

F. W. STEVENS.
CONCRETE FLOOR CONSTRUCTION.
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947,514.

Patented Jan. 25, 1910.

Fig. 2.

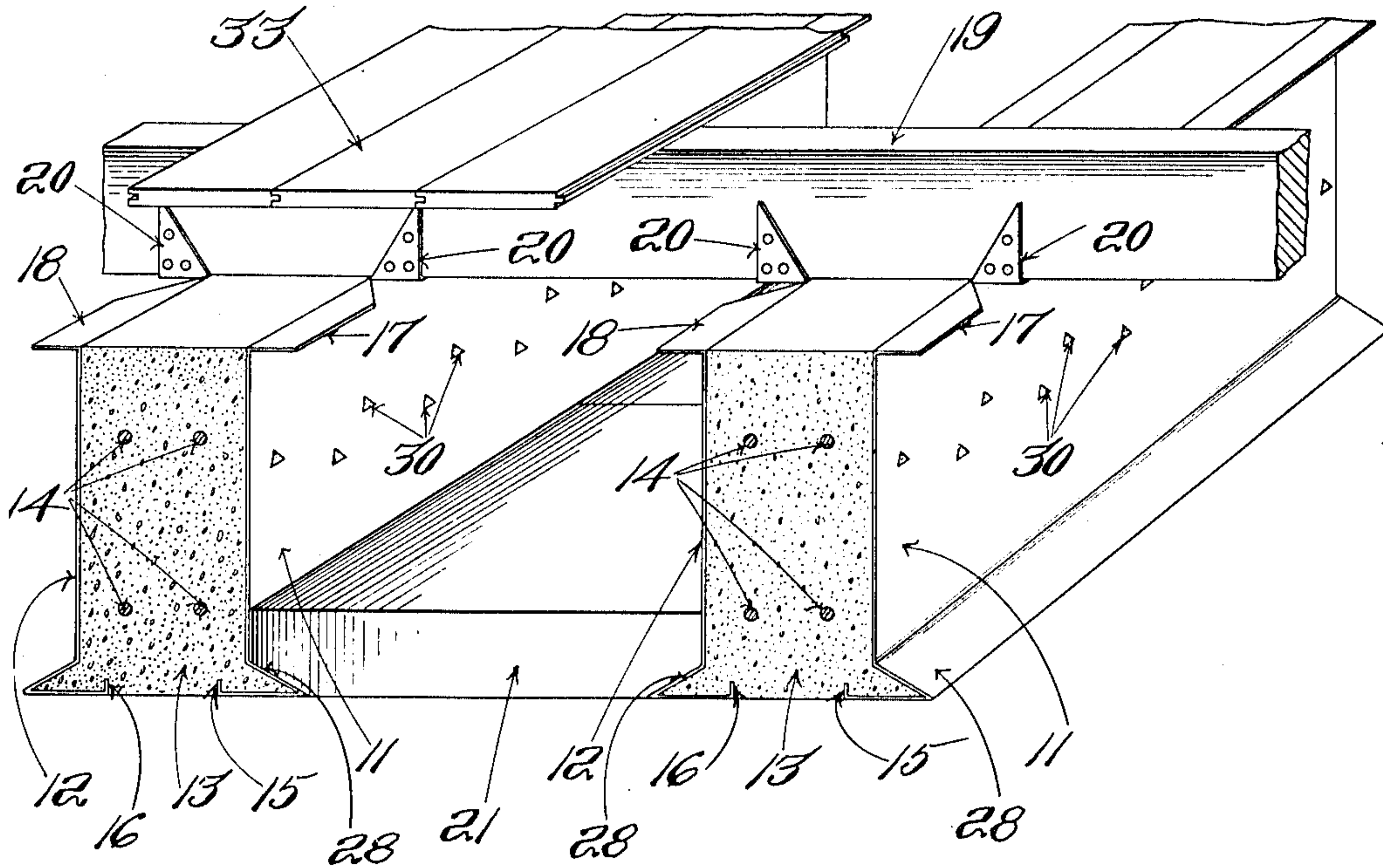
