Nov. 21, 1939. S. ROGOW 2,180,964

CONCRETE JOIST FORM AND THE LIKE

Filed March 2, 1937 2 Sheets-Sheet 1

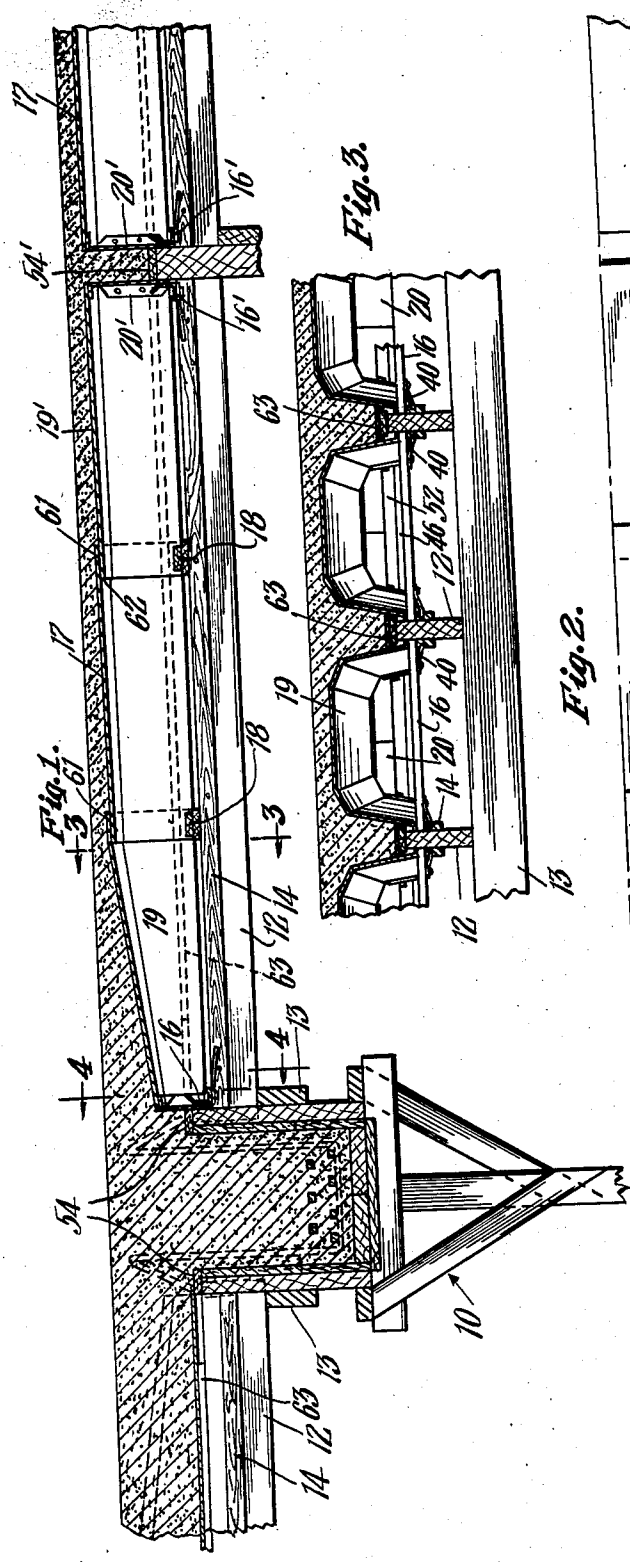

Fig. 1.

Fig. 3.

