

W. GRIFFITH.  
PLATING METAL.

(Application filed Sept. 28, 1901.)

(No Model.)

Fig. 1.

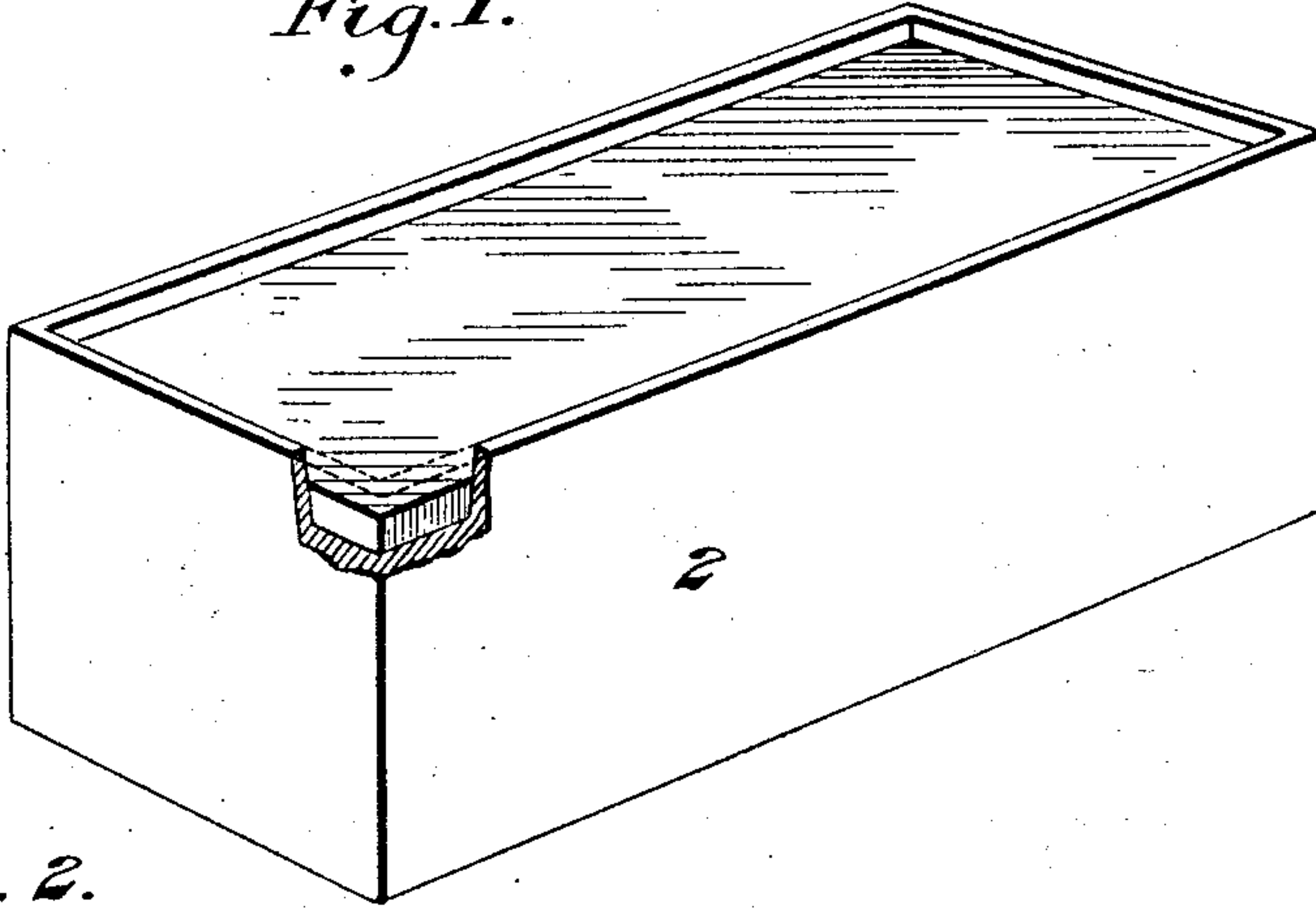


Fig. 2.

