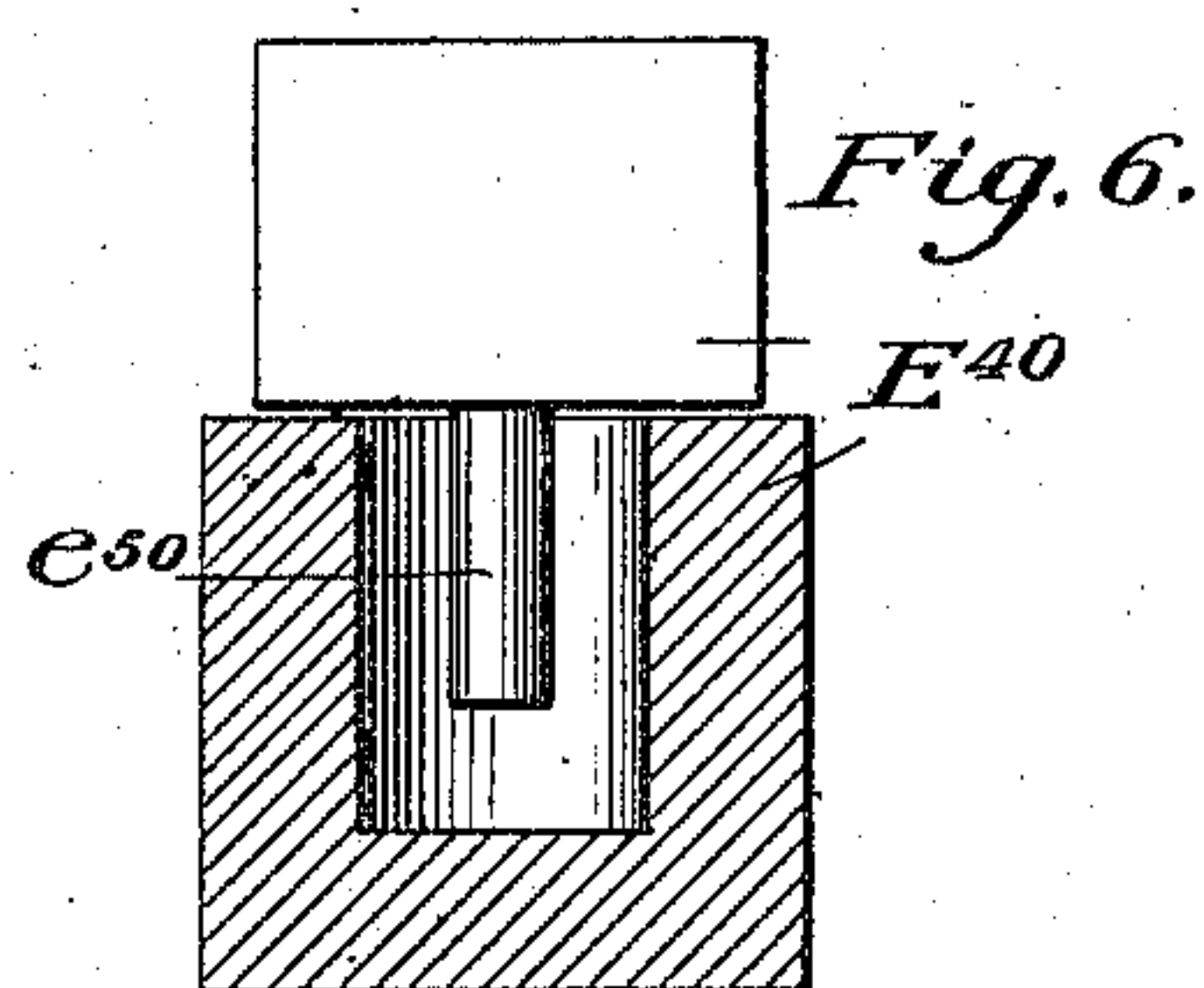
