

(No Model.)

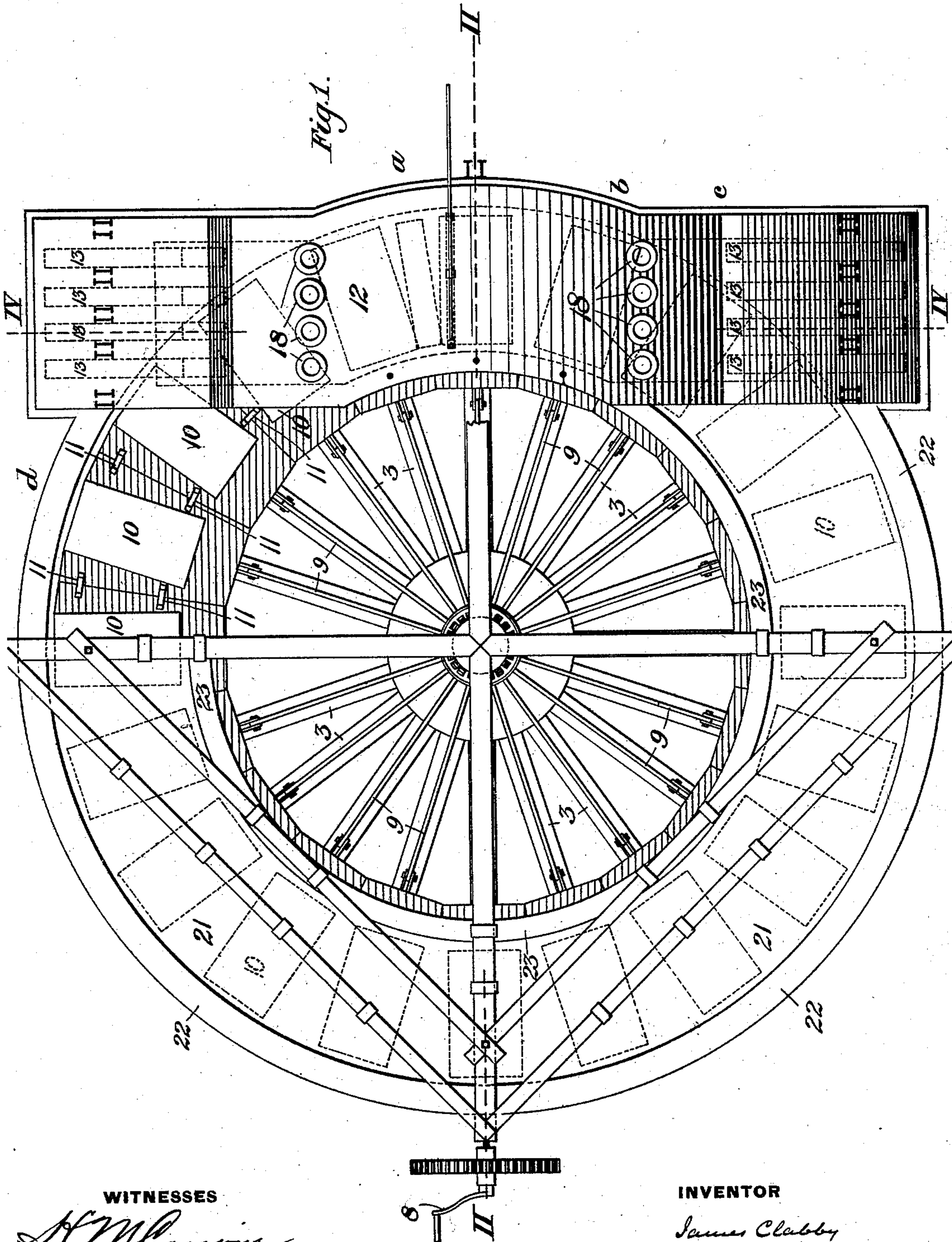
3 Sheets—Sheet 1.

