Dec. 8, 1925. 1,564,889

H. A. ORLOPP ET AL

FORM TIE AND SPACER CONSTRUCTION

Filed Nov. 6, 1923

Fig. 1

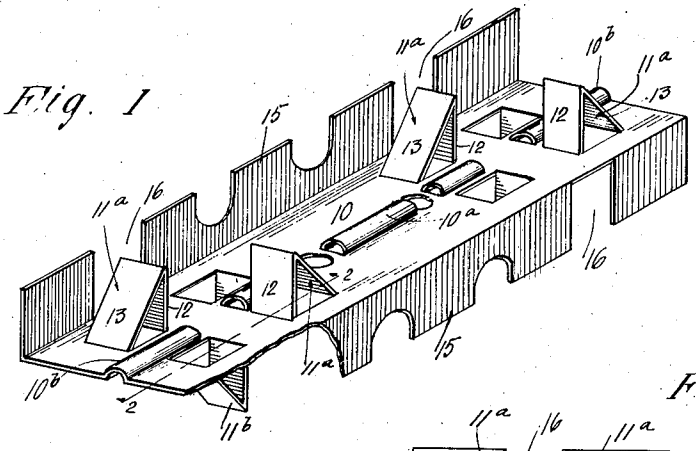



Fig. 2.

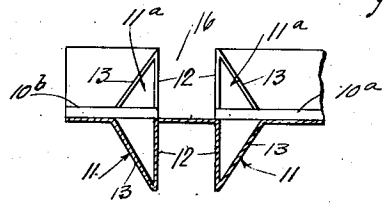



Fig. 3.

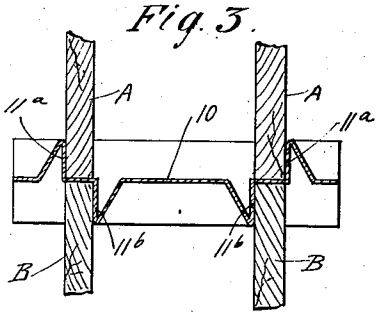



Fig. 4.

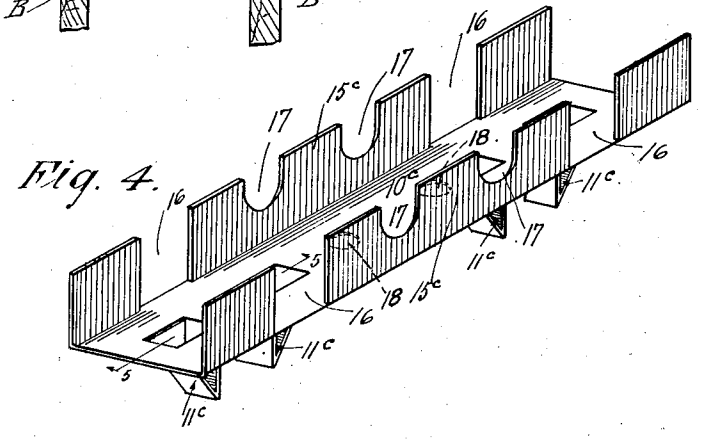
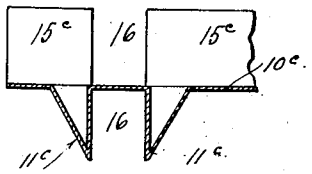



Fig. 5.




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by
their Attorney.

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# UNITED STATES PATENT OFFICE.

HARRY A. ORLOPP, OF VENICE, AND DAVID BAKER SMITH, OF LOS ANGELES, CALIFORNIA; SAID ORLOPP ASSIGNOR TO SAID SMITH.

## FORM TIE AND SPACER CONSTRUCTION.

Application filed November 6, 1923. Serial No. 673,062.

*To all whom it may concern:*

Be it known that we, HARRY A. ORLOPP and DAVID BAKER SMITH, citizens of the United States, residing at Venice and Los Angeles, respectively, in the county of Los Angeles and State of California, have jointly invented new and useful Improvements in Form Tie and Spacer Constructions (#5), of which the following is a detailed description.

This invention relates to tie and spacer devices of the kind shown and described in our issued Patent #1,468,790, dated September 25th 1923, and in our co-pending application Serial No. 651,813, filed July 16th, 1923, now Patent No. 1,491,413; a general object of the present invention is to provide a simple and inexpensive form of tie and spacer device applicable for use in the erection of forms for concrete or the like. It is also an object to provide a device that may be expeditiously and easily applied and that will save time and labor in the erection of concrete and like forms.

Other objects and corresponding accomplishments of the invention will be best understood from the following detailed description and for that purpose we refer to the accompanying drawings in which:

Fig. 1 is a perspective showing one form of our improved tie and spacer device;

Fig. 2 is a detailed section on line 2—2 of Fig. 1;

Fig. 3 is a small cross-section showing the application of the device to the boards of the concrete form;

Fig. 4 is a perspective showing another typical form of device; and

Fig. 5 is a detailed section on line 5—5 of Fig. 4.