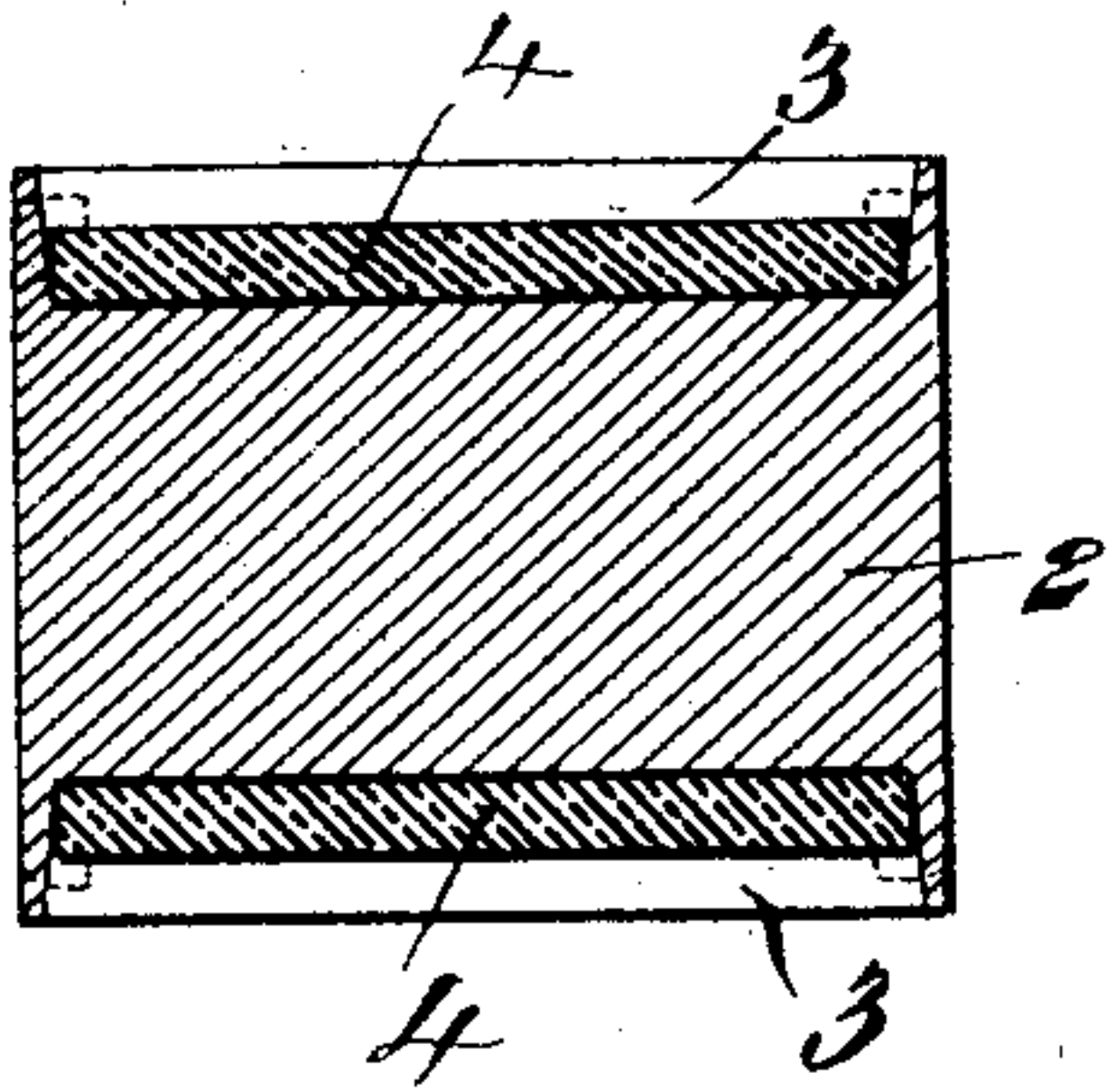


Fig. 3.