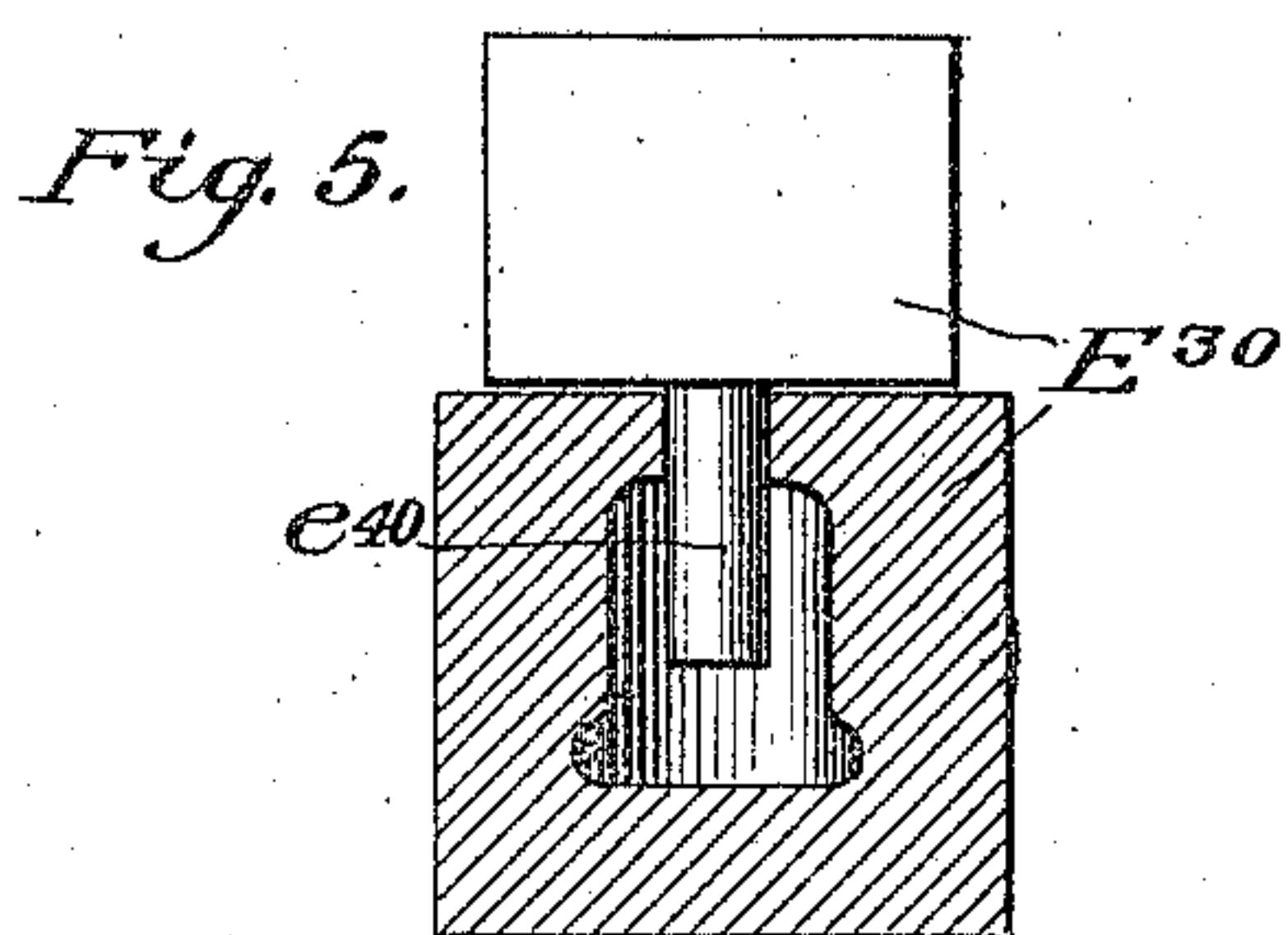
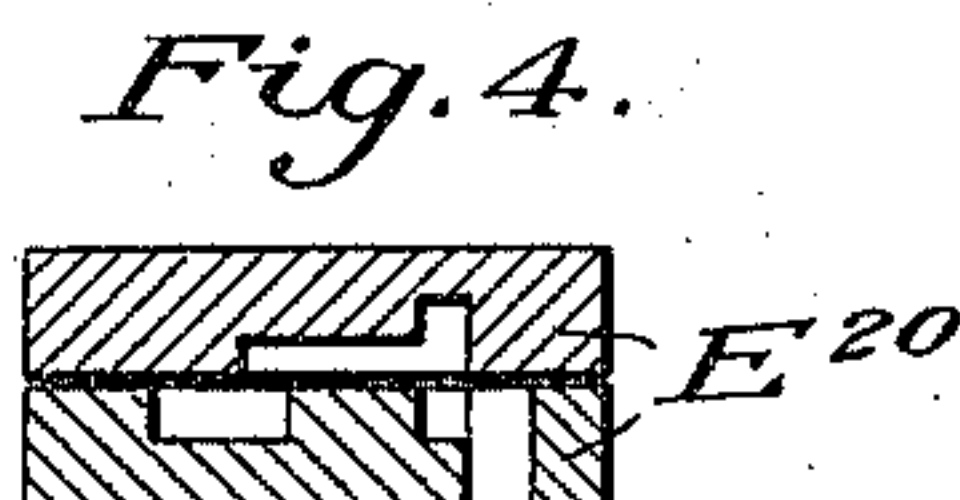
