

No. 614,530.

Patented Nov. 22, 1898.

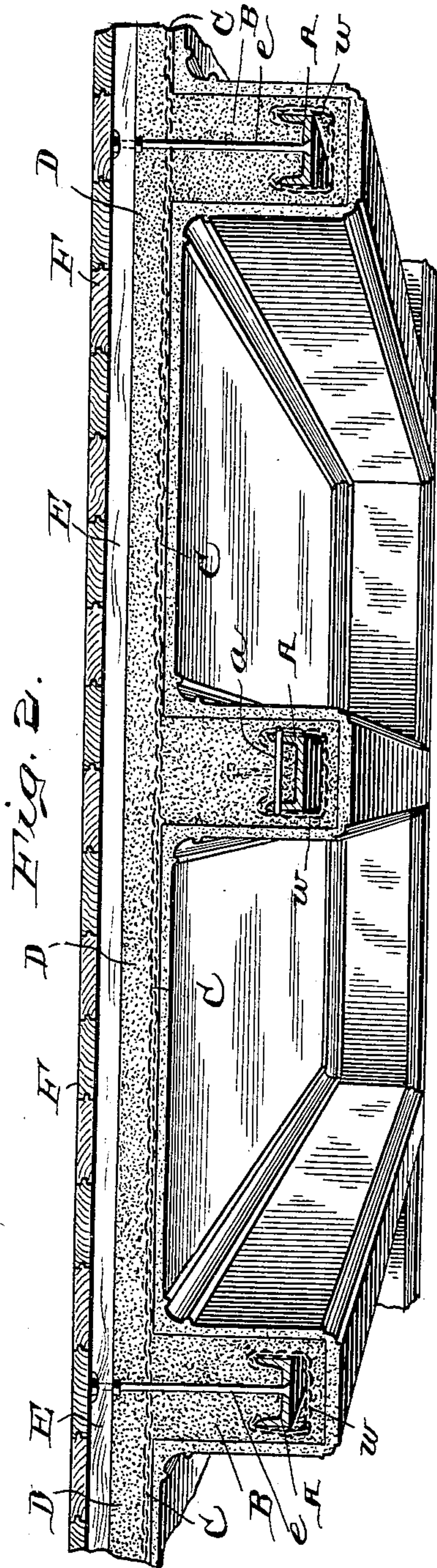
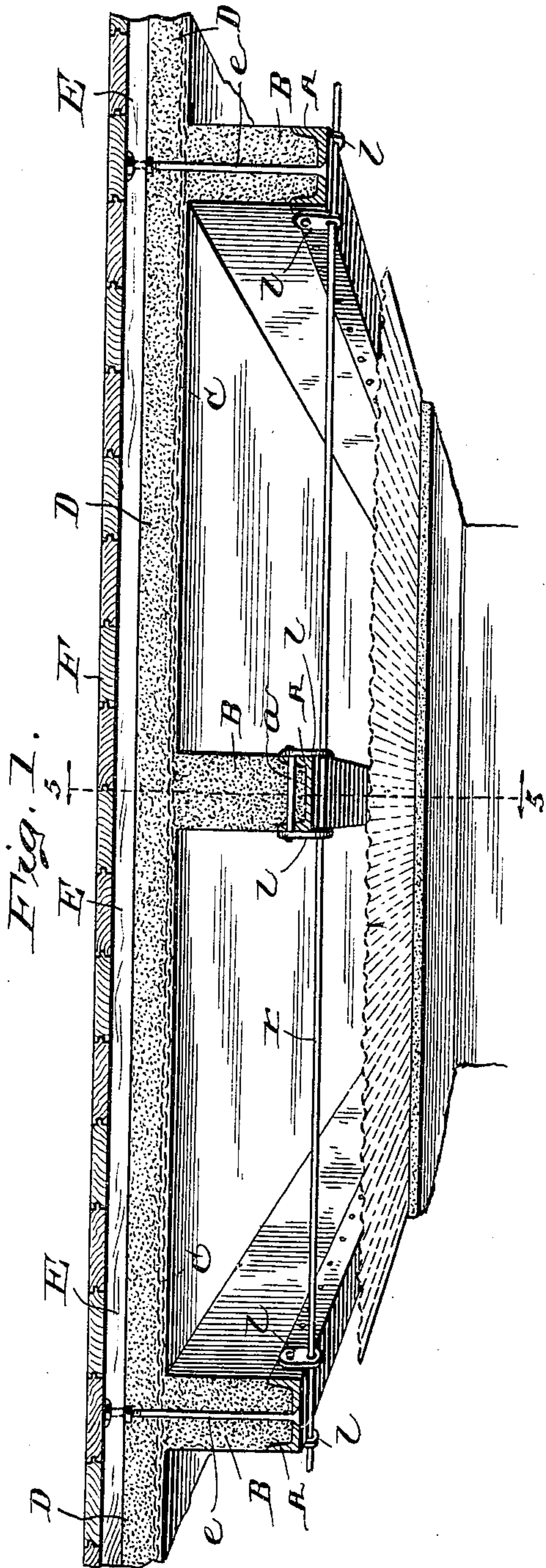
W. H. BROWN.

