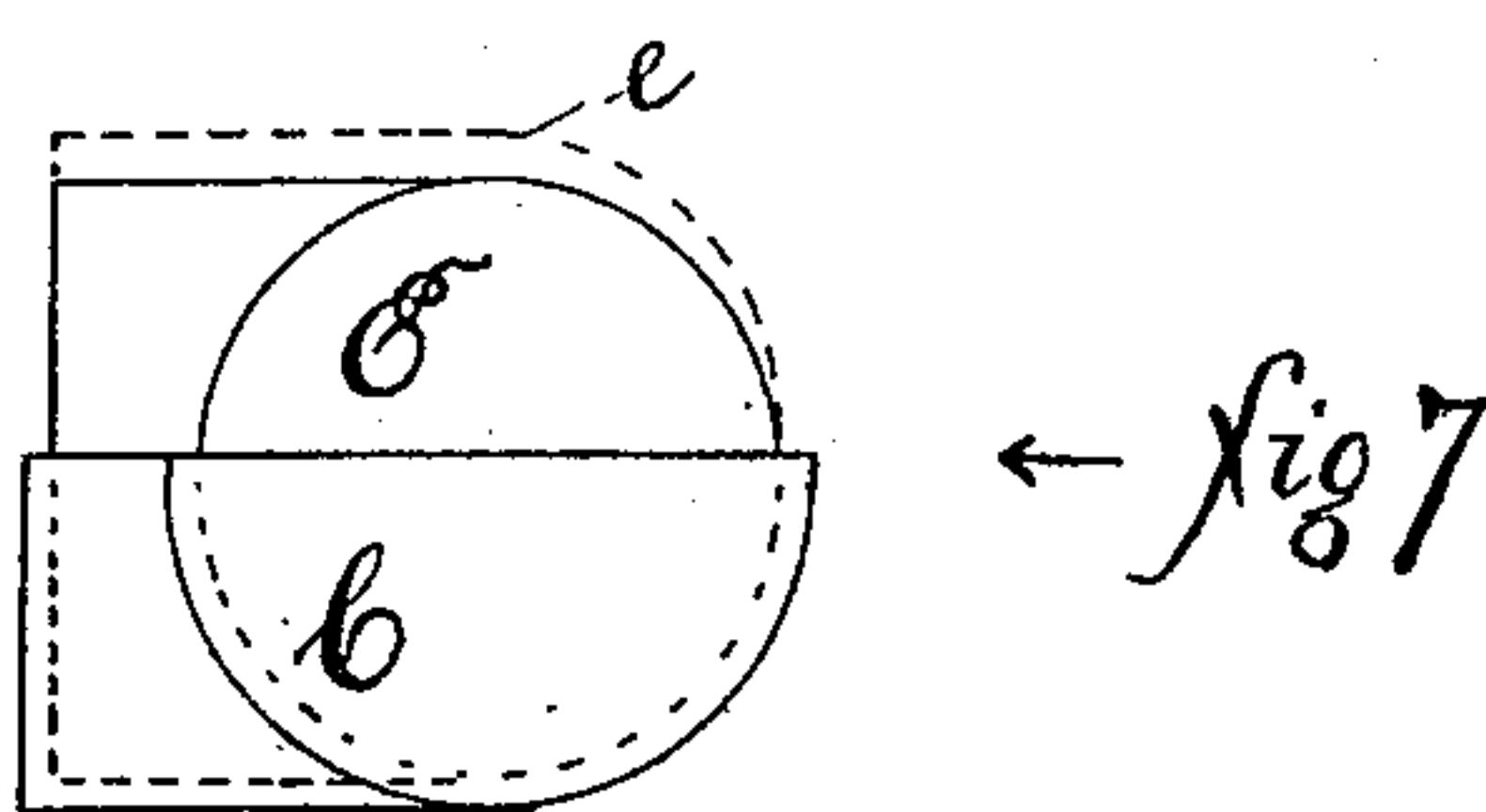
