June 19, 1951 H. G. SACHLEBEN ET AL 2,557,693

ADJUSTABLE CONCRETE FORM SPREADER

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Fig. 2.

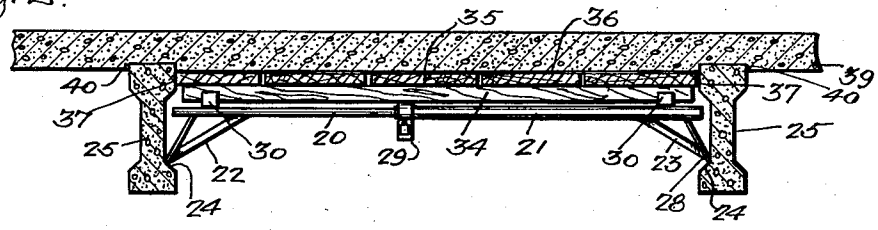


Fig. 1.

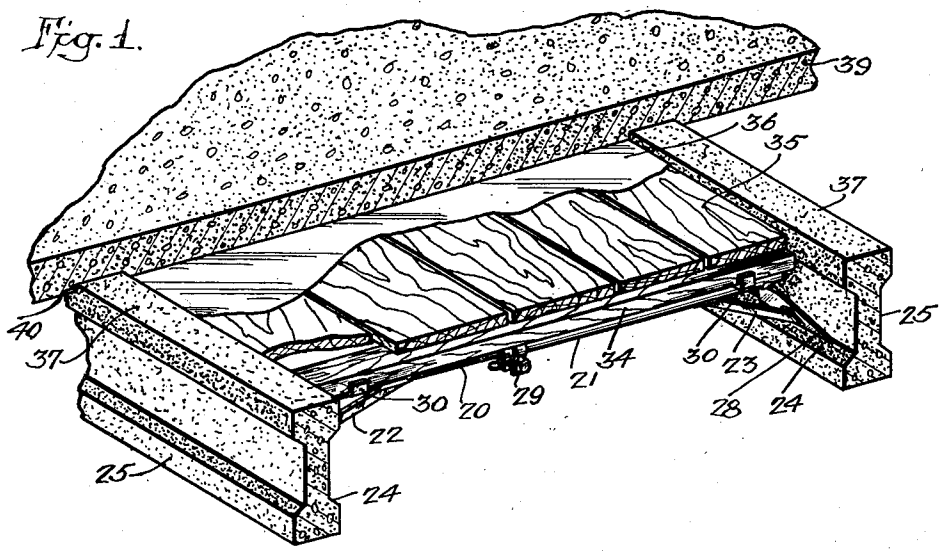


Fig. 3.

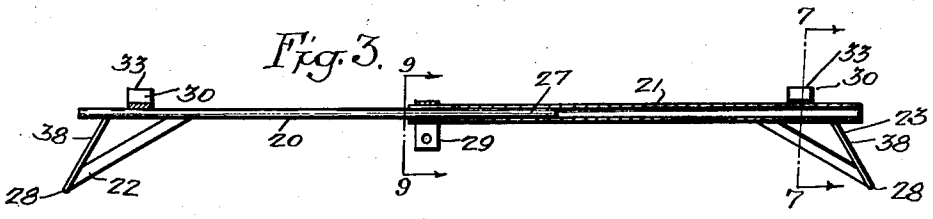
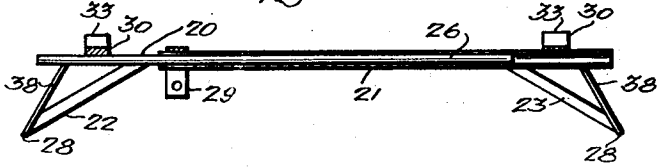


Fig. 4.



Inventors.
Harold G. Sachleben
Nicholas Sachleben
by Dorsett, Jackson & Gauger
Attorneys.

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Fig. 7.

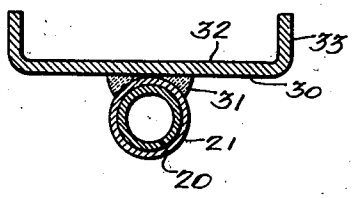


Fig. 7a

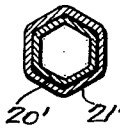
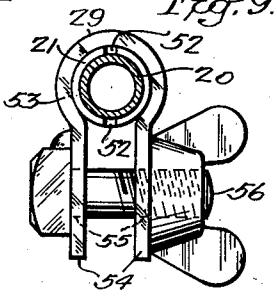


Fig. 9.



