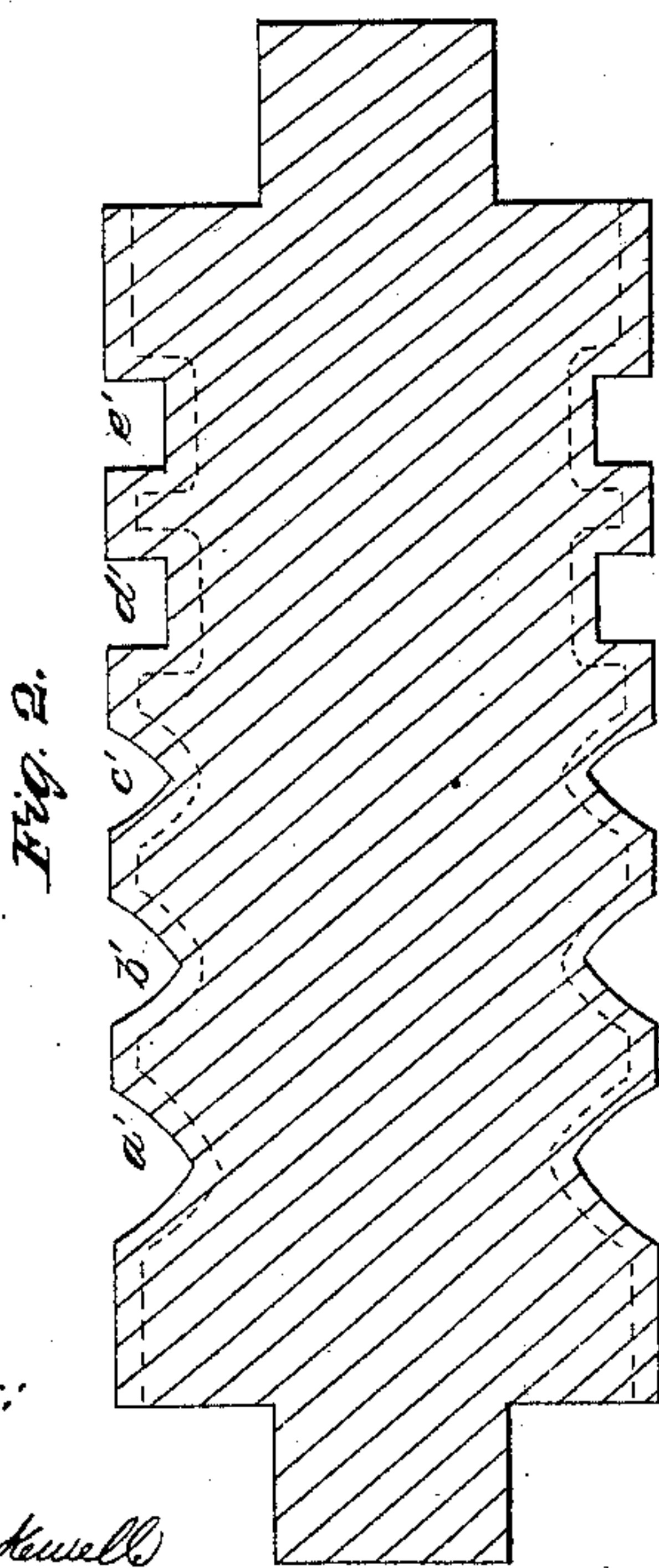