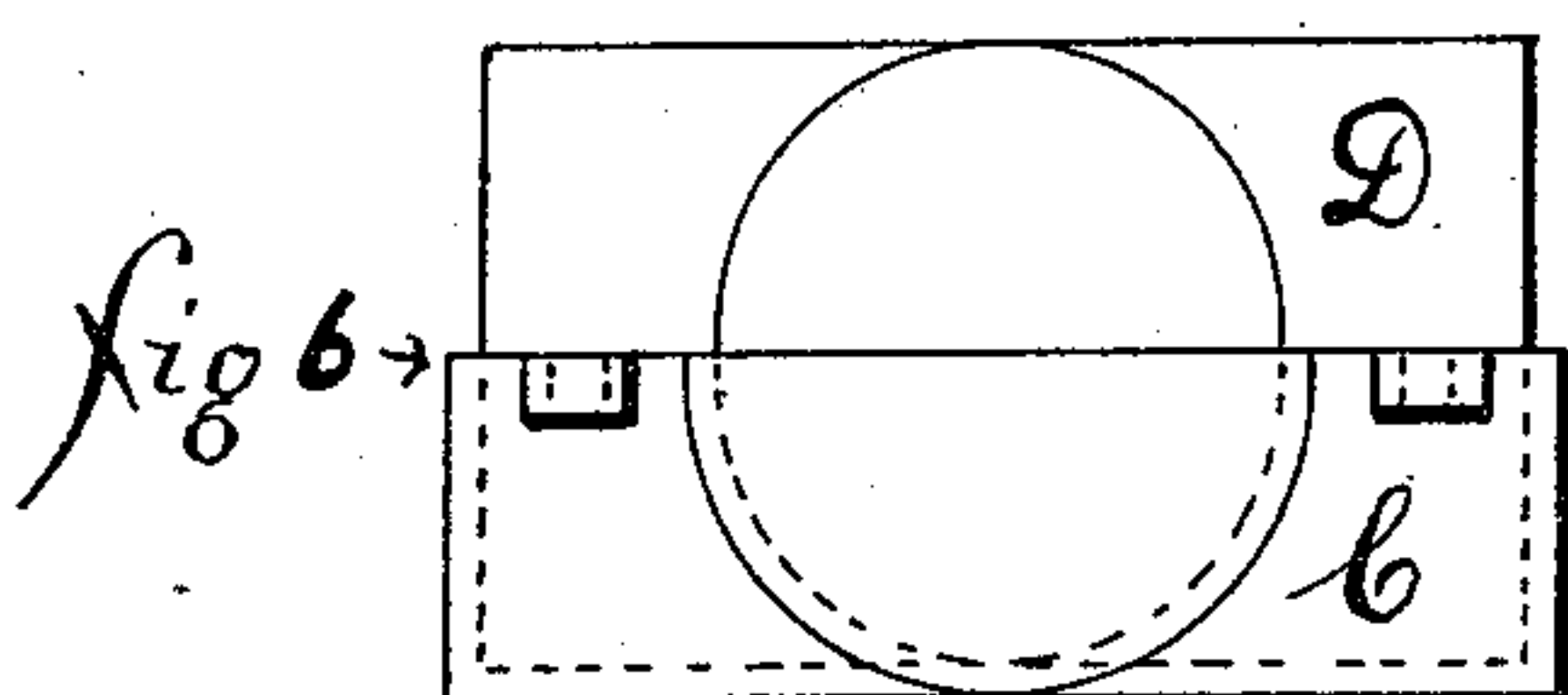
