

C. H. HOWARD.  
FORMING MOLDS FOR CASTINGS.  
APPLICATION FILED APR. 19, 1909.

999,308.

Patented Aug. 1, 1911.

Fig. 1.

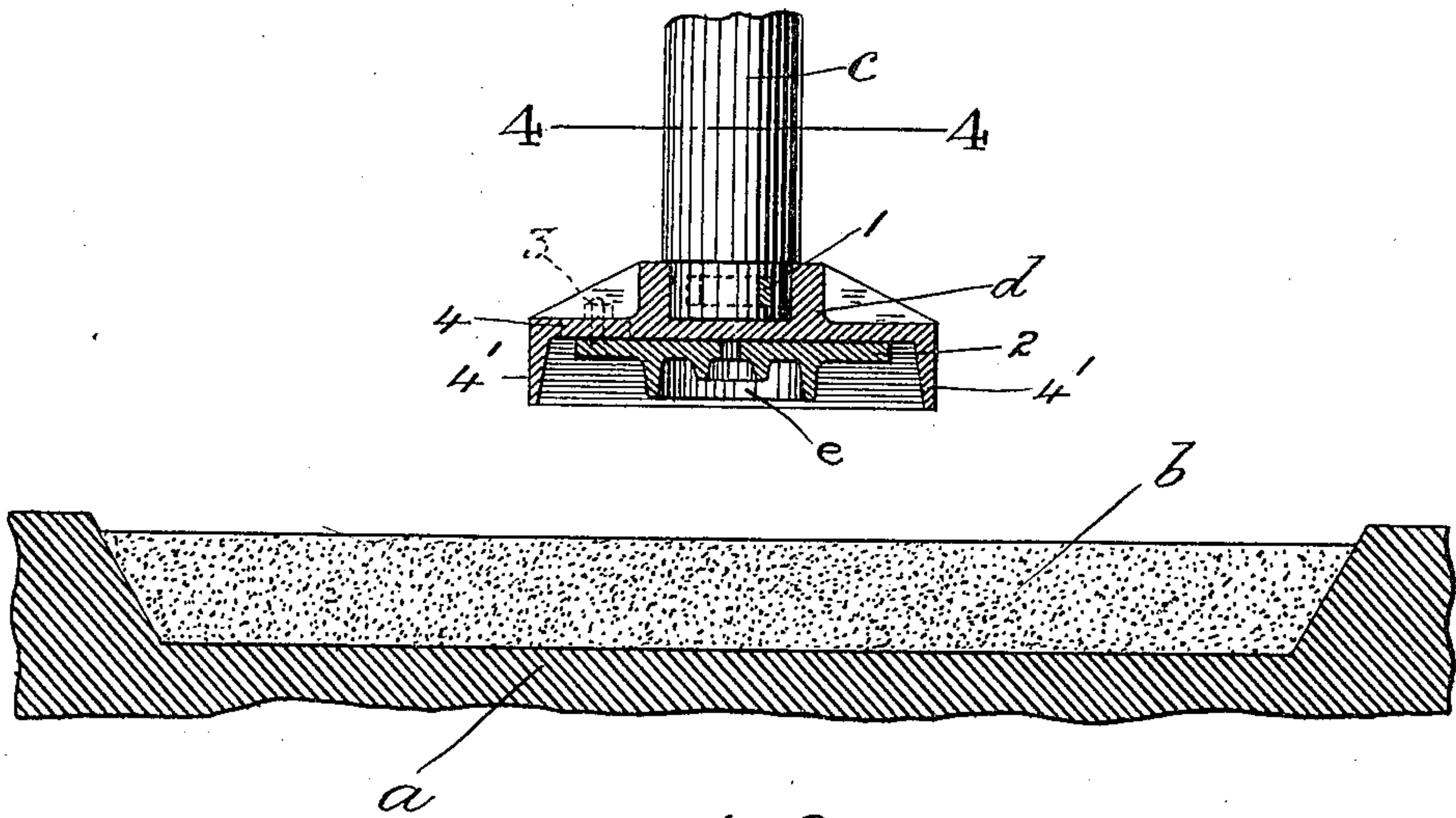


Fig. 2.

