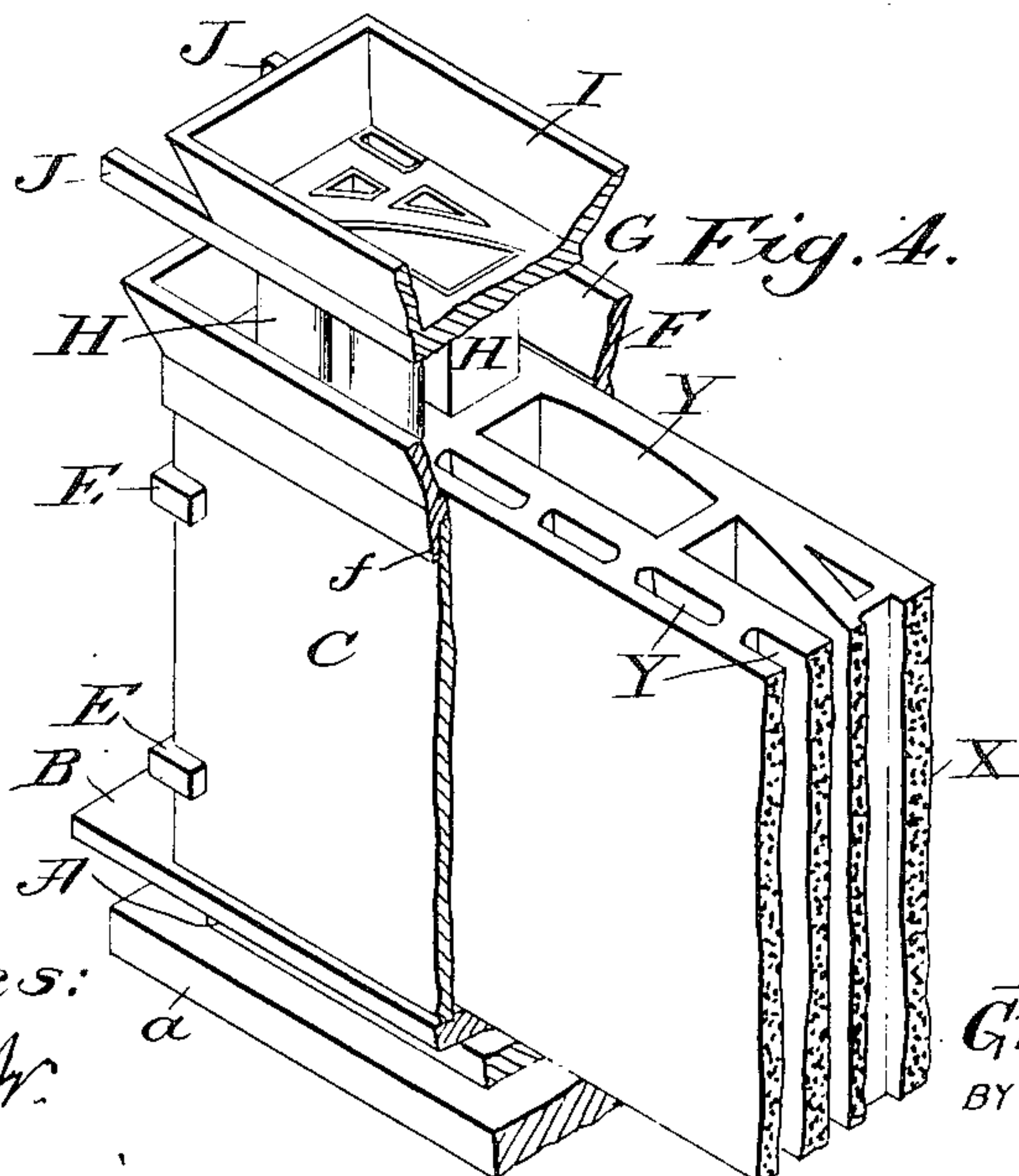
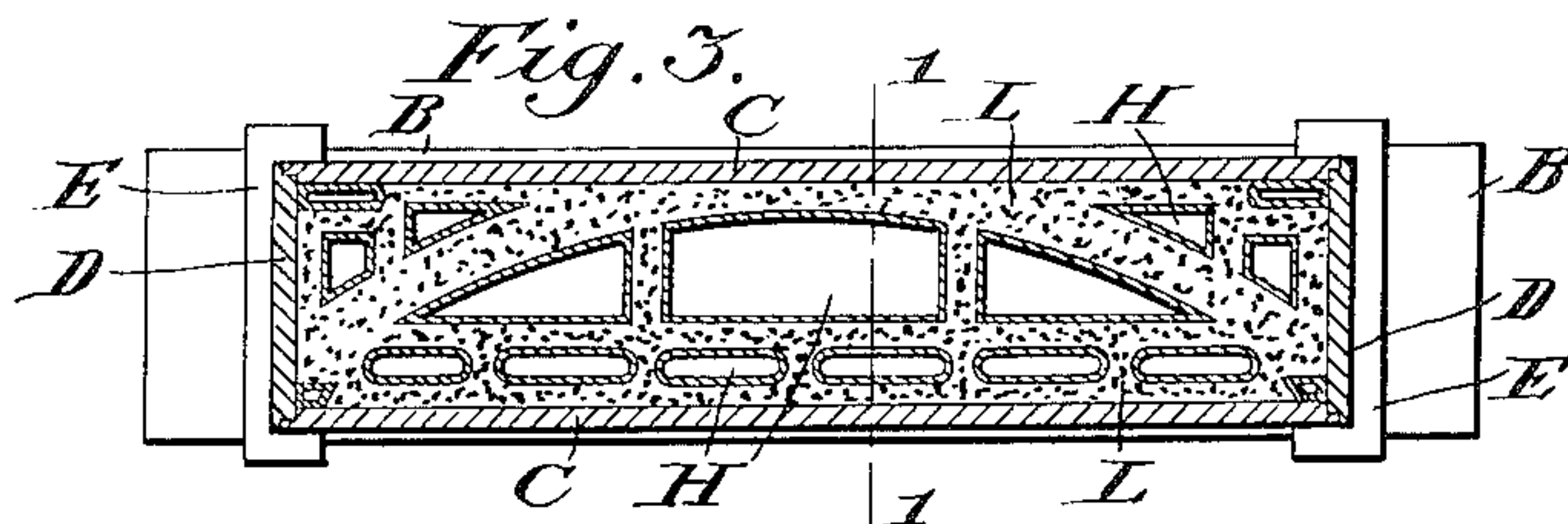
