Dec. 15, 1931. E. L. SOULÉ 1,836,197

FLOOR FORM AND SUPPORT

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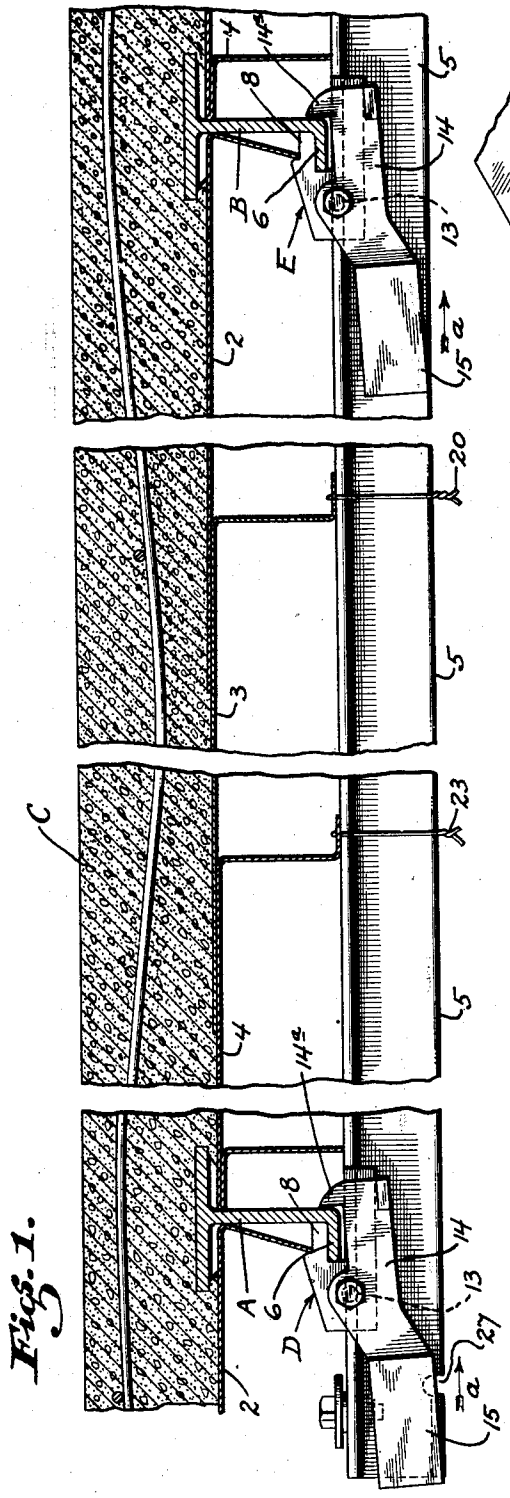


Fig. 1.

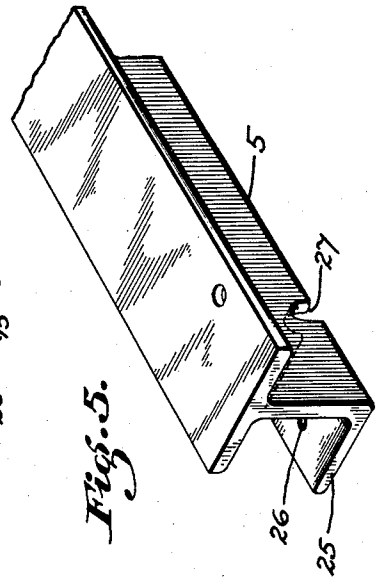


Fig. 5.

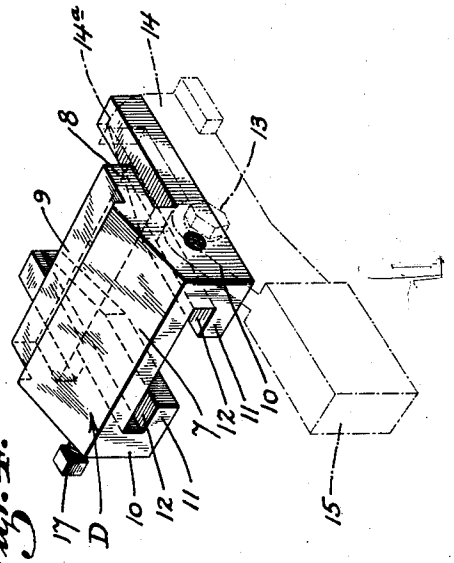


Fig. 4.