FLOOR.

(Application filed Mar. 23, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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No. 614,530.

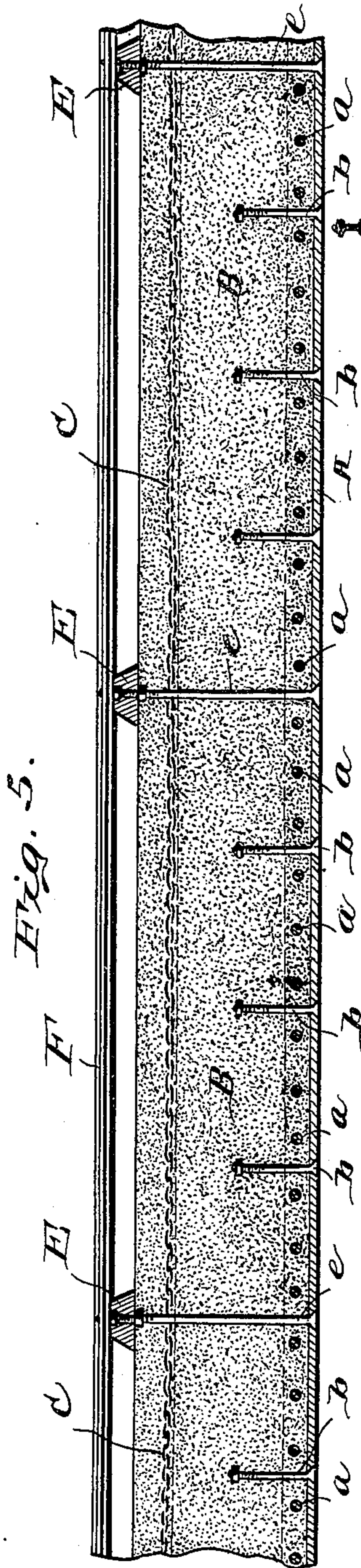
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2 Sheets—Sheet 2.



WITNESSES:

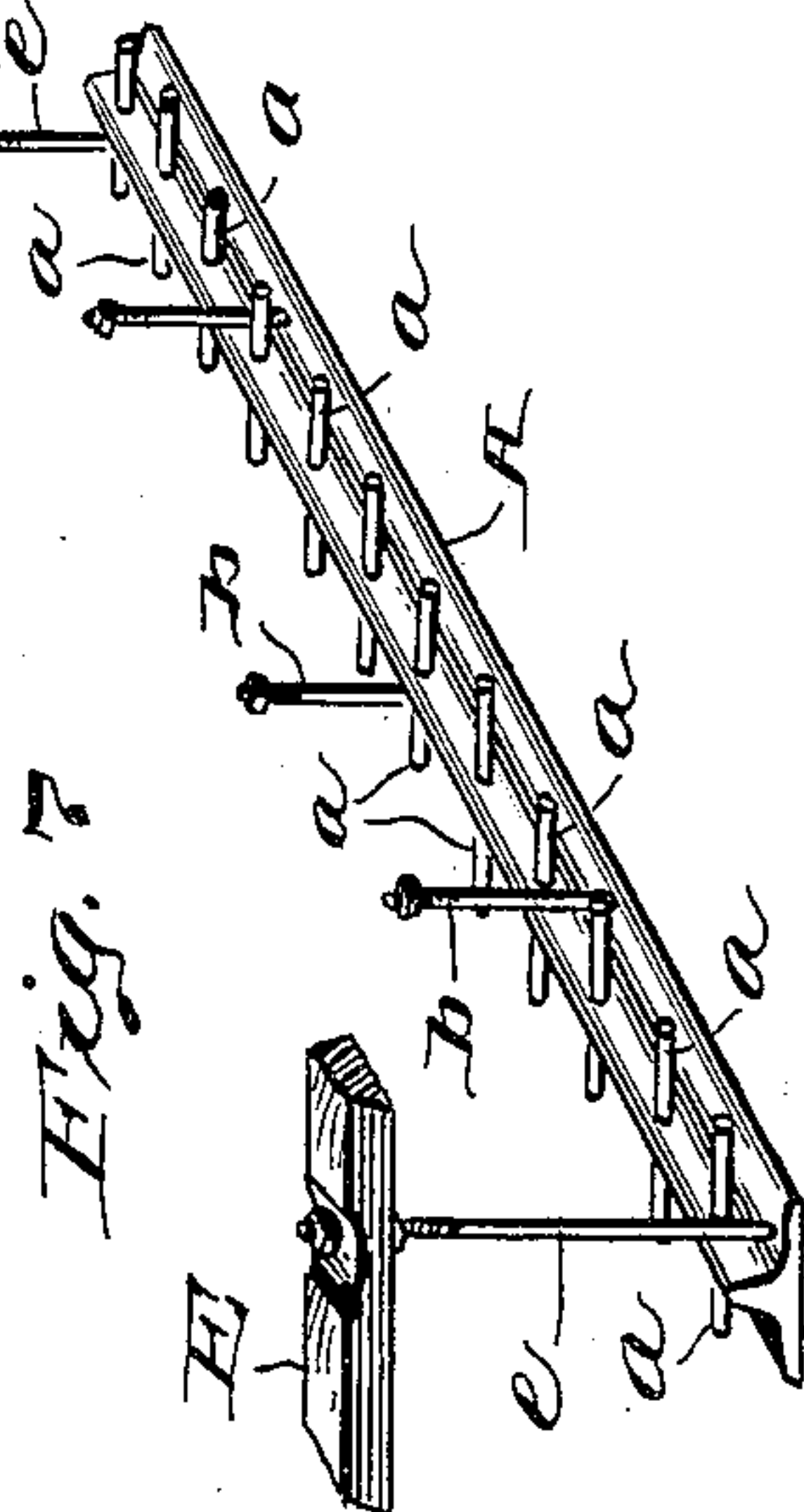
