

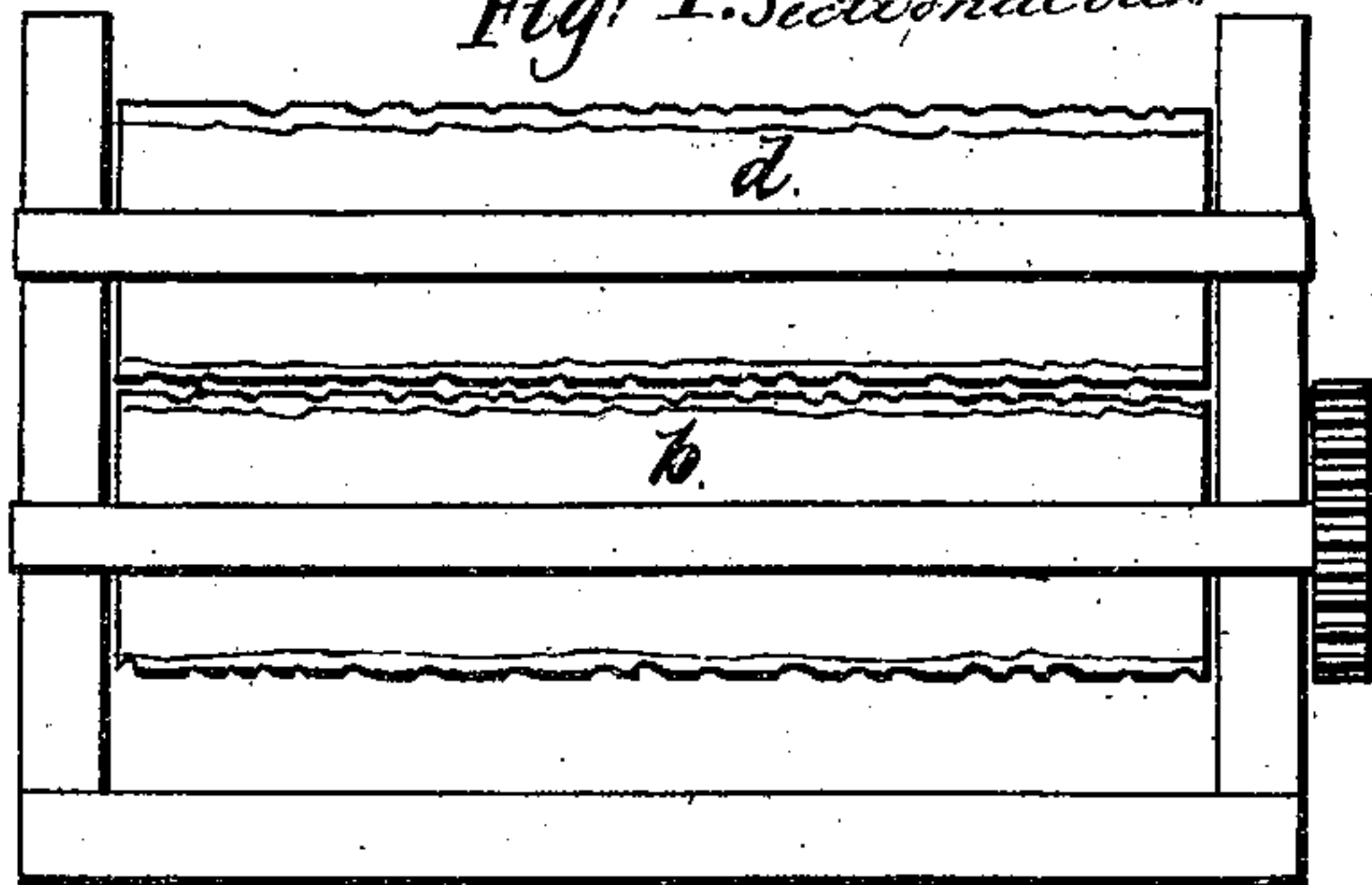
*S. Barber*

*Making Sheet Iron.*

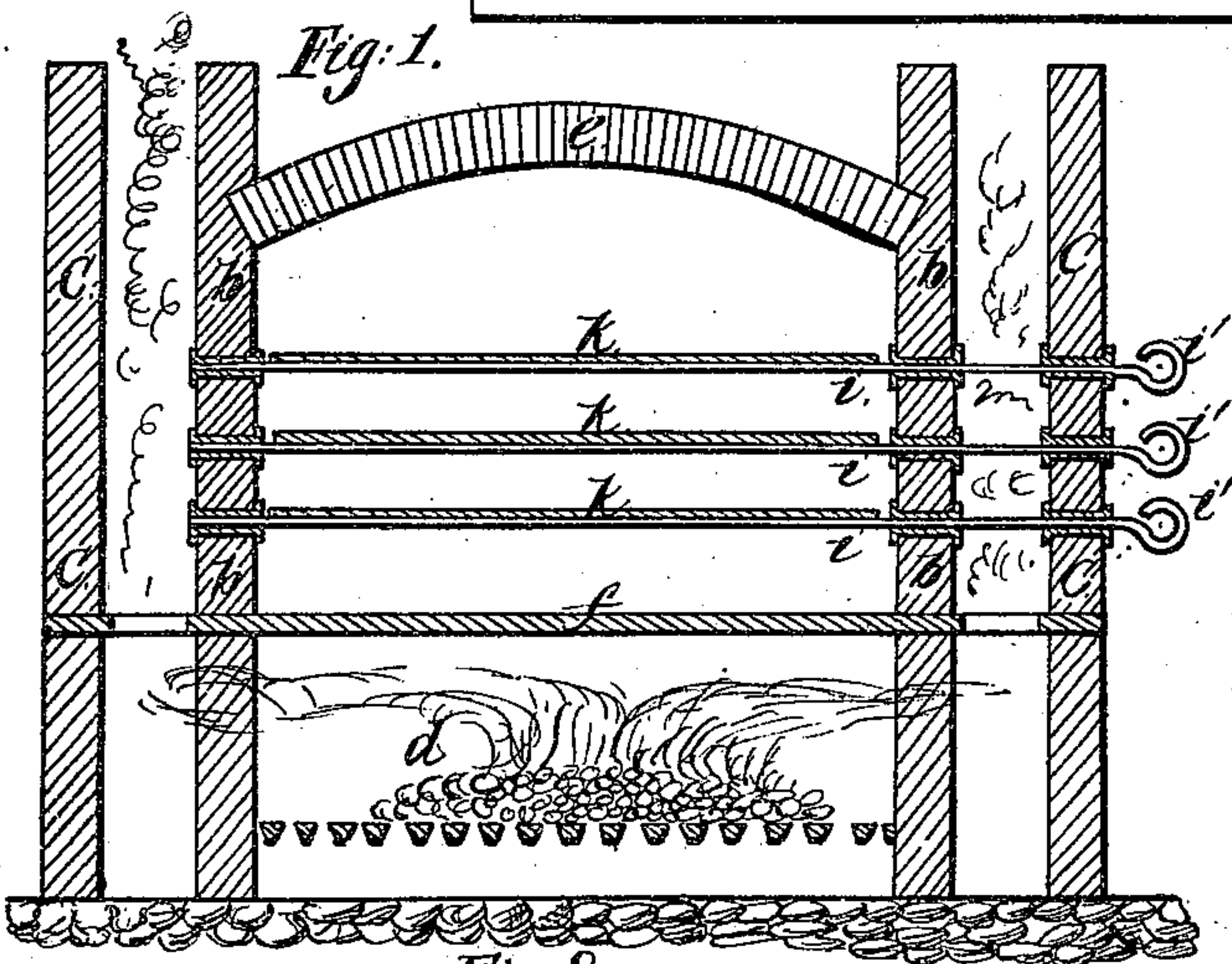
*N<sup>o</sup> 95,554.*

*Patented Oct. 5, 1869.*

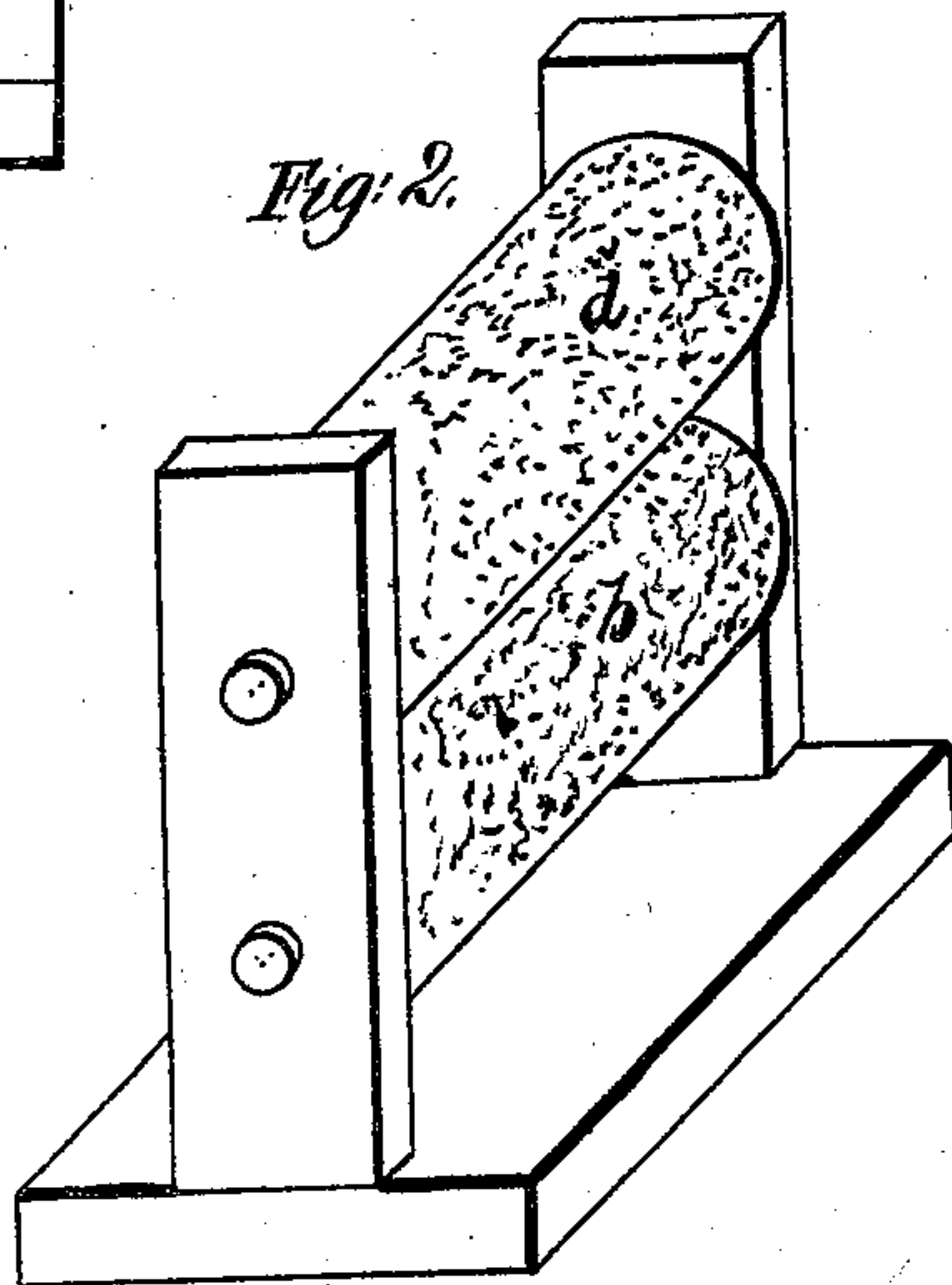
*Fig: 1. Sectional view*



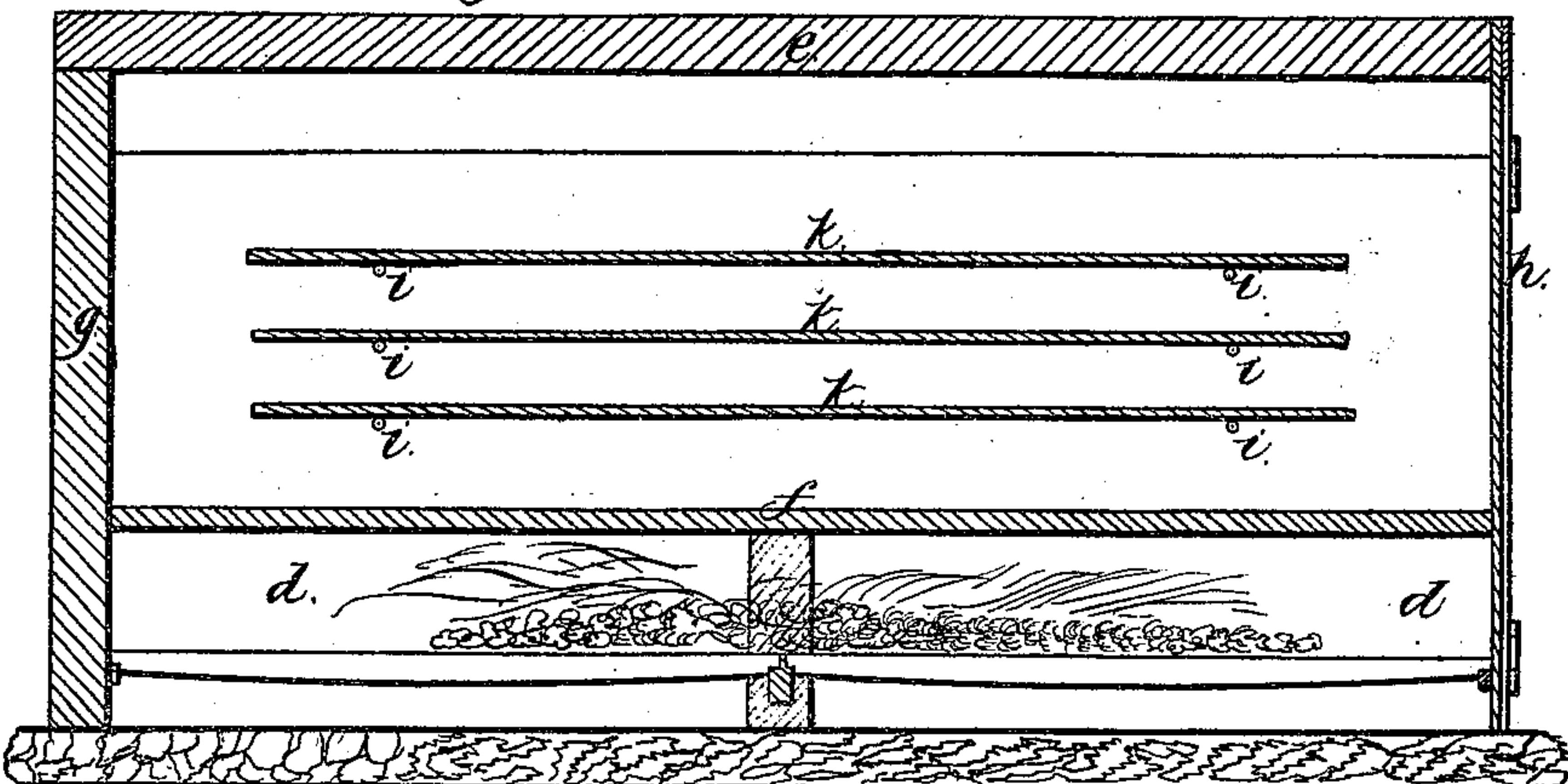
*Fig: 1.*



*Fig: 2.*



*Fig: 2.*



*Witnesses:*

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*Inventor:*

*Silas Barber*  
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# United States Patent Office.

SILAS BARKER, OF HARTFORD, CONNECTICUT, ASSIGNOR TO HIMSELF AND HENRY S. PRATT, OF SAME PLACE.

*Letters Patent No. 95,554, dated October 5, 1869.*