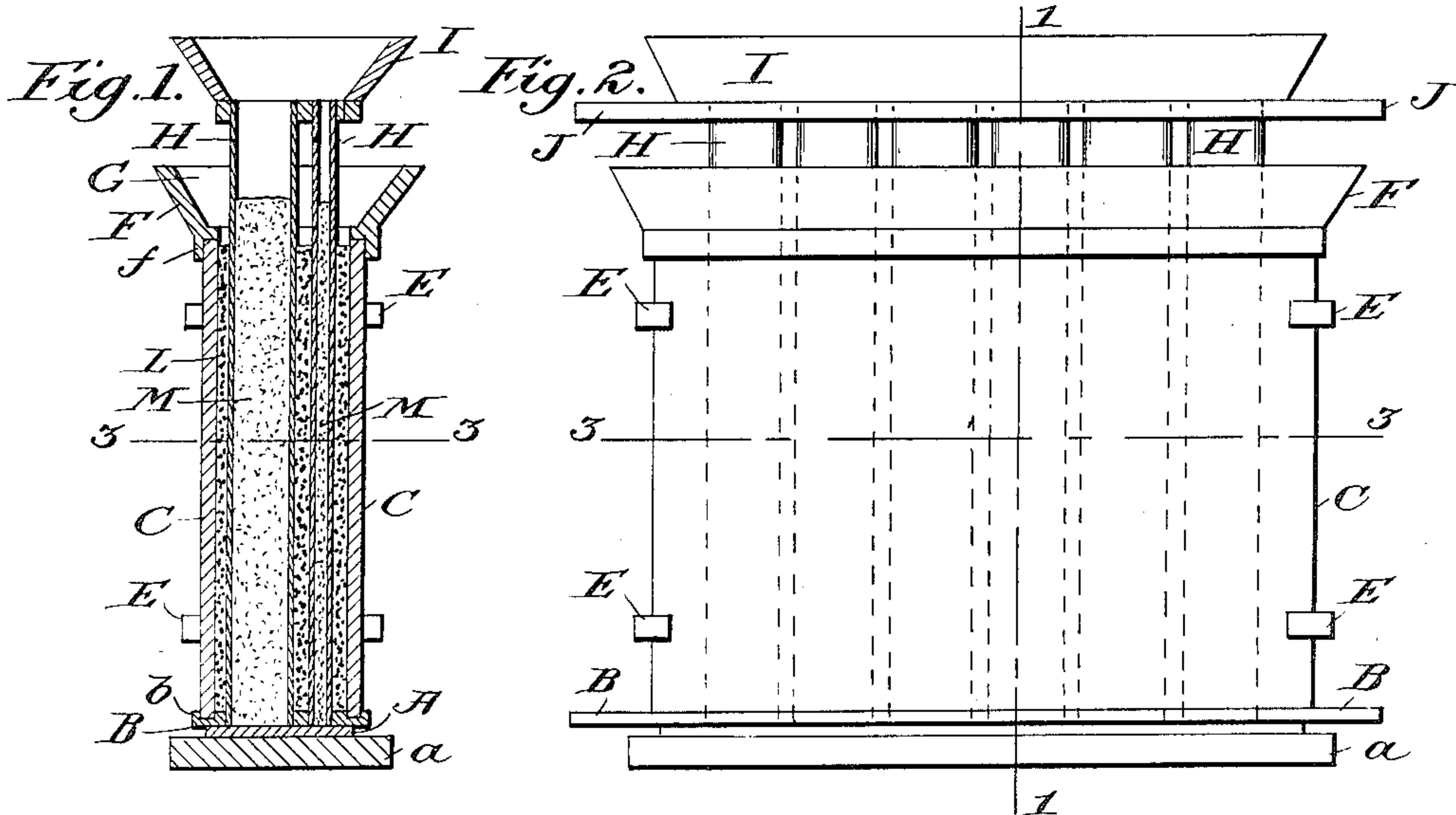