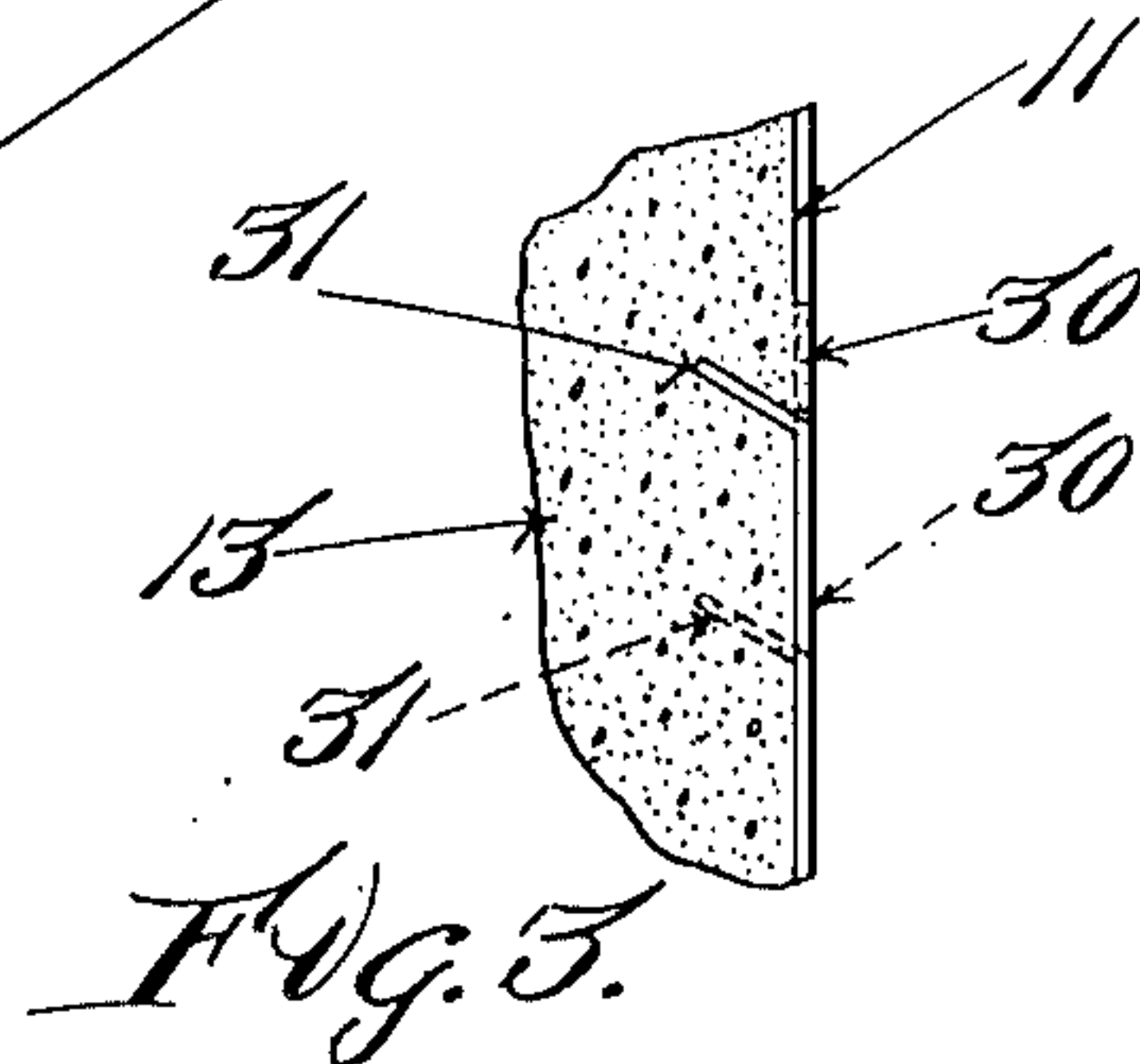
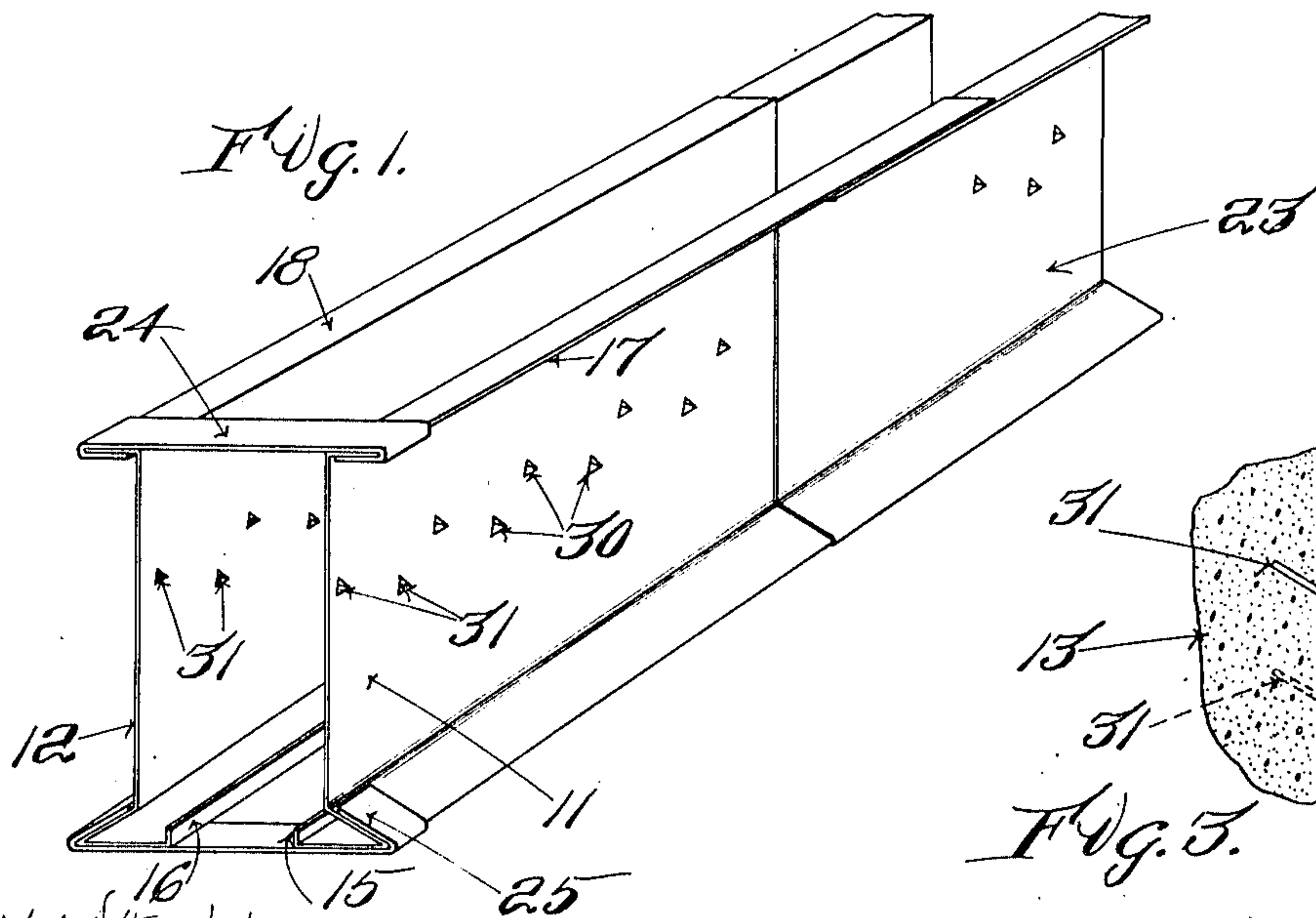