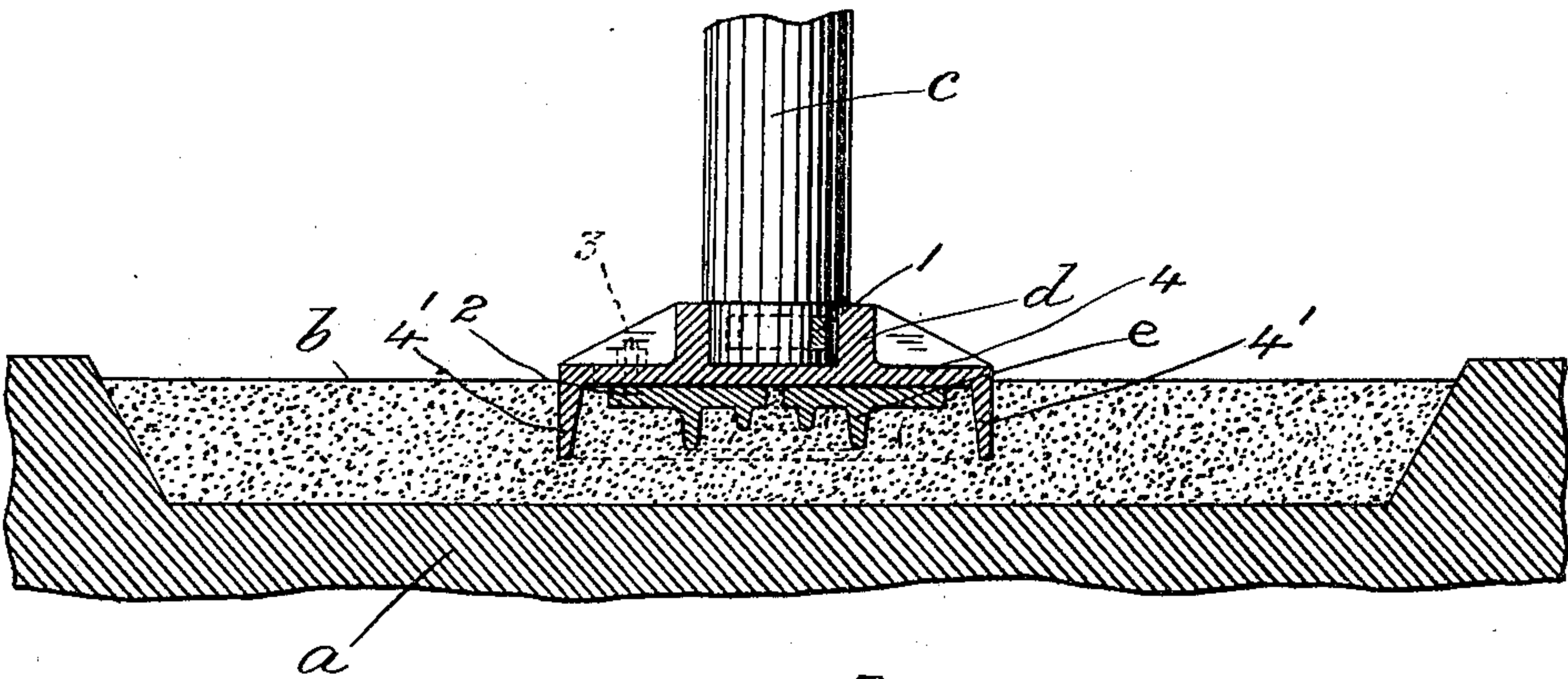


Fig. 3.

