June 28, 1927. 1,633,715

E. E. SEELYE

CONCRETE FORM FOR BUILDING CONSTRUCTION

Filed April 23, 1924 2 Sheets-Sheet 1

Fig. 1.

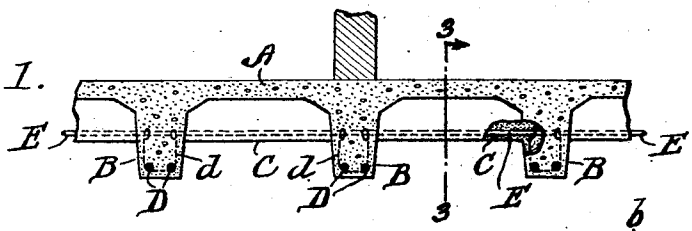


Fig. 2.

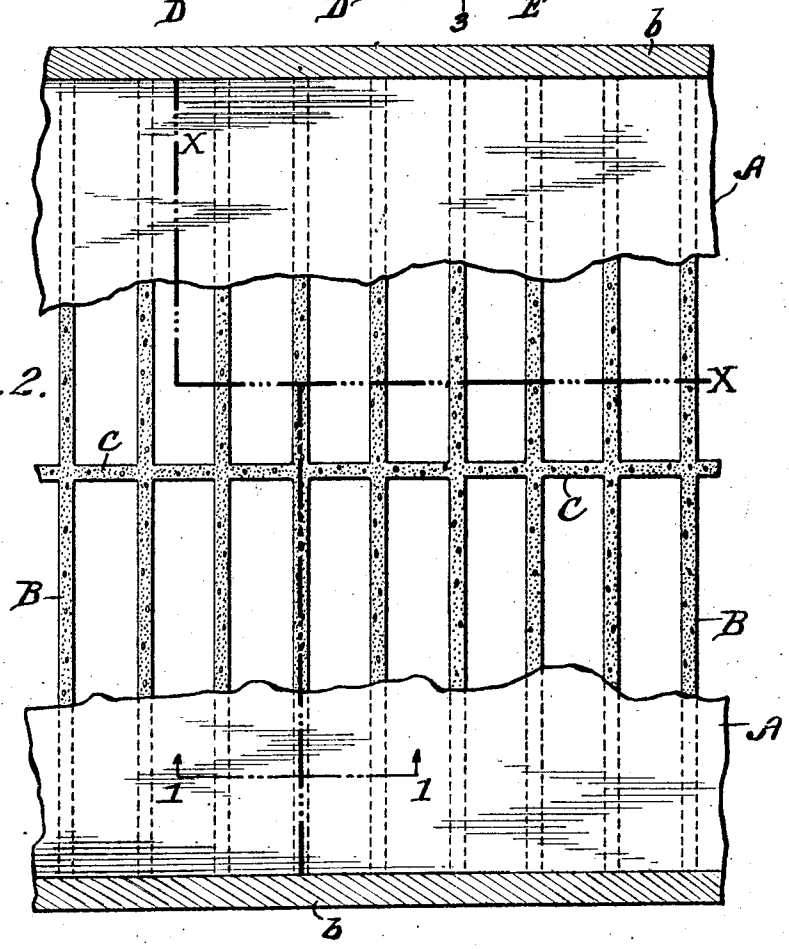
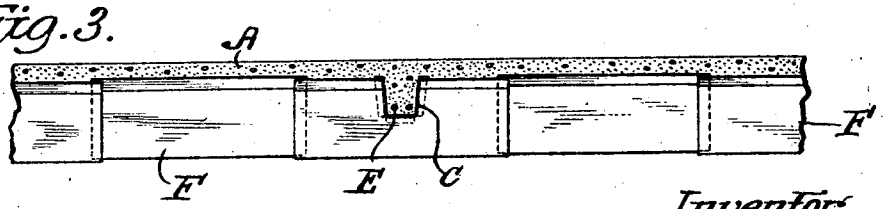


Fig. 3.



Inventor:
Elwyn E. Seelye
By N. J. Burbank
Attorney.