Fig. 1.



Witnesses:
John H. Parker
R. Wallace

Inventor:
Frank W. Stevens
by Method, Calver, Copeland & Dineen,
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK W. STEVENS, OF NEWTON, MASSACHUSETTS.

CONCRETE FLOOR CONSTRUCTION.

947,514.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK W. STEVENS, citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a certain new and useful Improvement in Concrete Floor Constructions, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object an improved method of concrete construction which shall be less expensive and more readily constructed than those heretofore in use.

It relates particularly to means for making concrete beams for supporting the fireproofing to which the ceiling of the room below may be secured and to means for securing the furring screeds, or floor timbers for the floor above.

In concrete constructions, so far as is known to me, it has heretofore been customary to construct the molds for the concrete floor beams of wood in the place where the beam is to be used. The material for the beam is then filled into the mold and allowed to harden after which the mold is torn down. This method of necessity involves the destruction of the mold. As these molds are made of wood, the expense and consequent waste is very considerable. It has also been found impossible to form, by means of wooden molds, beams having a flange at the bottom to support the fireproofing, because the flange thus formed is not in itself of sufficient strength to resist the removal of the wooden mold or to support the fireproofing, and this fact has made it necessary to use other means than a flange to support the fireproofing or to employ material other than concrete for the beams when it is desired to support the fireproofing on flanges.

By my improved method of construction, flanged concrete beams may be readily constructed, and in any desired location, as for instance, on a floor, in which case they are subsequently raised into place. The molds for the beams are formed from pieces of thin sheet metal rolled or bent to the desired form and preferably supported in place on a floor or in any other convenient location. The mold is then filled with concrete, steel rods for reinforcing being embedded therein if desired. The mold formed from this thin

sheet metal is so constructed as to be held by the hardening of the concrete so that it is not easily removed, and thereupon becomes a part of the beam itself reinforcing it, and forming a sheathing or facing for the major portion of the exterior surface of the beam, so that the beam has the appearance of a steel or metal beam. The metal sheathing performs the functions both of a mold and of a reinforce, and accordingly in the following specification and in the claims I have also applied the latter name to it although by so doing I do not intend to limit myself to a structure in which this element performs the strengthening function only. It will also be seen that by the employment of the herein described invention, it is possible to form flanges on the beams capable of supporting the weight of the fireproofing, and this produces a great saving in expense as the tiles or fireproofing may be laid directly on the flanges being supported thereby. I also form beams embodying my improved construction with top flanges covered by a portion of the metal comprising the reinforces. By cutting these flanges as will be hereinafter described and bending up the cut portions, a convenient means of attaching the furring or floor beams is afforded.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features will be pointed out and clearly defined in the claims at the close of the specification.

In the drawings,—Figure 1 is a view in perspective of the sheet metal mold employed, said sheet metal mold being composed of two reinforces. Fig. 2 is a view in perspective of a portion of a floor showing the construction of the beams, the means of attaching the flooring thereto, and the manner of supporting the tiles or fireproofing. Fig. 3 is a detail showing the means for securing the reinforces to the concrete composing the beam.

Referring now to the drawings and more particularly to Fig. 1, there will there be seen the mold composed of two reinforces by the use of which a floor beam is constructed. This mold is composed of two reinforces 11 and 12 of thin metal rolled or otherwise formed to a shape to conform to the contour of one side of the beam which is to be con-

constructed by their use and held in position relatively to each other by means of strips 24 and 25 of hoop iron.