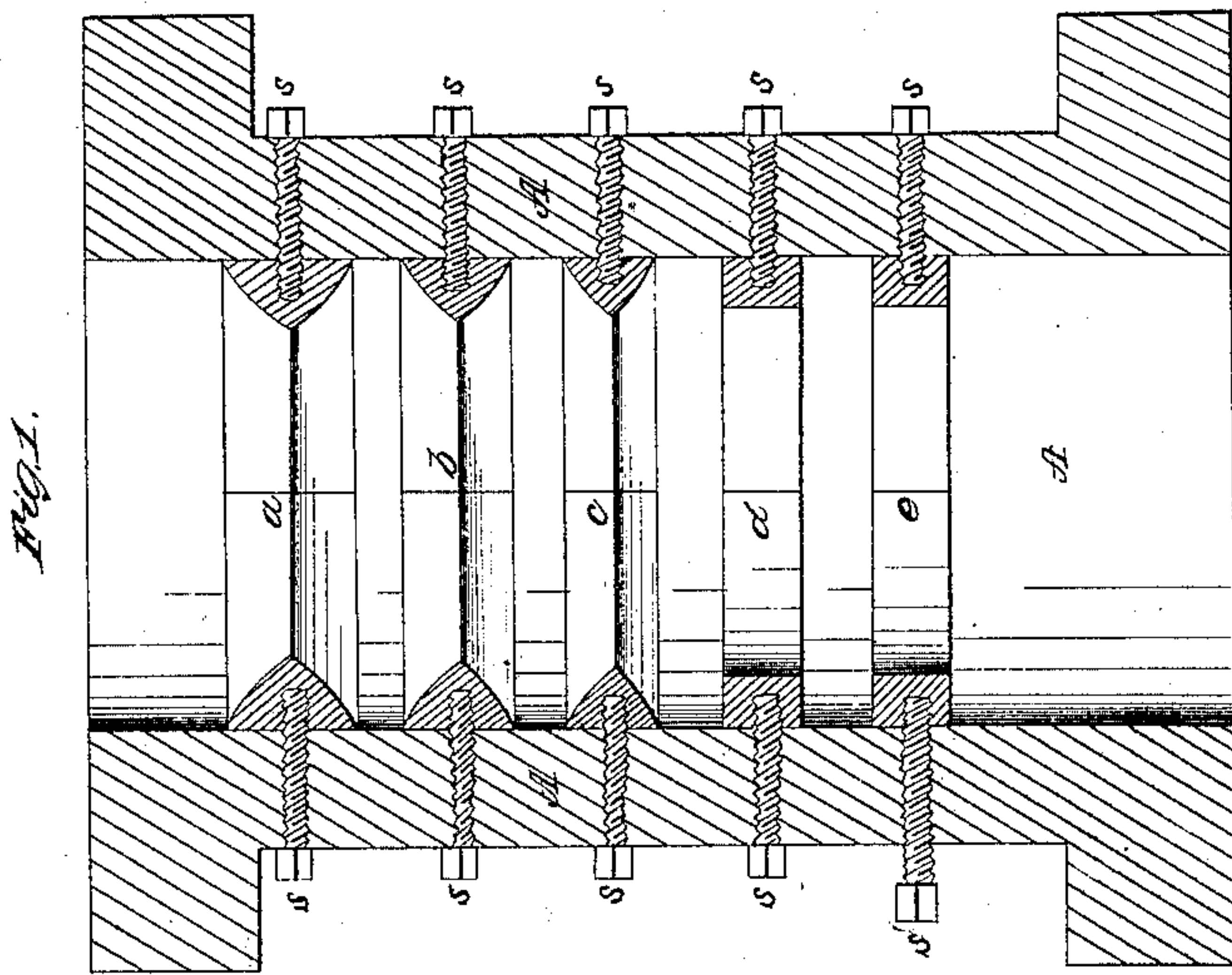


