May 14, 1929. E. L. SOULÉ 1,713,100

ADJUSTABLE END FORM

Filed March 19, 1927 2 Sheets-Sheet 1

Fig. 1.

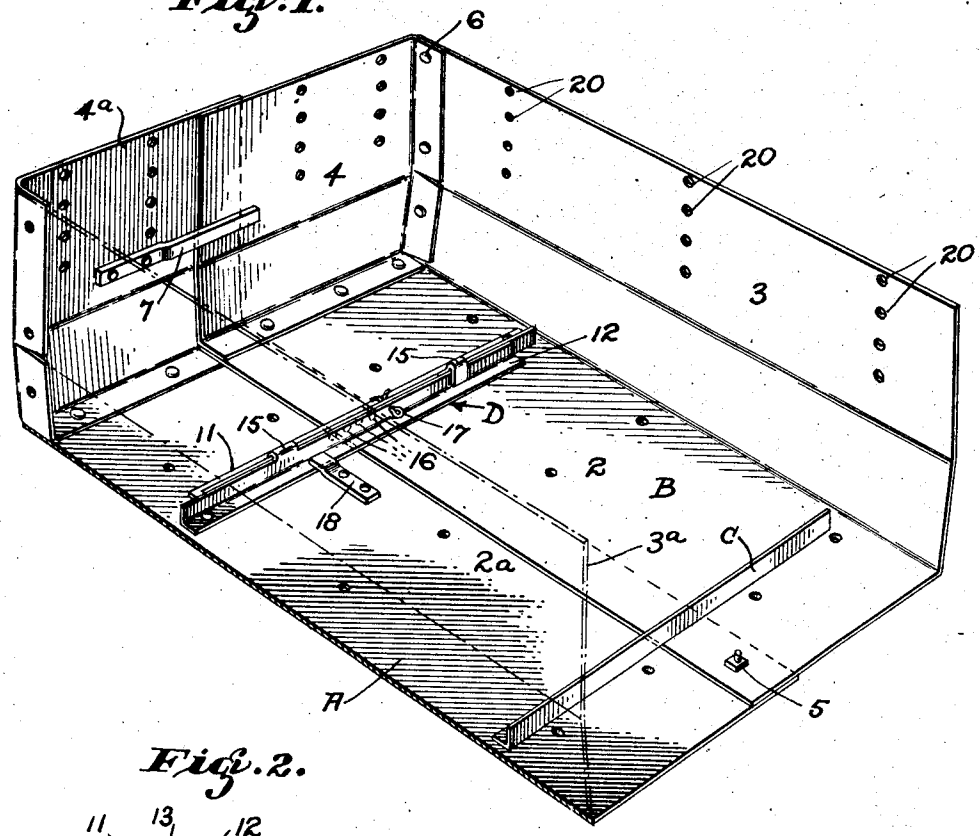
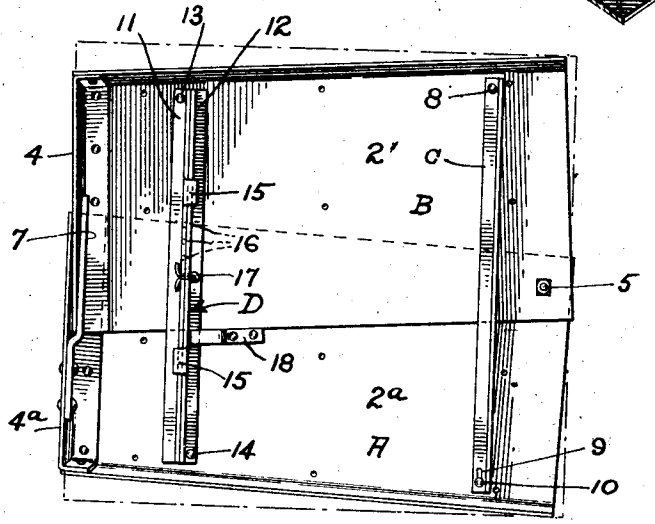


Fig. 2.