June 28, 1927. 1,633,715

E. E. SEELYE

CONCRETE FORM FOR BUILDING CONSTRUCTION

Filed April 23. 1924 2 Sheets-Sheet 2

Fig. 4.

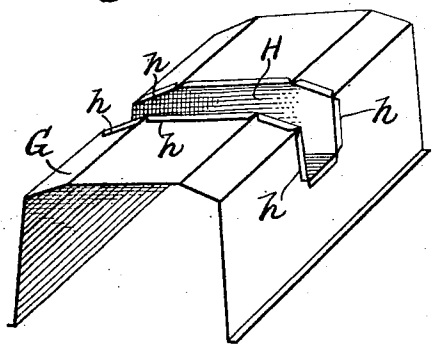


Fig. 5.

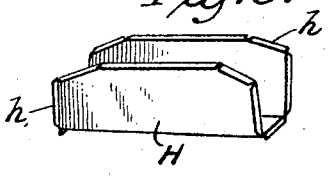


Fig. 6.

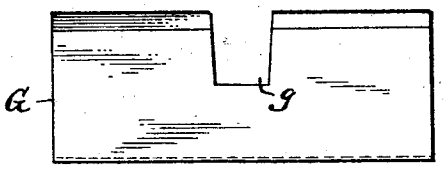


Fig. 7.

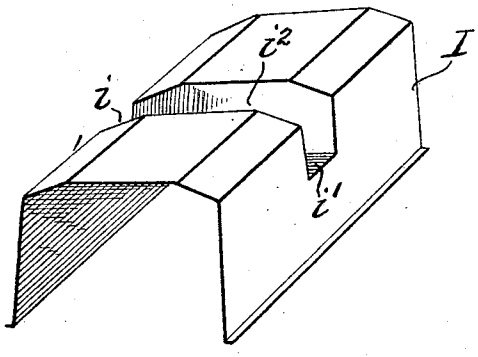


Fig. 9.

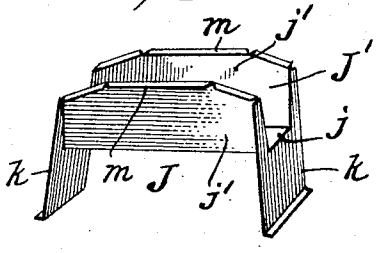
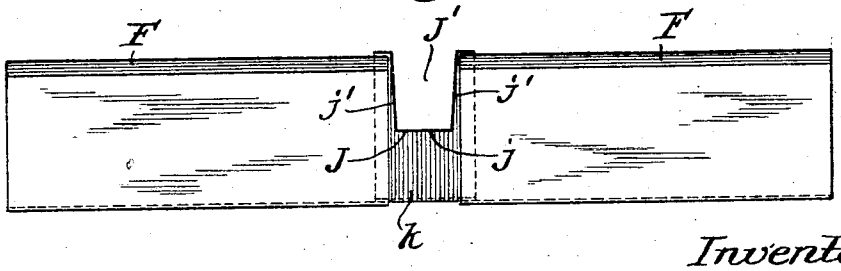


Fig. 8.



Inventor:
Elwyn E. Seelye
By W. J. Brueckner
Attorney

Patented June 28, 1927. 1,633,715

UNITED STATES PATENT OFFICE.

ELWYN EGGLESTON SEELYE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO NATIONAL CONCRETE METAL FORMS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CONCRETE FORM FOR BUILDING CONSTRUCTION.

Application filed April 23, 1924. Serial No. 708,379.

This invention is a concrete form whereby a header beam may be molded so as to be unitary with a slab and a beam section.

In the art pertaining to concrete floor construction, it is usual to employ in the production of the floor molds or forms of one character or another which forms or molds are supported in position by shoring and are assembled to support the concrete material in a manner to produce a floor slab and to produce beams unitary with said slab, whereof the depth of the beams exceeds to a material extent the thickness of the slab.

One object of my invention is to produce a concrete slab floor construction wherein the stresses upon the beams are distributed should the load imposed, accidentally or designedly, exceed the estimated capacity of said beams to carry the load.