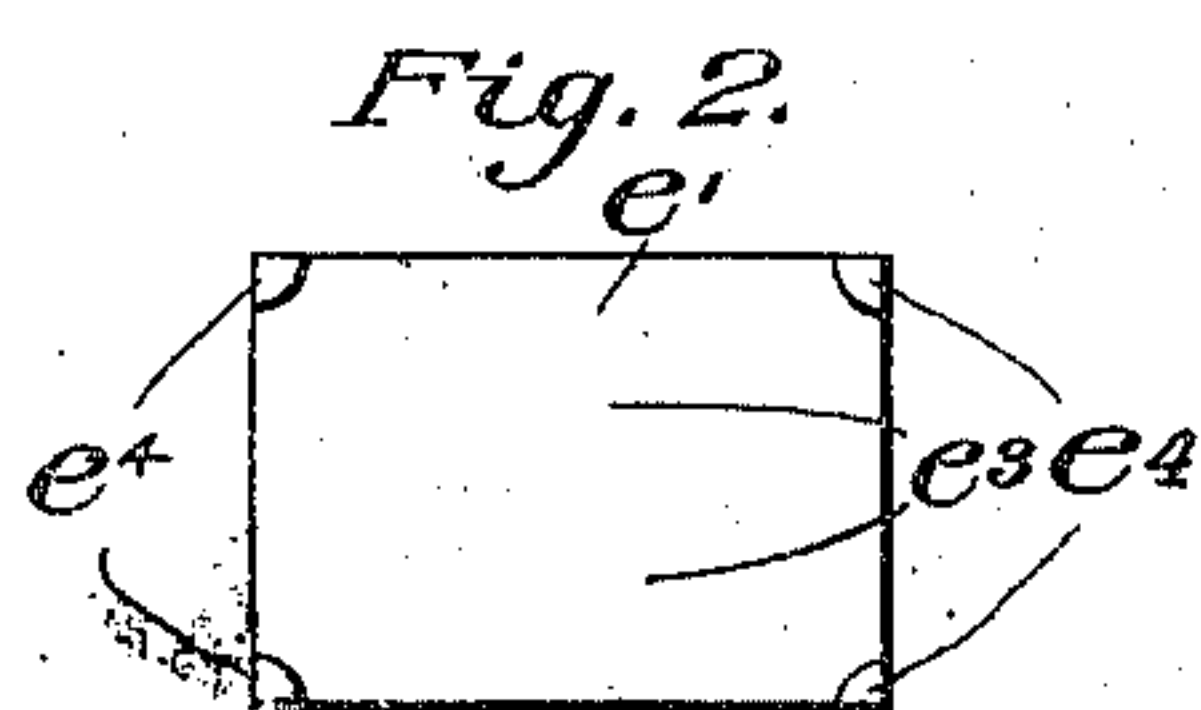