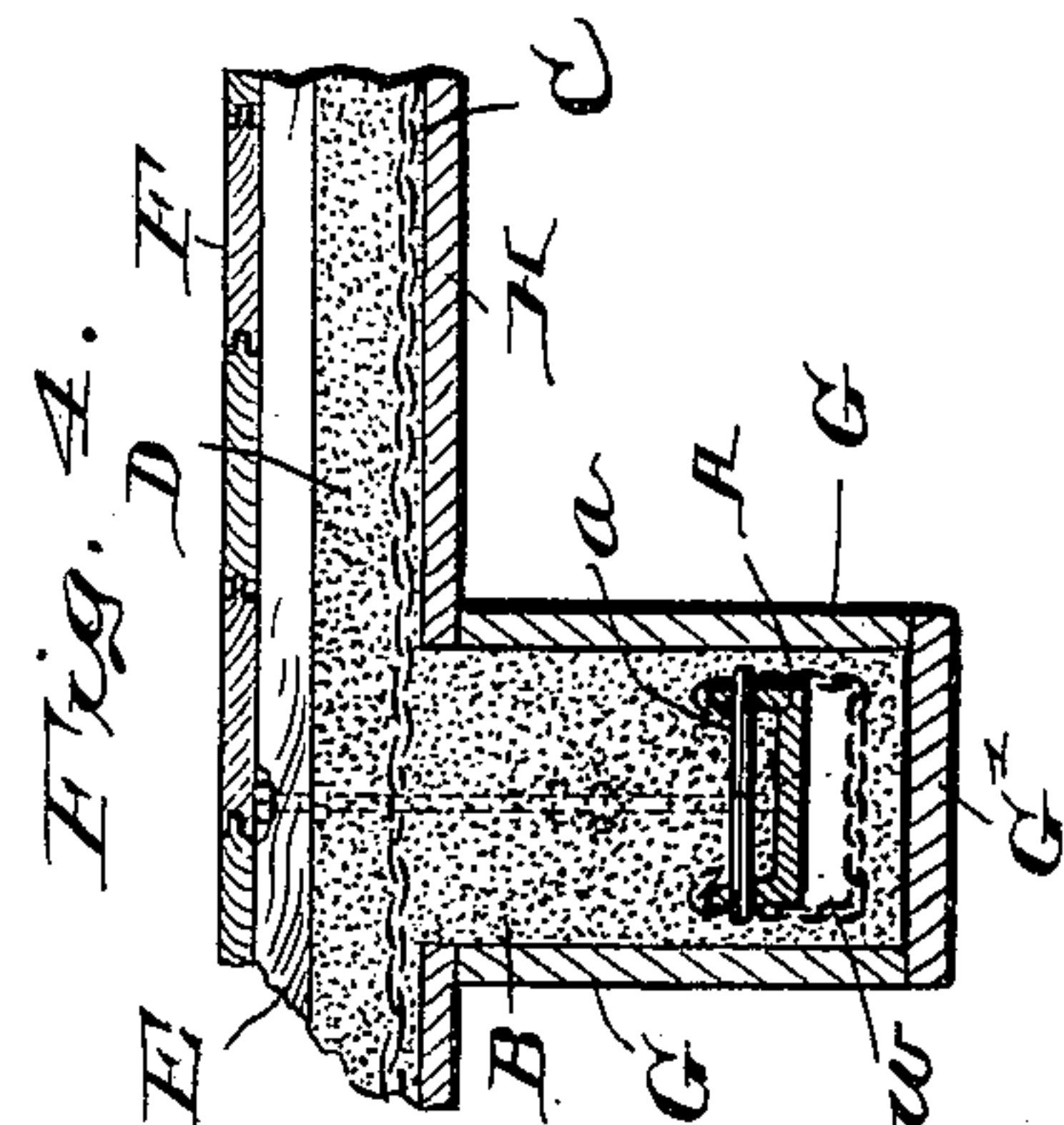
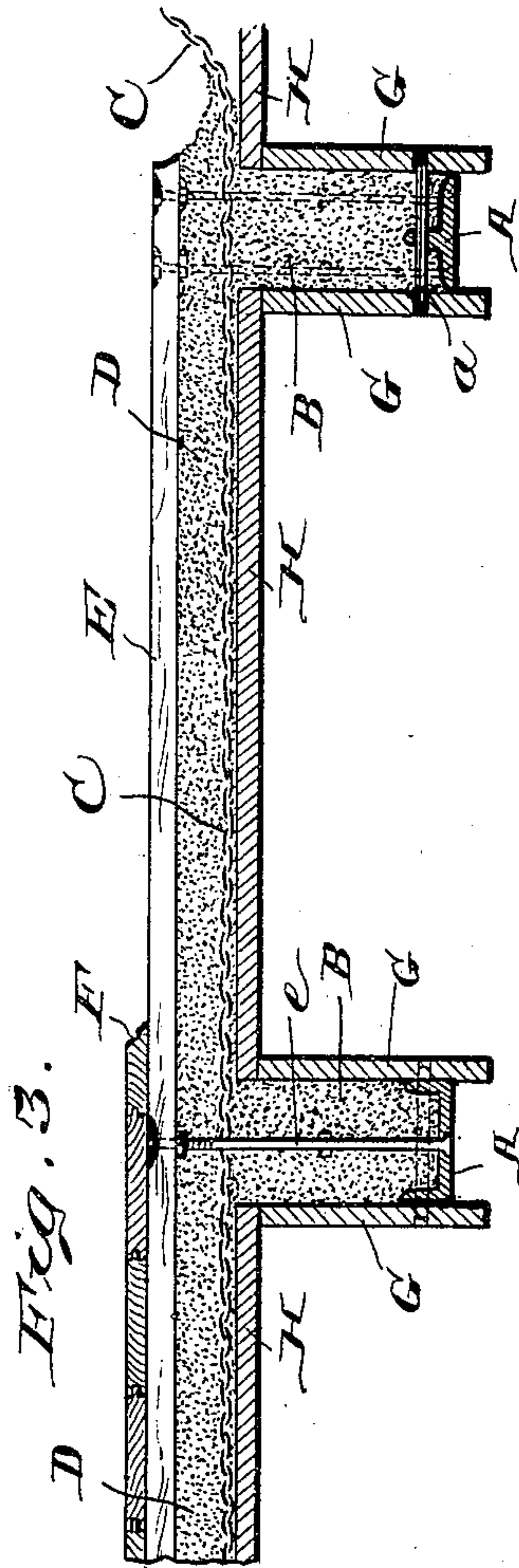