Loading of a floor slab beyond its estimated capacity is occasioned in some instances by the erection of partitions upon the slab, and in other cases by the concentration of weighty material within a definite area upon the slab. In such cases, it has been heretofore required to materially increase the cross section of the beams, or to resort to the expedient of embedding steel in compression either in the beam or the slab, or in both; but according to my invention, such increase in the cross section of the beams or in the use of embedded compression steel is avoided by the employment of header beams which span the longitudinal or main beams and which perform the function of distributing the stresses upon said longitudinal or main beams, and thus compensate for excess loading of the slab. The header beams are useful, more particularly, in wide span floor slabs, and such beams are molded so as to be unitary with the slab and the main beams, although it is to be remarked that the header beam or beams are not equal in depth, usually, to the depth of the main beams.

My invention comprises a form or mold, whereby the main beams and the header beams are molded with the slab in a facile manner, and with attendant economy in the use of the lumber required in the erection of the shoring by which said forms or molds are supported in the position required for molding the concrete resulting ultimately in the production of the slab with the beams, both main and header.

Various constructional forms of the molds may be employed for producing the header beams unitary with the main beams and the slab. According to one embodiment, a header mold may be positioned intermediate the end portions of two adjacent slab molding forms, whereas in another constructional form a header mold may constitute a unitary part of the main form or mold, but as a preferred construction I employ a slab mold provided intermediate its ends with a transverse slot, with which slotted mold is associated a header mold that is insertible and demountable at will, to the end that the molds may be assembled with facility and adapted for assemblage on the job and at the same time the structure can be disassembled and compactly arranged for storage and shipment.

Other functions and advantages of the invention will appear from the following description taken in connection with the accompanying drawings, wherein—

Figure 1 is a cross sectional view of a concrete floor slab and a succession of main beams with which are associated header beams in accordance with my invention, the plane of said section being indicated by the dotted line 1—1 of Figure 2.

Figure 2 is a plan view, with a portion of the floor slab broken away, illustrating the main beams and the header beams bridging the main beams.

Figure 3 is a section at right angles to Figure 1 and on the dotted line 3—3 of said figure, with the forms in place for molding the concrete to produce the header beams unitary with the slab and the main beams.

Figure 4 is a perspective view on an enlarged scale illustrating a slab and beam mold recessed or slotted to co-operate with a header mold.

Figure 5 is a perspective view of the header mold as it appears when displaced from the slab and beam mold.

Figure 6 is a side elevation of the slotted slab and beam mold, the header mold being removed.

Figure 7 is a perspective view of another form of mold wherein the member for mold-

ing the header beam is unitary with the member for molding the slab and main beam.

Figure 8 is a view in side elevation of a plurality of slab and beam molds assembled in end to end order and with an interposed member for molding the header beam, and

Figure 9 is a perspective view of the header mold adapted for assemblage with the main mold as depicted in Figure 8.

Referring to Figures 1, 2 and 3, A is a floor slab, B a series of main beams extending lengthwise of said slab or from one bearing wall *b* to an adjacent bearing wall *b*, and C are header beams which span or bridge the main beams.

The main beams B and slab A are unitary, and in my invention the header beams C are also unitary with the slab and with the main beams, all the specified parts or elements A, B, C being molded in situ and composed usually of concrete material with or without the so-called "filler blocks," the latter being used on occasion for reducing the weight of the slab.

The depth of the main beams B is considerably in excess of the thickness of the slab, see Figure 1, so that said beams depend from the plane of the slab.

The depth of the header beams C is not, however, equal to the depth of the main beams B, thus effecting economy in the use of concrete material required for the production of the header beams. As shown, the header beams C is about one-half the depth (more or less) of the main beams, but these header beams are molded at their ends to join with the main beams and are molded for the tops of said header beams to join with the floor slab A, thus resulting in a monolithic structure.

It is apparent that the slab and the beams may be reinforced by steel rods as is usual in the art, and in Figure 1 such reinforcing rods are indicated at D, E, wherein the rods D are embedded in the material of main beams B, and rods E are similarly embedded in header beams C, suitable straps or hangers *d* being used for connecting the rods.