J. CLABBY.

COMBINED FLATTENING AND ANNEALING OVEN.

No. 505,418.

Patented Sept. 19, 1893.



WITNESSES

H. M. Corwin
C. T. Byrnes.

INVENTOR

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by H. B. Russell & Sons
his attorneys

(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

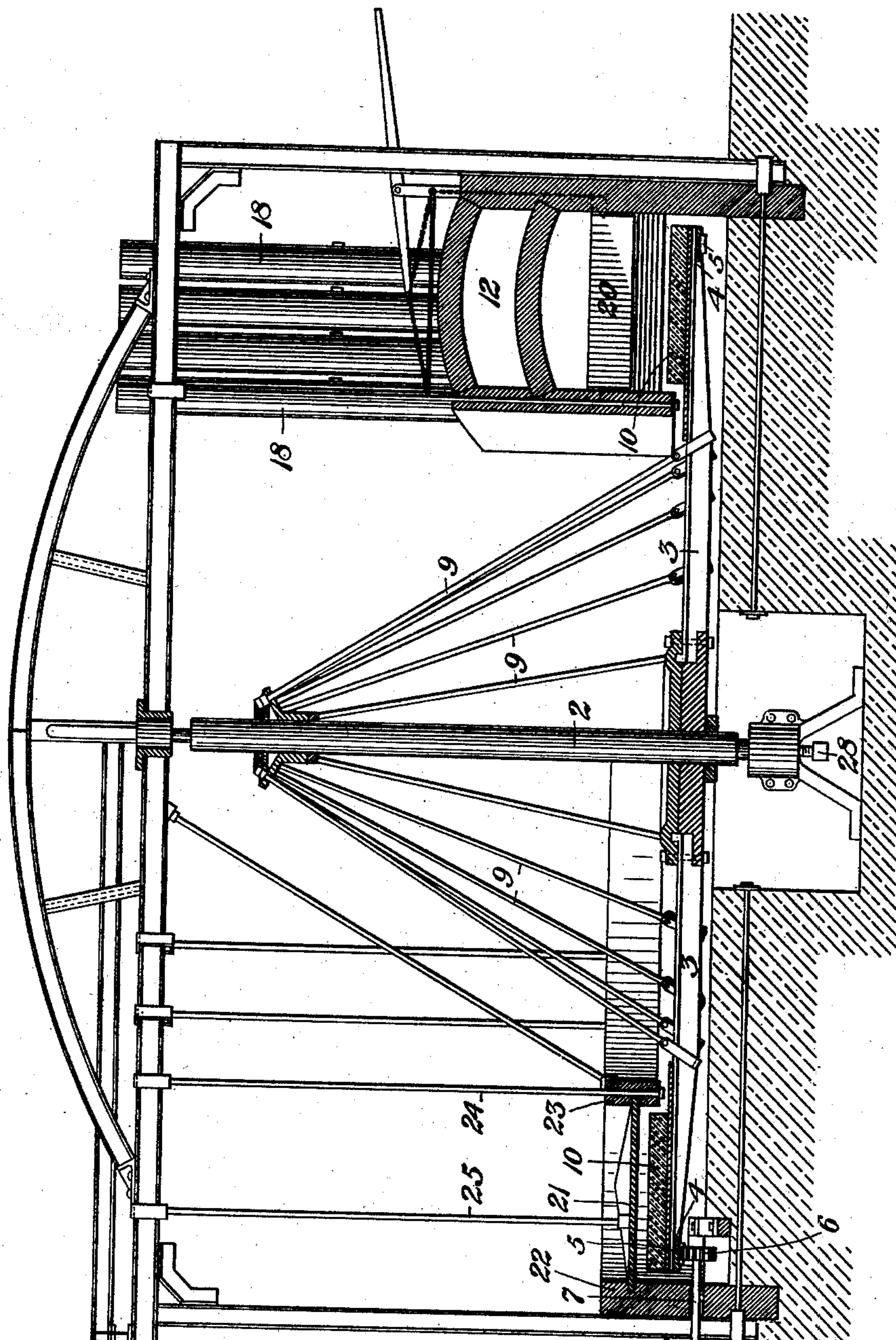
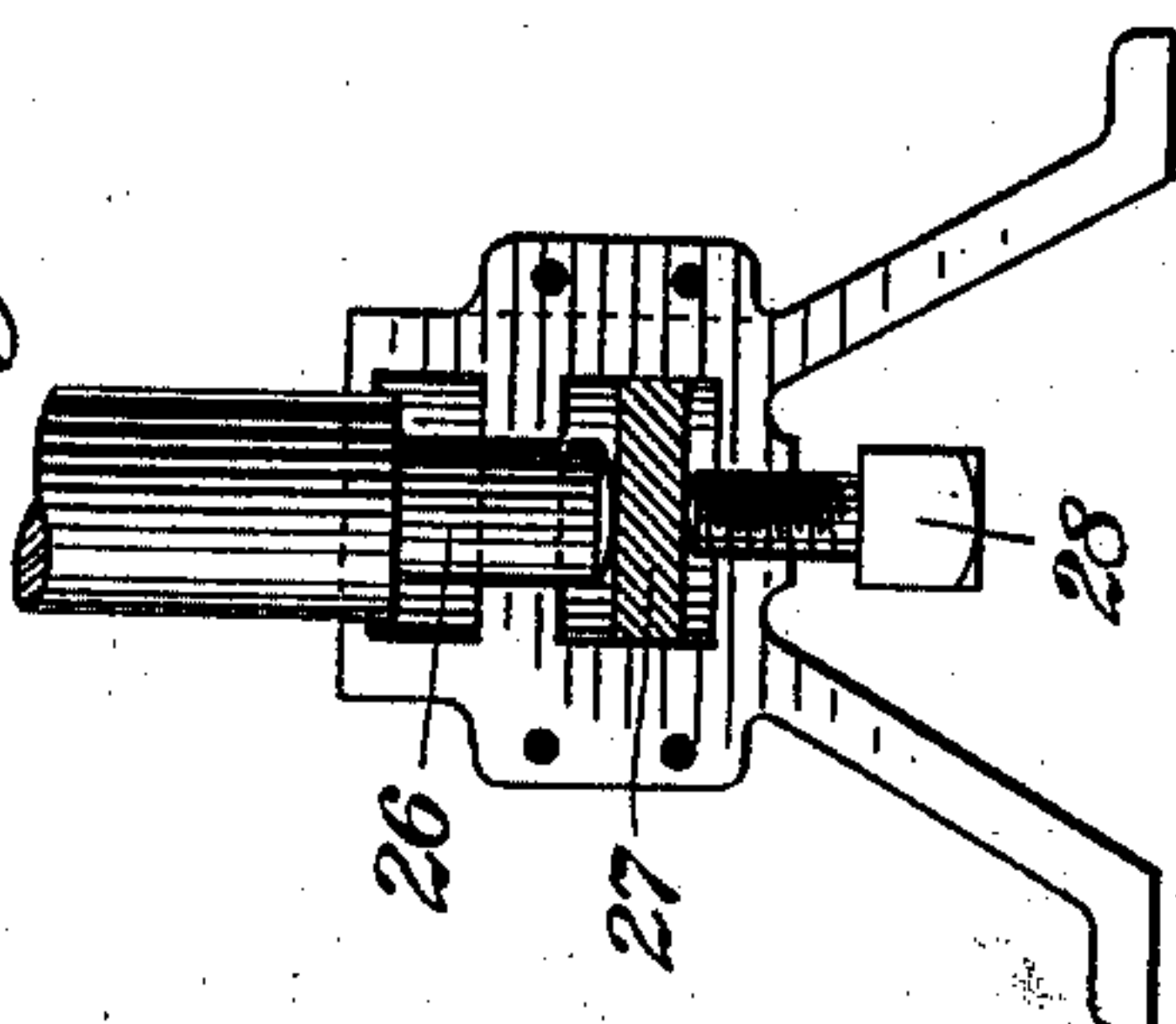


Fig. 5.