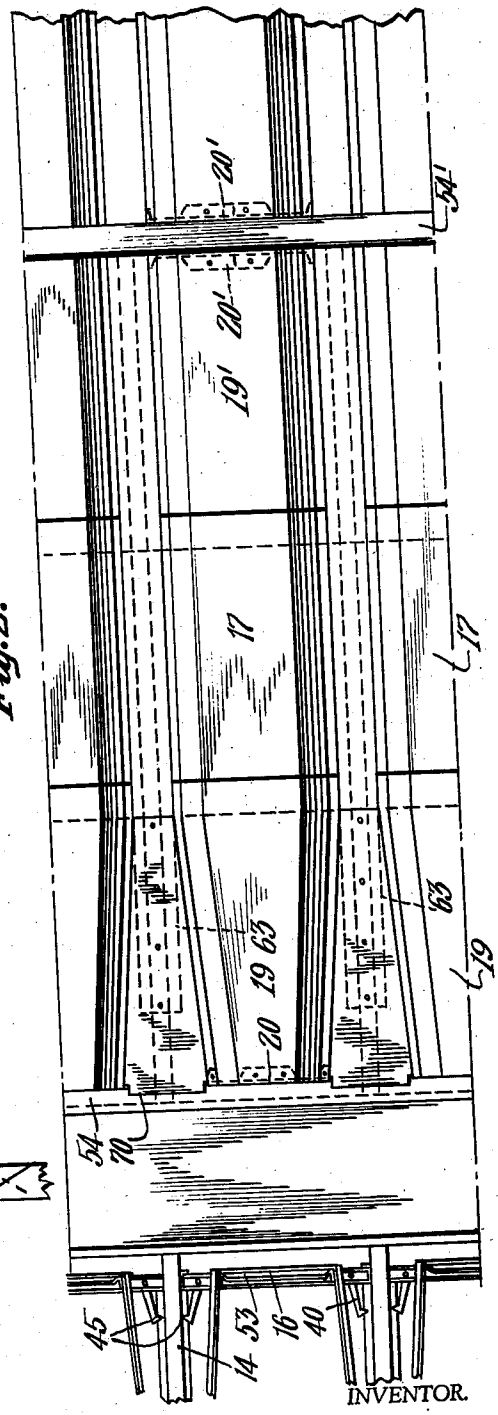

Fig. 2.

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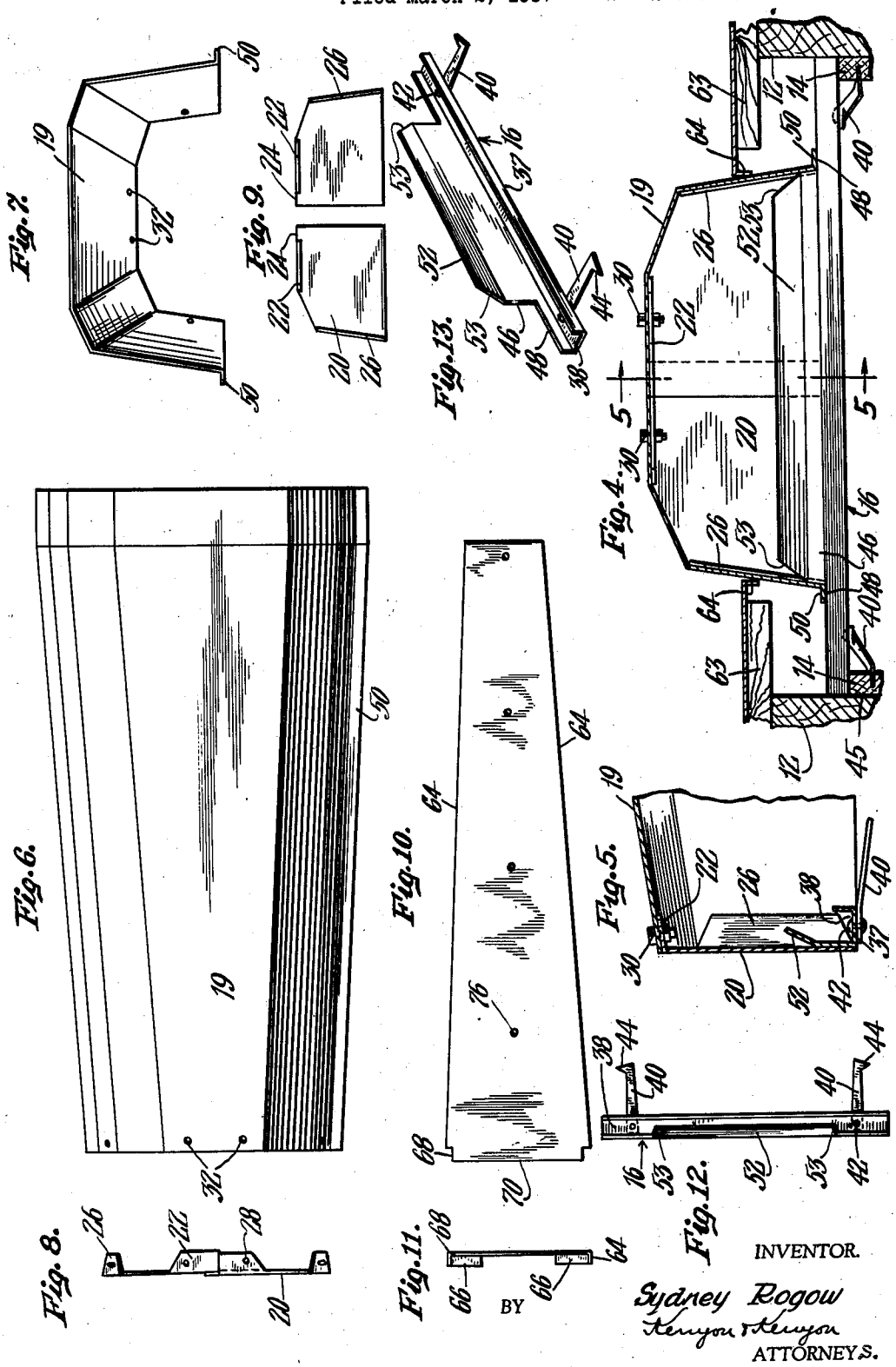