R. C. Totten,

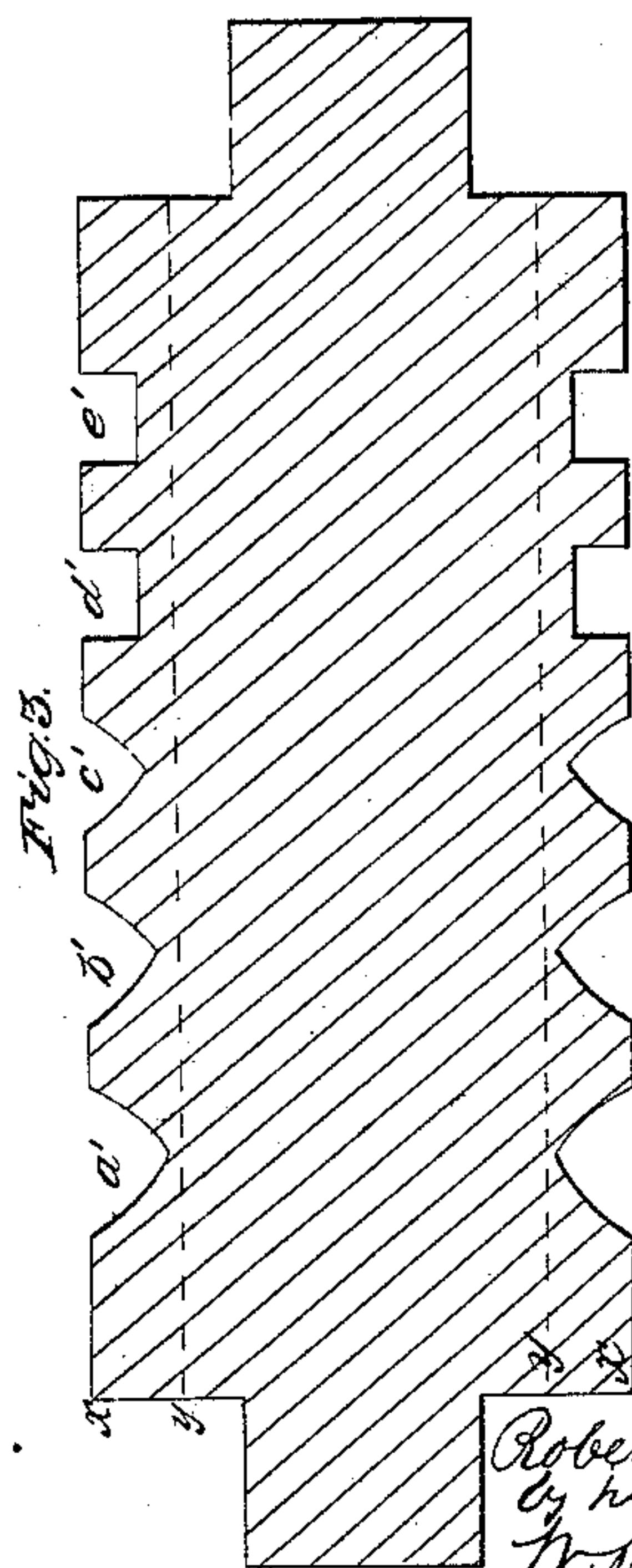
Casting Grooved Rolls.

N^o 50,187.

Patented Sep. 26, 1865.



Witnesses:
W. Lewis
Allan C. Bakewell



Inventor:
Robert C. Totten
by his atty
W. Bakewell

UNITED STATES PATENT OFFICE.

ROBERT C. TOTTEN, OF PITTSBURG, PENNSYLVANIA.

CASTING GROOVED ROLLS IN METAL MOLDS.

Specification forming part of Letters Patent No. 50,187, dated September 26, 1865.

To all whom it may concern:

Be it known that I, ROBERT C. TOTTEN, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Casting Grooved Chilled Rolls; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section through the axis of the chill or mold in which I cast grooved rolls. Fig. 2 is a longitudinal section of a grooved chilled roll cast on my improved plan. Fig. 3 is a longitudinal section through a grooved chilled roll made in the ordinary way.

The ordinary method of making grooved chilled rolls is to cast the rolls of cylindrical shape in a metallic mold or chill in the manner usually practiced in making plain chilled rolls and afterward to cut the grooves in the face of the roll.

In order to secure a chilled or hardened surface in the entire concave surface of the grooves it is necessary to chill the iron down to a depth from the surface of the cylinder somewhat greater than the depth of the deepest of the grooves. This will be seen by reference to Fig. 3, which represents a section of a chilled roll made in the manner described. *a' b' c' d' e'* are grooves in the roll, of various depths. Now, if the roll is chilled or hardened before the rolls are grooved it will be necessary to chill the iron from the outer surface of the cylinder to a depth equal to or greater than the deepest groove, as from *x* to *y* in Fig. 1.