In the drawings a mold suitable for a flanged beam is shown. The two reinforces for the sides of the beam are conveniently supported in place upon a floor at the desired distance apart, this distance being determined by the strength required of the beam. The space between the two reinforces 11 and 12 is then filled with concrete 13, reinforcing rods 14 being embedded within the concrete if desired. The lower edges of the reinforces 11 and 12 are bent upwardly as shown at 15 and 16, so that they are themselves embedded in the concrete, thereby assisting to secure the molds to the concrete composing the beam. In order that the beam and the reinforces may be united into as homogeneous a whole as possible so that the metal of the reinforces may be kept from buckling thereby adding to the strength of the finished beam as much as possible, I punch small holes 30 in the reinforces to allow the concrete to enter. In practice, I consider it desirable to make these holes triangular in form as shown in Fig. 3, and to turn in the punchings 31 at an oblique angle so that they become embedded in the concrete of the beam.

The upper edges of the reinforces are turned outwardly as shown at 17 and 18 to form flanges, portions of which may be employed to secure the furring or screeds 19 of the floor 33 above in place. This is conveniently done by cutting a diagonal slit in the flange with tinsmith's shears and bending up the ear formed thereby. These ears 20 may then be nailed to the furring or screed 19. This forms a convenient method of holding the said furring in place, and as the furring is supported on the concrete floor beams, convenient spaces between the bottom of the floor and the top of the concrete floor beam, also between the fireproofing and the floor, are left through which may be run water and gas pipes and electric wires in either direction.

When it is desired to construct a beam which is longer than the sheets of the metal from which the reinforces are made, two or more sheets are employed, one being allowed to lap over the other in the manner shown in Fig. 1 where the said second sheet is designated 23.

From the foregoing, it will be seen that a flange 28 on the lower edge of the beam is readily formed, and that the said flange is composed of concrete contained within an envelop of sheet-metal which strengthens the concrete sufficiently so that it will sustain the load of the fire-proofing 21 which is conveniently laid on the said flange 28. Since the reinforces composing the molds are not stripped from the beams, it will be seen that

the beams are given a metallic finish which in some cases may be desirable. It will also be seen that there intervenes between the under surface of the tile 21 and the concrete bottom surface of the beam only a narrow strip of metal, and this strip of metal is so narrow that it is possible to plaster across it without the necessity of wrapping the beam with metallic lathing, since the plaster will adhere to the under side of the tile 21 and to the concrete portion 13 of the beam.

It will be seen that by the employment of the invention described herein, it is possible to form beams of different strengths by the use of identical sheet metal reinforces, it being only necessary to support said reinforces at different distances apart.

What I claim is:

1. The improved beam for floor construction which consists of two independent sheet metal reinforces on two opposite vertical sides of the beam, capable of being spaced at any desired distance apart determined by the strength required of the completed beam and concrete filling the space between the two reinforces and exposed on the top and bottom of the beam for the space between the proximate edges of the reinforces.

2. The improved beam for floor construction which consists of two independent sheet metal reinforces shaped to form flanges on the beam, said reinforces being located on two opposite vertical sides of the beam capable of being spaced at any desired distance apart determined by the strength required of the completed beam, and concrete filling the space between the two reinforces and exposed on the top and bottom of the beam for the space between the proximate edges of the reinforces.

3. The improved beam for floor construction which consists of a sheet metal reinforcement in two parts independent of each other, spaced a suitable distance apart and having their longitudinal edges turned in, and concrete filling the space between the said parts and exposed on both the top and the bottom for the space between the proximate edges of said two parts, said concrete embedding said longitudinal turned-in edges.

4. The improved beam for floor construction which consists of a sheet metal reinforcement in two parts independent of each other spaced a suitable distance apart each of said parts having a longitudinal edge thereof turned in and concrete filling the space between said parts and embedding said turned in edges.

In testimony whereof I affix my signature, in presence of two witnesses.

FRANK W. STEVENS.

Witnesses:

GEORGE P. DIKE,
ALICE H. MORRISON.