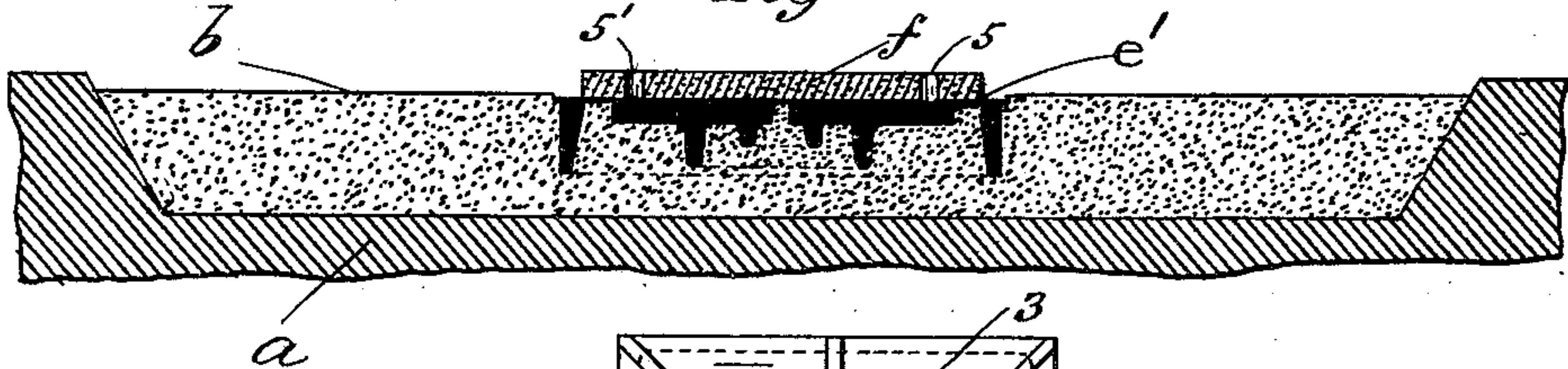
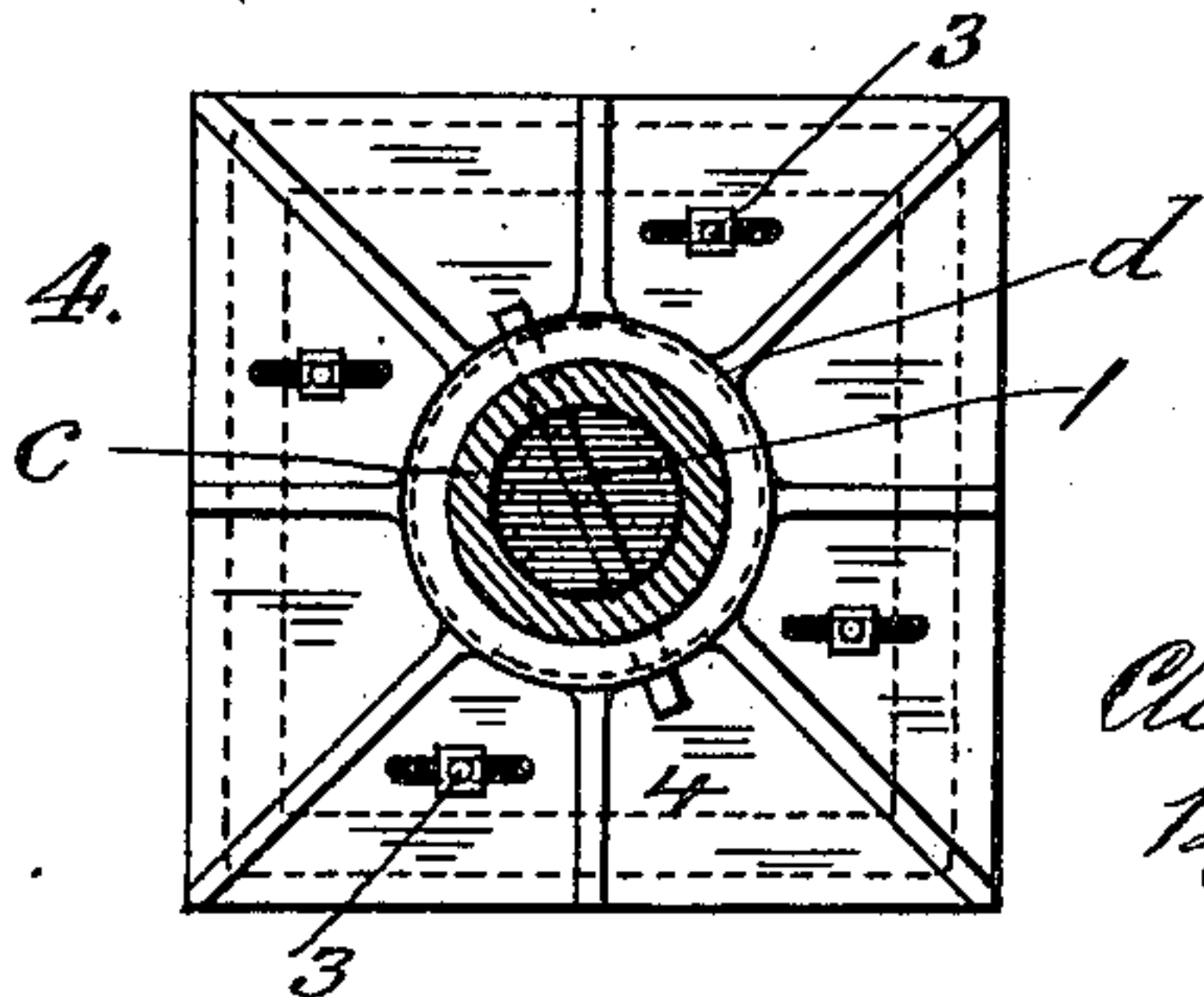


