

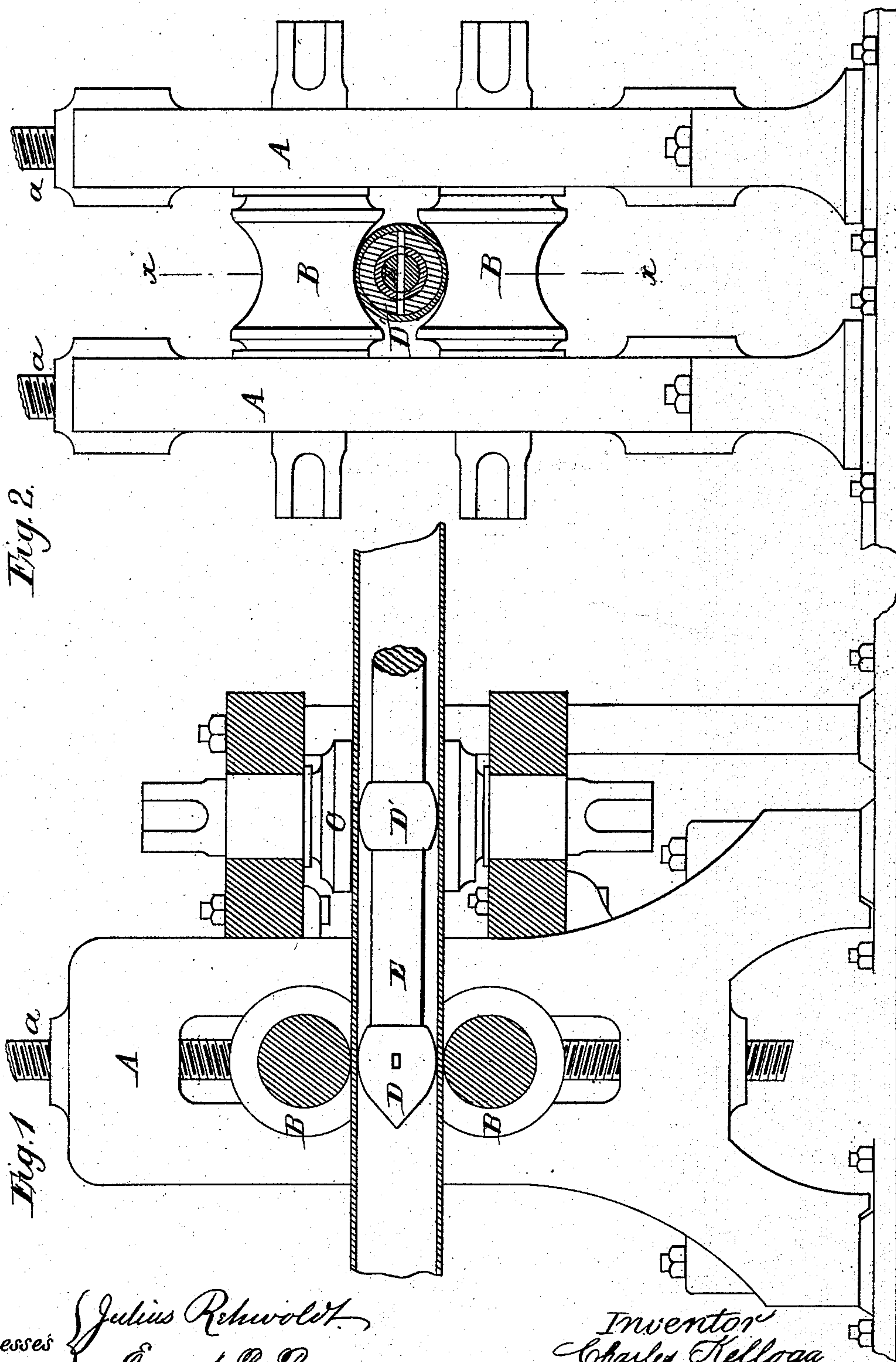
(No Model.)

3 Sheets—Sheet 1.

C. KELLOGG.
TUBE ROLLING MACHINE.

No. 325,938.

Patented Sept. 8, 1885.



Witnesses { *Julius Rehwoldt.*
Ernest B. Payne.

