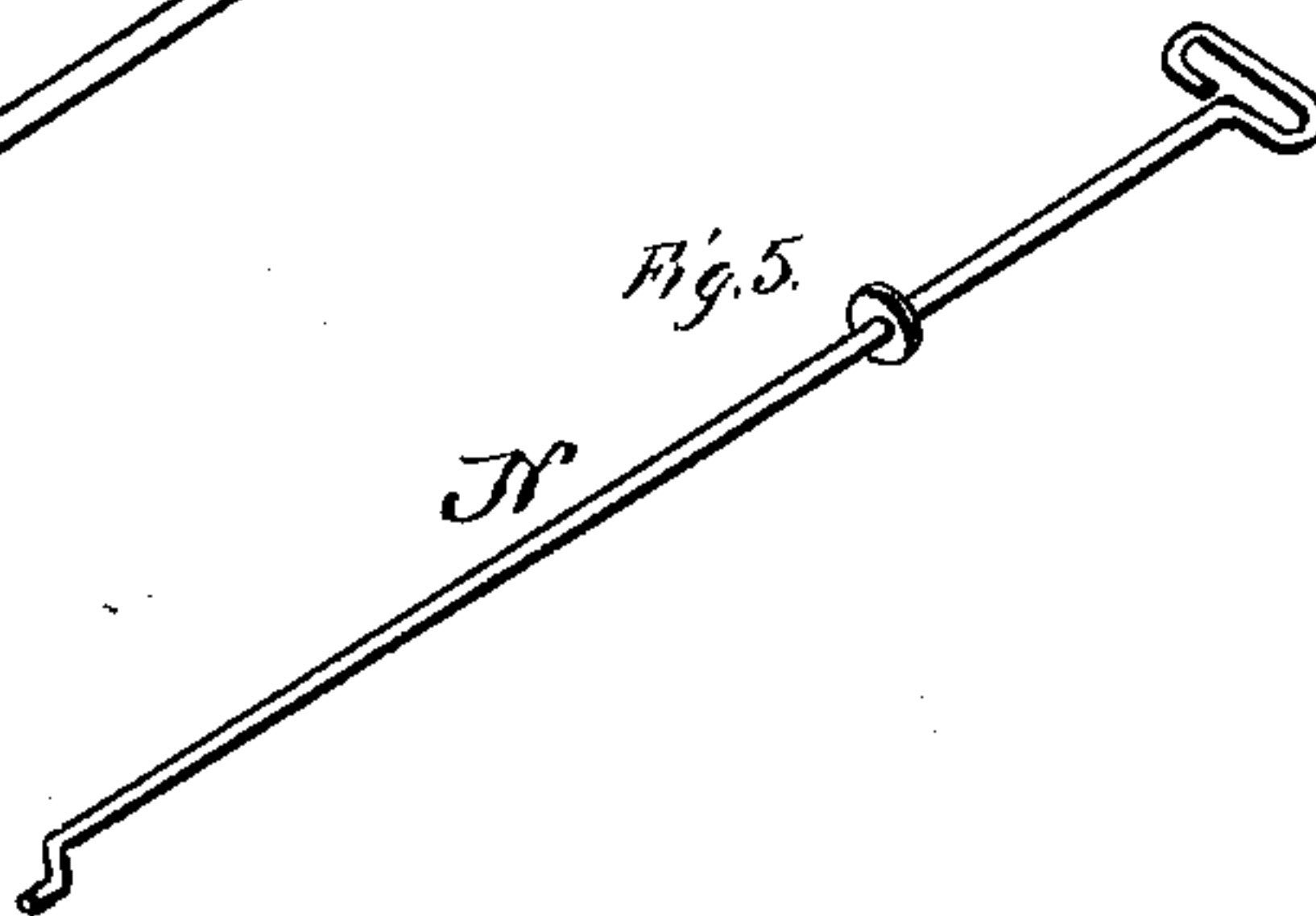