Fig. 4.



WITNESSES  
*E. J. Messers*  
*Hazel E. Ragland.*

INVENTOR  
Clarence H. Howard  
By *Edward W. Furrell*  
His Atty



# UNITED STATES PATENT OFFICE.

CLARENCE H. HOWARD, OF ST. LOUIS, MISSOURI.

FORMING MOLDS FOR CASTINGS.

999,308.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed April 19, 1909. Serial No. 490,759.

*To all whom it may concern:*

Be it known that I, CLARENCE H. HOWARD, a citizen of the United States, residing at St. Louis, in the State of Missouri, have  
5 invented a new and useful Improved Method of Forming Molds for Castings, of which the following is a specification.

My invention relates to an improved method of forming sand molds for casting  
10 purposes, and has for its object to obtain a firm and well defined mold, and to economize time and labor.

My invention consists in the use of a bed of properly prepared sand or analogous  
15 molding material which is laid upon a table, floor, or other support, and above this bed is arranged within a suitable cylinder, a ram or plunger having the pattern of the desired casting affixed to its bottom end and  
20 adapted therewith to be lowered and raised to and from the sand by any suitable power and combined mechanism.

On the ram being lowered the pattern is forced thereby into the sand and forms a  
25 matrix therein corresponding in shape to the pattern, against the various parts or members of which the sand is forced or packed by suitable means cooperating with the pattern, so that on raising the ram and with-  
30 drawing the pattern from the sand, a firm and well defined mold is obtained. Over the mold thus formed is placed a cover piece of suitable material through which are  
35 formed the usual ingate and vent openings to and from the mold, which is then ready to receive the molten metal.

In carrying out my invention I do not limit myself to any particular means as various means may be designed for the purpose, such as shown on the accompanying  
40 drawing forming part of this specification, whereon,

Figure 1, is a vertical section through a pattern with its holder attached to a preferably  
45 hollow cylindrical ram or plunger (broken away) arranged above a bed of molding sand in which a mold of the pattern is to be formed; Fig. 2, a similar view to Fig. 1 showing the pattern forced by the ram into the sand; Fig. 3, a similar view to Fig. 1  
50 (omitting the pattern and its combined parts) showing the matrix or mold formed in the sand by the pattern, and the cover piece thereover, ready for receiving the  
55 molten metal, and Fig. 4, a horizontal sec-

tion through the ram on line 4,4, in Fig. 1, showing the pattern holder in top plan view.