Inventor
Charles Kellogg
By *H. C. Bohlen*
His Attorney

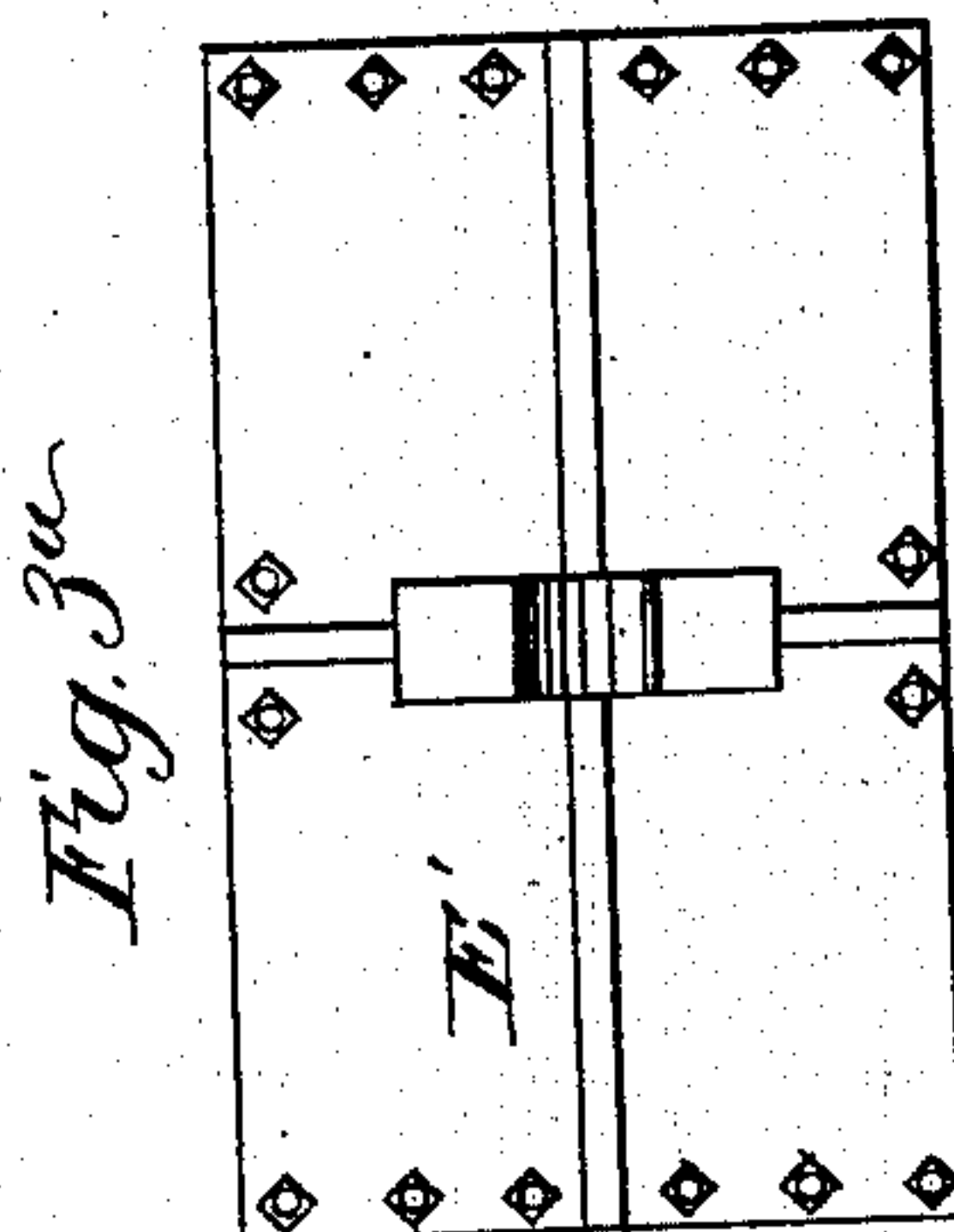
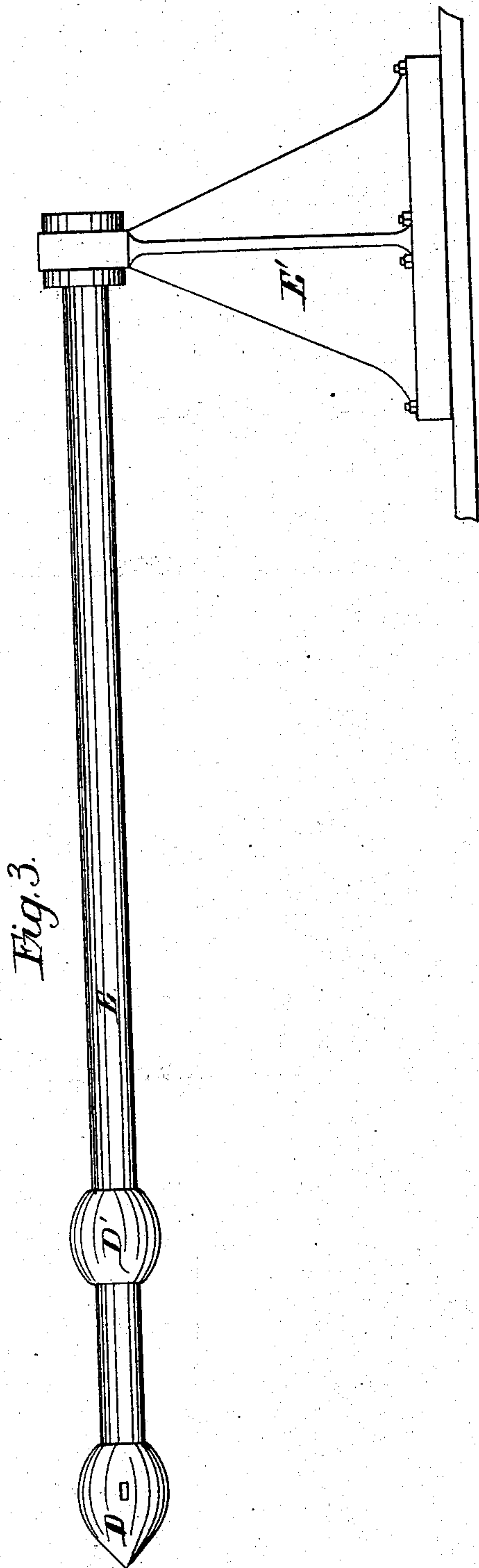
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Witnesses. { Julius Rehnoldt.
Ernest B. Payne.