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CONCRETE JOIST FORM AND THE LIKE

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12 Claims. (Cl. 25—131.5)

This invention relates to improvements in forms for concrete joist constructions.

In usual constructions using removable metal forms or pans and end caps, the spreader for the end cap is of wood and it is necessary to "back-up" the end caps from below after wedging the spreader into position. This is an expensive addition to the erection cost, as the work must all be done on scaffolds and by carpenters. By the use of my novel end cap spreader this labor cost is entirely eliminated. Also in use the wood spreaders become damaged and must be replaced from time to time. My metal spreader does not warp or break and can be used indefinitely.

Where tapered end pans are used, it is necessary to use a fishtail to form the flared end of the joist soffit at that point. The wood fishtails heretofore used do not last throughout an entire job and must be replaced. The wood fishtails are easily broken in stripping. In making the fishtails out of metal several advantages result. An important advantage is the saving of materials obtained by using a metal fishtail. The metal fishtail eliminates the necessity of cutting the lumber to exact size, and further eliminates the necessity of cutting the soffit boards to an exact length to fit in between the fishtails.

Further advantages of my invention will be hereinafter pointed out.

In the drawings:

Fig. 1 represents a longitudinal section of a floor slab with the pans in position and with the concrete poured and showing tapered end pans and a metal spreader for the end cap at one end and a square end pan and metal spreader for the same at the other end.

Fig. 2 represents a top plan view of the construction shown in Fig. 1;

Fig. 3 represents a vertical transverse cross section taken substantially on line 3—3 of Fig. 1, showing the spreader in position;

Fig. 4 represents an enlarged vertical transverse section taken substantially on line 4—4 of Fig. 1;

Fig. 5 represents a longitudinal cross section taken substantially on line 5—5 of Fig. 4;

Fig. 6 represents an enlarged top plan view of a tapered end pan;

Fig. 7 represents an end elevation of the end pan shown in Fig. 6 looking from the large end toward the small end;

Fig. 8 represents a top plan view of the end cap for use with the end pan;

Fig. 9 represents a side elevation of the end cap shown in separated condition;

Fig. 10 represents a top plan view of a metal fish plate;

Fig. 11 represents an end elevation of fish plate;

Fig. 12 represents a top plan view of a metal end cap spreader; and

Fig. 13 represents a perspective view of the spreader shown in Fig. 12.

Referring now to the drawings, the reference character 10 generally designates the under framing for supporting the various members of the mold construction. The joist planks 12 are supported by members 13 and have bearing strips 14 upon which the metal end spreaders 16 and 16' and intermediate spreaders 18 are mounted. The pans have flanges which rest on the metal spreaders 16 and 16' and intermediate wood spreaders 18. Each end pan 19 or 19' is provided with an end cap 20 or 20'. The end cap 20 comprises two parts (see Figs. 8 and 9) having horizontal flanges 22 cut away as at 24 to permit relative movements of the parts for adjustment purposes. The parts of the end cap also have vertical flanges 26. The end cap flanges 22 and 26 are provided with openings 28 to receive bolts 30 passing through openings 32 in the end pan 19 corresponding in position to openings 28 in the flanges of the end caps. In Figs. 6, 8 and 9, I have shown the end cap for the small end of a tapered end pan but it will be understood that the end caps 20' are used for the square-end pans 19' which are not tapered. See the right hand end of Fig. 1.