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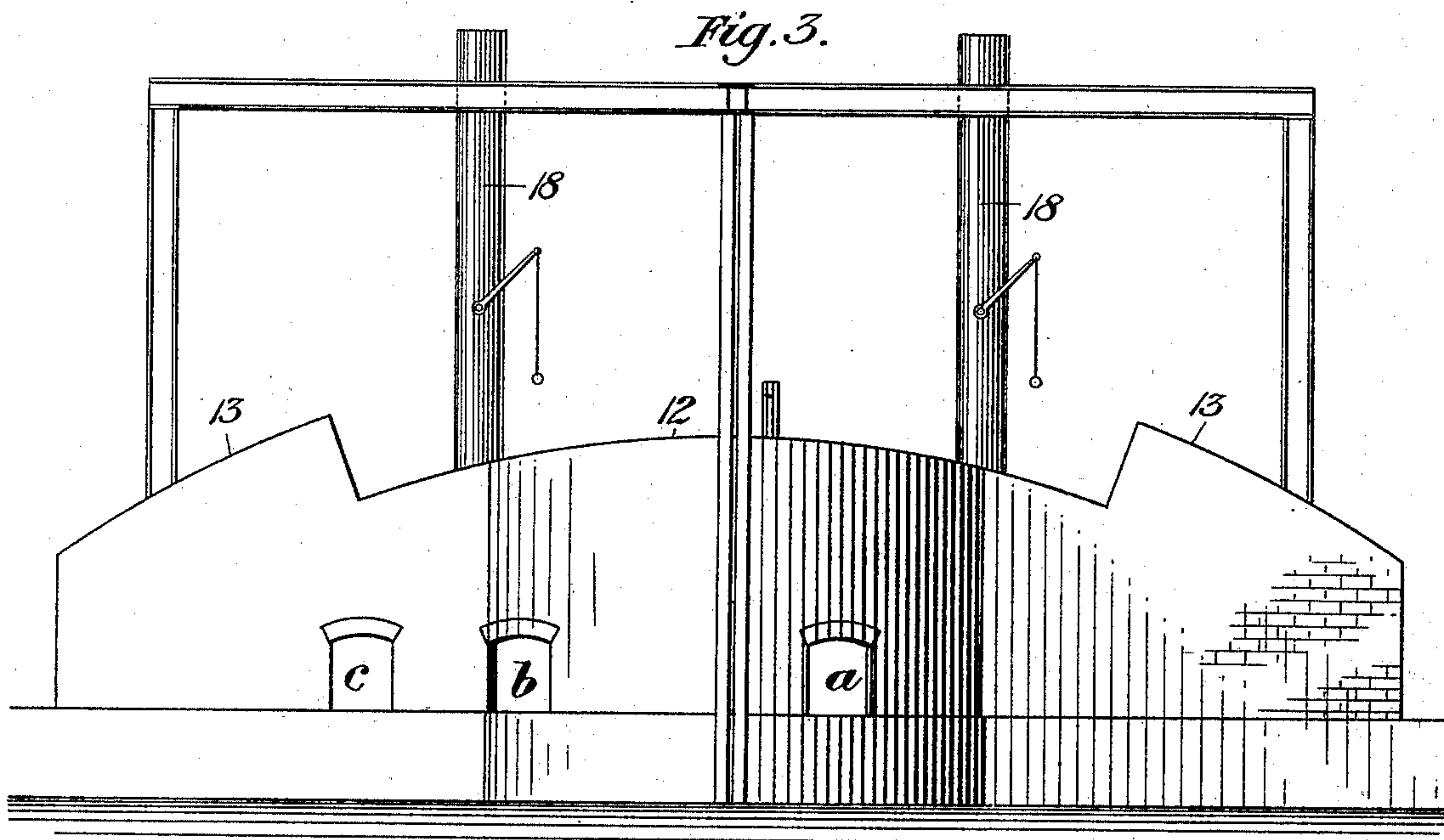