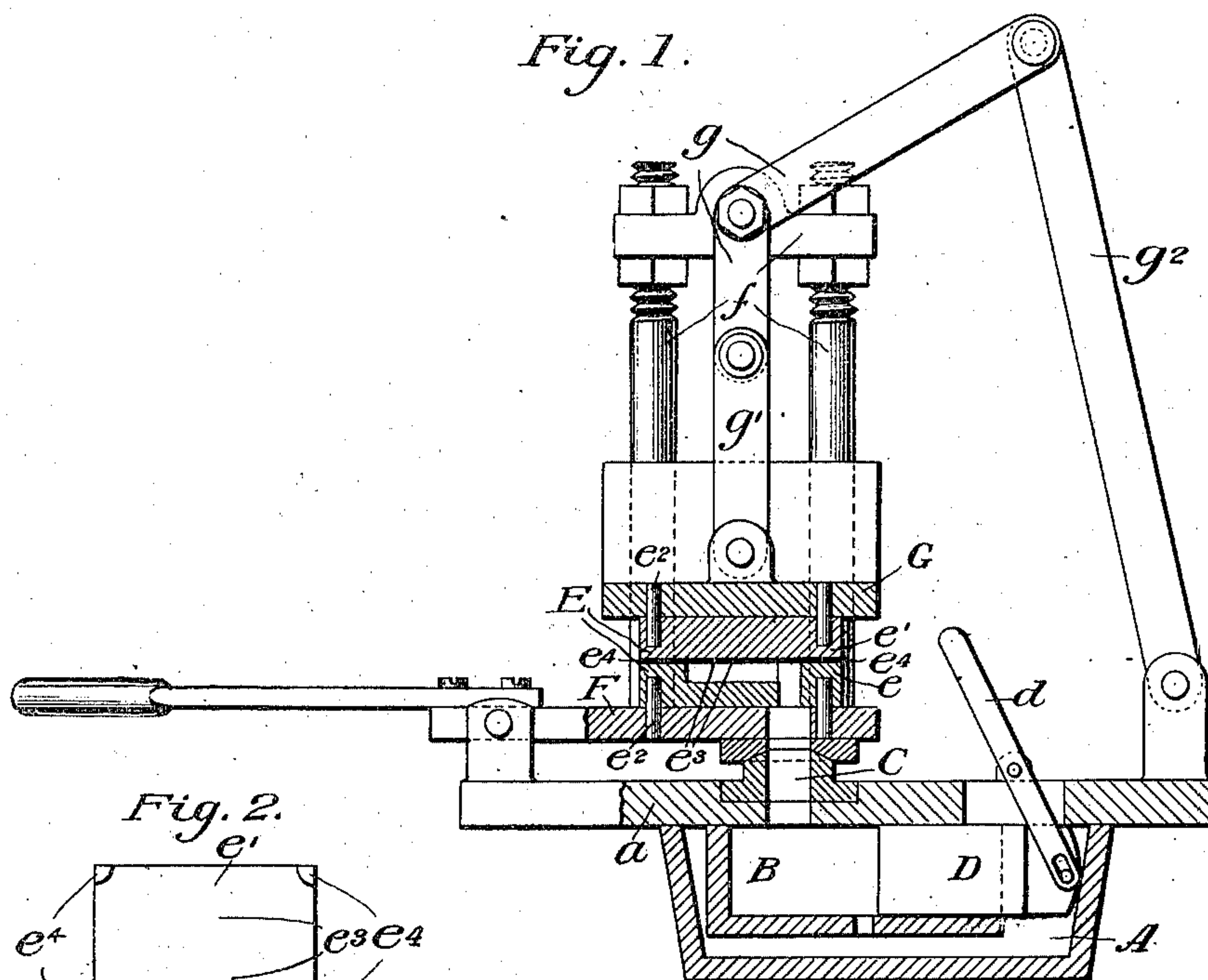