It is well known that in apartment buildings, hotels, and office buildings, where partitions are numerous, it becomes necessary to change the location of such partitions, as indicated by the dot and dash line X in Figure 2, to meet the requirements of tenants, etc. Furthermore, a floor slab is subject to the concentration within a definite area of an excessive load. Ordinarily conditions in the change of the load is met by designing the main beams of such cross section as to carry an estimated excess of load, but such designs involve the use of beams of greater depth and require an excess of steel in compression. Such objections are, however, overcome in my invention by the use of header beams which span or bridge the main beams, such header beams performing the function of distributing the load over two or more of the main beams.

The slab and the beams B C are molded by forms assembled in series as shown in Figure 3, certain of said forms being constructed for molding the concrete to produce the header beams C. The forms or molds employed are adapted primarily for molding the concrete to produce the slab A and main beams B, as in Figure 3, wherein a series of forms F are assembled in end to end order and in lapping relation. Such forms are assembled in rows to produce a continuous slab A and a series of beams B, such forms or molds F being supported by an underframing or lumber structure known in the art as shoring and which requires the work of carpenters in cutting, fitting, assembling and installation with adequate skill to produce a floor slab construction of the required character. Those skilled in the art are aware that the underframing or shoring ordinarily employed involves the use of parts known as soffit boards and soffit joists with which co-operate the forms F in a manner to mold concrete for producing the under surface of the slab A, and the side and under faces of the beams B; but as such underframing or shoring is well known in the art, I have not considered it necessary to further describe the same nor to illustrate the same herein. It is to be said, however, that to mold the concrete for the production of the header beams it is ordinarily necessary to cut the soffit planks and joists, involving an undue mutilation of lumber and necessitating an unnecessary amount of time and labor in the erection of the shoring. To overcome these difficulties and to attain economy of time and labor, as well as to reduce the quantity of concrete material required in the production of the header beams C, I provide means illustrated in various constructional forms in Figures 4 to 9, inclusive, of the drawings.

G is a mold or form, see Figures 4 and 6, open at the bottom and ends and with side walls and a top, the same being preferably of metallic construction. This form is provided with a slot *g* which is cut in the top and the opposite sides, the depth of said slot being about one-half the depth of the form. The slot is about midway the length of the form and is transverse to its longitudinal axis. With the slotted form is associated a header mold H, see Figure 5, comprising a metallic structure composed of a bottom and two sides, and of such form and dimensions as to snugly fit within the slot *g*. Said header mold is flanged at the top and end edges of its sides, as well as the end edges of the bottom, as at *h*, in order that the flanges *h* may contact with the form G adjacent

the boundary edges of the slot g, whereby the header form H is supported by the slab and beam form G and is confined by its flanges h from displacement relatively to the slab and beam form G.

To use the forms G, H, the header beam mold H is placed within the slot g of form G, and the latter is assembled with other slab and beam forms F so that the mold G with the superposed mold H will be at the place where it is desired to mold the concrete, see Figure 3. The required number of forms F, G, having been assembled in rows, and with the molds H occupying the slots g of molds G, the plastic concrete is deposited as usual to fill the spaces produced by the forms and the soffit planks and to fill, also, the spaces within the transverse molds H, so that there ultimately is produced by the setting of the plastic concrete material a floor slab with main beams the space between which beams is bridged by the header beams C. As shown in Figure 2, the header beams C are at the middle part of the main beams, but obviously the number of header beams may be increased.