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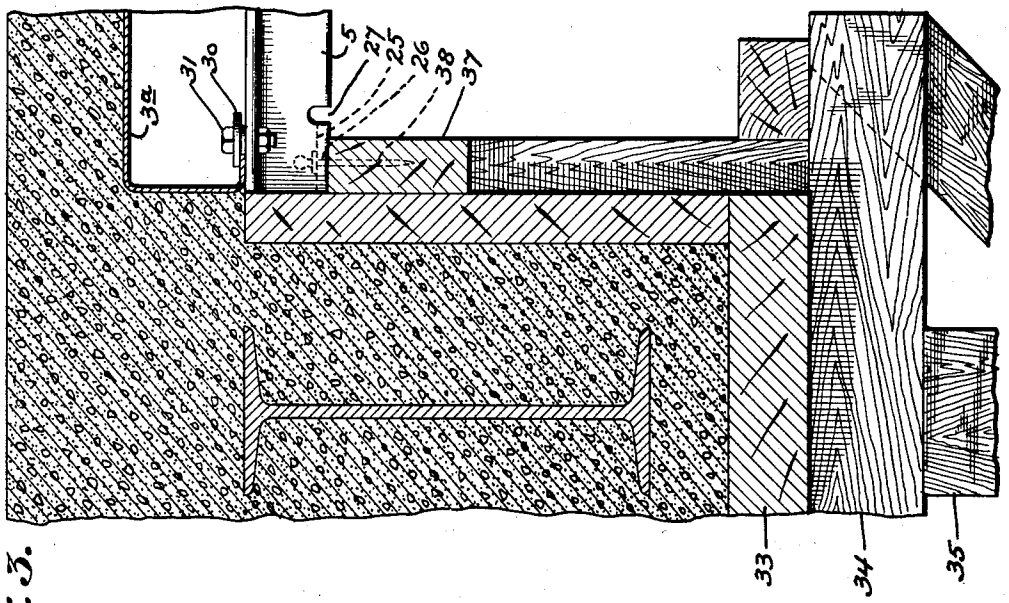


Fig. 5.

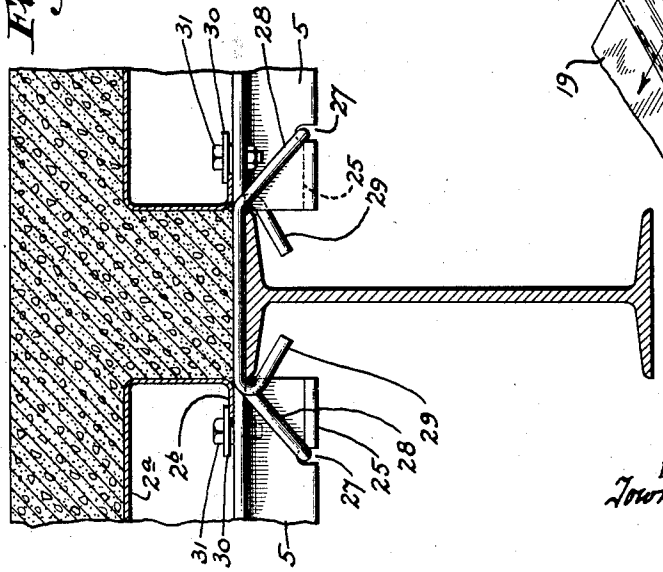


Fig. 2.

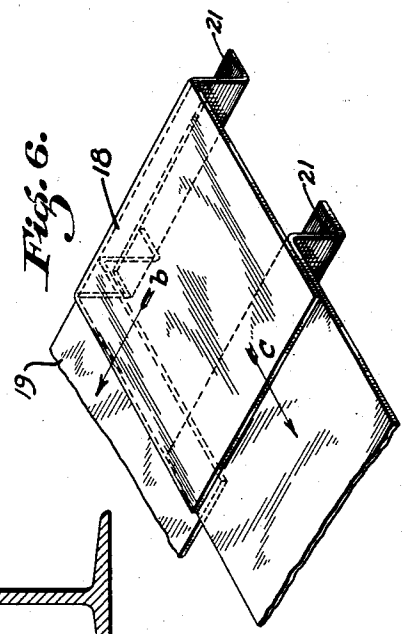


Fig. 6.

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UNITED STATES PATENT OFFICE

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FLOOR FORM AND SUPPORT

Application filed October 10, 1928. Serial No. 311,507.

This invention relates to a floor form upon which concrete slabs are cast, and especially to a support for the floor form.

In modern buildings, whether steel or concrete, the floor structure usually consists of reinforced concrete slabs which are supported by girders, beams or joists. The concrete floor slabs are poured during the construction of the building and numerous types of forms have been employed, both wood and steel, to support the concrete when it is being poured. Steel forms are being used more and more as the waste of lumber in wooden forms is too great and costly. However, due to great differences in span and length of floor beams in different buildings, it is often necessary to resort to wooden forms as the steel forms are not always sufficiently adjustable to accommodate all conditions.