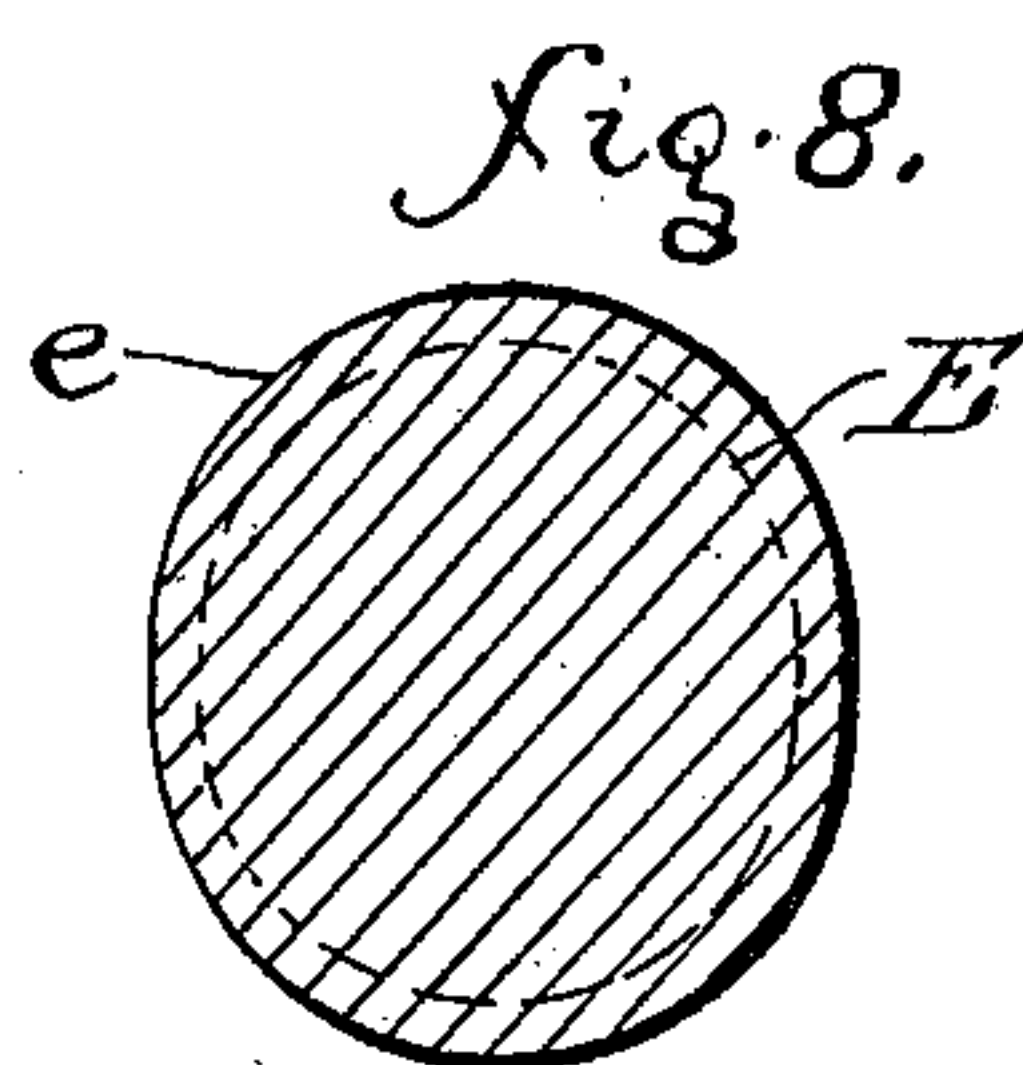
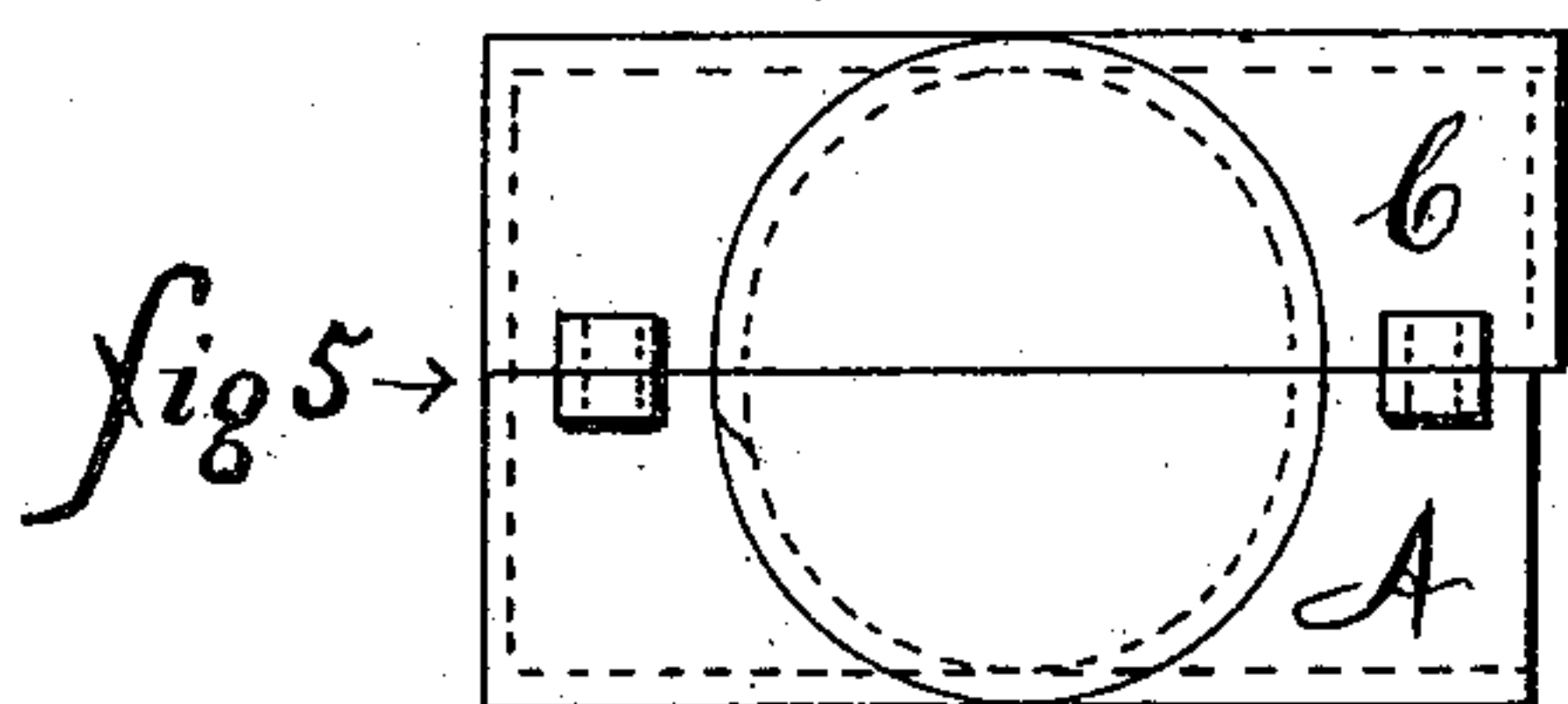