Inventor
Charles Kellogg
By H. C. Young
His Attorney

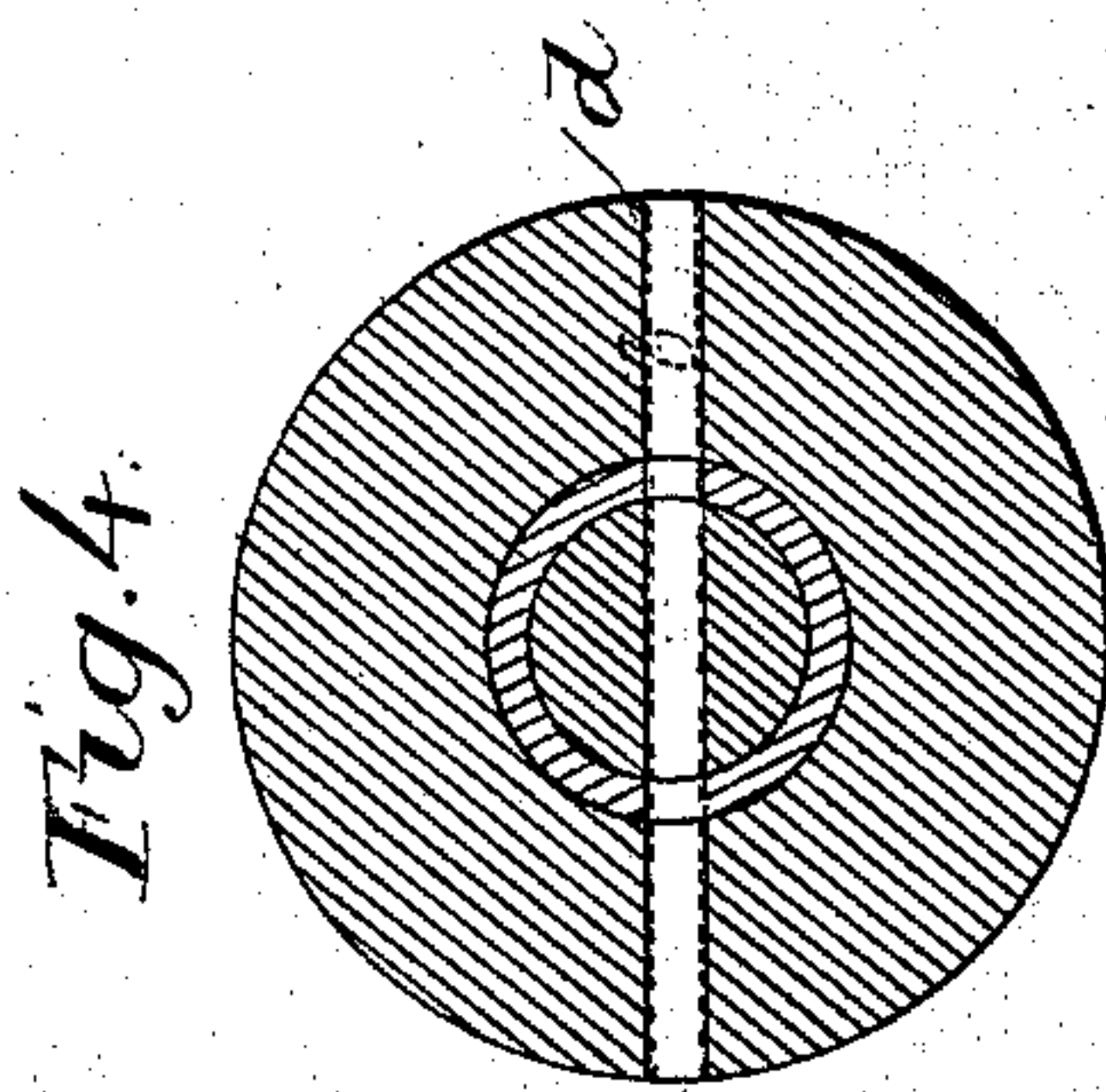
