposite pair of said slats interlocked with the flanges of the ridge plate 22. The interlocking of the uppermost pair of slats 23 with the flanges of the ridge plate 22 assists in supporting said slats from the ridge plate and, at the same time, permits all of the slats 23 to move toward the center of the arch, upon the collapsing of the form. To prevent cement from filling in on the ridge plate 22 and thereby make it difficult to remove the same, and which would also prevent the slats 23 from moving toward the center of the arch, upon the collapsing of the form, I provide a cover plate 27. This cover plate 27 overlaps the joints between the ridge plate 22 and slats 23, and is supported in part from the ridge plate 22 by short legs 28, which directly engage said ridge plate.

In setting up the collapsible form, the sills 5 are first positioned on the sills 6. The arch bars 16 are then mounted on the tripping abutments 9 with the cables 15 extending outside of the space to be occupied by the arch. The last operation is to hang the slats 24 from the shoulders 21 and place the ridge plate 22 and slats 24 in position on the arch bar 16. It will thus be seen that the form may be very quickly set up in position to support the concrete or other materials from which the arch is to be formed.

After the arch is completed and the materials from which it is constructed properly set, the form may be removed by first drawing on the cables 15 to cause the collapse thereof. This movement of the cables 15 releases the tripping abutments 9 and permits the arch bar 16 to drop straight down, with respect to the formed arch, bearing brackets 7 and slats 24. In the downward movement of the arch bar 16, the ridge plate 22, slats 23 and cover plate 27 are carried therewith or, in case they should adhere to the arch, they may be readily removed. With the form collapsed, the same may be very quickly and easily removed from under the formed arch.

By adding a pair of angle brackets 29 to each arch bar 16, a substantially rectangular arch or opening may be formed. These angle brackets 29 have their lower ends loosely resting in the seats 20 and their upper ends removably mounted in the seats 19. The ridge plate 22 and slats 23 are supported on the brackets 29 in the same manner as on the arch bars 16, with the exception that the vertical members of the brackets 29 have short upwardly and outwardly projecting fingers 30 from which the lowermost opposite pair of said slats are hung. The two upper slats 23 are held in position against the vertical members of the brackets 29 by the depending flanges on the outer longitudinal edges of the overlying horizontal slats 23. By bending one of the flanges of each slat 23 inward, said slats are permitted to closely follow the outline of either of the arches shown in Figs. 1 and 4.

What I claim is:—

1. A collapsible form for use in the construction of arches including a tripping abutment, and an arch bar supported on the tripping abutment, said tripping abutment arranged to move from under the arch bar to permit the same to move straight down.

2. A collapsible form for use in the construction of arches comprising tripping abutments, arch bars supported on the tripping abutments, said tripping abutments having interlocking engagement with the arch bars for holding the same against transverse movement with respect to the arch, and side plates supported on the arch bars.

3. A collapsible form for use in the construction of arches including a tripping abutment, an arch bar supported on the tripping abutment, and means for releasing the tripping abutment, said tripping abutment arranged to move from under the arch bar to permit the same to move straight down.

4. A collapsible form for use in the construction of arches including a tripping abutment, an arch bar supported on the tripping abutment, a lock for the tripping abutment, and means for releasing the lock to render the tripping abutment inoperative, said tripping abutment arranged to move from under the arch bar to permit the same to move straight down.

5. A collapsible form for use in the construction of arches comprising tripping abutments, arch bars supported on the tripping abutments, latches for holding the arch bars in upright positions on the tripping abutments, means for releasing the tripping

abutments to permit the arch bars to lower and side plates supported on the arch bars.

6. A collapsible form for use in the construction of arches comprising tripping abutments, arch bars supported on the tripping abutments, latches for holding the arch bars in upright positions on the tripping abutments, said tripping abutments and latches having interlocking engagement with the arch bars to hold the same against transverse movement with respect to the arch, means for releasing the tripping abutments to permit the arch bars to lower, and side plates supported on the arch bars.

7. A collapsible form for use in the construction of arches comprising bearing brackets having tripping abutments, arch bars supported on the tripping abutments and against the bearing brackets, latches for holding the arch bars in upright positions on the tripping abutments and against the bearing brackets, means for releasing the tripping abutments to permit the arch bars to lower, and side plates supported on the arch bars.

8. A collapsible form for use in the construction of arches comprising bearing brackets having tripping abutments, arch bars supported on the tripping abutments and against the bearing brackets, gravity-held latches for holding the arch bars in upright positions on the tripping abutments and against the bearing brackets, means for releasing the tripping abutments to permit the arch bars to lower and move away from the latches, and side plates supported on the arch bars.

9. A collapsible form for use in the construction of arches comprising tripping abutments, arch bars supported on the tripping abutments, means for releasing the tripping abutments to permit the arch bars to lower, a ridge plate supported on the arch bars, side plates supported on the arch bars and interlocked with the ridge plate with freedom to move toward the center of the arch during the collapsing of the form, and a cover plate extending over the ridge plate and interlocked edges of the side plate.

10. A collapsible form for use in the construction of arches comprising a pair of longitudinal sills, bearing brackets on the sills and having tripping abutments, arch bars supported on the tripping abutments, said arch bars having at their lower extremities shoulders, side plates made up of a plurality of slats, the lowermost pair of which are hung from the shoulders on the arch bars and overlap the sills, means for releasing the tripping abutments to permit the arch bars to lower with respect to the side plates, the other of said side plates being supported on the lowermost pair of side plates with freedom to move toward the center of the arch during the collapsing of the form.

11. A collapsible form for use in the construction of arches comprising a pair of arch bars, and side plates on the arch bars made up of a plurality of slats having flanges at their longitudinal edges upon which the slats may rest, the one upon the other, one of the flanges of the abutting slats being bent inward, whereby the slats may be laid in the same plane or on a curve.

12. A collapsible form for use in the construction of arches comprising a segmental arch bar, and angle brackets detachably applied to the arch bar.

13. A collapsible form for use in the construction of arches including an arch member, and angle brackets detachably applied to the arch member.

In testimony whereof I affix my signature in presence of two witnesses.

GLENN A. COMPTON.

Witnesses:

CLARA DEMAREST,

HARRY D. KILGORE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."