

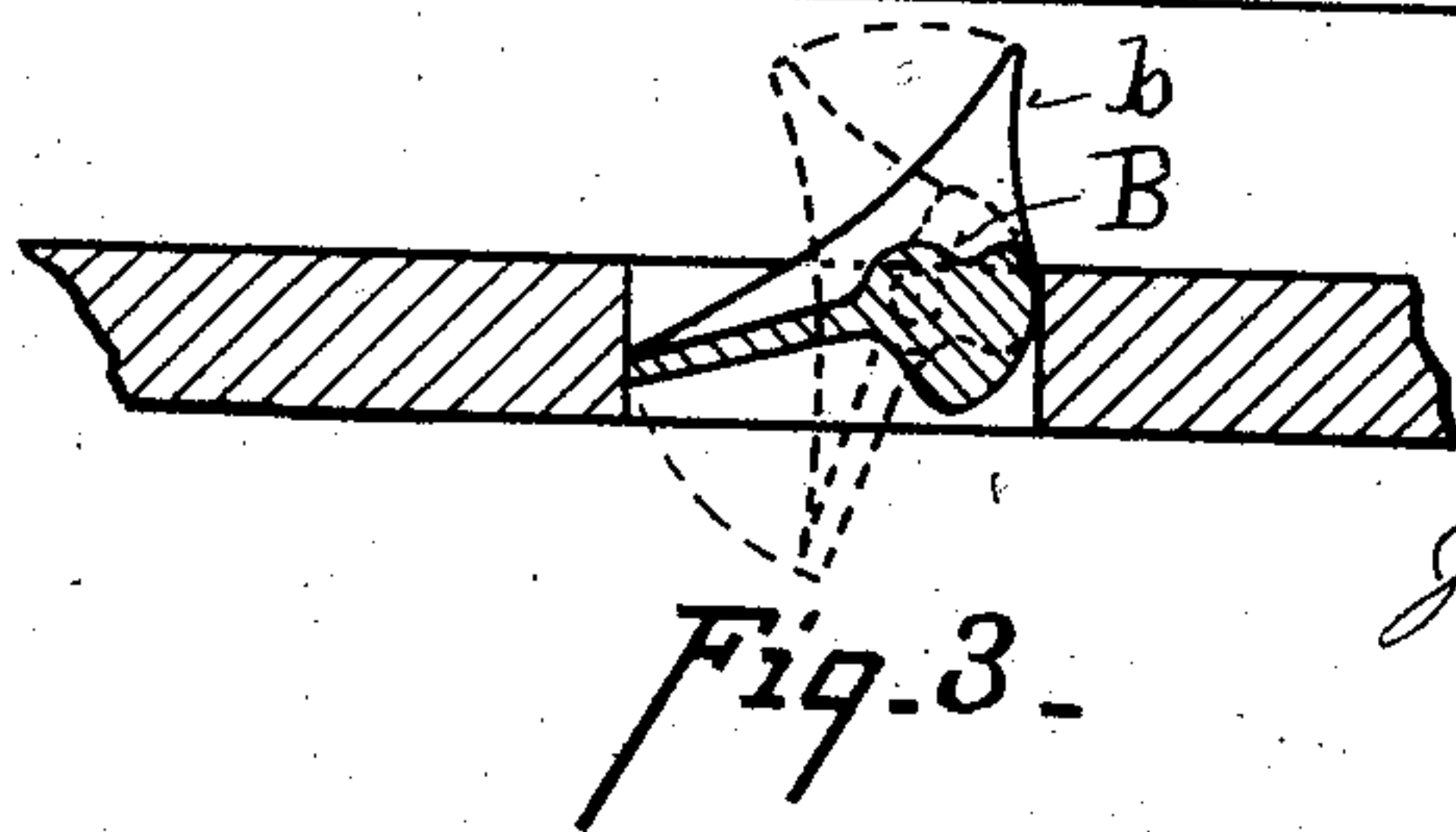