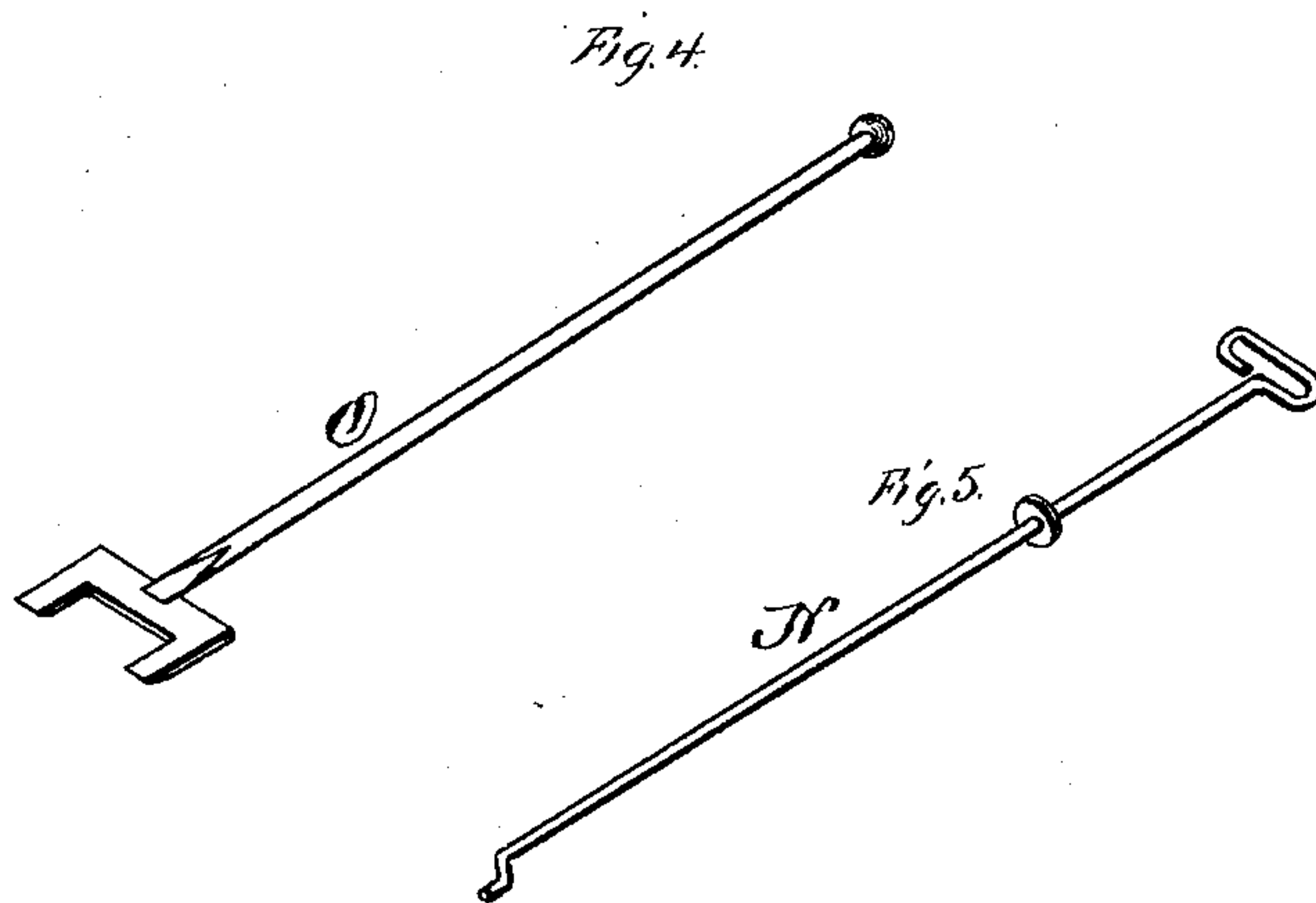