No. 748,061.

PATENTED DEC. 29, 1903.

H. H. FRANKLIN.  
PROCESS OF CASTING.  
APPLICATION FILED JUNE 9, 1902.

NO MODEL.



Witnesses:

*William F. Hall*  
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*Herbert H. Franklin*  
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# UNITED STATES PATENT OFFICE.

HERBERT H. FRANKLIN, OF SYRACUSE, NEW YORK.

## PROCESS OF CASTING.

SPECIFICATION forming part of Letters Patent No. 748,061, dated December 29, 1903.

Original application filed September 20, 1901, Serial No. 75,918. Divided and this application filed June 9, 1902. Serial No. 110,910. (No specimens.)

*To all whom it may concern:*

Be it known that I, HERBERT H. FRANKLIN, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Process of Casting, of which the following is a specification.

My invention has for its object the production of a process for casting which facilitates the removal of the air from the mold.

In describing this invention reference is had to the accompanying drawings, in which like letters refer to corresponding parts in all the views, said drawings showing apparatus suitable for carrying out my process and forming the subject-matter of my pending application for United States Letters Patent No. 702,194, dated June 10, 1902, the present application being divisional of that for said patent.

Figure 1 is a sectional view, partly in elevation, of a preferred apparatus for practicing this invention. Fig. 2 is an inverted plan view of one of the sections of the mold seen in Fig. 1. Figs. 3, 4, 5, and 6 are views of detached molds for carrying out my process.

In the casting of type and other articles of metal in metal molds it is well known that the air in the molds and the air and other gases introduced with the metal to be cast are not expelled from the molds, but become more or less mixed with said metal, causing "blow-holes." Especially is this true when the metal is introduced quickly and under pressure. The specific gravity of a given bulk of type or metal cast in this manner is less than the specific gravity of an equal bulk of the solid metal. The air may be compressed and diffused through the metal so finely that the bubbles or blow-holes are not perceptible except under a magnifying-glass, or the bubbles may be less numerous, and consequently larger. In either case the strength of the casting is less than if it were solid and of natural specific gravity. Furthermore, the air in the mold increases the difficulty of the casting operation by preventing the easy and satisfactory entrance of the metal to all parts of the mold. If the metal is introduced rapidly, as is usual when pressure is employed, it is apparent that in order to remove the air from the mold by displace-

ment there must be a free outlet. When this outlet is sufficiently large to permit a free displacement of the air, the metal will also enter the outlet, or, in other words, will escape from the mold. Aside from the annoyance incidental to the escape of the metal a projection or rough place is left to be finished. In the case of type this method of casting would be impracticable, and in casting articles of varied shapes and sizes it would be difficult to so locate an outlet as to permit the full removal or displacement of the air.

By my invention I supply to the mold the material to be cast. Separate contiguous surfaces of the parts or sections of the mold hold said surfaces apart during the introduction of the material to be cast, and thus readily and freely remove or displace the air and other gases from substantially all parts of the mold through a narrow space at the parting or opening lines of the mold, said space being too narrow to permit the escape of the metal. The amount of separation of the contiguous surfaces of the parts or sections of the mold is dependent upon the size and shape of the casting, the amount of pressure applied, and the speed of introduction of the material to be cast. In many cases a separation of three one-thousandths of an inch is sufficient. If extreme pressure is used for forcing the metal into the mold, a less separation of the contiguous surfaces of the sections of the mold will be sufficient. The ready displacement of the air is due to the fact that it is free to escape from substantially all portions of the parting or opening lines of the mold and is not required to pass from some particular part of the mold, as an end or side or a portion thereof.