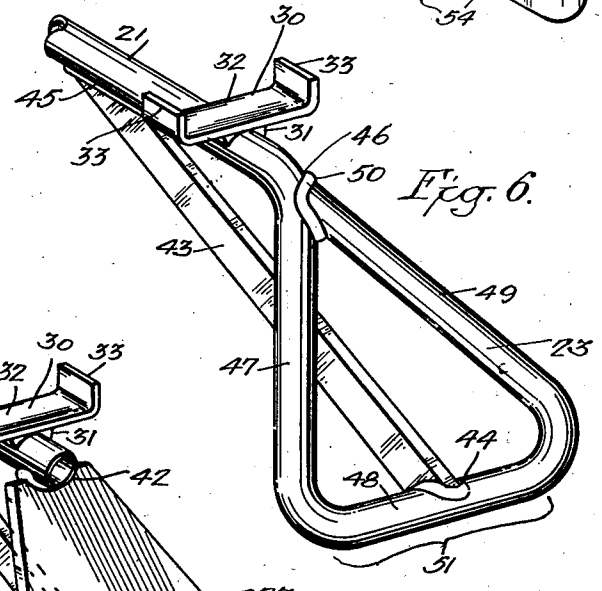


Fig. 6.

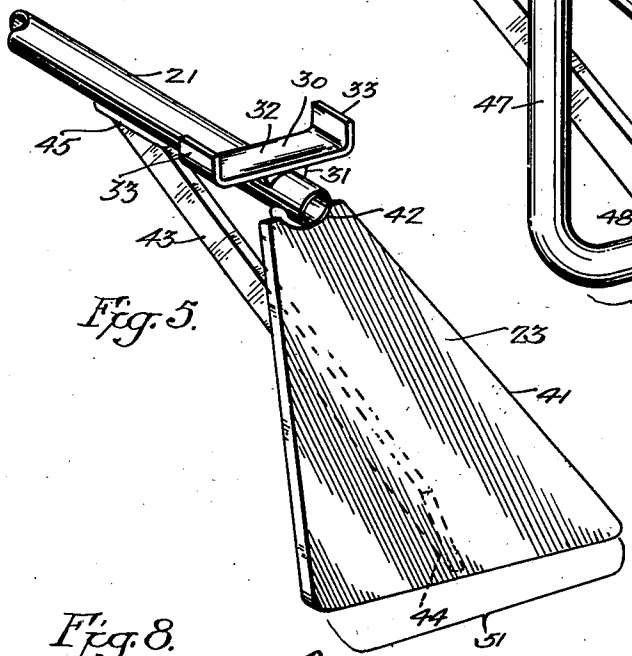
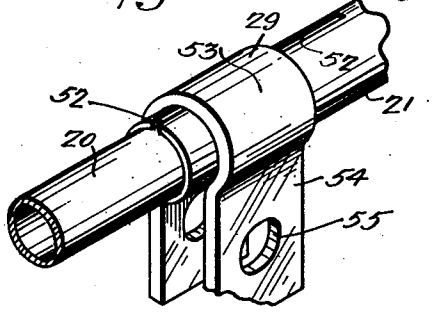


Fig. 5.

Fig. 8.



Inventors.
Harold G. Sachleben
Nicholas Sachleben
by Dewitt Jackson & Co
Attorneys

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ADJUSTABLE CONCRETE FORM SPREADER

Harold G. Sachleben, Bellmawr, and Nicholas Sachleben, Clementon, N. J.

Application June 27, 1946, Serial No. 679,802

3 Claims. (Cl. 189—37)

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Our invention relates to forms for concrete building construction.

A purpose of our invention is to simplify the manufacture of adjustable concrete forms for floors and similar construction and to render such forms more convenient and reliable in service.

A further purpose is to employ in a concrete form for floor construction and the like, straight telescoping members adapted to extend horizontally, means for clamping the telescoping members in an adjusted position, and metallic knees secured preferably rigidly to the telescoping members near their opposite ends and extending downwardly preferably in a diagonal direction to engage on flanges of joists of the floor at a plurality of widely spaced points.

A further purpose is to mount metallic saddles on the top of the telescoping members to engage the form.

A further purpose is to make the knees on the opposite ends of the telescoping members by bending the telescoping members down to give a wide line of contact with the flanges of the joists of the floor, and to provide diagonally downwardly extending braces for the knees.

A further purpose, in a concrete form for floor construction and the like, is to provide a horizontal platform extending from joist to joist adjacent the tops thereof, and having cross pieces at intervals along the bottom transverse to the joists, and spreaders below the cross pieces each having telescoping metallic members extending lengthwise below the cross pieces, saddles on the telescoping members supporting the cross pieces, a clamp holding the telescoping members in adjusted position, and knees at the ends of the telescoping members, extending downwardly to engage in the joists and widening on either side of the telescoping members at the locations of contact with the joists.