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Fig. 3.

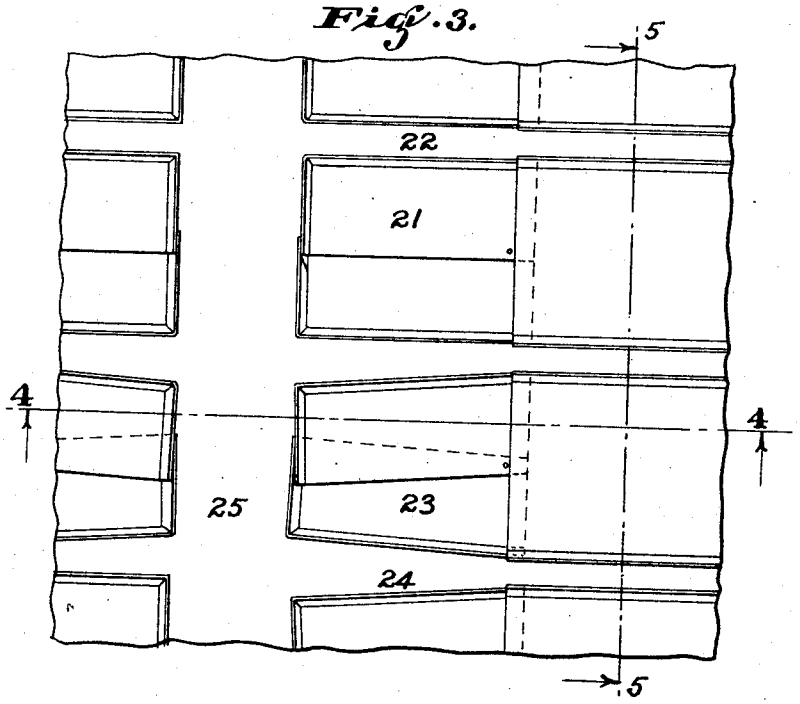


Fig. 4.

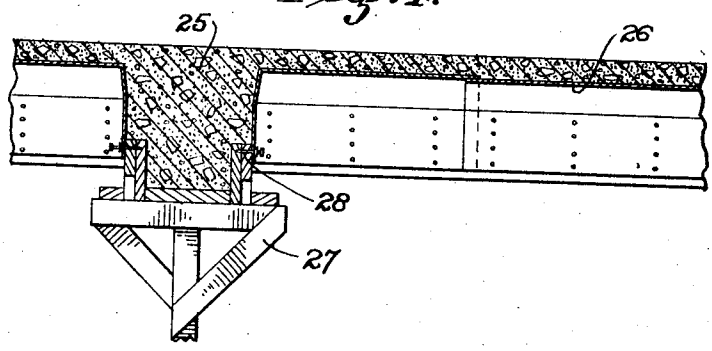
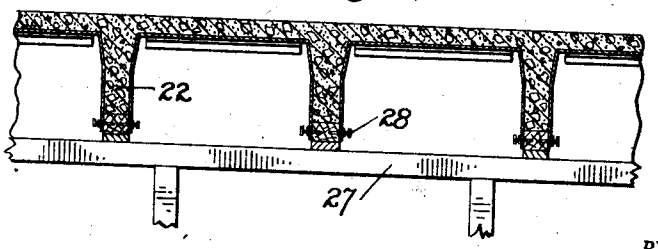


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ADJUSTABLE END FORM.

Application filed March 19, 1927. Serial No. 176,603.

This invention relates to steel forms such as used in concrete floor structures and especially to an adjustable form.