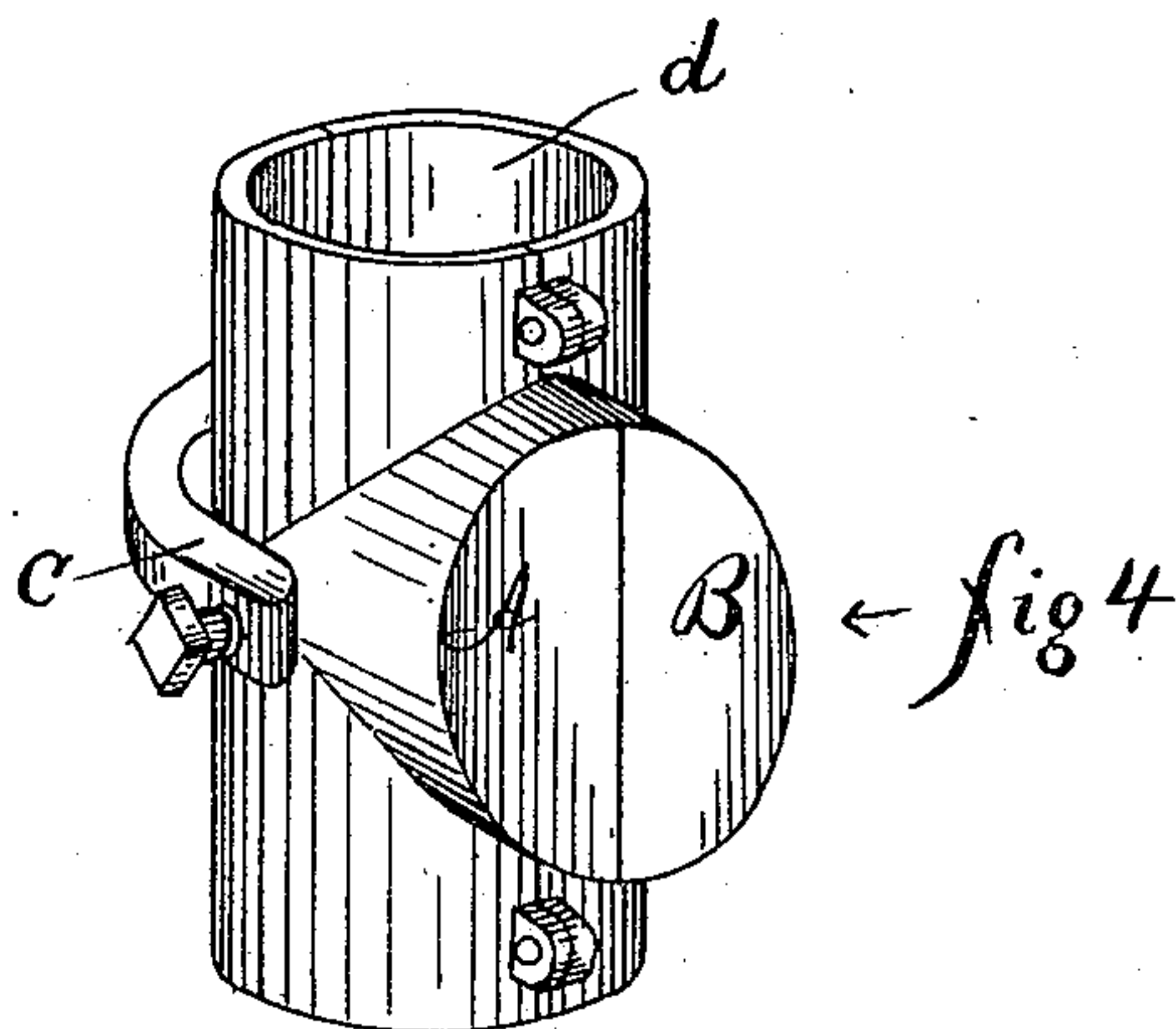