Our devices are designed to be best and most economically made of sheet metal; but it will be understood that they may be made in other manners, as for instance, of cast metal, without departing from the invention. Likewise, it will be understood that although for the purposes of this description, we refer to the devices as being applied to form boards, they may be applied to any other elements, such as plates or the like, that make up the confining walls of a concrete form. And likewise, although we described the devices in their positions as applied to and between horizontally extending boards laid edge on edge above each other; it will be understood that the devices may be applied in any required or suitable position. For instance, Fig. 3 may as well be a horizontal section as a vertical section.

In the form of Fig. 1 we show a metal plate 10 with form board engaging shoulders 11 struck up in opposite directions from the plate, as will be best understood from a consideration of the drawings. For instance, say from the two shoulders $11^a$ (describing now the formation of one end of the plate, the formation of the opposite end being a duplicate) by striking them up to stand above the plate 10 and to engage the upper boards A; and we preferably arrange these two shoulder portions $11^a$ in staggered formation as illustrated. The two other shoulders $11^b$ are struck up to project down from the plate and to engage the lower boards B between them; these two shoulders being also arranged in staggered relation. When the device is applied to the form boards, the plate 10 lies between the substantially abutting edges of the board; and although we have not found it necessary in a good many cases, if desired, the boards may be slightly notched at the places where the plates are applied so that their edges may be in actual abutment if desired.

Each of the shoulders $11^a$ has a perpendicular face part 12 and a rear diagonal bracing part 13, so that the shoulders are strongly supported and are capable of holding the boards rigidly, tightly, and accurately in place.

In order to stiffen the plate 10 and to give it compressive strength to hold the form boards rigidly apart under any strains that might tend to move them toward each other, we may provide the plate 10 with edge flanges 15. These flanges 15 are shown in Fig. 1 to extend in opposite directions from the opposite longitudinal edges of the plate 10. Although they might extend both in the same direction from the opposite edges, this particular disposition of the flanges as shown in Fig. 1 allows the flanges to have form board receiving notches 16, so that one flange will receive the edge of the lower board and the other flange will receive the edge of the upper board. Thus, this flange structure not only strengthens plate 10 but also gives an additional bearing on the boards. In case no great compressive strength is required in the device, the side flanges 15 may

be omitted; and we then have a very simple tie device, with a certain amount of compressive strength sufficient for many purposes, but with a great tensile strength to resist outward pressure on the form boards due to interior pressure of concrete. And in such a device, or in the form of Fig. 1, the compressive strength may be materially increased without the use of extra metal and without the necessity of any additional forming or stamping operations, by longitudinally beading the plate 10 as for instance is indicated at $10^a$. And a longitudinal part at $10^b$ in the end parts of the plate outside the outer face of the form boards, will materially strengthen the end part against deformation due to the outward pressure of the form boards. These beadings may be used whether or not flanges 15 are used.

In Fig. 4 we show another form of device wherein such shoulders as hereinbefore described are used at $11^c$ projecting from only one face of plate $10^c$ to engage, say, the lower boards B; and wherein two flanges $15^c$ extend above plate $10^c$ and have board receiving notches 16 to engage the upper boards A. The structure here will otherwise be apparent in its details and operation from what has been said before regarding the form of Fig. 1. In either form the flanges may have reinforcing rod receiving openings or notches 17, while plate 10 may have holes 18 for passage of vertical reinforcing rods.

The characteristic feature of the subject matter of this application is the board engaging shoulders formed substantially as described. The feature of flanges with board receiving notches is the characterictic feature of a co-pending application filed on even date herewith Serial No. 673,060. In that application the board receiving flanges are claimed; while in this present application it is only the combination of such flanges with the shoulders that enters into a part of the claims.

Having described a preferred form of our invention, we claim:—

1. A spacer and tie device for concrete or like forms, embodying a flat metal plate with struck up portions forming braced shoulders for engaging the edges of form boards or the like, said shoulders extending from opposite faces of the plates.

2. A tie and spacer device for concrete forms and the like, comprising a metal plate having form board engaging shoulders, some of which are formed by struck up portions from the plate forming projecting braced shoulders, and others of which are formed by notches in turned flange portions of the plate.

3. A tie and spacer device for concrete or like forms, comprising a flat metal plate with flanges at its opposite edges, such flanges having form board receiving notches therein, and form board engaging shoulders struck up from the plate with a board engaging part substantially perpendicular to the plate and a diagonal brace part behind the board engaging part.

4. A spacer and tie device for concrete or like forms, embodying a flat metal plate with a longitudinal ridge having notches for receiving the edges of form boards or the like, and board engaging shoulders struck up from the plate.

In witness that we claim the foregoing we have hereunto subscribed our names this 1st day of November, 1923.

HARRY A. ORLOPP.
DAVID BAKER SMITH.