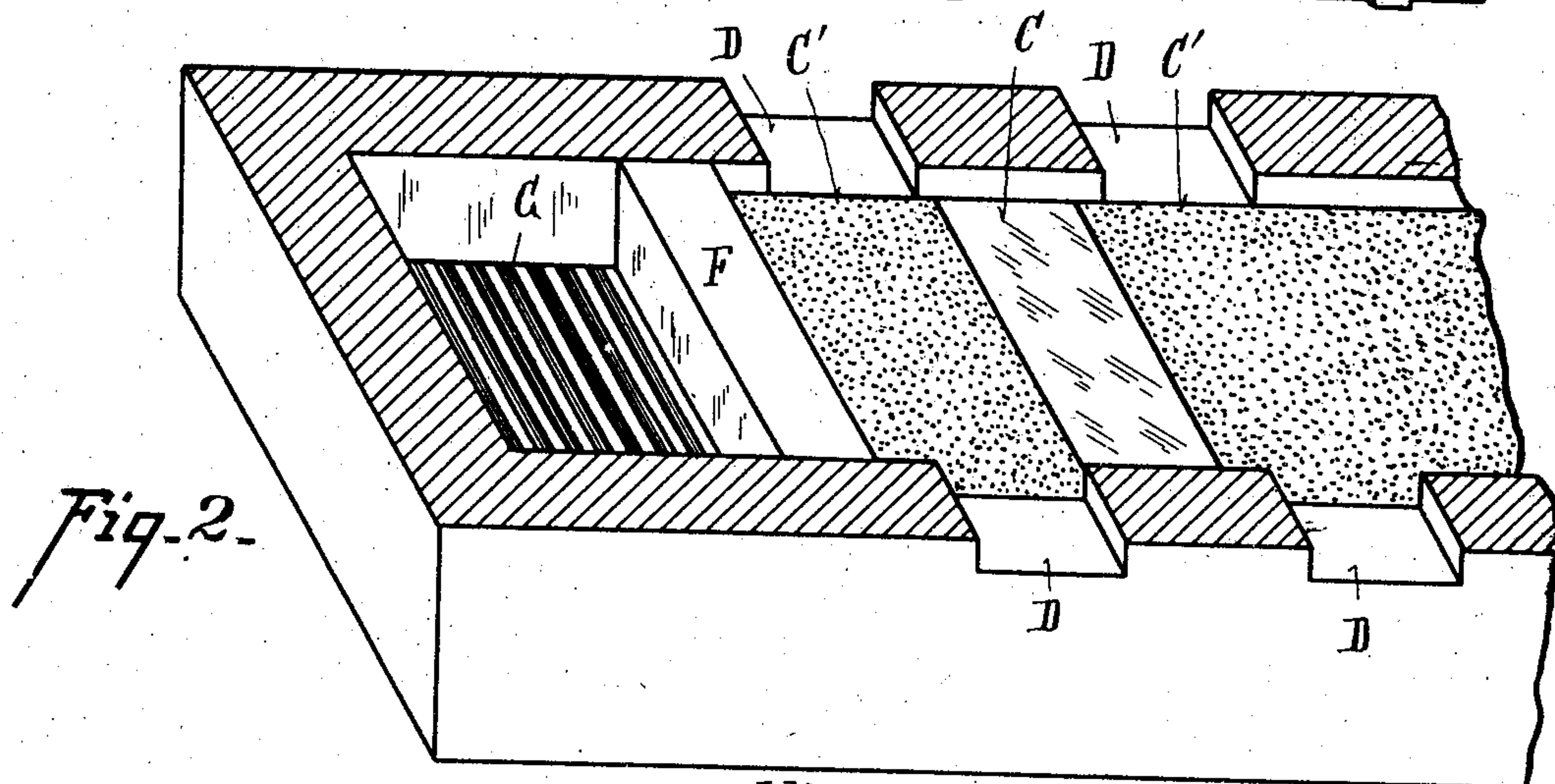