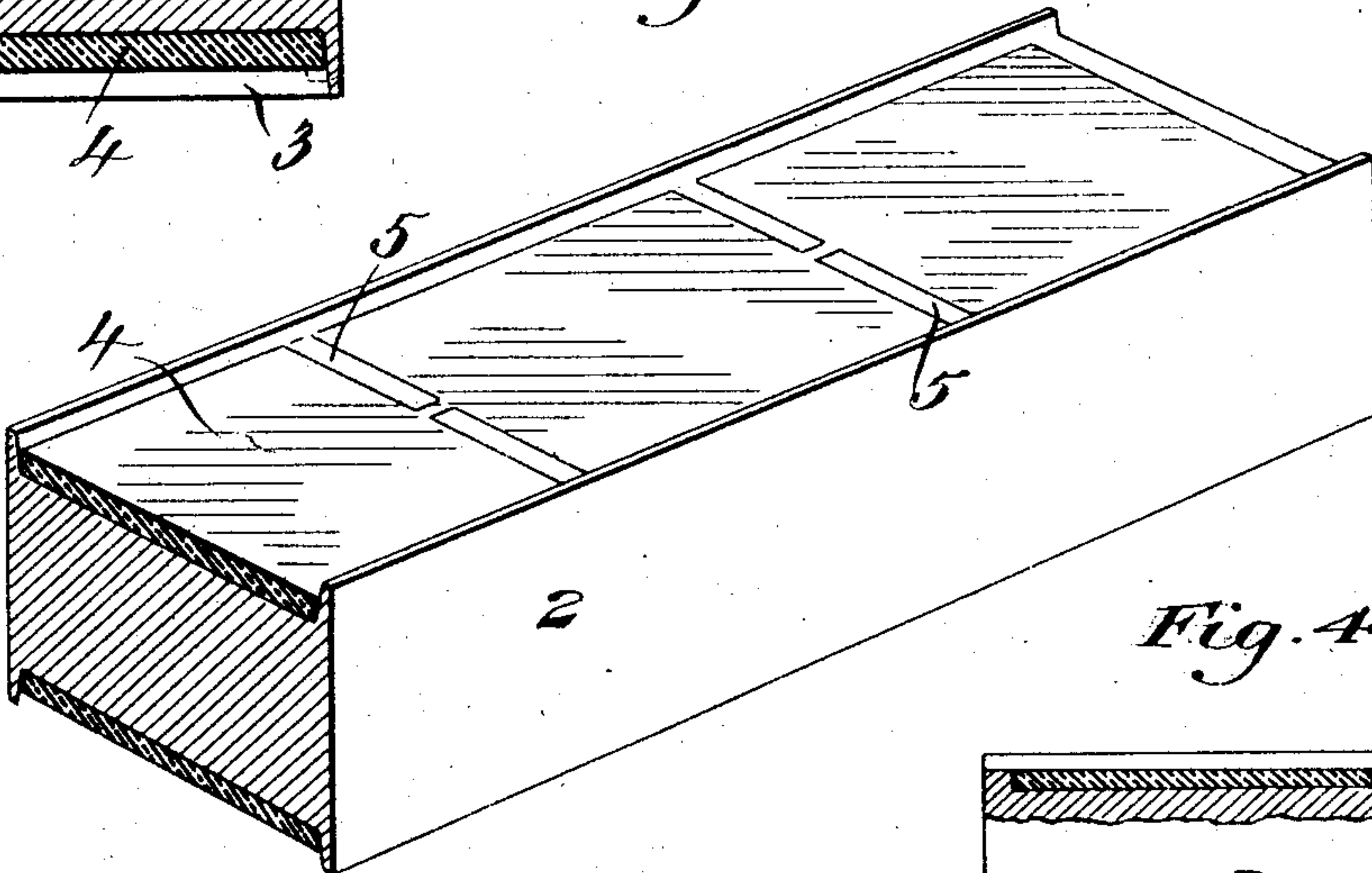
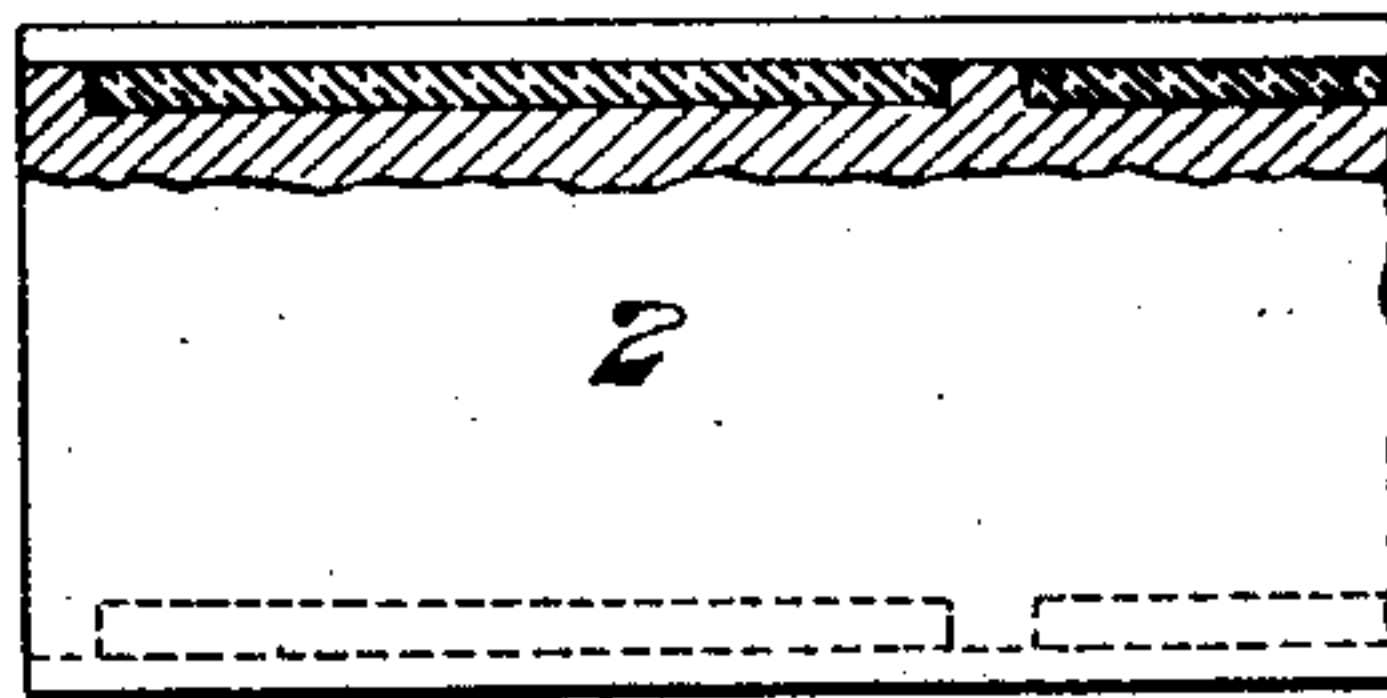


