No. 857,074. PATENTED JUNE 18, 1907.

L. W. KIRK.

MACHINE FOR CHARGING RETORTS.

APPLICATION FILED MAR. 19, 1906.

Fig. 2.

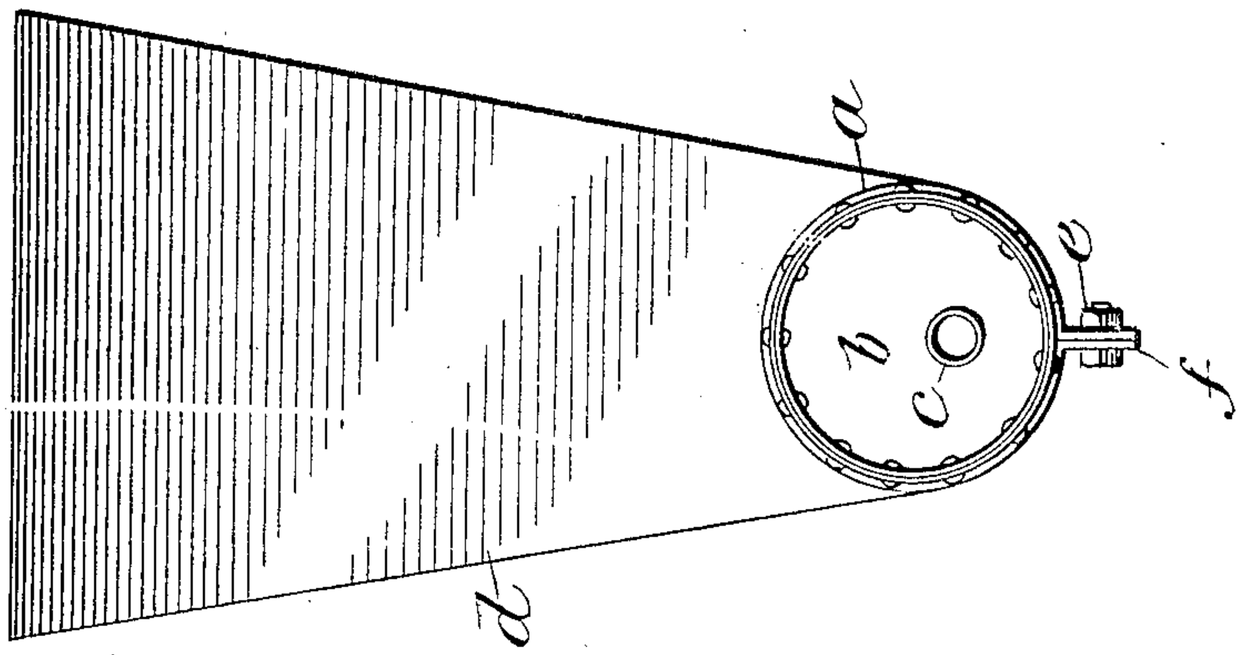
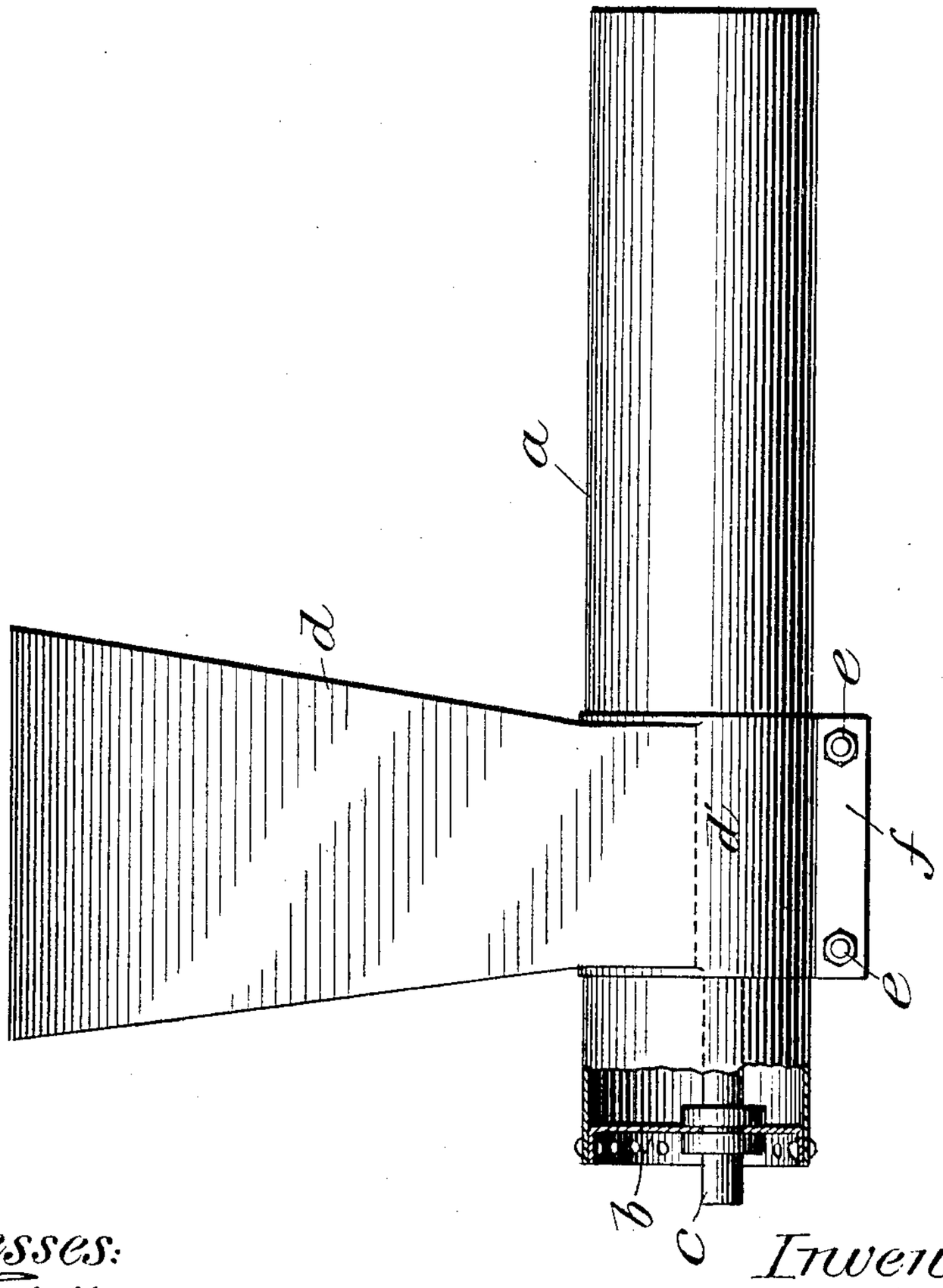