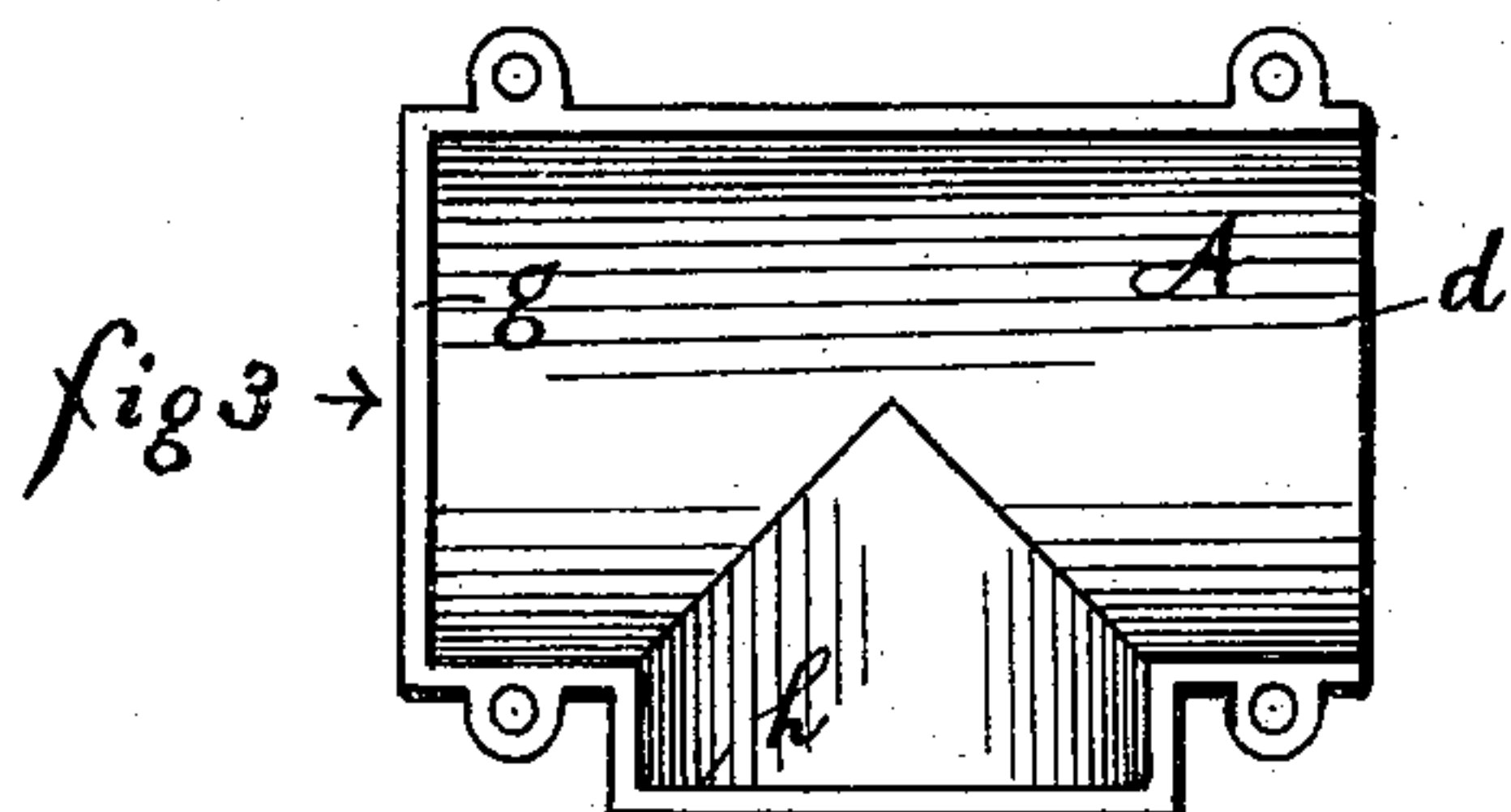