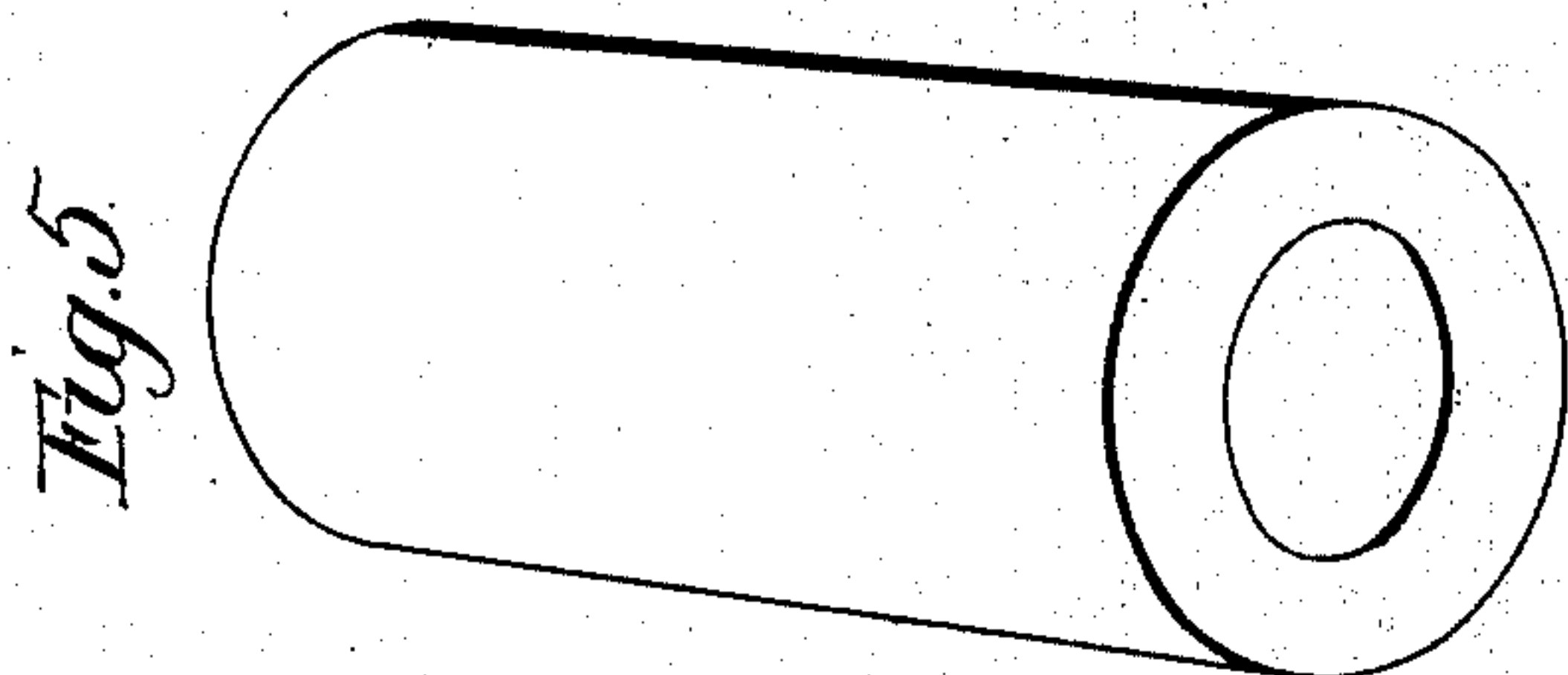
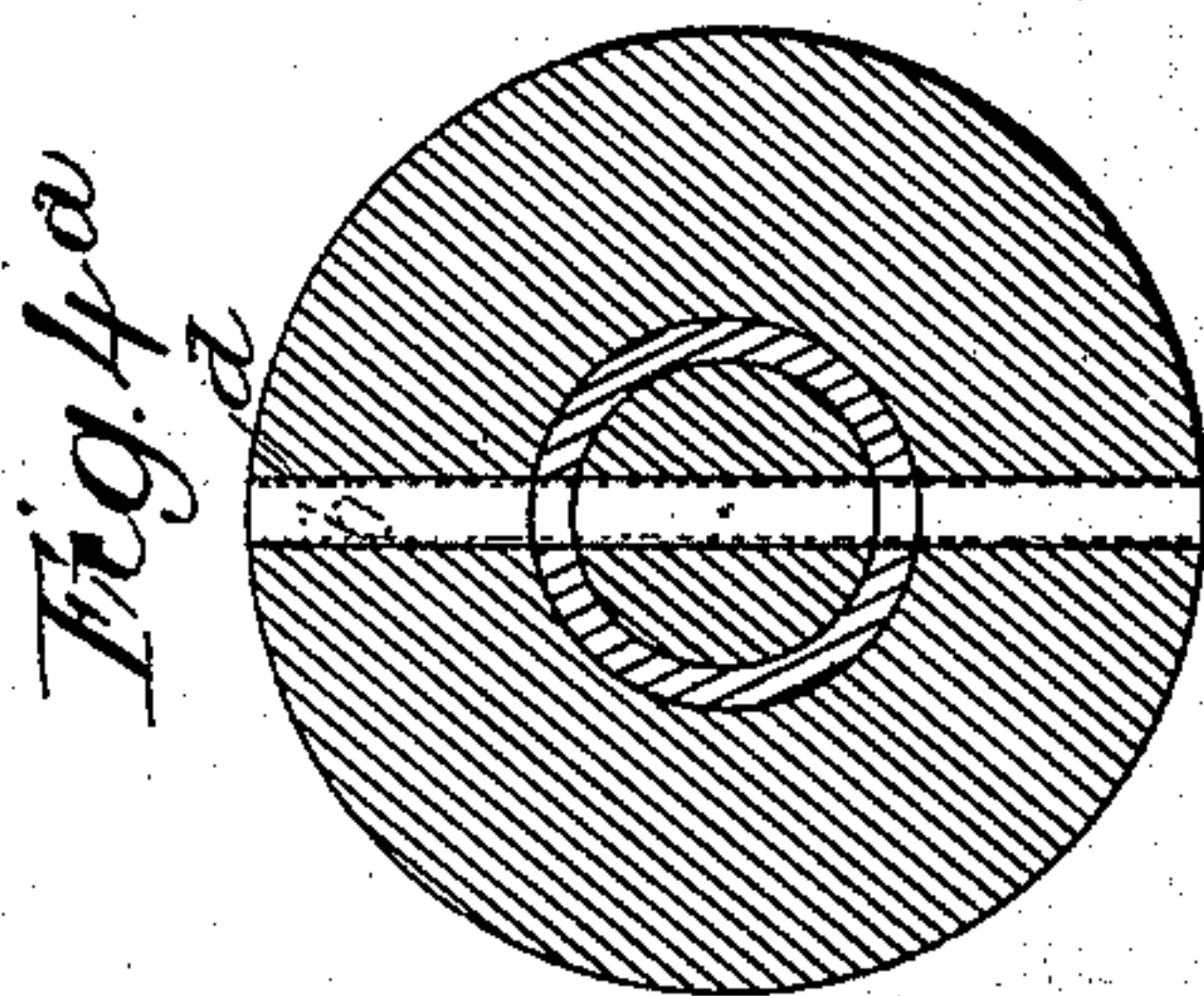