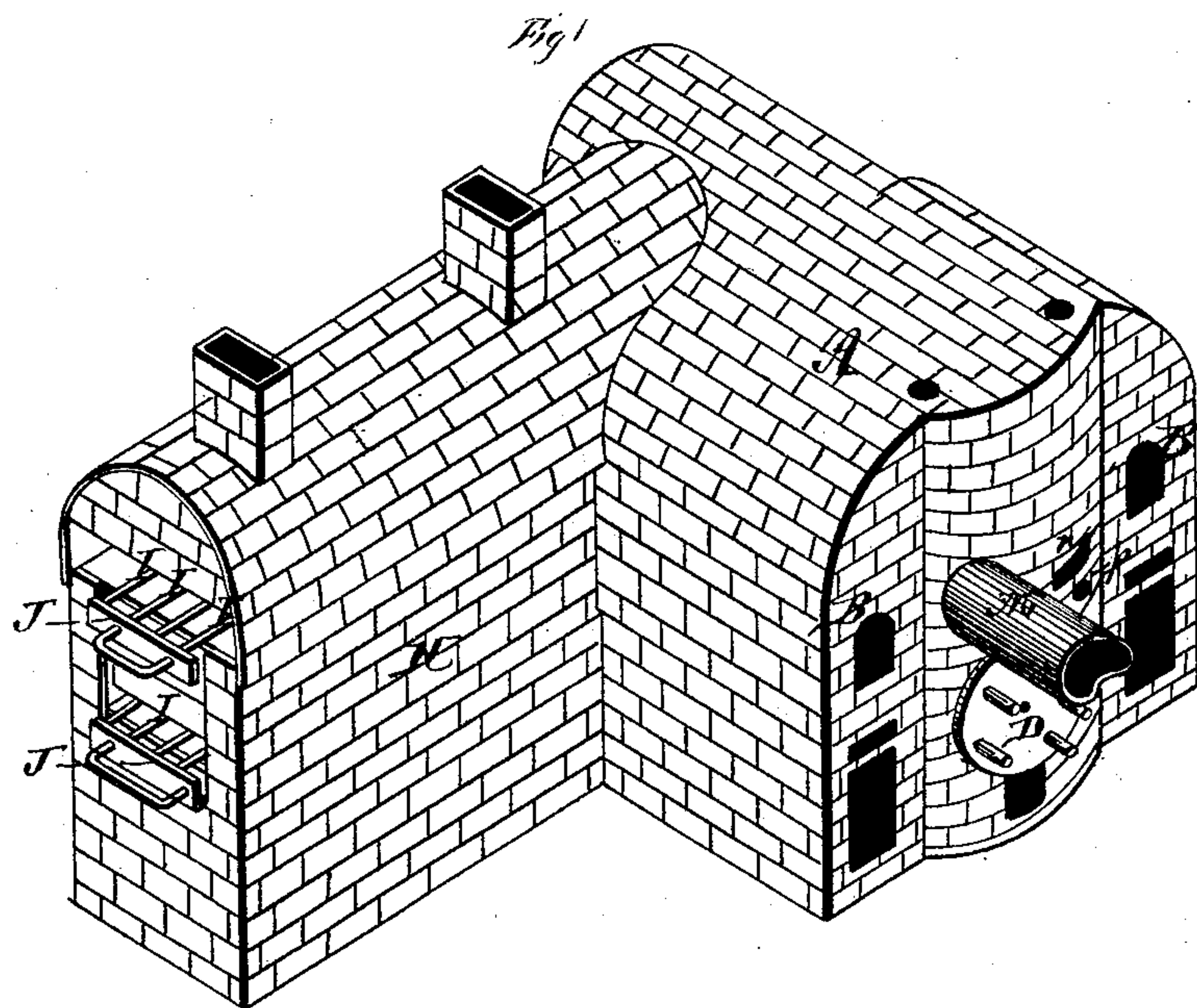