In the art of concrete floor construction the floor proper is usually supported by girders which in turn are connected sideways by a series of joists, the girders, joists and overlying floor being formed integrally of concrete and the girders commonly having metal reinforcing rods lying in and lengthwise of the lower or tension region thereof. The steel forms or moulds employed are usually channel or U-shaped in cross-section and inverted. The concrete is poured over the forms which extend from girder to girder and are so positioned with respect to each other that the joists are formed between the adjacent sides of spaced rows of forms, the end form of each row having a vertical or substantially vertical end wall which provides a portion of the side wall of the girder. In some instances, the joists are gradually widened or thickened as they merge into the girder so as to reinforce their points of junction and to provide a greater width for vertical shear.

The present invention relates to the end forms whereby the point of juncture between the joists and the girder is obtained, the object being to construct an end form which is adjustable to increase or decrease thickening or widening of the joists at the point of junction with the girder, to provide an end form which is adjustable as to height or depth of girder, to provide a rigid locking mechanism whereby the end form is substatnially secured when adjusted and further to provide means for stiffening the end form, to prevent collapse or change of adjustment while the concrete is being poured.

One form which the end form may assume is shown by way of illustration in the accompanying drawings in which:

Fig. 1 is a perspective view of the end form showing one side of the form in dotted lines,

Fig. 2 is a bottom view of the end form showing the stiffening and locking mechanism whereby the end form is secured when adjusted to form a tapering or thickened end on the end of a joist,

Fig. 3 is a plan view of a series of end and intermediate forms showing their position and the matter of positioning the same to form the girder and the joist,

Fig. 4 is a cross-section taken on line 4—4, Fig. 3,

Fig. 5 is a cross-section taken on line 5—5, Fig. 3.

Referring to the drawings in detail and particularly Figs. 1 and 2, it will be noted that the end form is constructed of two main sections such as indicated at A and B. The section B consists of a top section 2, a side section 3 and an end section 4. The section A similarly consists of a top section 2^a, a side section 3^a indicated by dotted lines and an end section 4^a. The sections A and B are substantially identical in construction. They are pivotally connected at the open end as indicated at 5. By placing the section B on top of the section A and by placing the end section 4 interior of the end section 4^a, adjustment of the closed end to produce a tapering form may be obtained. The end sections 4 and 4^a may be formed integral with the side and top sections 2, 3, 2^a and 3^a or they may be formed from separate material and riveted thereto as shown at 6 in Fig. 1. The end sections 4 and 4^a are secured and maintained in contact with relation to each other by means of a clip such as indicated at 7. The top sections 2 and 2^a are secured in contact with each other by means of cross-bars generally indicated at C and D. The bar C may be constructed of angle iron or like material so as to produce stiffness and rigidity. It is pivotally secured to the top section A at one end as indicated at 8 and it is slotted at the opposite end as indicated at 9 and is secured to the top section 2^a by means of a headed pin or rivet 10, the reason for slotting the bar C being to permit pivotal movement of the two form sections when adjusting them to assume a tapering position as shown in Fig. 2. The bar D is also preferably constructed of angle iron. It consists of two sections such as indicated at 11 and 12. The section 11 is pivotally secured as at 13 to the top section 2 while the bar 12 is pivotally secured to the top section 2^a as at 14. The bars lie parallel as shown and they are secured against separation by bent interlocking tongues or lugs such as shown at 15. The bars 11 and 12 are freely movable longitudinally with relation to each other when the form sections are swung about the pivot 5 and both bars are provided with a series of perforations 16 to receive a cotter pin 17 or the like which may be passed through the perforations to lock the bars against endwise movement. The top section 2^a is also provided with a stop lug 18 which limits endwise

movement on the form sections with relation to each other.