## IMPROVEMENT IN THE MANUFACTURE OF SHEET-IRON.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, SILAS BARKER, of Hartford, in the county of Hartford, and State of Connecticut, have invented a new and useful Improvement in the Manufacture of Sheet-Iron; and I declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon, forming a part of this specification.

My improvement relates to the manufacture of a sheet-iron which shall resemble the so-called "Russia" sheet-iron, and have about the same qualities.

I commence with the common article of American sheet-iron, as it is found in commerce, covered with a black oxide. Of course, the better the quality of the iron to commence with, the better the finished product.

I take this common sheet-iron and immerse it in a bath of acid diluted with water. I have heretofore found it preferable to use a bath of sulphuric acid and water. The proportions differ with each different lot of acid used, as the sulphuric acid of commerce is not at all uniform in strength.

I have used six parts of water to one of acid, and still stronger. The only rule that can be given is, to make a weak bath at first, and add more acid, till it will start the black oxide readily from the sheets.

The sheets are left immersed in this bath till the black oxide is all scaled off. The operation can be somewhat assisted by a wire brush.

The black oxide being all removed, the sheet is then washed thoroughly under a copious jet of water, so that the acid shall be all washed off.

When the sheet is thoroughly washed of acid, and while it is yet covered with a film of water, it is immediately dipped into a bath of potash dissolved in water, or of water mixed with any of the alkalies.

The purpose of dipping the sheet at this point into the alkaline bath is, first, to neutralize any acid that may possibly still remain on the sheet, and, second, to keep the cleaned sheet from contact with the air till it is subsequently rolled.