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J. B. BOULICAULT.
Flattening Ovens for Plate-Glass.
No. 144,946. Patented Nov. 25, 1873.



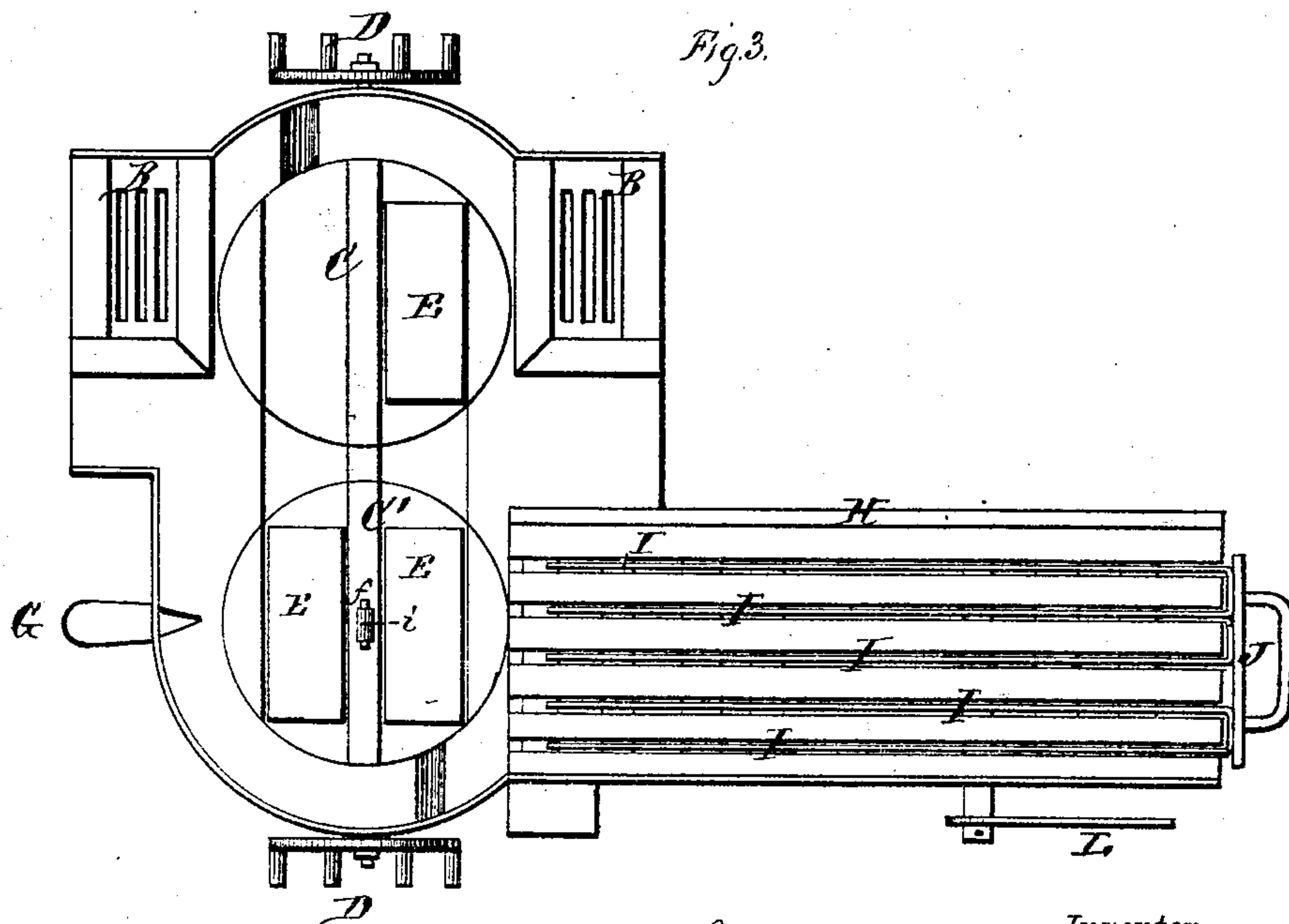
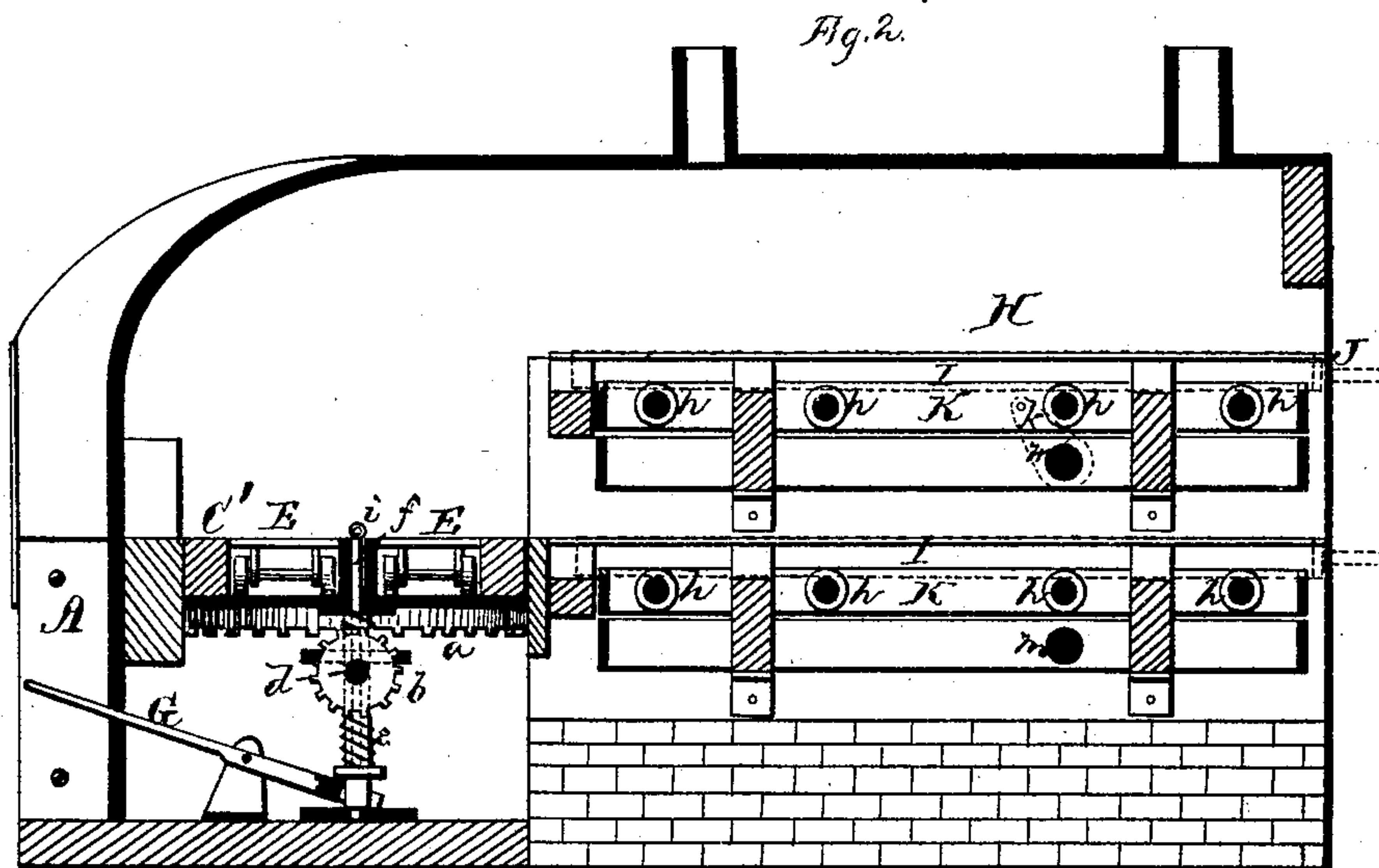
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UNITED STATES PATENT OFFICE.