The top and side sections 2, 2ª, 3 and 3ª respectively are adapted to assume a position in parallelism with relation to each other as shown in Fig. 1 and as shown by a dotted line in Fig. 2. This position is maintained by inserting the cotter pin 17 through the perforations 16 which will be in register with each other at that point of adjustment. The top and side sections may also assume angular positions with relation to each other as shown in full lines in Fig. 2 when a tapering end on a joist is desired. The angular position on the mould sections assumes a maximum when the top section 2 abuts the stop lug 18. The form sections may here be locked with relation to each other by inserting the cotter pin 17 through the perforations 16 which are so arranged as to register when this adjustment is obtained. A number of perforations are employed and many intermediate adjustments may be obtained between the parallel positions and a maximum position as a number of perforations 16 are provided which permits locking of the form sections at any point desired. The bars 11 and 12 form two functions, first, that of adjusting and securing the form sections either in parallelism or in an angular position with relation to each other. Secondly, they form the function of stiffening and supporting the top sections when the concrete is being poured. The bar C cooperates with the bars 11 and 12 and in that instance to further stiffen the form sections. It should also be noted that the side and end sections are perforated at different elevations as indicated at 20. This is important as it permits vertical adjustment of the form sections to produce beams or girders of different height or depth and also to increase or decrease the floor thickness. The use of the floor form is best illustrated in Figs. 3, 4 and 5. In Fig. 3 one of the end forms is indicated at 21. It will here be noted that they assume a parallel position and that the end of the joist indicated at 22 is in that instance left parallel and unthickened throughout its length. If the end form is adjusted as shown at 23, the end of a joist indicated at 24 will be tapered and thickened where it joins the girder 25. Figs. 4 and 5 merely illustrate the manner of supporting the end forms and intermediate forms 26 with relation to the temporary scaffolding or underpinning generally indicated at 27. Fig. 4 in addition illustrates a wooden bottom form for the girder 25, said bottom form also forming a support for the end forms as the end forms are nailed or otherwise secured thereto as indicated at 28.

1. As a brief summary it might be stated that the end forms can be locked to produce a standard end form of uniform width.

2. The form can be used as a tapered end with open end fixed and closed end adjustable as to width.

3. The taper or adjustment can be made of any magnitude between a parallel position of the sides and a maximum taper.

4. By nailing the forms through the ends and sides it is possible to quickly position and rigidly support the same.

5. It also becomes possible to adjust the forms vertically to increase or decrease the height or depth of the beams and the thickness of the floor.

6. By employing the stiffening bars C and D, collapse and change of adjustment is prevented when concrete is being poured.

7. The use of a form of this character decreases the amount of equipment required for any one job and as such produces material economy in cost and in the amount of material required for form work.

While certain features of the present invention are more or less specifically described and indicated, I wish it understood that various changes may be resorted to within the scope of the appended claims; similarly, that the materials and finish of the several parts employed may be such as the manufacturer may dictate or varying conditions or uses may demand.

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

1. A concrete form of the character described which is elongated and substantially channel shaped in cross-section, said form being divided longitudinally in two halves and said halves being pivotally connected at one end and one half form overlapping the other to permit the opposite end to be swung about the pivot from a parallel position to assume an angular position and an end plate on each half form, said end plates also overlapping each other to permit said angular adjustment.

2. A concrete form of the character described which is elongated and substantially channel shaped in cross-section, said form being divided longitudinally in two halves and said halves being pivotally connected at one end and one half form overlapping the other to permit the opposite end to be swung about the pivot from a parallel position to assume an angular position and an end plate on each half form, said end plates also overlapping each other to permit said angular adjustment and means whereby the two half forms may be secured with relation to each other when adjusted.

3. A concrete form consisting of two half forms and each half form consisting of a top, a side and an end section, a pivot connecting the top sections of the respective half forms at one end, the top and end section of one form overlying the top and end section of the other half form to permit the re-

spective half forms to be swung about the pivot to assume an angular position with relation to each other and means whereby the two half forms may be secured with relation to each other either with the side and top sections parallel or when adjusted to assume an angular position with relation to each other.