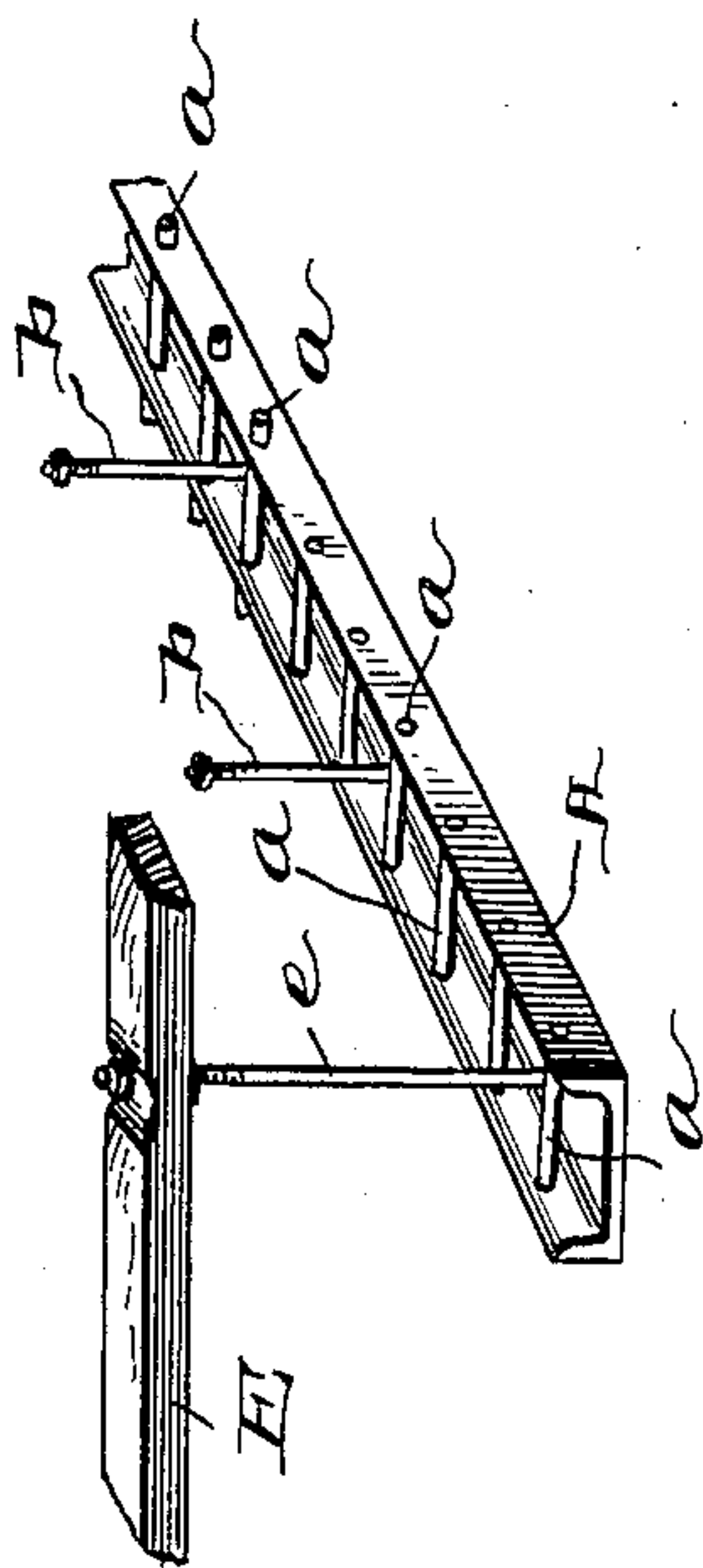