In order to chill the iron to the requisite depth, when the roll requires to be deeply grooved, a harder and more brittle quality of metal must be used, because it is found that within certain limits the softer and better qualities of iron will not chill or harden to so great a depth as the harder and more brittle kinds. Therefore it is that grooved chilled rolls cast in the ordinary way, where they are chilled to the depth of the deepest groove, are so brittle as to be very liable to break at the grooves.

When iron has to be chilled to a greater depth than five-eighths or three-fourths of an inch it can only be done at the expense of the strength of the roll; and the object of my invention is to enable grooved chilled rolls to be

made of good soft metal by casting them in a chill having metallic beads or projections in its cavity corresponding with the required grooves in the rolls, and thereby chilling the iron to an uniform depth of three-fourths or five-eighths of an inch from the surface of the grooves, as well as from the surface of the plain part of the rolls, no matter to what depth the grooves are made.

To enable others skilled in the art to use my invention, I will proceed to describe my improved mode of casting grooved chilled rolls.

In the drawings, A, Fig. 1, represents an iron chill or mold having a cylindrical cavity. In the cavity of this chill are placed a number of iron rings, *a b c d e*, the exterior diameter of each ring being equal to that of the cavity of the chill, and their exterior shape being cylindrical. The shape of the inner surface of these rings and the size of their interior diameter is such as to form inside the chill projections corresponding with the depressions or grooves in the roll to be cast, so as to form rectangular, semicircular, triangular, or other shaped grooves. These rings are divided into two or three parts, the plane of section passing through the axis of the cylinder, so that when the roll is cast and removed from the chill with the rings lying in the grooves they may be readily removed therefrom. These groove-rings *a b c*, &c., are set in the cavity of the chill with their axes coinciding with the axis of the chill A, and are held in place by screws *s s*, &c., which are inserted in the body of the chill from outside, and passing through the side of the chill take into the rings *a b*, &c., as seen in Fig. 1. When the roll is cast, and before it is desired to remove the casting from the chill, the screws *s* are drawn back far enough to bring their points within the body of the chill and free the rings, as shown by the screws *s'* in the drawings.

As the metallic rings *a b*, &c., may expand more rapidly than the chill A when the melted metal is poured in, and thus by tightening the rings prevent their being moved in the chill, it is better to make the chill itself in two pieces, dividing it longitudinally, the parts being united by keys or clamps in the manner ordinarily practiced with parting metallic molds.

The mode of operation in casting grooved chilled rolls is as follows: The chill A being

fitted with the metallic rings *a b*, &c., fixed in their proper places by the screws *s s*, &c., the metal is run in through gates in the ordinary way. As soon as the metal is sufficiently set to allow of it the screws *s s* are withdrawn sufficiently to free the rings *a b*, &c., so that as the casting cools and contracts longitudinally it may not be cracked or thrown out of shape by the rings, but that the rings may draw down in the chill as the roll contracts. When the casting is cold enough to be removed from the chill, or rather to have the chill withdrawn from it, this is done in the usual way, or by parting the mold, and the rings forming the grooves are then also removed.

The result of this method of casting chilled rolls is that the rolls are cast with grooves in them, and that the surface of the metal in the grooves and elsewhere is chilled to an uniform, or nearly uniform, depth, and does not need to be chilled any more deeply at any point than is necessary for a plain cylindrical roll. When thus cast the roll is turned in the ordinary way, excepting that there is a great saving of time and expense and metal by reason of it not being necessary to cut down the grooves, but only to dress off and smooth their

surfaces. Grooved rolls thus cast are not only more expeditiously and more cheaply made, but, as they can be constructed of a better quality of iron than if they had to be chilled to a greater depth, are less liable to break.

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

1. Casting chilled rolls with grooves by means of a metallic mold or chill furnished with suitable projections in its inner surface, substantially in the manner hereinbefore described.

2. The combination, with a chill or metallic mold for casting rolls, of the rings *a b*, &c., divided into two or more parts, and attached to the inner surface of the chill by means of screws or other equivalent device, for the purpose of casting grooved chilled rolls, substantially in the manner hereinbefore described.

In testimony whereof I, the said ROBERT C. TOTTEN, have hereunto set my hand.

ROBT. C. TOTTEN.

Witnesses:

A. S. NICHOLSON,
W. BAKEWELL.