The object of the present invention is to generally improve and simplify the construction and operation of steel floor forms, to provide a form and support therefor which is adjustable to take care of all variations in span, and length between the floor beams, to provide a steel form which is adjustable both laterally and longitudinally so as to take care of any change in span between the beams, or any change in length, and further to provide a rigid support for the steel forms which is adapted to be quickly attached to the floor beams when the forms are to be placed in position, and just as quickly and readily removed when the concrete has been poured and set.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a vertical section of a floor slab showing the position of the floor forms and the support with relation to the beams in the floor,

Fig. 2 shows the manner of supporting the floor forms with relation to a floor beam where fireproofing is not required,

Fig. 3 shows the manner of supporting the floor form where fireproofing of the floor beam is required,

Fig. 4 is a perspective view of a supporting bar clamp,

Fig. 5 is a perspective view of one end of the supporting bar.

Fig. 6 is a perspective view showing the manner of overlapping the floor forms for longitudinal and lateral adjustment.

Referring to the drawings in detail particularly to Fig. 1, A and B indicate a pair of interspaced floor beams, and C a reinforced concrete floor slab supported thereby. The floor forms which support the floor slab when the concrete is being poured are indicated at 2, 3 and 4. Means for supporting the floor forms are indicated at 5. The means employed will hereinafter be referred to as the supporting bar. It is T-shaped in construction and may be as long as desired. It is provided with one or more clamps, generally indicated at D and E. These clamps are slidably mounted on the supporting bar 5 and they engage the lower flange 6 of the floor beams A and B, thus securing the bar with relation to the beams. The bar in turn forms a support for the floor forms indicated at 2, 3 and 4 and the concrete may thus be poured to form the slab indicated at C.

One of the clamps is illustrated in perspective, see Fig. 4. It consists of a top section 7, which is extended to form a clamping flange 8, and an upper shoulder 9. It is provided with side sections 10, 10 and these side sections are inturned, as at 11, to form channels 12, which engage and support the clamp with relation to the head of the T-bar 5. Pivotally mounted as at 13 on one side of the clamp is a latch 14. This latch is free to pivot at the point 13, and is provided with a counter-weight 15, which serves the function of automatically swinging the latch 14 into engagement with the opposite side of the beam, as shown in Fig. 1, the function of the latch being that of retaining and securing the clamp as a whole against endwise movement on the supporting bar when it has been brought into engagement with the lower flange 6 of a beam. The forward face of the latch is inclined, as indicated at 14*a*, this inclined face serving the function of automatically depressing the latch as it passes over the base flange of the beam, but when it passes the counter-weight raises the latch and

thus automatically locks the clamp with relation to the beam.

In actual operation, a series of supporting bars 5 are placed beneath the floor beams A and B, as shown in Fig. 1. The clamps D and E are slid longitudinally of the bars in the direction of arrow *a*. This causes the lugs 8 of the respective clamps to engage the lower flange 6 of the beams, and it also causes depression of the retaining latches and final engagement of the same, due to the action of the counter-weights 15.

When the clamps are engaged the bars 5 may be secured if desired by tightening up set screws 17 mounted in the sides of the clamps. The whole supporting structure is thus rigidly secured to the floor beams. The floor forms 2, 3 and 4 are next placed in position as shown. These forms are laterally adjustable as they overlap each other, and they are also longitudinally adjustable as they overlap each other end for end, as clearly shown in Fig. 6, that is, the form section indicated at 18, overlies the form section 19, and these may accordingly be adjusted longitudinally in the direction of arrow *b* to suit any variation, or to fit any change in length of beams. The lateral adjustment caused by the overlap indicated by the arrow *c* takes care of any difference in span between beams.

After the floor forms have been placed in position they may be secured by wires, such as indicated at 20, see Fig. 1. That is, the base sections of the floor forms are perforated as at 21, see Fig. 6 and wires may thus be passed through the perforations and around the bars 5, thus securing the form sections against movement once they have been placed. The endmost form section indicated at 2 engages the shoulder 9 and it is thus secured between the shoulder and the side of the beam, and as such is also held against displacement, the end form shown at 4 being secured by wiring as indicated at 23.

The clamps D and E are only employed when the supporting bars 5 are attached to the lower flanges 6 of the beams, and especially when a floor beam of J section is employed, as shown in Fig 1. The supporting bars may, however, be supported above the beams, for instance as shown in Fig. 2. By referring to Fig. 5 it will be noted that the end of the supporting bar is provided with a foot extension 25, which is perforated as at 26, and it should also be noted that it is provided with a notch, as indicated at 27. This notch is required when the supporting bars are placed in the position shown in Fig. 2. A wire or rod hanger, such as shown at 28 is placed in the notch 27 and the opposite end is passed over the top flange of the I-beam, as indicated at 29. The hanger thus forms a rigid support for the bar 5 and this in turn can then support the floor forms, for instance, as indicated at 2*a*. This particular form is provided at its base with an inturned flange 2*b*, and this may be clamped against movement by a washer 30, which is held in clamping engagement therewith by means of a bolt and nut, such as shown at 31.