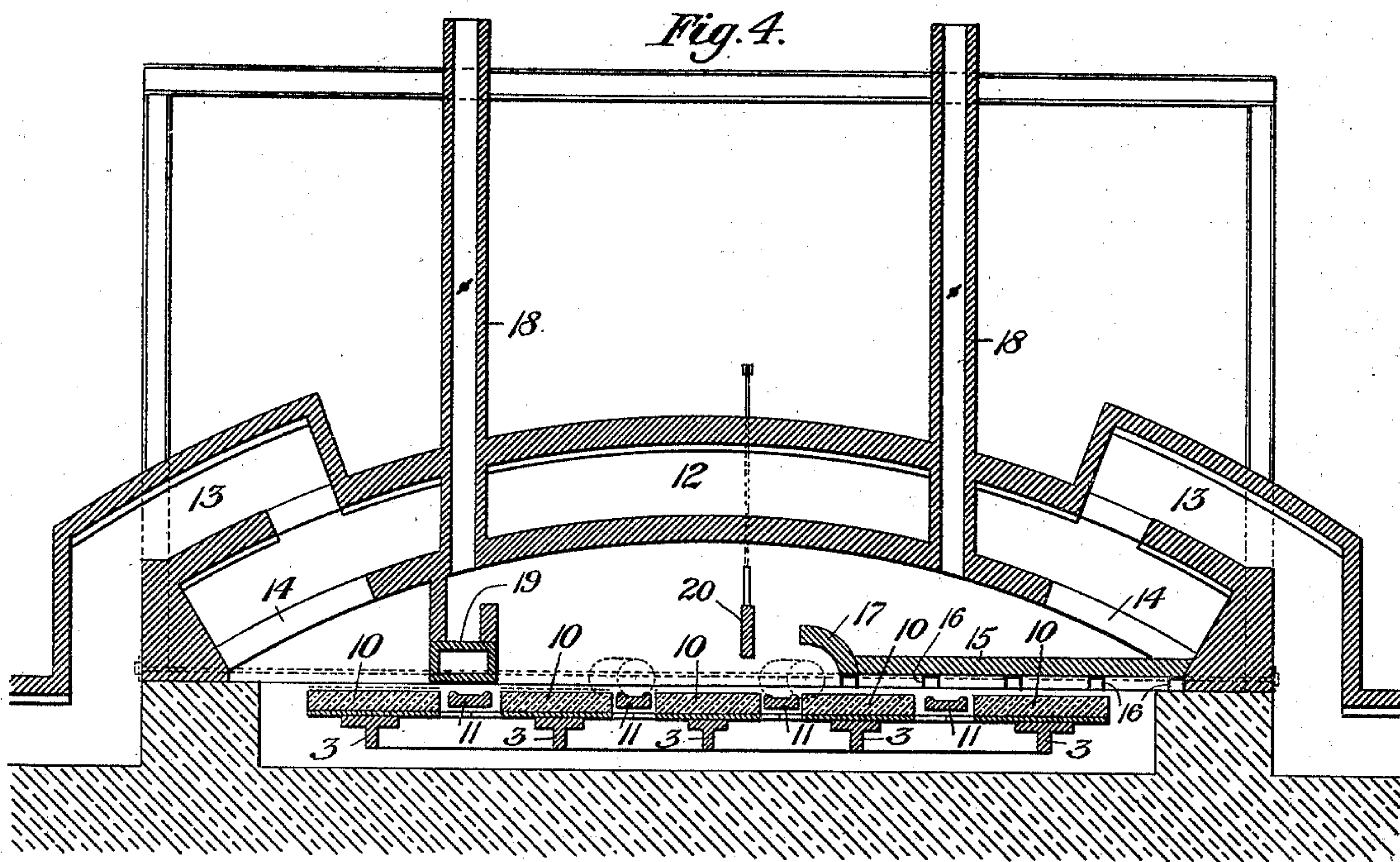
3 Sheets—Sheet 3.