In order that my process may be clearly understood, I will now briefly describe the illustrated apparatus for carrying out the same.

In Fig. 1, A is a source of supply for the material to be cast. B is a chamber communicating with said source of supply. C is a discharge-nozzle leading from the chamber B. D is a plunger for forcing the material to be cast from the chamber B through the discharge-nozzle C. E is a sectional mold, and F G are opposite supports for the parts or sections of the mold. The source of supply A is



heated by any desirable means, is partly filled with the material to be cast, and depends from a plate *a*, from which the chamber B also depends within said source of supply.

5 The discharge - nozzle C projects upwardly from said plate *a*. The plunger D is operated by a hand-lever *d*, and the sectional mold E is composed of opposite parts or sections *e e'*, which are arranged between contiguous sur-

10 faces of the supports F G, are respectively secured to these supports by dowel-pins *e<sup>2</sup>*, and are rigidly held in position with contiguous surfaces *e<sup>3</sup>* thereof slightly separated. The amount of separation of the surfaces *e<sup>3</sup>*

15 may be determined by feet or projections *e<sup>4</sup>*, of small height, extending from portions of one section, as the corners thereof, and engaging the contiguous surfaces of the other section. The support F is pivoted to the

20 plate *a* and is provided with a standard *f* for guiding the support G, and a lever *g* is connected to the support G for moving the same toward and away from the portion of the support F upon which the part or section *e* of the

25 mold E is mounted. The lever *g* is pivoted to the standard *f*, and one end thereof is connected by a link *g'* to the support G, and its other end is actuated by a link *g<sup>2</sup>*, pivoted to said lever and to the plate *a*. When the lever *g* is in its operative position, the pivots for connecting the lever *g* and the link *g'* and for connecting said parts to the standard *f* and the support G are in alinement in order that the support G may be rigidly held from

30 displacement during the entrance of the metal to be cast.

My invention is not limited to any particular construction of mold, and consequently I have shown a number of additional different

40 molds E<sup>10</sup> E<sup>20</sup> E<sup>30</sup> E<sup>40</sup>, all of which, as will be obvious to those skilled in the art, are provided with parts or sections contiguous surfaces of which are separated during the entrance of the metal to be cast.

45 In carrying out my process by the apparatus shown in Fig. 1 the support F is moved to its operative position, whereupon the link *g<sup>2</sup>* actuates the lever *g* and the link *g'* to move the support G into its operative position for

50 holding the section *e'* of the mold E in position, with contiguous surfaces of the sections *e e'* slightly separated. The metal is then

forced into the mold, and during its entrance the air is readily removed by displacement from the mold between the contiguous sur- 55 faces of the sections thereof, and owing to the minute separation of said surfaces of the sections *e e'* substantially no metal escapes between the sections. After the entrance of the metal within the mold the support F is 60 rocked on its pivot to move the mold away from the discharge-nozzle, and during this movement of the support F the support G and the section *e'* are moved away from the section *e*, thus separating the sections of the 65 mold for permitting the removal of the cast article.

My process will now be readily understood upon reference to the foregoing description and the accompanying drawings. 70

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

1. The herein-described process of casting with a sectional mold, the same consisting in 75 supplying to the mold the material to be cast and in removing the air from the mold through a narrow space formed by separating contiguous surfaces of sections of the mold during the entrance of the material to be cast, 80 said space being too narrow to permit the escape of the material to be cast, substantially as and for the purpose specified.

2. The herein-described process of casting with a sectional mold, the same consisting in 85 supplying to the mold the material to be cast and in removing the air from the mold through a narrow space formed at substantially all portions of the parting or opening lines of the mold by separating contiguous surfaces of 90 sections of the mold during the entrance of the material to be cast, said space being sufficiently narrow to prevent any substantial escape of the material to be cast, substantially as described. 95

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 7th day of June, 1902.

HERBERT H. FRANKLIN.

Witnesses:

S. DAVIS,

F. G. BODELL.