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM H. BROWN, OF INDIANAPOLIS, INDIANA.

FLOOR.

SPECIFICATION forming part of Letters Patent No. 614,530, dated November 22, 1898.

Application filed March 23, 1897. Serial No. 628,824. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BROWN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Floors, of which the following is a specification.

The principal object of my invention is to produce a composite structure at a small expense which shall take the place and serve the purpose of the ordinary heavy metal floor-beams in architectural construction. In doing this I form the lower edge of the structure of metal and provide it with numerous interlocking points or devices and then build upon the metal so formed a cement or concrete upper portion. The metal being, as is well known, very strong to resist tensile strains, and the concrete being equally strong to resist compression, while very much cheaper in cost than metal, besides being possessed of high combustion-resisting qualities, the composite structure embodies in a high degree the advantages while avoiding the disadvantages of both materials, besides securing comparative inexpensiveness.

Further objects are to provide a means for securing the flooring-strips strongly and securely to the beams, means for adjusting said floor-strips, and to provide convenient spaces for pipes, wires, &c., comprised in the lathing or other equipment.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view illustrating an architectural floor construction embodying my said invention; Fig. 2, a similar view illustrating an alternative form of construction; Fig. 3, a transverse sectional view illustrating the method of constructing the variety of floor shown in Fig. 1; Fig. 4, a similar view illustrating the method of constructing the variety of floor shown in Fig. 2; Fig. 5, a longitudinal sectional view (i. e., longitudinal of one of the beams) as seen from the dotted line 5 5 in Fig. 1, and Figs. 6 and 7 fragmentary perspective views of two forms of metal members adapted for use in the construction of beams embodying my invention.

In said drawings the portions marked A represent the metal members; B, the concrete members; C, an "expanded-metal" sheathing, which is laid over the floor-beams to form the lower side of the floor; D, a body of concrete laid upon said expanded metal; E, wooden strips laid upon or embedded in said concrete; F, a wooden floor laid upon said strips, and G, G', and H casing-boards, which are used during the building of the floor as sides of molds, whereby the beams and ceiling are given the desired shape.

The metal beams A are preferably channel-beams, as shown in most places in the drawings, but may be T-beams, as shown in Fig. 7. These are arranged in use with the flanges extending upwardly and the smooth surface on the under side. Through the flanges are extended numerous horizontal pins or bolts *a*, around which the concrete in being placed in position will pass and which when the concrete is "set" will be firmly embedded therein, forming interlocking or engaging points or devices and strongly uniting the metal and concrete members of the completed beam. In the structure illustrated in Fig. 1 these transverse pins *a* extend through the flanges of the iron beams and project somewhat beyond the surfaces thereof. Upon these projecting ends I hang links *l*, which carry rods *r*, and these in turn support the lathing to which the plastering is applied. Said pins or rods *a* thus serve a double purpose, both entering into the construction of the beams and forming a means for supporting the plastering. In addition to these transverse pins *a* I prefer also to insert vertical pins or bolts *b*, which pass up into the concrete, as shown, and which are preferably provided with tapered heads adapted to fit into countersunk holes in the under side of the metal members. These, as they extend up a considerable distance into the concrete, aid considerably in the matter of securing the members strongly together. They may or may not be provided with nuts or collars on the upper ends; but manifestly such nuts or collars are of some advantage. I also employ at suitable intervals vertical bolts *c*, which are like the bolts *b*, except that they are of greater length, and which at the upper ends pass through the wooden strips

in place. I prefer to thread the upper ends of these bolts *e* for a considerable distance and provide each bolt with two nuts. The nuts are thus adapted to bear against each side of the wooden strips *E*, through which the bolts pass. By this means a perfect adjustment of said strips may be secured, so that a perfectly level or slightly crowning or other variety of floor may be easily secured without the interposition of other means. I have shown the strips *E* as resting upon the top of the bed of concrete, thus leaving spaces between the edges of said strips, the upper surface of said concrete, and the under side of the wooden floor, within which electric or other wires or gas or other pipes may be placed, if desired. The strips being firmly anchored to the beams by means of the bolts *e* enables me to do this, as said strips do not need to be embedded in the concrete. However, if it is desired to fill the spaces between the strips with concrete it can of course be done, and if done after the wires and pipes are laid said wires and pipes are thus embedded therein.