Another constructional form of means for molding the header beams integral with the slab and the main beams is shown in Figure 7, wherein the slab-and-beam mold or form I is provided with a depression i bounded by a bottom i' and two side walls one of which is shown at i^2. In this construction the mold for molding the header beam is unitary with the mold for molding the slab and main beam, the boundary walls i', i^2, for the header beam mold cavity i being in fixed relation to the parts of the slab and main beam mold I. It is preferred to employ the construction of Figures 4, 5 and 6 for the reason that the header beam mold H may be detached from the slab and main beam mold G, whereby a number of molds G may be nested in compact relation, and the header beam molds H may also be nested, to the end that the molds G, H, may be stored and transported with facility. This function is not inherent in molds of the construction depicted in Figure 7 for the reason that the cavity i constituting the header beam mold space interferes to a certain extent with the operation of nesting the molds for storage and transportation. A further embodiment of the invention is shown in Figures 8 and 9, wherein a header beam mold J is interposed between the end portions of two adjacent slab and main beam molds F. This header beam mold is composed of a bottom j and side walls j' forming the mold cavity, J', and with legs k at the ends of the mold cavity. The legs are in pendent relation to the mold cavity, and the walls j' are flanged at m to the end that the marginal parts of mold J will overlap the end portions of molds F upon the assemblage of the molds F, J. Obviously, the adjacent molds F are separated or spaced at the line where the header beams are to be molded, and the molds J are positioned intermediate the proximate ends of molds F or their end caps (not shown), the molds F, J. being carried directly or indirectly by the soffit joists of the shoring or underframing. The concrete material is dumped upon the molds which are so related that molds F operate to mold the slab and main beams, whereas the molds J impart the required cross section to the header beams, the depth of said header beams being less than the depth of the main beams and the header beams being unitary with the slab and the main beams.

It will be noted that the header-beam molds extend crosswise of the slab and main beam molds, and further that the closed bottom members of said header beam molds are well above the open under sides of said slab and main beam molds, as a result of which the said molds co-operate in the formation of the plastic concrete material to produce the slab, the main beams and the header beams, the under surface of which header beams are well above the under faces of the main beams. This organization of molds attains a desired economy in the formation of the plastic concrete to produce the header beams, and furthermore, the several molds are assembled by the use of continuous soffit planks and soffit joists on the shoring or underframing; in other words, it is not required to cut and mutilate the soffit planks and soffit joists to accommodate the transversely positioned header beam molds, thus further attaining a desirable economy of lumber and also in the time and labor required for the installation of said shoring or underframing.

My new construction of forms for the production of header beams in a concrete floor slab attains economy in the plastic concrete material, in the lumber required for the shoring or underframing, and in time and labor required for the installation of such shoring. The new floor construction with header beams intermediate the main beams eliminates the necessity for special width joists or beams and the additional expense of carpenters on the job for locating such special beams in a manner to line up the joists with respect to the positions to be occupied by the partitions in accordance with the plans of architects or builders. Again, the header beams in the concrete floor slab construction distributes the stresses to adjacent beams which stresses are occasioned by concentration of loads upon the slab, and such header beams also tend to relieve weakened beams from the requirement to carry the full load apportioned thereto, and, further, such header beams add stability to deep beams on long span slab constructions.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a structure of the class described, a mold provided with a transverse slot and a header-beam mold positioned in said slot and separable from said mold.

2. In a structure of the class described, a mold provided with a slot the depth of which is less than that of the mold, and a header-beam mold occupying said slot and separable from said mold.

3. In a concrete mold of the class described, the combination with a plurality of unitary molds assembled for forming a slab and a plurality of main beams integral with said slab, of a plurality of header-beam molds each extending within the limits of one of the slab-forming molds and co-operable therewith for the production of header-beams unitary with the resulting slab and with the main beams.

4. In a concrete mold of the class described, the combination with a unitary slab-forming mold, of a unitary header-beam mold contacting for substantially its length with said slab-forming mold and separable as a unit therefrom.

5. In a concrete form of the class described, the combination with unitary slab-forming molds, of unitary header-forming molds each extending transversely to one slab-forming mold and separable as a unit therefrom, the marginal portions of said header-forming mold contacting for substantially its length with said slab-forming mold.

6. In a concrete form of the class described, the combination with a unitary slab-forming mold, of a unitary header-forming mold extending transversely to, and within the limits of, said slab-forming mold.

7. In a concrete form of the class described, the combination with a unitary slab-forming mold, of a unitary header-forming mold supported solely by said slab-forming mold and demountable as a unit therefrom.

In testimony whereof I have signed my name hereto this 5th day of March, 1924.

ELWYN EGGLESTON SEELYE.