Before placing the end pan and end cap in position, it is necessary to locate my metal spreader 16 in correct position on the bearing strips 14. This spreader includes a base member 37 formed as a channel 38 having hooks 40 pivoted to the underside of the channel at 42. The channel reinforces the base member. The hooks have sharp points 44 so that the hooks may be driven into the bearing strips 14 as at 45 or other part of the frame. The hooks may be bent to be attached to any adjacent part of the frame. In this way the spreader is firmly fastened without the use of nails. The spreader 16 has a vertical flange 46 extending upwardly from one side of the channel 38, the flange being spaced from the ends of the channel to provide shoulders 48 upon which the lower flanged edges 50 of the end pans 19 rest and are supported. The flange 46 at its upper end has an inwardly bent portion 52 to assist in guiding the end cap of the

end pan during assembly. The bent portion 52 has bevelled ends 53 which assist in assembly of the parts. The metal spreader 16 or 16' is placed on bearing strips 14 so that vertical flange 46 is vertically in line with the edge of strip 54, leaving enough clearance for the thickness of end cap 20. Strip 54 is supported on joist planks 12 running transversely thereof and forms the soffit of the concrete T-beam or shoulder lying in substantially the same plane as the soffit board later to be described. In the case of spreader 16', flange 46 is in line with the edge of bridging joist soffit 54, and the hooks 40 are driven into strips 14 as shown in Fig. 3 so that the spreader is securely held in correct position. The end pan with its end caps bolted to it by bolts 30 is then positioned over flange 52 and then forced downwardly. The flanges 52 and 46 assist in guiding the end pan as it is wedged between the end spreader 16 and strip 54. The end cap is firmly held in place so that it cannot move when the concrete is poured. The end pan is supported on the shoulders 48 of the spreader. The flange 46 is of about the same length as the width of the end pan to support the sides of the pan and prevent collapsing or buckling of the sides thereof during pouring of the concrete. Also the flange 46 prevents inward buckling or collapsing of the end cap during pouring of the concrete. From the above it will be seen that the spreader provides a reinforcement for the end of the pan and helps to form a tight joint between the parts. The ordinary spreaders 18 may be used at the joints 61 between the pans. As in usual practice the pans are in overlapping relation at their ends as at 62.

With the pans assembled as above set forth and with soffit boards 63 in place on joist planks 12, concrete may be poured. After the concrete is hard, the metal spreaders may be removed by releasing the hooks 40 and they can be used for another operation. The other spreaders 18 are also removed so that the pans can be removed and used on another floor or another job.

Where tapered end pans are used, I provide a tapered metal fishtail as shown in Figs. 10 and 11, for example, in order to form the flared end of the joist soffit at that point. The fishtail is wedged between adjacent end pans. This fishtail member is made with tapering sides 64 having flanges 66. At its wide end the fishtail has a part of the flanges 66 cut away as at 68 to provide a supporting extension 70. In use the fishtail is applied to the construction after the metal forms have been positioned as above set forth but of course before the concrete is poured. The fishtail is placed between the tapered end pans and is forced or wedged therebetween so that extension 70 of the fishtail rests on and is supported by strips 54 mounted on the ends of joist planks 12, and running at right angles thereto. (See Figs. 1 and 2). The rest of the fishtail is supported by soffit boards 63. It will be noted that soffit boards 63 do not extend for the entire length of the fishtail but extend only for a portion of the length. While the soffit boards may extend for the entire length of the fishtail, it is not necessary where my metal fishtail is used. This is one of the advantages of using my metal fishtail. Where wood fishtails are used, it is necessary to cut the soffit boards to an exact length to fit in between the fishtails. Any slight change in span length means that a standard length soffit board has to be cut down or spliced out which increases the cost of installation. If wood fishtails are used, a large percentage of them has to be replaced on each successive floor because the wood fishtails are easily broken in stripping. With the use of metal fishtails, the standard width soffit boards can run through at random length anywhere to within six to twelve inches or so of the end of the joist. The metal fishtail gives better results because it does not warp and is supported at its wide end on strip 54 by means supporting end 70 so that the fishtail cannot turn or deflect when the concrete is poured. The flanges 66 also reinforce the fishtail to give a stronger construction.

The fishtail may be provided with openings 76 for inserting the nails or hangers which are to remain in the concrete after the metal forms are removed, as for lathing or the like.

With the metal pans and fishtails in position as above set forth, the concrete is poured and after the concrete is hard, the metal pans and fishtails can be removed and used immediately for other construction work, if desired.