In the form of floor illustrated in Figs. 2 and 4 I have shown the metal beams as protected from heat by means of an open space immediately below said beams as well as by the surrounding concrete. Such open space is secured by attaching to the beams pieces of the wire lathing *w*, which may be so attached by bringing the edges thereof up alongside the beams and bending them over the edges thereof, as will be readily understood. Then when the concrete is filled into the box-like space formed by the boards *G* and *G'* it will pass between said boards and said wire lathing, leaving it in the form shown, with an open space next the metal. As will be readily understood, with this construction it is practically impossible by means of any local fire within the building to make the beams sufficiently hot so that they will bend or yield, and this arrangement therefore contributes in a considerable degree to the safety of the construction.

The expanded-metal sheathing *C*, the concrete *D*, the strips *E*, (except as to the means of securing an adjustment already described,) and the flooring *F* severally are or may be of any usual or desired construction and arrangement and do not in themselves embody my invention, but are illustrated in connection therewith to show a complete structure embodying said invention and illustrating the manner of its use.

The boards *G* (and, where they are used, the boards *G'*) are secured in place alongside the metal members *A* after the latter are put in the desired position, and the concrete is then filled in between said boards (which thus serve as the sides of a mold) in such a manner as to make it a compact and homogeneous mass.

The boards *H* are held up so as to cause a

smooth surface to the ceiling in the construction shown in Fig. 1. After the concrete is set these boards are removed, and then the beams and ceiling are finished in any desired manner, being incased by plastering, as shown in Fig. 2, to form a panel-ceiling, or covered by an ordinary plain ceiling, as shown in Fig. 1.

The boards *G*, *G'*, and *H* are supported by any ordinary staging and clamping construction or any such temporary supporting devices as may be considered desirable or convenient by the builder, and these support the elements of the structure while being assembled and while the concrete is hardening.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a beam for architectural uses, of the flanged metal member *A* having numerous transverse pins *a*, and vertical pins or bolts *b*, and the concrete member *B* filled in around said pins or bolts *a* and *b*, substantially as shown and described and for the purposes specified.

2. The combination of a floor-beam composed of a metal member and a concrete member, bolts secured to the metal member and extending up through the concrete member, strips to which the floor is to be nailed positioned above said concrete member, nuts on said bolts for attaching said strips thereto whereby said strips are anchored firmly to the strong metal portion of the floor-beam, and a floor mounted on said strips.

3. The combination, with floor-beams, of bolts extending upwardly therefrom and threaded at the upper ends and provided with two nuts on each bolt, and strips to which the floor is to be attached and through which the threaded ends of said bolts pass, whereby, by adjusting said nuts, said strips may be adjusted to such position as is desired to receive and support said floor.

4. The combination, in a beam for architectural uses, of the flanged metal members, pins or bolts secured to the upper sides thereof, wire lathing secured to the under sides of said members, and concrete placed upon and around said members and against the outer side of said lathing, whereby a composite beam is produced with an open air-space on its under side, and a temporary casing whereby said composite beam is given form, substantially as set forth.

5. The combination, with a beam for architectural uses composed of iron members *A* having transverse pins *a* extending there-through and projecting to the outside and the concrete members *B*, of links *l* suspended from the ends of said pins *a*, rods carried by said links, and lathing supported by said rods.

6. A floor-beam for architectural uses, composed of a flanged metal member *A* forming the lower side or under surface of the beam

and provided at a point above its upper horizontal face with a number of engaging pins, as *a*, and a concrete member B placed on the upper side of the metal member A and formed
5 thereon while yet plastic to embrace the engaging points or pins of the said flanged metal member and to form when hardened the upper portion of the beam, whereby the metal and concrete are firmly united and so
10 combined as to utilize the best strength of

both, all substantially as shown and described and for the purposes set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 20th day of March, A. D. 1897.

WILLIAM H. BROWN. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.