JOHN B. BOULICAULT, OF NEW ALBANY, INDIANA.

IMPROVEMENT IN FLATTENING-OVENS FOR PLATE-GLASS.

Specification forming part of Letters Patent No. **144,946**, dated November 25, 1873; application filed March 21, 1873.

To all whom it may concern:

Be it known that I, JOHN B. BOULICAULT, of New Albany, in the county of Floyd and in the State of Indiana, have invented certain new and useful Improvements in Flattening-Ovens; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon making a part of this specification.

The nature of my invention consists in the construction and arrangement of a flattening-oven for the manufacture of plate-glass, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a perspective view of my flattening-oven and furnace. Fig. 2 is a longitudinal vertical section, and Fig. 3 a horizontal section, of the same. Figs. 4 and 5 show certain implements used with my oven.

A represents the oven, with heaters or furnaces, B B, the outside size and shape of which may be that of any now in use. Between the main heaters B B, and in front of the oven, is a revolving circular platform or turn-table, C, provided on its under side with a cogged rim, *a*, into which gears a cog-wheel, *b*, on a short horizontal shaft, *d*. This shaft extends through to the front, and is on its outer end provided with a hand-wheel, D, for turning the same, and thereby revolve the turn-table C. In rear of this turn-table C is another turn-table, C', with its cogged rim *a*, cog-wheel *b*, and shaft *d*, and a hand-wheel, D, on the outer end of the shaft to revolve the turn-table. The two turn-tables C and C', as well as the space between them, are provided with wagon roads or ways for two wagons, E E, which are used to convey the glass from one to the other. Through the center of the second turn-table C' passes a narrow frame, *f*, with a friction-roller, *i*, on its upper end, which frame is operated by a lever, G, to raise the roller to any height desired, and the frame is thrown down by a spring, *e*, when the pressure is removed from the lever. H represents the cooling-apartment, having two or more series of horizontal sliding bars,

I I, the bars of each series attached to a handle, J, by which they are operated. Under each series of bars J is a frame, K, provided with a series of circumferentially-grooved rollers, *h h*, in the grooves, upon which the sliding bars I I rest. This frame K is moved a short distance up and down by means of a crank or arm, *k*, on a shaft, *m*, which has on its outer end a lever, L, by means of which it is operated.

The rolls of glass are first placed in the tube M on the left side in the front of the oven, and through which tube the rolls are then placed on the first wagon on the left side of the first turn-table, C, where the glass is heated and somewhat softened. The turn-table C is then turned, placing the first wagon with glass on the right side and an empty wagon on the left side is brought from the rear turn-table C' to the front table C, to receive another roll of glass from the front tube M. The first roll of glass introduced, and on the right-side wagon of the front turn-table C, is there flattened through a flattening-hole, *n*, at the front part of the oven-cap, which wagon is then moved to the rear turn-table C' on the right side by pushing against the wagon with a rod, N, through another hole, *p*, in the front part of the oven-cap, where the glass is polished through a hole in the rear part of the oven-cap, after which the rear turn-table C' is turned, bringing the wagon and polished glass on the left side of the rear turn-table, from which place the glass is taken with the fork O, worked on the roller *i*, and placed in the cooler H, where it is managed and moved to any convenient distance by the slides I I. The said roller *i* can be made to project up any convenient distance by pressing on the lever G. The slides I in the cooling-department are worked by the levers L. When the lever L is pressed down it raises the slides, through the medium of the frame K, about one-twelfth of an inch above the surface of the cooler, allowing the slides to be drawn back any convenient distance, taking along any plate-glass that may be placed thereon. Then the pressure of the lever is removed, allowing the slides to sink to a level with the surface of the cooling-department, when the slides are again moved forward to their original position to receive another piece

of glass. There may be as many series of sliding bars in the cooling-department as can be conveniently used, and no piece of glass need to be taken out of the cooling-department until the whole surface of the cooler and slides is covered with the number of pieces of glass they may hold. On the side of the cooling-department H is an oven, P, which is used in regulating the heat in that department.

The plate-glass is never piled or stacked up on top of each other while going through the oven and cooling-department; it will, consequently, always remain straight, and never break. Then I only use three wagons, instead of some forty odd wagons used in the old ovens, thus reducing the expense materially.

It is much easier managed, run cheaper, and can be erected cheaper, than any one now in use. My improvement can be attached and used in any furnace and oven now in use with very little expense.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the two turn-tables C C' with the slides I and frames K, all substantially as and for the purposes set forth.

2. The frame *f* with friction-roller *i*, arranged in the center of the turn-table C' and operated by means of the lever G and spring *e*, substantially as and for the purposes herein set forth.

3. The combination of the slides I, frame K with rollers *h*, and the lever L, shaft *m*, and arm *k*, all constructed and arranged to operate substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of February, 1873.

JOHN B. BOULICAULT.

Witnesses:

JOHN B. LODEN,
JEAN LS. ROBELLAZ.