Further purposes appear in the specification and in the claims.

In the drawings we have chosen to illustrate a few only of the embodiments in which our invention appears, choosing forms shown from the standpoint of convenience in illustration, satisfactory operation and clear demonstration of the principles involved.

Figure 1 is a fragmentary perspective of a floor construction to which our invention has been applied.

Figure 2 is a fragmentary vertical section of the structure of Figure 1.

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Figure 3 is a central longitudinal vertical section showing our improved spreader extended.

Figure 4 is a view corresponding to Figure 3 showing the spreader contracted.

Figure 5 is an enlarged fragmentary perspective of the knee construction of the end of the spreader of Figures 1 to 4 inclusive.

Figure 6 is a view corresponding to Figure 5 showing a variation in the knee construction.

Figure 7 is an enlarged section of our spreader on the line 7—7 of Figure 3.

Figure 7a is a fragment of Figure 7 showing a variation.

Figure 8 is an enlarged fragmentary perspective view of the clamp.

Figure 9 is an enlarged section on the line 9—9 of Figure 3.

Describing in illustration, but not in limitation and referring to the drawings:

Our invention relates to concrete building construction and especially to such construction in which reinforced concrete joists are used, although it may be applied permissibly to structures using steel joists.

Our invention relates to a more convenient, economical and rapidly operating concrete form for temporary use until a concrete slab hardens. While the invention is most readily applicable to the construction of floor slabs, and the term "floor" is used at numerous points in the description and claims, it will be understood that it may equally well be applied as a form for the construction of roofs, decks, streets over structural supports, and in other similar construction.

In the prior art, spreaders for concrete forms have often been specially made to fit the particular span, and provided with rocking or swinging members for end engagement.

Skill is required to install such prior art spreaders properly, and they are frequently difficult to remove or in some cases they require destruction or disassembly for removal. By the present invention the spreader can be installed by unskilled labor, with a great saving in time, and can be removed without destruction, and very quickly.

In the prior art where joists were not precisely set at the predetermined spacing, delay and difficulty frequently was encountered in preparing special spreaders. In accordance with the present invention no special reliance is placed upon maintaining an accurately predetermined spacing of the joists, and in fact the installer can disregard joist spacing within wide limits.

Considering first the embodiment of Figures 1

to 4 inclusive, our improved spreader includes inner and outer preferably tubular telescoping members 20 and 21 having near their opposite ends, knees 22 and 23, which engage against lower flanges 24 of joists 25 arranged at suitable spacing and preferably in substantial parallelism.

When the spreader is set in position, the telescoping members are extended from a collapsed position as shown in Figure 4, where a suitable length 26 of the inner member 20 is telescoped within the member 21, to the position as shown in Figure 3 in which a comparatively short length 27 of the inner member 20 is telescoped within the outer member 21. Of course, the extent to which the spreader is lengthened during assembly will depend upon the spacing of the joists, but it will be recognized that during the normal installation some lengthening will occur.

When the ends 28 of the knees are engaged against the flanges 24 of the joists, and the spreader is firmly mounted upon the joists in extended position, a clamp 29, desirably located at the adjoining end of the outer telescoping member 21, is suitably tightened to hold the spreader in position.

Saddles 30, as shown more in detail in Figure 7, are suitably attached as by welding at 31, one near the outer end of the inner member 20 and one near the outer end of the outer member 21, resting flat on the top surfaces of the members. The saddles are desirably U shaped and preferably have flat portions 32 which will desirably be horizontal, and upwardly extending sides 33, which will limit lateral movement of cross pieces 34, suitably of wood, resting in the saddles and extending longitudinally above the telescoping members from end to end of the span between the joists, as shown in Figure 2.

Upon the cross pieces 34 we suitably provide a platform 35, which may consist of boards nailed to the cross pieces, boards suitably united in some other manner, or loose boards preferably having their end joints located at cross pieces. Above the platform and to assist in preventing infiltration of concrete into cracks of the form as well as to provide a smooth lower surface of the slab, we provide suitable water proof paper or concrete form paper 36, extending from joist to joist.

In the described construction it will be noted that the platform 35 abuts against the sides of the upper flanges 37 of the joists while the knees are supported by the lower flanges 24 of the joists. The diagonal character of the knees 38 tends to carry the load of the form down against the lower flanges and engage the lower flanges very firmly against unintended dislodgement of the form.