Fig. 4.



WITNESSES

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# UNITED STATES PATENT OFFICE.

WILLIAM GRIFFITH, OF PITTSBURG, PENNSYLVANIA.

## PLATING METAL.

SPECIFICATION forming part of Letters Patent No. 704,793, dated July 15, 1902.

Application filed September 28, 1901. Serial No. 76,974. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM GRIFFITH, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Methods of Plating Metals, of which the following is a full, clear, and exact description.

My invention relates to an improvement in the art of plating or coating iron or steel or other metal with a different metal, such as copper, nickel, aluminium, brass, bronze, or other metal or alloy; and it consists, broadly, in applying to the metal to be coated some of the coating metal in a pulverized condition, placing a plate of the coating metal on the pulverized metal, heating the metals, and subjecting them to pressure, as is hereinafter more fully described.

I shall now describe my invention so that others skilled in the art to which it appertains may employ the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a steel ingot prepared to be heated and having a plate of copper or other metal placed on the pulverized metal. Fig. 2 is a cross-sectional view of the same. Fig. 3 is a perspective view, and Fig. 4 a side elevation, partly in section, of a modified form of ingot.

The ingot or billet 2, of iron, steel, or other metal to be coated, is prepared in the usual manner and is provided, preferably on one or more of its surfaces, with one or more recesses 3, which extend over the greater portion of the surface. The ingot having first been pickled to remove scale and oxid is ready to receive the pulverized metal and plate which are to form the plating or coating. The pulverized metal is reduced to its pulverized state either mechanically or chemically, as chemical compounds or salts of metal, which may be reduced to a metallic state by heat, may be employed. This pulverized metal, although it may be used in its dry state, is preferably made into a paste by a mixture with oil or other suitable binding material, and the recess or recesses 3 in the ingot are filled or partially filled with the paste. The coating-plate 4 is then placed on the paste, and the edges of the recesses may be turned down on the plate 4 to hold the

plate in proper position. The ingot is then placed in a furnace and raised to a temperature below the fusing-point of the coating metal. After it has been raised to this temperature a cold cap or cover of brick, metal, or other suitable material is placed over the coating-plate, which chills the same and prevents oxidation and permits the steel ingot to be raised to a greater heat. The ingot is then withdrawn, and it may be cut and rolled into billets or bars of suitable shape to be formed into sheets, the effect of the rolling, pressing, or hammering being to weld the coating-plate to the surface of the ingot.

In Figs. 3 and 4 the ingot 2 is formed with portions 5, forming lines for cutting the ingot.

The pulverized metal employed in each instance should be of substantially the same composition as the coating-plate. The function of the pulverized metal is to create a bond between the hard flat surface of the coating metal and the hard flat surface of the metal to be coated. It is a fact that without the pulverized metal there would be no weld, or at least a very imperfect one, while with the pulverized metal there will be a perfect welding. The pulverized metal enters the minute pores of the steel or other metal and binds thereto where a plate would not adhere at all. The coating-plate then readily adheres to the coating of metal formed by the pulverized metal.

In order to render the copper or other coating metal easy to pulverize, I may use antimony, cobalt, cyanid of potassium, or other similar material to form an alloy which may be used in the place of the copper or other metal.

The advantages of my invention will be apparent to those skilled in the art.

I claim—

1. The method of plating, iron, steel, and other metals with a different metal, such as copper or other metal or alloy, consisting in covering the surface of the metal to be plated with the coating metal or alloy in a pulverized condition, placing a plate of the coating metal on the pulverized metal, heating the metals, and subjecting them to pressure; substantially as described.

2. The method of plating a metal with another metal which fuses at a different degree

of heat, consisting in first covering the surface of one of the metals with a layer of the other metal in a pulverulent condition, then heating the two metals when mechanically  
5 united into a pack to a temperature insufficient to fuse the more readily fusible metal, then covering the metal which fuses at the lower degree of heat, and subjecting the pack

to a greater degree of heat; substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM GRIFFITH.

Witnesses:

JAMES K. BAKEWELL,  
A. M. STEEN.