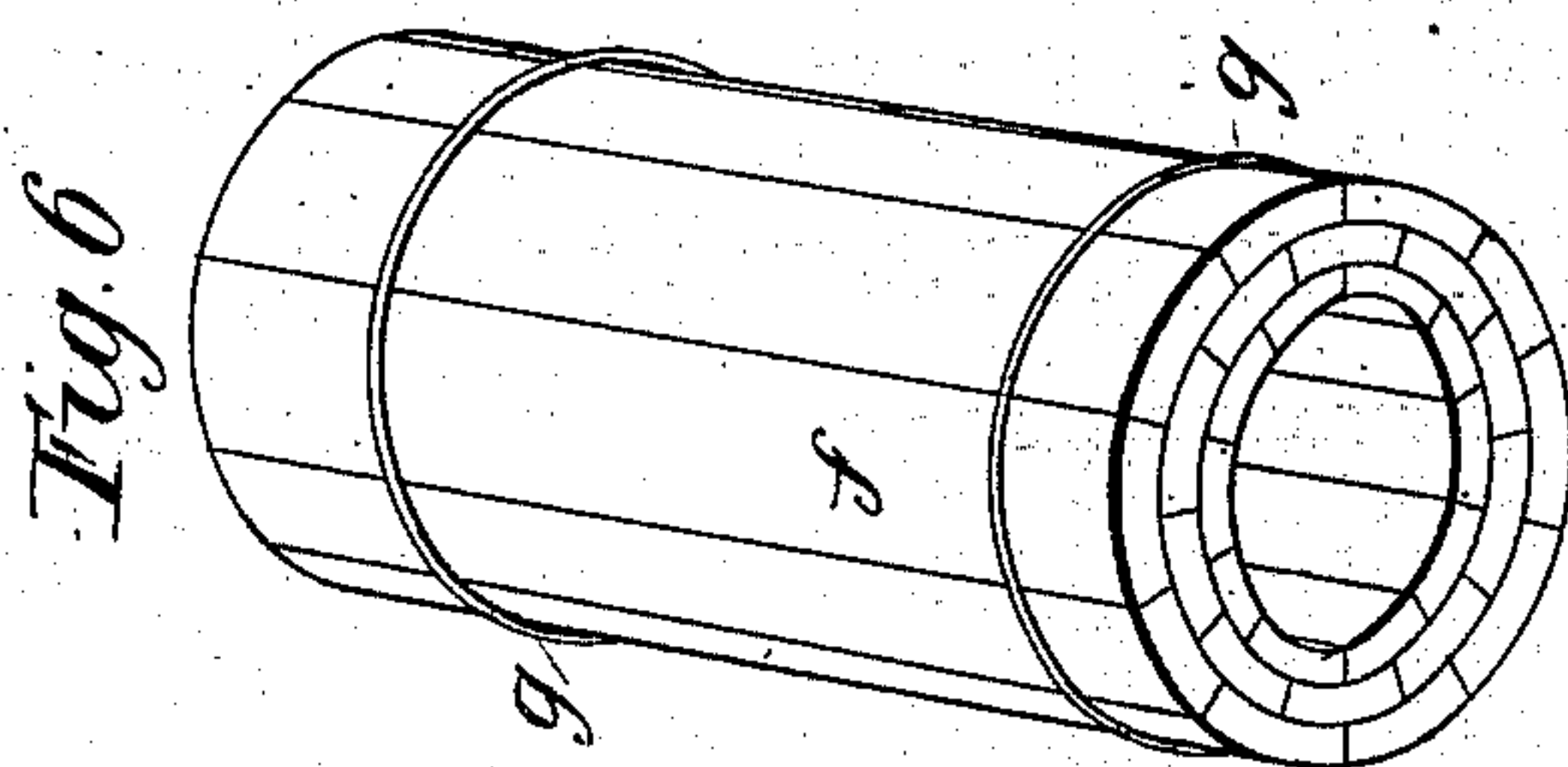
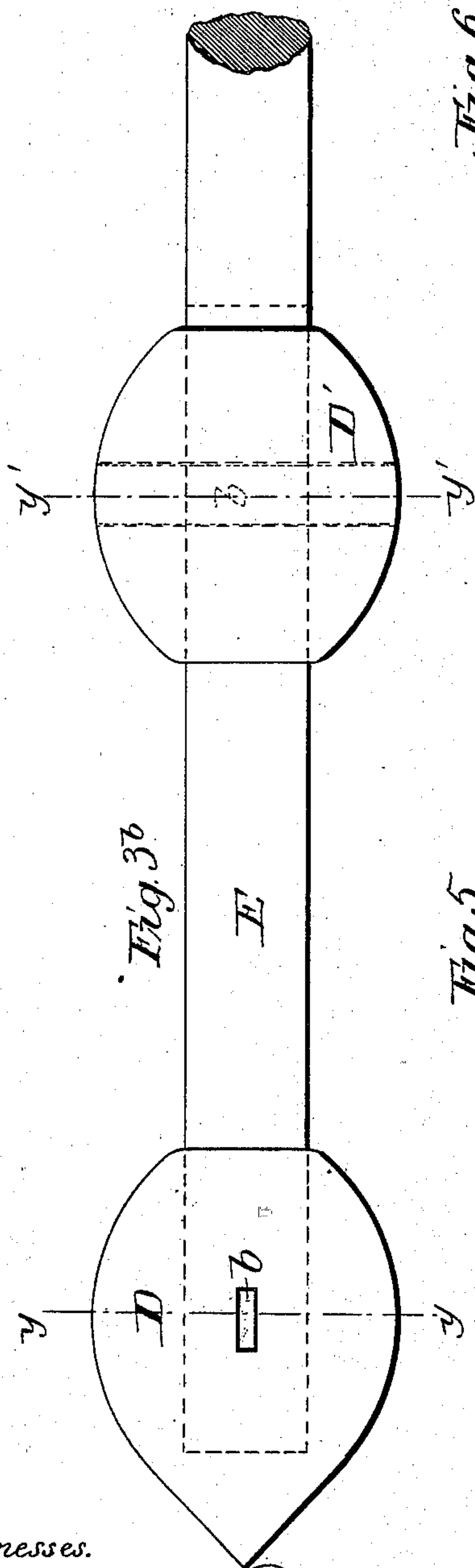
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TUBE ROLLING MACHINE.