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No. 505,418.

Patented Sept. 19, 1893.



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UNITED STATES PATENT OFFICE.

JAMES CLABBY, OF JEANNETTE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO FREDERICK MILLER, OF SAME PLACE.

COMBINED FLATTENING AND ANNEALING OVEN.

SPECIFICATION forming part of Letters Patent No. 505,418, dated September 19, 1893.

Application filed January 21, 1893. Serial No. 459,073. (No model.)

To all whom it may concern:

Be it known that I, JAMES CLABBY, of Jeannette, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Improvement in a Combined Flattening and Annealing Oven, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved oven. Fig. 2 is a central section on the line II—II of Fig. 1. Fig. 3 is a front view of the flattening chamber. Fig. 4 is a longitudinal section on the line IV—IV of Fig. 1; and Fig. 5 is a detail view of the spindle step.

My invention relates to the flattening and annealing of glass, and is designed to greatly facilitate these operations, to do away with most of the breakage in the working of the glass, and to cheapen the cost of the plant and the expense of operating the same, as well as produce a superior quality of glass.

To that end it consists in a connected glass-flattening and annealing oven and a carrier which moves the stones, upon which the glass is flattened, through the annealing oven and returns them to the flattening oven, and in the above combination, together with a reheating oven for the stones through which the carrier passes before again reaching the flattening-oven.

It also consists in my improved method of working glass, consisting in flattening the same upon a suitable block or stone, and passing said stone through the annealing oven, as well as in the construction and arrangement of the parts as hereinafter more fully described and set forth in the claims.

In the drawings, in which similar numerals indicate corresponding parts, 2 represents a central spindle having secured thereto the radial arms 3, provided at their outer ends with the circular rim 4, having upon its lower side a circular rack 5 whose teeth are engaged by a pinion 6 upon a shaft 7, which passes through the side wall of the oven and is operated by a handle 8. These arms, 3, at their inner ends, are held between two annular plates bolted together and secured to the shaft, as shown in Fig. 1, and are supported

by guy-rods 9 depending from a collar fastened to the upper part of the shaft.

Upon the rim 4 are carried the flattening stones 10, the number of these stones depending upon the size of the wheel, and between each pair of stones are supported the rests 11 upon which the glass cylinders are placed as they are introduced by the shove-in boy.

Across one side of the circle formed by the wheel and covering a segmental portion thereof, is built the double arched oven 12, which furnishes the requisite heat for flattening the glass cylinders, and reheating the stones after they have passed through the cooling or annealing oven. This arch is hollow, and built over each end of this arch are four parallel flues 13, which extend downwardly at their outer ends and communicate with a suitable source of heat.

To supply the requisite heat, coal, gas, or any suitable combustible may be used, as the grit, carbon, and dirt in the products of combustion are deposited in the arch, and do not reach the glass. At their inner ends these flues enter the top of the arch and communicate with the space therein.

Beneath the inner ends of the flues, in the lower wall of the arch, I form a series of openings 14, which lead into the flattening chamber, and immediately beneath the set of said openings, at the right hand of Fig. 4, I support a thin plate 15 upon the U-irons 16 passing beneath the same. This plate terminates in an arc-shaped shield 17, which serves to protect the cylinder, as it is shoved in, from any grit which might remain in the heated products, and to protect it from too sudden heating. The chamber formed beneath the plate 15 serves as a reheating chamber for the stones and prepares them for the flattening of the glass thereon.

Through the arch, near each end, passes the series of flues or chimneys 18, having dampers therein, and beneath the left-hand series of Fig. 4 is the depending mantel 19, which serves to prevent the escape of the heat from the flattening chamber.