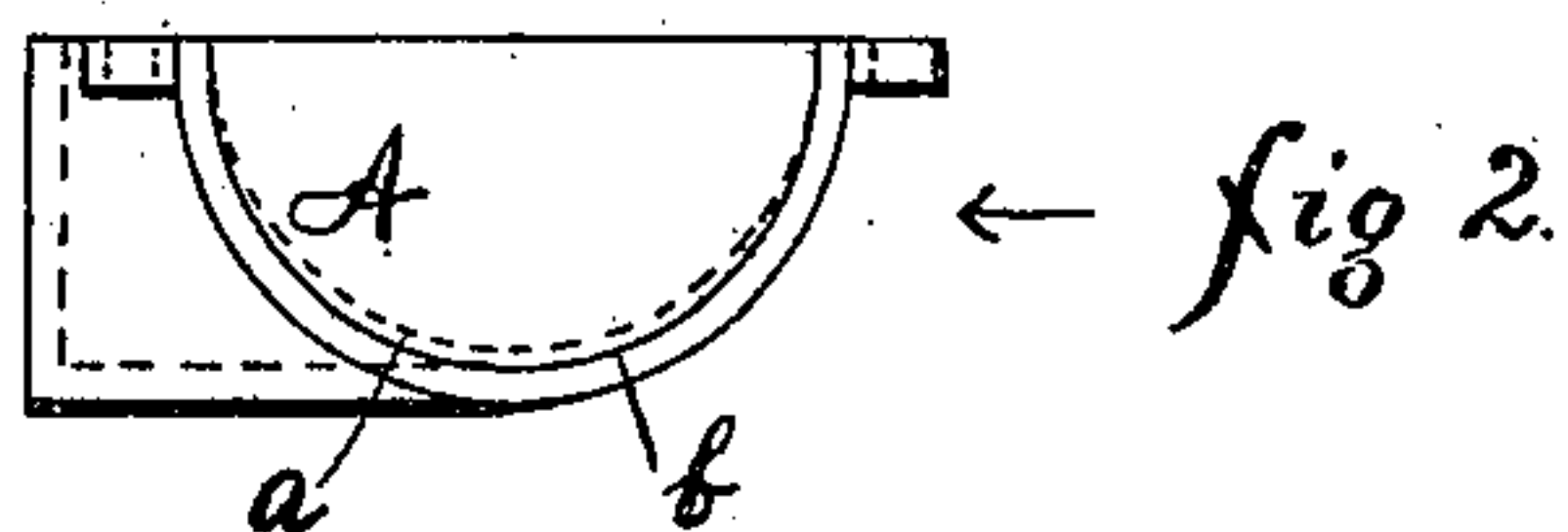