No. 325,938.

Patented Sept. 8, 1885.



Witnesses.

Julius Rehwoldt.
Ernest B. Payne

Charles Kellogg
Inventor.
By W. C. Dunn
His Attorney

UNITED STATES PATENT OFFICE.

CHARLES KELLOGG, OF BUFFALO, NEW YORK, ASSIGNOR TO W. C. DONN,
DAVID W. BURT, AND RICHARD TAYLOR, ALL OF SAME PLACE.

TUBE-ROLLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 325,938, dated September 8, 1885.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES KELLOGG, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Machine for Manufacturing Seamless Tubes and other Hollow Cylindrical Articles, of which the following is a specification.

This invention constitutes improvements on the invention for which I obtained Letters Patent of the United States No. 278,340, dated May 29, 1883; and the present invention relates to the mandrel used with the rolls of a universal rolling-mill in forming tubes and other articles.

Heretofore the mandrel has been provided with small rolls which operated upon the inside of the cylindrical ingot or pile with a rolling action; but this kind of mandrel is complicated and expensive, and while valuable in making tubes and other hollow cylindrical articles from ingots or billets, it is not so well adapted to the making of such articles from cylindrical piles of bar-iron, as the slag and scale which is knocked off from the iron interferes with the action of the rolls.

The object of this invention is to provide a simple form of mandrel specially adapted to the rolling of large tubes, &c., and to the rolling of tubes and similar articles from cylindrical piles formed of bar-iron, &c.; and this part of the invention consists in a solid stationary mandrel composed of as many parts of equal size diametrically as there are sets of rolls in the mill, each of said parts being attached to a rod so as to be held between or in the pass of the rolls in such a position that at the pass of the work the mandrel and the mill-rolls act upon, consolidate, and roll the ingot pile or tube simultaneously and at points of the exterior and interior surface directly opposite each other.

In the accompanying drawings, Figure 1 represents a sectional view, taken on line xx of Fig. 2, of a universal rolling-mill with the mandrel and a section of a tube in process of manufacture. Fig. 2 is a sectional elevation of the same. Figs. 3 and 3^a represent the mandrel and mandrel-rod and the device for supporting and centering the same. Fig. 3^b

is an enlarged view of the mandrel. Figs. 4 and 4^a are sections of the mandrel, taken on lines yy and $y'y'$ of Fig. 3^b. Fig. 5 represents an ingot prepared for rolling into a tube, and Fig. 6 represents a pile formed of bars of metal prepared for rolling into a tube or other hollow cylindrical articles.

Referring to the drawings, A represents the housings of a universal rolling-mill, the horizontal rolls being designated by the letter B, the vertical rolls by the letter C, and the adjusting-screws for the horizontal rolls by the letter a , the adjusting screws for the vertical rolls not being shown.

The mandrel is composed of two parts, D D', corresponding to the two sets of rolls, B C, said parts D D' being of the same diameter. These parts are placed upon a mandrel-rod, E, and secured thereto by keys b , passed through key ways or seats d in the mandrels and the rod.