Blocks or plugs are provided for stopping up any of the openings 14, or the inner ends of the flues 13, and near the shield 17 I provide the vertically-movable shield 20, which

is lowered when the glass cylinder is introduced, and prevents any injury to the adjacent glass resulting from the bursting of the cylinder being introduced. The shield 20 and chimney-dampers are operated by suitable projecting handles shown in Fig. 3.

The major portion of the rim is covered by a roof or cover 21, which is composed of suitable plates supported between the outer wall 22 and an inner circular band 23 carried by hangers 24 depending from the upper framework, additional hangers 25 being also used to support the plates themselves. This cover extends from one end of the flattening chamber over the wheel rim nearly to the other end, an open space being left as shown at *d* in Fig. 1, for removing the annealed sheets of glass.

To adjust the stones at a suitable distance below the cover and to lower the same for repairs or replacing of one of the stones, I arrange the lower end of the spindle as shown in Fig. 5, a reduced stem 26 resting upon a plate 27 carried upon a vertically adjustable screw 28.

It is evident that by rotation of the screw the wheel may be raised and lowered and access thus had to the stones, thereby doing away with the necessity of tearing down a portion of the structure when repairs are needed and giving an accurate vertical adjustment of the rim.

The operation of my improved oven is as follows:—The glass cylinder being introduced at *a*, Fig. 1, is there heated, and at the next movement of the carrier is transferred to the flattening station at *b*. Being here flattened, it is next carried to the re-flattening or smoothing station *c*, and thence proceeds by an intermittent movement to the take-off station, at *d*, where the glass is removed. The stone from which the plate has been removed then passes into the re-heating chamber beneath the plate 15, where it is heated up again for the reception of another cylinder.

In supplying the heat to the flattening chamber I preferably block up part or all of the openings 14, at the left hand end of the arch, causing the heated products entering at this end to pass through the space between the two arch walls and join the products entering at the right hand end.

The great advantages of my invention will be apparent to those skilled in the art. The many handlings of the glass necessary in the ordinary flattening oven and leer are done away with, and after flattening the cylinder it is not touched until removal of the same, thus doing away with much scratching and breaking of the glass sheets. The cylinders and stones are protected from the direct cur-

rents of the products of combustion, and are not thereby roughened and blackened. The heat can be nicely regulated and concentrated at the exact point needed, and injury to one cylinder does not delay and injure other sheets.

Many variations may be made in the form and arrangement of the parts without departure from my invention as claimed herein, since I consider myself the first to anneal the glass by moving the flattening stone itself through a cooling oven, and desire to cover the same broadly.

I claim as my invention—

1. The method of flattening and annealing glass, consisting in flattening the cylinders upon suitable supports, moving said supports through an annealing oven and allowing the sheets to become entirely annealed and cooled before removal from the supports; substantially as described.
2. The method of flattening and annealing glass, consisting in flattening the cylinders upon suitable stones, moving said stones through an annealing oven, allowing the sheets thereon to become entirely annealed and cooled, removing the sheets, and reheating the stones preparatory to flattening other cylinders thereon; substantially as described.
3. The combination with an annular annealing oven and carrier passing therethrough, of a double arched flattening oven built over a portion of the path of said carrier, substantially as described.
4. An endless carrier, having a double arched flattening oven built over a portion of its length, substantially as described.
5. A flattening-oven, having a hollow roof, flues leading from an exterior source of heat into the space therein, openings leading from said space into the flattening-chamber, and means for closing said openings, substantially as described.
6. A flattening oven, having a hollow roof, flues leading thereinto, openings leading therefrom to the oven, and a shield extending over part of the flattening stones, substantially as described.
7. A flattening-oven, having an adjustable shield between the adjacent supports for the glass, upon the wheel substantially as described.
8. A spindle carrying flattening stones, and means for vertically adjusting said spindle, substantially as described.

In testimony whereof I have hereunto set my hand.

JAMES CLABBY.

Witnesses:

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W. B. CORWIN.