No. 828,833.

PATENTED AUG. 14, 1906.

G. ATTERBURY.  
MAKING CONSTRUCTIONAL SECTIONS.

APPLICATION FILED DEC. 5, 1904.



Witnesses:  
Edw. W. Vaill Jr.  
Thos. J. Maguire.

Inventor:  
Grosvenor Atterbury  
BY HIS ATTORNEYS

Atto Rm Chappin Atto



# UNITED STATES PATENT OFFICE.

GROSVENOR ATTERBURY, OF NEW YORK, N. Y., ASSIGNOR TO CHARLES L. ATTERBURY, OF NEW YORK, N. Y.

## MAKING CONSTRUCTIONAL SECTIONS.

No. 828,833.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed December 5, 1904. Serial No. 235,521.

*To all whom it may concern:*

Be it known that I, GROSVENOR ATTERBURY, a citizen of the United States, and a resident of the borough of Manhattan, city and State of New York, (having a post-office address at 20 West Forty-third street, in said borough of Manhattan,) have invented certain new and useful Improvements in Apparatus for Making Constructional Sections, of which the following is a full and true description, reference being had to the accompanying drawings, which show means devised by me for making building-sections.

I have devised a new mode of building-erection employing large building-sections, which engage parts carried by the building-skeleton. I preferably use cellular or hollow building-sections in order to assure economy and lightness and to also provide passages for wires, pipes, &c. The building-sections referred to are preferably composed of a hardened concrete cement and are formed by filling concrete grout or other suitable material into a mold-box or other frame.

My present invention relates to an improved apparatus for making cellular or hollow constructional sections, especially building-sections.

In the accompanying drawings I have shown an apparatus for making a floor-section to be fitted by gravity into engagement with the floor-beams of the building-skeleton.

Figure 1 is a vertical section, on the line 1 1 of Figs. 2 and 3, of one form of the novel molding apparatus which I employ. Fig. 2 is a side view of such apparatus. Fig. 3 is a horizontal section on the lines 3 3 of Figs. 1 and 2, and Fig. 4 is a fragmentary perspective view showing portions of the assembled mold-sections and in part the general outline of a floor-section as made therein.

The molding apparatus may rest upon a floor A, made of thin boards or plates, which may rest upon a heavier flooring a.

B is the base of the mold, and C C and D D indicate, respectively, the sides and ends of the mold box or flask. As shown in Fig. 1, the base may have grooves b, into which the lower edges of C and D will fit, thus assuring a tight joint between the bottom and the sides and ends. The sides and ends may each comprise a single board or plate or be built up in any way desired.

End clamps E, which may be iron bars or castings adapted to grip opposite sides of the mold-box, may be used to hold the parts of the box firmly together and to permit the sides and ends to be readily taken away in order to remove the hardened building-section.

A hopper-frame F, having its sides and ends made of boards or plates secured together, so as to have a wide mouth and inwardly-inclined sides G, fits down upon the upper edge of the mold-box, and in order to have a tight fit between the parts referred to the lower edge of the hopper-frame is cut away to provide a dependent frame f and a corresponding shoulder, as shown in Figs. 1 and 3.