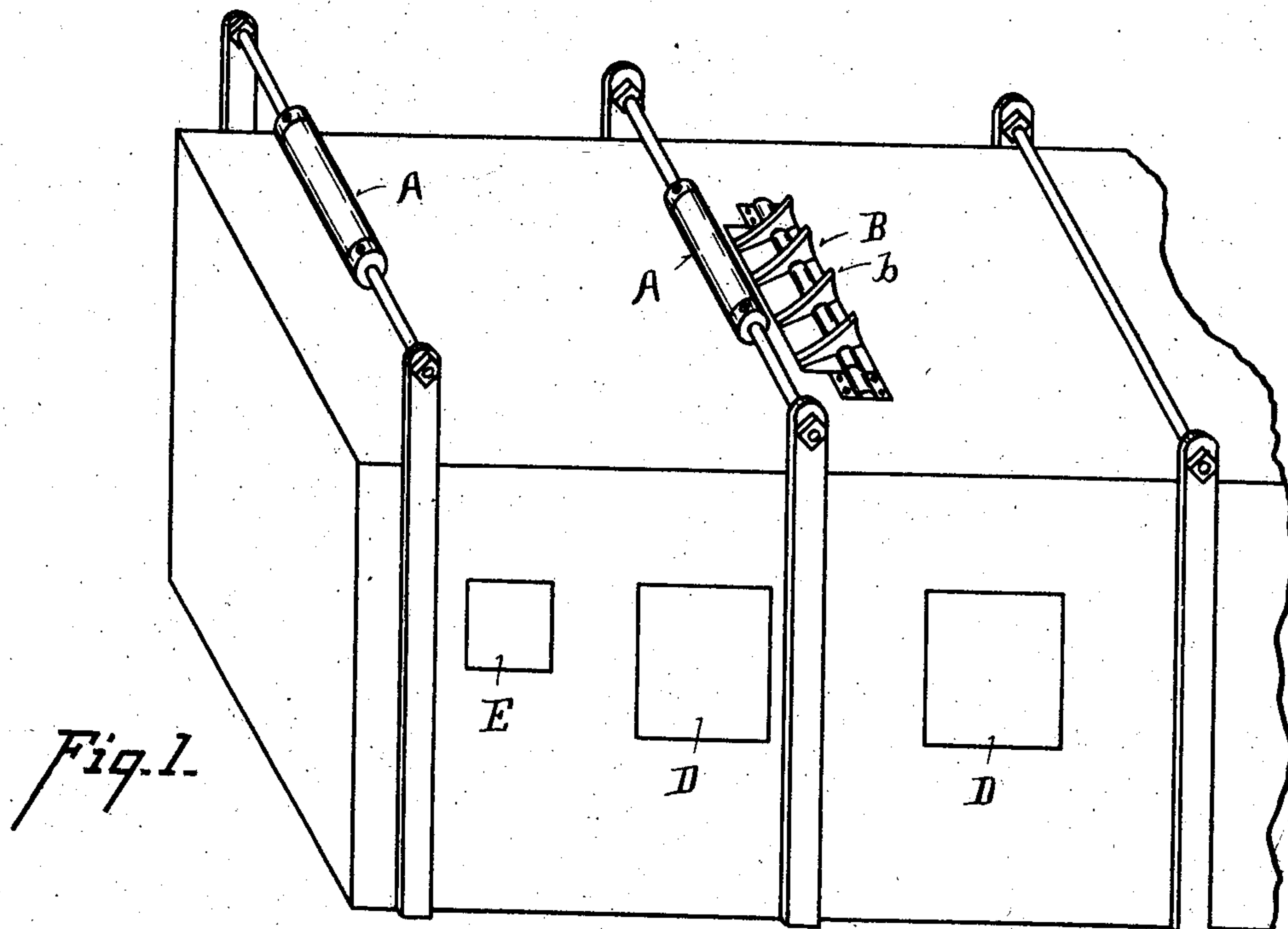
No. 768,576.