The floor, or other suitable horizontal slab 39, cast on the form, suitably extends for a short distance down below the tops of the joists at 40, and this distance can be varied in an individual case by varying the thickness of the cross pieces 34 or the boards making up the platform.

It will be understood, of course, that the slab and the joists will normally contain suitable steel reinforcing, not shown, which will in the case of the slab be suitably supported on the form, if desired, before the slab is cast.

It will be understood, of course, that various constructions can be used for the knees. In Figure 5, the diagonally downwardly extending end member 41 is welded to one of the telescoping members at 42 near its end, while a suitable metallic diagonal brace 43 is welded to the end member 41, as at 44, and welded to the telescoping member at the opposite end 45.

If desired the tube or other metallic shape making up the telescoping member may be bent or formed into a triangle to aid in the construction of the knee, as shown in Figure 6. Here the tube is bent downward and to one side at 46 to form one element 47 of a triangular knee, then bent across as at 48 to form the bottom, and back and up as at 49 to form the other side of the knee, being welded adjacent to the area 46 at 50. The diagonal brace 43 is welded at 44 and 45 in this construction as in the form of Figure 5.

It is important to note that the contact area 51 of the knee extends for a substantial distance on either side of the vertical center line through the telescoping members so as to provide considerable lateral stability against over-turning moment. The knee suitably engages the joist along the entire length 51, or at the ends thereof, and this structure is very stable against up-setting laterally. This feature is important as the spreaders may be used at considerable spacings, as for example, four feet, and some tendency may exist for the form to slide or rock with respect to the joists unless the knees have wide contact on the joists.

It will be evident, of course, that any suitable tube cross section may be used for the purpose of telescoping. Figure 7a shows, as an example, an inner member 20' and an outer member 21' of octagon shape, and it will be evident that other shapes may be employed.

The clamp, as shown in detail in Figures 8 and 9, is desirably made by slotting the outer telescoping member 21 as at 52, extending a clamp strap 53 around the outer telescoping member at the slotted portion, and providing tightening lugs 54 on the strap which have holes 55 for a clamping bolt 56.

In removing the concrete form of the present invention, it is simply necessary to release the clamp, collapse the telescoping members, take out the spreader and then pull out the cross pieces and platform, separately or together depending upon the particular construction used. The spreader and desirably also the cross pieces and platform may then be reused on other parts of the same job, or other jobs, as required.

In view of our invention and disclosure, variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of our invention without copying the structure shown, and we therefore, claim all such insofar as they fall within the reasonable spirit and scope of our claims.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. In a concrete form for floor construction and the like, a straight metallic tube adapted to extend horizontally, a straight metallic rod telescoping inside the tube, a clamp on the end of the tube engaging the rod for holding it in adjusted position, a pair of rigid metallic knees one secured to the end of the tube remote from the clamp and the other secured to the end of the rod remote from the knee on the tube, each knee extending transversely to the length of the tube and rod and each knee being in transverse plane narrow where it joins the tube or rod and diverging away from the tube or rod to a wide base remote from the tube or rod, and a brace extending diagonally from the tube or rod to the knee at a point on the knee remote from the tube or rod.

2. In a concrete form for floor construction and the like, a straight metallic tube adapted to extend horizontally, a straight metallic rod telescoping inside the tube, a clamp on the end of the tube engaging the rod for holding it in adjusted position, a pair of rigid metallic knees one secured to the end of the tube remote from the clamp and the other secured to the end of the rod remote from the knee on the tube, each knee extending transversely to the length of the tube and rod and each knee being in the transverse plane narrow where it joins the tube or rod and diverging away from the tube or rod to a wide base remote from the tube or rod, and a brace extending diagonally from the tube or rod to the knee at a point on the knee remote from the tube or rod, each of the knees being respectively integral with the tube or rod and formed by bending the same.

3. In a concrete form for floor construction and the like, a straight metallic tube adapted to extend horizontally, a straight metallic rod telescoping inside the tube, a clamp on the end of the tube engaging the rod for holding it in adjusted position, a pair of rigid metallic knees one secured to the end of the tube remote from the clamp and the other secured to the end of the rod remote from the knee on the tube, each knee extending transversely to the length of the tube

and rod and each knee being in the transverse plane narrow where it joins the tube or rod and diverging away from the tube or rod to a wide base remote from the tube or rod, a brace extending diagonally from the tube or rod to the knee at a point on the knee remote from the tube or rod, and saddles on the tube and on the rod at points adjoining the knees and on the side of the tube and rod remote from the knees, the saddles being adapted to support a cross piece.

HAROLD G. SACHLEBEN.
NICHOLAS SACHLEBEN.

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