In conjunction with a mold-box or a substitute therefor I may use any suitable construction of cores or core mechanism in order to assure the molding or hardening of the constructional section in the form desired, a cellular or hollow hardened block of hardened cementitious material, such as concrete. In order, however, that the cost of the cores shall be reduced and to produce cores which may be repeatedly used and readily put in place and removed and without the necessity of reassembling the parts of the core mechanism, I use hollow cores, preferably tubular, instead of solid, ones, and fill suitable material thereinto to the extent desired and then remove the tubes and leave the filling material to retain the shape of the cells or hollow parts Y in the hardening cementitious material, which constitutes the constructional section X.

As shown in the drawings, I may use a plurality of thin sheet-metal tubes H, which are preferably of substantially equal thickness throughout and whose exterior corresponds to the interior of the cells or hollow parts of the building-section. The several tubes may be connected in any suitable way for simultaneous insertion and removal from the mold-box, and for this purpose the upper ends of all the tubes may be connected through the bottom of a hopper-box I, which also affords a simple means for maintaining all of the tubes in the desired relation and to permit them to be quickly filled, as desired, with the sand. As a further means for maintaining the tubes in the desired relation the lower ends of said tubes may fit into openings through the



mold-base B. To facilitate the handling of the core mechanism, handles or rods J are provided at the ends of the hopper I and permit the core mechanisms to be readily raised or lowered.

When the mold-box and the core devices are assembled, as shown in Figs. 1 and 2, the liquid or semiliquid cementitious or other hardening material (which may be a hot asphalt mixture or concrete grout or any other hardening or cementitious mixture) to constitute the building-section or other constructional section is shoveled or poured into the frame or hopper F and falls into the mold-box, filling all parts of the same exterior of the tubes H. Sand (either wet or dry) or other non-cementitious or filling material M, preferably of approximately the same specific gravity as the material L, is also shoveled, poured, or dumped into the hopper I and falls into and fills the tubes H to the extent desired. The two materials L and M may be simultaneously or successively filled into the apparatus. The two mixtures being of substantially the same specific gravity, the tubes H may be withdrawn immediately or within a short time after filling both mixtures into the molding apparatus, leaving the filling material to support the surrounding concrete mixture or other material during the time necessary for it to set and season. When this result has been attained, the mold-box may be taken apart, and the building-section having been lifted or tilted the sand or other filling material will flow or empty from or be easily driven out of the cells or openings Y in the building-section. If desired, the entire mold-box may be raised so as to permit the sand to run from the openings in the base B either before or after the mold-box is taken apart.

The employment of wet sand or other suitable filling mixture for the purpose hereinbefore stated gives several advantages, among which are the following: first, permits the use of cementitious material in semiliquid or even liquid form, thereby saving time and expense necessary to the packing of a drier form of mixture in the ordinary casting methods; second, renders the withdrawal of the cores much easier and quicker than where they are held by the friction resultant from the ordinary dry mixtures, which must be packed in order to make them stiff enough to avoid collapse on the withdrawal of the

cores; third, renders it possible to cast very thin sections or webs of the cementitious material and of as great a height as may be desired, since the tubular cores may be partially withdrawn and additional casting mixture and filling material introduced both inside and outside until the desired height of casting is obtained, and thus without increasing the height of the tubular cores; fourth, the avoidance of any disturbance of the hardening material after its introduction around the cores by reason of friction and jarring when removing the cores, whereas in the usual processes of casting the cores must be left for a time to permit the surrounding material to set sufficiently for withdrawal of the cores without collapse of the material; fifth, furnishing to the mixture L, if it be concrete or cement, a sufficient amount of water during any desired period, which is a necessary condition to secure the maximum degree of strength, and, sixth, the filling mixture, which during the setting process loses much of its moisture, is readily removed from or falls out of the sells or hollow parts of the building-section and can be again wet and reused.

Having described one form of apparatus involving my invention, I claim—

1. An apparatus for making cellular or hollow building-sections, comprising a suitable mold, tubular cores within said mold, said cores being longer than the height of said mold to allow simultaneous filling of said cores and mold.

2. An apparatus for making cellular or hollow building-sections, comprising a suitable mold, tubular cores within said mold, said cores being longer than the height of said mold, and a hopper connecting the upper ends of said cores, to allow simultaneous filling of said cores and mold.

3. An apparatus for making cellular or hollow building-sections, comprising a suitable mold having a hopper surrounding its top, tubular cores within said mold, said cores being longer than the height of said mold, and a hopper connecting the upper ends of said cores, to allow simultaneous filling of said cores and mold.

In witness whereof I have hereunto signed my name this 1st day of December, 1904.

GROSVENOR ATTERBURY.

In presence of—

ALBERT E. WILSON,  
JOEL L. HALLSTRÖM.