PATENTED AUG. 30, 1904.

J. W. ARNOLD.
HEATING FURNACE.

APPLICATION FILED FEB. 13, 1903.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES WALTER ARNOLD, OF COVINGTON, KENTUCKY.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 768,576, dated August 30, 1904.

Application filed February 13, 1903; Serial No. 143,214. (No model.)

To all whom it may concern:

Be it known that I, JAMES WALTER ARNOLD, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Heating-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in furnaces for heating iron or steel.

One of its objects is to provide a furnace in which the billets or bars of metal to be heated or reheated are mechanically charged into the furnace and can thus be charged either hot or cold.

Another object is to provide an improved furnace adapted to receive the billets when so charged without injury to the furnace.

Another object is to provide an automatically-closing door in the crown or side of the furnace, through which the billets are charged.

It also consists in certain details of form, combination, and arrangement, all of which will be more fully set forth in the description of the accompanying drawings, in which—

Figure 1 is a perspective view of the furnace. Fig. 2 is a broken sectional view showing the interior of the furnace. Fig. 3 is a detail sectional view of the automatically-closing charging-door.

The practice heretofore in treating iron and steel, particularly in the production of bars from various kinds of scrap, has been after the scrap has been fused or welded together and passed through the muck-rolls to then allow the bars formed by the muck-rolls to cool, after which they were cut into sections or billets, which were charged by hand through doors in the sides of a separate heating or reheating furnace, where they were reheated to the proper temperature and then removed and passed through the ordinary finishing-rolls. This involved a loss of the heat contained in the bars coming from the muck-rolls and also the loss of heat incident to charging the bars by hand through the side doors, which admitted a current of cold air with each charge, thereby chilling the furnace.

With my improved apparatus either cold bars or the hot bars as they come from the muck-rolls after being cut into sections or billets are successively charged by any suitable mechanism to deliver the billets upon the upper face of the charging-door B, which is preferably located in the crown of the furnace. This door B is pivoted in such a manner as to normally close the opening; but when the billets are dropped thereon from the apron they severally disturb the equilibrium of the door, which opens to discharge the billets onto the hearth of the furnace.

b represents inclined guides to guide the bars to the edge of the door.

As heretofore constructed the hearth has consisted of a loose friable material, such as sand, which is not adapted to receive the billets when automatically charged upon the hearth. I therefore provide a hearth composed of a rigid section C, adapted to withstand the impact of the automatically-charged billets without injury, and I also preferably provide one or more sections C' of the hearth of loose friable material, upon which the billets are disposed until sufficiently heated, when they are withdrawn through the doors D and passed to the finishing-rolls. The furnace may be arranged with doors D upon one or both sides of the furnace, as desired. E represents the stoking-door, through which the furnace-fire is maintained. F represents the fire-bridge, and G the grate, of ordinary construction. The rigid section C may be formed of a tough grade of fire-brick, but is preferably formed of iron ore, which is tamped in place and then when heated forms a rigid compact body.

By reason of the above improvements I am enabled to secure a greater output from a single furnace and to effect a great economy of labor and fuel.

Having described my invention, what I claim is—

1. In a heating-furnace for iron and steel, an automatically-operated charging-door located in the crown of the furnace, a hearth-section of substantially the area of the charging-door, located beneath the door and adapted to withstand without injury the impact of

the charged metal, other hearth-sections adjacent to said first-named section, and a door for removing the heated metal.

2. In a heating-furnace for treating iron and steel, an automatically-operated charging-door located in the crown of the furnace, a hearth-section of substantially the area of the charging-door, located beneath the door and adapted to withstand without injury the impact of the charged metal, a hearth-section of friable material adjacent to said first-named section, and a door for removing the heated metal.

3. In a heating-furnace, a heating-chamber, an automatically-operated charging-door located in the crown of said chamber, and through which the charged metal is adapted to be dropped so as to fall upon the floor of said chamber, a rigid section adapted to withstand the impact of the charged metal, forming part of the floor of said chamber, a section of the floor of said chamber formed of friable

material, and a door for removing the heated metal.

4. In a heating-furnace for iron and steel, a heating-chamber, an automatically-operated charging-door located in the crown of said chamber, and through which the charged metal is adapted to be dropped so as to fall upon the floor of said chamber, a rigid section adapted to withstand the impact of the charged metal, forming part of the floor of said chamber, a section of the floor of said chamber adjacent to and in the same horizontal plane as said rigid section, formed of friable material, and a door for removing the heated metal.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES WALTER ARNOLD.

Witnesses:

ED. C. KELLEY,
A. E. STRICKLETT.