Like letters and numerals of reference denote like parts in all the figures.

*a* represents a floor on which is laid a bed  
60 of properly prepared sand or analogous molding material *b*. Above the sand *b* at a suitable distance therefrom is a vertically arranged ram or plunger (broken away) *c* which is adapted to fit within a cylinder  
65 forming part of preferably, an overhead traveling mechanism (not shown) of any ordinary well-known construction and operated by hydraulic, steam, pneumatic, electric, or other motive power for raising and  
70 lowering the ram *c* within its cylinder and for moving it horizontally in various directions according to the desired position of the mold to be formed in the sand *b*.

To the bottom end portion of the ram or  
75 plunger *c* is fixed by any suitable means, such as by a key 1 as shown, a head or holder *d* for the pattern from which it is desired to form a mold in the sand *b*. The pattern *e*, which in the present case is shown  
80 as that of a car bolster center-plate having a rectangular base-plate 2, is affixed to the underside of the holder *d* by any suitable means, such as by bolts 3 which are passed  
85 through the base-plate 2 and correspondingly shaped bottom member 4 of the holder *d* against the top of which they are clenched by nuts, the heads of the bolts 3 being countersunk in and flush with the underside of  
90 the base-plate 2 as shown.

From the holder *d*, at preferably a suitable distance from the outer edges of the base-plate 2 of the pattern *e*, depend flanges  
95 4' having their inner faces, which are opposite to the said edges and to the adjacent parts of the pattern *e* which depend from its base-plate 2, tapered outward from their junction with the underside of the holder *d*, the said parts being outwardly oppositely  
100 tapered to the said faces, and in like manner the other depending parts respectively, of the pattern *e* oppositely tapered, or wedge-wise.

In operation, on lowering the ram or  
105 plunger *c*, the pattern *e* is forced into the sand *b* (Fig. 2) which, owing to the tapered surfaces of the flanges 4' cooperating with the oppositely tapered surfaces of the various parts of the pattern *e*, is thereby consolidated and wedged or packed against the  
110



said parts so as to form a matrix or mold corresponding to the shape of the pattern *e*. The ram or plunger *c* with the holder *d* and pattern *e*, being then raised, the latter is  
5 withdrawn from the mold *e'* thus formed (Fig. 3) and a cover-plate or piece *f* having the usual ingate and vent openings 5, 5', respectively, laid over the mold *e'* which is then ready for receiving the molten metal.  
10 Similarly with other patterns having different arrangements of parts or members, the above method of forming molds therefrom may be used with or without the use of cores as the case may be.

15 By my invention a series of communicating matrices or molds from the same or different patterns can be formed in the sand *b* at suitable intervals and the castings therefrom made simultaneously.

20 What I claim as my invention and desire to secure by Letters Patent is:—

1. The herein described method of forming a mold for casting without the use of a flask consisting in forcing a pattern of the  
25 desired form downward into a body of molding material lying unconfined on the ground

or a flat surface until the entire pattern lies below the plane occupied by the top surface of the body of molding material and simultaneously forcing the entire body of mold- 30 ing material immediately adjacent the top and sides of the pattern toward said pattern.

2. The herein described method of forming a mold for casting without the use of a flask consisting in forcing a pattern of the 35 desired form downward into a body of molding material lying unconfined on the ground or a flat surface until the entire pattern lies below the plane occupied by the top surface of the body of molding material, simul- 40 taneously forcing the entire body of molding material immediately adjacent the top and sides of the pattern toward said pattern, then withdrawing the pattern from the molding material, and finally covering the 45 mold cavity with a cover piece provided with an ingate.

CLARENCE H. HOWARD.

Witnesses:

C. T. WESTLAKE,  
EDWARD W. FURRELL.