I claim:

1. A construction of the character described including, in combination, joist planks and soffit boards, a plurality of spaced tapering end metal pans supported by said joist planks, end caps in said end pans, a spreader in each end pan for reinforcing the end pan and end cap in each pan, and metal fishtail members wedged between said end metal pans and resting on said soffit boards, said spreader including a base member, and an upper portion extending from said base member and so formed with respect to said base member as to leave support on the latter for said pan, and said soffit boards extending only for parts of the lengths of said fishtail members.

2. A construction of the character described including, in combination, underframing, a member supported by said underframing, joist planks and soffit boards supported by said underframing, a soffit strip supported by said joist planks and extending transversely thereof, a plurality of spaced tapered end metal pans supported by said joist planks, end caps in said end pans for closing the ends of said pans, a spreader in each end pan for reinforcing the end pan and end cap in each pan and for forming a sealed joint between the parts, and metal fishtail members tapered to fit between said tapered end pans, said fishtail members being wedged between said tapered end pans, said fishtail members having portions resting on said soffit boards and other portions resting on said soffit strip.

3. A construction of the character described, including, in combination, joist planks and soffit boards, a plurality of spaced tapered end metal pans supported by said joist planks, end caps in said end pans, a spreader in each end pan for reinforcing the end pan and end cap in each pan, and tapered metal fishtail members wedged between said end metal pans and resting on said soffit boards, each of said spreaders including a base member and an upper portion extending from said base member and having an inclined surface facing said end caps, said upper portion being so formed with respect to said base member as to leave supports on the latter for said pans, and said soffit boards extending only parts of the lengths of said fishtail members.

4. A construction of the character described including, in combination, a supporting member, joist planks, soffit boards and soffit strips thereon, tapered end pans supported by said joist

planks, and tapered fishtail members each having a supporting extension at one end and flanged sides, each of said fishtail members being supported near one end by said soffit boards and at the other end by said supporting extension resting on said soffit strips, said fishtail members being wedged between said tapered end pans.

5. A spreader of the character described including a base member and an upper portion extending from said base member, said upper portion having an inclined surface and said upper portion being so formed with respect to said base member as to leave supports in said base member for a pan with which said spreader is adapted to be used.

6. A metal spreader adapted for use with pans for concrete joist constructions, including a base member, a flange extending from said base member, said flange having a bent top portion, said top portion having beveled ends, and hooks pivotally mounted on the end portions of said base member, said flange being so formed with respect to said base member as to leave supports on said base member for a pan with which said spreader is adapted to be used.

7. A metal spreader of the character described, including a channeled base member, a flange extending upwardly from one side of the base member, said flange having an inwardly bent top portion, and hooks pivotally mounted on the end portions of said base member, said flange being so formed with respect to said base member as to leave supports on the latter for a pan with which said spreader is adapted to be used.

8. A metal spreader adapted for use with pans for concrete joist constructions, including a channeled base member, a flange extending from one side of said channeled base member and positioned inwardly of the ends of said base member so as to provide shoulders for supporting a metal pan in assembly, and means on said base member and adapted to securely hold the spreader in position in a part of the wood framing of the concrete mold.

9. A construction of the character described including in combination joist planks, spreaders between said joist planks and supported thereby, pans supported by said spreaders and end caps in said pans, said spreaders including a base member, an upper portion extending from said base member to reinforce said end caps and positioned inwardly of the ends of said base member so as to provide shoulders for supporting said pans, and means co-operating with said spreaders and said joist planks to maintain said upper portion of said spreaders in position to reinforce said end caps.

10. A construction according to claim 9 wherein the upper portion of said spreaders has an inclined surface facing said end caps.

11. A construction of the character described including in combintion underframing, joist planks and soffit boards supported by said underframing, a soffit strip extending transversely of said joist planks, spaced end pans supported by said joist planks and having the outermost ends of the pans spaced from each other further than the inner ends thereof and tapered metal fishtail members between said end pans and supported by said soffit strip adjacent the wider end thereof and supported near the other end thereof by said soffit boards, said soffit boards terminating short of the soffit strip.

12. A construction of the character described including in combination underframing, joist planks and soffit boards supported by said underframing, spaced end pans supported by said joist planks and having the outermost ends of the pans spaced from each other further than the inner ends thereof, and tapered metal fishtail members between said end pans and supported adjacent the narrower end thereof by said soffit boards and supported adjacent the other end by support means substantially wider than the width of said soffit boards to prevent tilting of said fishtail members.

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