(No Model.)

G. & E. LEE.
DRY SAND MOLD.

No. 583,493.

Patented June 1, 1897.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE LEE AND ENOS LEE, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE
CRANE COMPANY, OF SAME PLACE.

DRY-SAND MOLD.

SPECIFICATION forming part of Letters Patent No. 583,493, dated June 1, 1897.

Application filed June 28, 1894. Serial No. 515,922. (No model.)

To all whom it may concern:

Be it known that we, GEORGE LEE and ENOS LEE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented or discovered a new and useful Method of Making Dry-Sand Cores, of which the following is a specification.

Our invention has for its object the production of dry-sand cores at a less cost and of a better quality than is possible by any of the methods heretofore in use.

More specifically, our invention has for its object the production of a dry-sand core by a method which dispenses entirely with the use of rods or nails for stiffening, in which less than the normal amount of binding material is required, resulting in the formation of less gas when brought in contact with the heat of the melted iron or metal, and which, because of the lightness with which the core material is compacted, will produce a core of a more porous nature than cores made by methods heretofore in use, thus affording a more ready escape for such gases as are unavoidable.

The accompanying drawings, forming a part of this specification, illustrate some devices of preferred form used in carrying out our invention.

Figure 1 is a side elevation, Fig. 2 an end view, and Fig. 3 a plan view, of one-half of a core-box A such as we use for making ordinary pipe-T's. Fig. 4 represents two half-boxes A and B, held together by a clamp and ready to be filled. Fig. 5 shows a drier or tray C put over a core in place of one of the half-boxes. Fig. 6 shows the drier or tray C with the core D in it ready for drying. Fig. 7 shows the finished core E ready to be removed from the drier, and Fig. 8 is a cross-section illustrating in full and dotted lines, respectively, the core before and after drying.

The core-box A (shown in Figs. 1, 2, and 3) differs from similar prior constructions in two ways. First, it has two of the ends *g* and *h* closed and one, *d*, open, being so constructed to permit it to be completely packed from one end; second, it is distorted sufficiently in shape to allow for a predetermined amount of shrinkage or settling, which must be just

enough to permit the core to assume the proper shape when finished. The latter peculiarity of construction is rendered necessary by the fact that in the manufacture of cores by our improved method we employ a mixture containing no rosin at all and only about half the amount of flour usually used, which mixture is lightly packed in the box by hand and not rammed or pressed solid, as in the common method, in consequence of which the core is so soft and weak before drying that it settles or shrinks as the moisture is evaporated.

By the use of the above mixture we reduce to a minimum the amount of gas formed from the core, and by the above-described method of packing the sand we secure a very porous product, which affords a ready escape for such gases as are unavoidable.

The amount that the core-box must be distorted to allow for shrinkage or settling varies, of course, with the size and shape of the core and must be determined by experiment. On the accompanying drawings it is indicated (somewhat exaggerated) in Fig. 2, in which the dotted line (marked *a*) represents the shape the core should have when finished and the full line (marked *b*) shows the actual inside surface of the half-box.

In the practice of our invention we proceed as follows: Taking two half-boxes A and B, fastened together by a clamp *c*, (shown in Fig. 4,) we set them in position with the open end *d* at the top, as indicated in said figure. The mixture or sand is now put in through the opening and lightly pressed into the corners of the mold with the hand. When the box is full, it is leveled or struck off on top and laid upon one side. The drier or tray C, which is exactly like one of the half-boxes except that it is closed on all the ends, is now put on in place of one of the half-boxes, as shown in Fig. 5, and the whole is turned over and the other half-box removed, leaving the core D resting in the drier C, as shown in Fig. 6, in the position in which it lies in the oven. It is allowed to remain in the oven a sufficient length of time to become thoroughly hard and firm, so that when it is removed it can be handled without injury.

In Fig. 7 the finished core E is shown in full lines in the position it takes in the drier after having been baked, the original shape being indicated by the dotted lines e.

5 In methods heretofore in use it has been necessary, in order to secure sufficient firmness to hold the core in shape before and during drying, not only to pack the sand to an objectionable density, but also to use rods,
10 nails, and wire for stiffening. In the practice of our invention these are entirely unnecessary.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

15 1. The method of making dry-sand cores, consisting in shaping a mass of damp sand substantially free from a binder into a core having both its vertical and horizontal dimensions in cross-section greater than those desired in the finished product, and its vertical
20 dimension relatively more increased than its horizontal one, and then drying the core under

der such conditions that its dimensions are decreased, substantially as described. 25

2. The method of making dry-sand cores, which consists in taking a mass of damp sand substantially free from a binder, shaping it without material compression into a core having both its vertical and horizontal dimensions in cross-section greater than those desired in the finished product, and the vertical dimension relatively more increased than the horizontal one, and drying and hardening the core under such conditions that the vertical and horizontal dimensions are suitably decreased, the vertical dimensions being more largely decreased during the process of drying on account of the initial lightly-compacted condition of the undried core, as set forth. 30 35

GEORGE LEE.
ENOS LEE.

Witnesses:

W. W. GARRARD,
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