I am aware, that in attempts heretofore made to produce "Russia" sheet-iron, the sheets have been first dipped in an acidulous bath, and afterward covered with oil, resin, and the like; but to neutralize the acid in this way, and, at the same time, to prevent any, even the slightest oxidation by such immersion, I believe to be new, and is claimed herein as a part of my invention.

In all the methods heretofore followed, as I believe, a yellow oxide has been allowed to gather on the sheet, and has been rolled into the enamel, through which it soon made its appearance, and destroyed the enamel.

Instead of cleaning the sheets by an acid bath, as

just described, they may be mechanically cleaned, by grinding or polishing, and then immediately dipped into the alkaline bath.

Whichever way they are cleaned, they remain immersed in the alkaline bath till taken out for rolling, be the time elapsing more or less.

A number of these sheets, say twelve or twenty, having reached this point, are piled together in a "pack," and rolled.

The rolls, between which the "pack" is rolled, are shown in figs. 1 and 2, on Sheet No. 1 of the accompanying drawings.

Figure 1 is a sectional elevation, and

Figure 2, a perspective-view.

The letter *a* designates one roll, the letter *b*, the other.

The upper or the under roll, preferably the under, is driven by power, while the other is loose. Although not so shown, the rolls are, as a matter of course, adjustable up and down in their bearings, for the purpose of allowing the distance between the rolls to be regulated at pleasure.

These rolls are made of chilled iron, or some proper substitute therefor, and have irregular or pitted surfaces. I make the rolls by first turning a wooden roll of the right size, then taking a piece of sheet-zinc, which will just go around the roll, and indenting its surface with a blunt-pointed, round punch, till the raised and the depressed parts of the surface are about equal, and then fastening the zinc around the roll. It will now serve for a pattern, from which cast-iron moulds, for casting chilled rolls, can be made in the usual way.

The chilled rolls having been properly made and arranged for work, the "pack" of sheets is taken from the alkaline bath and rolled between them, till the surfaces of the sheets are properly enamelled. The irregular character of the surfaces of the rolls serves to give the sheets the hammered appearance of the genuine "Russia," and, at the same time, thoroughly polishes the sheets.

I am well aware that rolls, with mottled surfaces, have been used for this purpose heretofore, but they have not been made in such a way as to have the surfaces of the rolls irregular and yet smooth at the same time, as is the case with my rolls.

The "outsides" of the sheets of the "pack," that is, those next the rolls, will not be polished on both sides, and have to be put into the middle of the next "pack" and rolled again.

The sheets, being properly enamelled, are then put into an oven, shown in figs. 1 and 2, on Sheet No. 2 of the accompanying drawings.

Figure 1 is a cross-section.

Figure 2 is a lengthwise section.



The letters *b* and *b* designate the sides of the oven, made of fire-brick, with fire-spaces between them and the outside walls *c* and *c*.

*d* is the furnace, and

*e* is the top of the oven, also made of fire-brick.

The bottom of the oven, *f*, is a plate of cast-iron, so as to radiate the heat freely into the oven.

The oven is closed on all sides from direct contact with the flame.

*g* is the back of the oven, made of fire-brick, and

*h* is the door, which has an aperture in it, set with glass, through which light may be thrown, so as to see the sheets when desired.

The letters *i i i* designate sliding metal rods, more or less in number, two (2) upon the same plane, which draw out at the side, by means of the handles *i' i' i'*.

The sheets are taken, after rolling, and placed in this oven, upon the rods, and they will thus be entirely separated, one from the other, so that the heat will touch all points alike.

The sheets are shown thus placed upon the rods, and are designated by the letters *k k k*.

The oven is now evenly and carefully heated, till the sheets are thoroughly annealed, and till they have attained the fine blue color of the genuine "Russia,"

when the rods supporting the upper sheet are pulled, and the sheet dropped down on to the one below it, and so on, till all the sheets are again in a "pack," when they are taken from the oven and passed once or twice through the rolls, to restore the enamel, which may have been slightly disturbed in annealing, and the process is finished.

Instead of taking the "pack" from the alkaline bath and rolling it cold, it may be taken from the bath and heated, in the oven just described, not above a dull red heat, and then rolled till properly enamelled, when the sheets will need to be "blued" in the oven, and the process is finished.

I claim, as my invention—

The process, herein set forth, of making imitation "Russia" sheet-iron.

Also, the rolls, made by the process and in the manner described, and used for the purpose set forth.

Also, the oven, made as described, with the sliding rods, or their equivalents, and used for the purpose set forth.

SILAS BARKER.

Witnesses:

W. EDGAR SIMONDS,  
HENRY S. PRATT.