The part D is of a conical form with its base contracted, so that the sides present but a small bearing-surface, the object of this construction being to reduce the friction as much as possible between the mandrel and the tube; but I do not confine myself to the exact form shown, as it may be varied, if desired. The mandrel D is placed upon the front end of the mandrel-rod, and in such a position that its greatest diameter, which, of course, corresponds to the internal diameter of the tube or other hollow cylindrical article, falls in line with the axis of the upper and lower horizontal rolls; or, in other words, the bearing-faces of the two rolls, which come in contact with and form the outer surface of the tube, are exactly in line with the bearing-surface of the mandrel which forms the interior surface of the tube. In this way the reduction of the metal takes place at points exactly opposite each other on the outer and inner surfaces simultaneously, whereby the rolling is greatly facilitated and the tube is formed perfectly true.

The mandrel D' is preferably of the form of a frustum of an oval or ellipse, so as to present a narrow or contracted bearing-surface, for the purpose hereinbefore set forth at length. This mandrel is placed on the mandrel-rod at

such a point that its bearing-surface aligns with the axis of the vertical rolls, so that the bearing-surface of the rolls, or that point on their peripheries which comes in contact with
5 and exerts a formative action upon the surface of the tube, is exactly opposite the bearing-surface of the mandrel which forms the inner surface of the tube.

By this arrangement of the two mandrels
10 the tube is sustained, both laterally and vertically, against the pressure of the two sets of rolls and at such points that the formation of the tube and consolidation of the metal goes on both outside and inside simultaneously.

15 Furthermore, by this arrangement, the tube is made of uniform thickness throughout, the surfaces being kept parallel by the combined action of the two sets of rolls and the two-part mandrel, and the bore is formed perfectly true.

20 The mandrel is centered and held against the thrust and drawing action of the work by a mandrel bracket or stand, E', which is composed of a suitably-anchored base, from which rises a standard provided with a fork, in which
25 rests the end of the mandrel-rod. Two disks or lugs are fixed to the rod, between which the fork rests, as shown, and thereby the mandrel-rod and mandrels are prevented from moving longitudinally as the passes are made.

30 In the operation of rolling the ingot or pile and forming the tube or other hollow cylindrical article the passes are made back and forth, so that the mandrel is not removed from its position until the rolling of the article is
35 completed in the same manner as is described in Letters Patent No. 278,340, granted to me May 29, 1883, for "Machine for Rolling Tubes, Columns," &c., whereby great economy of time and labor is obtained.

40 The mandrels D D' being removable from

the rod, mandrels of various sizes can be employed, and thereby tubes and other articles of different sizes and thicknesses can be made by the same apparatus.

An ingot of steel or homogeneous iron suitable for rolling into a tube or other hollow
45 cylindrical article is illustrated by Fig. 5. Fig. 6 represents a pile formed of bars f, of iron, placed together to form a hollow cylinder and secured by bands or hoops g. 50

Where a pile is formed of iron, the slag knocked off from the inside surface is forced out by the solid mandrels and expelled from the pile without interfering with the action of the mandrels, whereas in the roller-mandrels
55 particles of slag would be apt to get between the rolls and their bearings and interfere with or stop the action of the rolls.

I claim—

1. As an improvement in machinery for
60 manufacturing tubes and other hollow cylindrical articles, the combination of the mandrels D D', having the same diameter and affixed to a suitable mandrel-rod, with the horizontal and vertical rolls of a universal
65 rolling-mill, for the purpose specified.

2. The combination of the horizontal and vertical rolls of a universal rolling-mill, a mandrel composed of the solid stationary parts
70 D D', having equal diameters and placed in the pass of the rolls, with the bearing-surfaces of the said parts respectively in line with the axes of the rolls B C, the mandrel-rod, and the forked standard E', substantially as specified.

CHARLES KELLOGG.

Witnesses:

JULIUS REHWOLDT,
MILLARD R. JONES.

Corrections in Letters Patent No. 325,938.

It is hereby certified that Letters Patent No. 325,938, granted September 8, 1885, upon the application of Charles Kellogg, of Buffalo, New York, for an improvement in "Tube-Rolling Machines," was erroneously issued to "W. C. Donn, David W. Burt, and Richard Taylor;" that said Letters Patent should have been issued to *Charles Kellogg, David W. Burt, and Richard Taylor*, said Burt and Taylor being assignees of one-half interest; and that the proper corrections have been made in the files and records of the case in the Patent Office and should be read in the Letters Patent that the same may conform thereto.

Signed, countersigned, and sealed this 15th day of September, A. D. 1885.

[SEAL.]

G. A. JENKS,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.