The method of supporting the bars 5 and the floor forms illustrated in Fig. 2 is only employed where fireproofing of the floor beams is not required.

By referring to Fig. 3 the manner of supporting the fireproof beam structure is shown. In such a structure, wooden forms are employed, as indicated at 33, these being supported in the usual manner by a cap 34 and a post 35. The side of the form will, in this instance, provide a support for the bar 5, and the floor form indicated at 3*a*. The foot extension shown at 25 in Fig. 5 is required in this instance. The foot extension is placed on a ledge 37 and nailed thereto, as indicated at 38. When so supported the floor forms indicated at 3*a* are placed in position and they are there secured by a washer 30 and bolt and nut 31, as described in connection with Fig. 2.

From the foregoing it will be noted that the bar 5 may be employed in conjunction with different floor structures, the type shown in Fig. 1, and the type shown in Figs. 2 and 3. In Figs. 1 and 2 the supporting bars are secured directly to the floor beams, while in Fig. 3 the supporting bars are supported by wooden forms or the like.

The advantages of the floor form and support described are:

1. They provide adjustability for different spans between trusses or beams.

2. They are also adjustable for varying lengths of beams,

3. The bars 5, no matter how they are attached, provide a rigid support for the floor form,

4. The floor form and support when employed, as shown in Figs. 1 and 2 eliminates shoring.

5. When the supporting bars are attached to the beams, as shown in Fig. 1 the clamps are automatically locked in position by merely sliding them along the supporting bars until engagement is made with the base flanges of the beams.

6. The supporting bars are easily and quickly placed in position.

7. The supporting bars and floor forms are of such size as to be easily handled when placing them in position or removing them.

8. By employing the bolts and nuts indicated at 31 at opposite ends of the supporting bars, the clamps D and E are secured against removal, thereby avoiding loss of parts.

9. The supporting bars may be of any length. They may cover a span between two floor beams or they may be extended to cover two or more beams if desired.

10. The clamps are provided with latches which automatically swing to locking position with relation to the floor beams when the clamps are applied and the latches may here be locked in their engaged position by tightening the pivot bolts 13. The clamps as a whole may in turn be locked to the bars by means of the set screws 17.

11. The supporting bars may also be attached to the floor beams without the clamps, as illustrated in Fig. 2, by merely notching the ends of the bars and supporting them by means of hangers as shown.

12. By providing foot extensions 25 on the ends of the supporting bars, they may be attached to bearing walls or to molds as shown in Fig. 3.

13. By referring to Figs. 1 and 4, it will be noted that the side sections of the clamp are extended beyond the latch 14 and they thus present a projection which may be struck by a hammer or like tool to cause release of the clamps if they should accidently become wedged or otherwise secured. In this connection it might also be stated that the latch is provided with a lug 14*a* so that this may also be struck with a hammer or like tool to release it should it become wedged.

14. By referring to Figs. 1 and 4, it will be noted that a liberal spacing is formed between the side sections of the clamps and the supporting flange 8, hence providing sufficient space to take care of flanges of varying thickness of cross section.

15. Means such as the washers 30, and clamping bolts 31 are employed for securing the end forms against displacement and by perforating the base flanges of the intermediate form sections it is possible to wire the same to the supporting bars and thereby secure them against displacement.

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

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

1. The combination with the beams of a floor structure of a plurality of supporting bars disposed below the lower flanges of the beams, clamping members carried by the bars and longitudinally adjustable thereon; said clamping members engaging the lower flanges of the beams to secure the bars to the beams; locking means carried by the clamps and adapted to automatically lock the clamps to the flanges of the beams; and floor forms supported by the bars between the beams.

2. The combination with the beams of a floor structure of a plurality of supporting bars disposed below the lower flanges of the beams; clamping members carried by the bars and longitudinally adjustable thereon; said clamping members engaging the lower flanges of the beams to secure the bars to the beams; a pivotally mounted latch on each clamp; means on each latch for automatically swinging it upwardly into locking engagement with relation to the flanges of the beams; and floor forms supported by the bars between the beams.

3. The combination with the beams of a floor structure of a plurality of supporting bars disposed below the lower flanges of the beams; clamping members carried by the bars and longitudinally adjustable thereon; said clamping members engaging the lower flanges of the beams to secure the bars to the beams; a pivotally mounted latch on each clamp; and a counter-weight on each latch adapted to automatically swing the latches upwardly into locking engagement with the flanges of the beams; and floor forms supported by the bars between the beams.

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