4. A concrete form consisting of two half forms and each half form consisting of a top, a side, and an end section, a pivot connecting the top sections of the respective half forms at one end, the top and end section of one form overlying the top and end section of the other half form to permit the respective half forms to be swung about the pivot to assume an angular position with relation to each other, a pair of bars disposed crosswise of the top sections of the respective half forms, one bar being pivotally connected at one end to one half form and the other bar being pivoted at the opposite end to the other half form, means maintaining the bars in parallelism with relation to each other, said means permitting longitudinal movement of the bars with relation to each other and a locking member cooperating with the bars to secure the respective half forms with relation to each other when assuming a parallel position and also when assuming an angular position.

5. A concrete form consisting of two half forms and each half form consisting of a top, a side and an end section, a pivot connecting the top sections of the respective half forms at one end, the top and end section of one form overlying the top and end section of the other half form to permit the respective half forms to be swung about the pivot to assume an angular position with relation to each other, a pair of bars disposed crosswise of the top sections of the respective half forms, one bar being pivotally connected at one end to one half form and the other bar being pivoted at the opposite end to the other half form, means maintaining the bars in parallelism with relation to each other, said means permitting longitudinal movement of the bars with relation to each other, said bars having a plurality of perforations adapted to register and a locking member insertable through the perforations to lock the bars and the respective half forms with relation to each other when assuming a parallel position and also when assuming an angular position.

6. A concrete form consisting of two half forms and each half form consisting of a top, a side and an end section, a pivot connecting the top sections of the respective half forms at one end, the top and end section of one form overlying the top and end section of the other half form to permit the respective half forms to be swung about the pivot to assume an angular position with relation to each other, a pair of bars disposed crosswise of the top sections of the respective half forms, one bar being pivotally connected at one end to one half form and the other bar being pivoted at the opposite end to the other half form, means maintaining the bars in parallelism with relation to each other, said means permitting longitudinal movement of the bars with relation to each other and a locking member cooperating with the bars to secure the respective half forms with relation to each other when assuming a parallel position and also when assuming an angular position and means for maintaining the end sections of the respective half forms in engagement with each other, said means permitting movement of the end sections with relation to each other.

7. A concrete form consisting of two half forms and each half form consisting of a top, a side and an end section, a pivot connecting the top sections of the respective half forms at one end, the top and end section of one form overlying the top and end section of the other half form to permit the respective half forms to be swung about the pivot to assume an angular position with relation to each other, a pair of bars disposed crosswise of the top sections of the respective half forms, one bar being pivotally connected at one end to one half form and the other bar being pivoted at the opposite end to the other half form, means maintaining the bars in parallelism with relation to each other, said means permitting longitudinal movement of the bars with relation to each other and a locking member cooperating with the bars to secure the respective half forms with relation to each other when assuming a parallel position and also when assuming an angular position and means for maintaining the end sections of the respective half forms in engagement with each other, said means permitting movement of the end sections with relation to each other and said forms having a plurality of vertically arranged perforations formed in their sides and end sections to permit the form as a whole to be nailed to a scaffold support.

8. A concrete form consisting of two half forms and each half form consisting of a top, a side and an end section, a pivot connecting the top sections of the respective half forms at one end, the top and end section of one form overlying the top and end section of the other half form to permit the respective half forms to be swung about the pivot to assume an angular position with relation to each other, a pair of bars disposed crosswise of the top sections of the respective half forms, one bar being pivotally connected at one end to one half form and the other bar being pivoted at the opposite end to the other half form, means maintaining the bars in parallelism with relation to each other, said means permitting longitudinal movement of the bars with relation to each other and a locking member cooperating with the bars to secure the respec-

tive half forms with relation to each other when assuming a parallel position and also when assuming an angular position and means for maintaining the end sections of the respective half forms in engagement with each other, said means permitting movement of the end sections with relation to each other and a bar extending crosswise of the two half forms at a point adjacent the pivotal end of the forms, said bar being pivotally connected at one end to the top section of one half form and being slidably and pivotally connected at the opposite end to the top section of the other half form and means for limiting angular adjustment of the two half forms beyond a point of maximum adjustment.

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