Fig. 1.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR CHARGING RETORTS.

No. 857,074. Specification of Letters Patent. Patented June 18, 1907.

Application filed March 19, 1906. Serial No. 306,883.

To all whom it may concern:

Be it known that I, LEOTIS W. KIRK, a citizen of the United States, residing in the city and county of Pueblo, State of Colorado, have invented certain new and useful Improvements in Machines for Charging Retorts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to apparatus for charging retorts with comminuted material, such as ore, coal and the like, and has for its object to provide a simple and efficient device, by means of which the material may be positively fed into the retorts, to the required degree, by one uninterrupted operation, and packed in the retorts more effectively than is possible by the old mode of hand charging, with the usual scoops or shovels.

To this end, the invention comprises an injector tube, through which the comminuted material is forced into the retorts, a hopper connected with said tube for supplying the material thereto, and a nozzle connected with the tube and delivering a jet of fluid pressure, such, for example, as steam or air, behind the material discharged from the hopper into the tube, in order to force said material in a substantially compacted stream into the body of the retort, and also to draw the material from the hopper into the tube, by reason of the injector-like action of the jet.

In the accompanying drawing, Figure 1 is a side elevation of a convenient form of apparatus embodying the invention, a portion thereof being broken away to better illustrate the same; Fig. 2 is a vertical end view thereof.

In charging the retorts of zinc furnaces, gas producers, or like receptacles in which the material, either in the form of comminuted ore or fine fuel, is required to be compacted more or less in the retort to secure the best results, it has been customary to feed the material into the retorts by hand, by means of shovels or scoops, and to pack the same by means of tamping bars or other suitable tools. This operation is slow and expensive, and more or less unsatisfactory because of the uneven charging of the individual retorts, and, moreover, requires that each retort be kept open during the entire shoveling and tamping operations. The present invention is designed to obviate these difficulties, and to completely charge the retort and compact the charge therein during a single operation, by means of a jet of air, steam, or other fluid under pressure, which carries the material in a substantially compacted stream into the retort, and packs the same therein to the desired degree.

While the invention is susceptible of embodiment in many different types of apparatus, I find the device illustrated in the accompanying drawings a simple, efficient and convenient one for the purpose.

In the drawings, *a* indicates a tube, conveniently formed of metal and generally circular in cross section. Mounted upon the tube intermediate the ends thereof, and connecting with the interior of the tube through a suitable opening in the bottom, is a hopper or receptacle *d* adapted to receive the comminuted ore, fuel, or mixture of the same. The hopper may be conveniently secured to the tube by means of the collar-like portion *d'* thereof, which embraces the tube on the outside and is provided with flanges *f* adapted to be brought together and secured by bolts *e*, to lock the hopper in position on the tube, with the bottom thereof registering with the lateral opening in the tube.

The rear end of the tube is closed by a head *b*, which may be conveniently secured thereto by rivets passing through the end of the tube and the flanged periphery of said head. The forward end of the tube is, of course, left open, and is of such size as to deliver a stream of material into the mouth or charging opening of the retort. Mounted in the rear end of the tube *a*, and passing through the head *b*, is a jet nozzle *c*, which is adapted to be connected by suitable hose or piping with a source of fluid pressure, such, for example, as steam or air, and to deliver the jet of fluid under pressure longitudinally of the tube *a*.

The apparatus, in the form described, may, if desired, be carried from place to place by the operator, or, if desired, may be mounted upon a suitable support capable of being moved or transported from place to place, so that the tube *a* may be brought into

registry or alinement with the charging openings or mouths of the retorts, successively.

In operation, the apparatus is supplied with the material to be charged into the retorts by filling the hopper *d* with said material, which, of course, will have been reduced to the desired degree of fineness, and, if the particular operation requires it, mixed in any desired proportions. The apparatus is then brought opposite the retort to be charged, so that the forward end of the tube *a* registers with the retort opening. Fluid pressure is then admitted through the nozzle *c*, and forces the material in the tube *a* out of the same in a compact stream into the retort, and, at the same time, by reason of the injector-like action of the jet of fluid pressure, which tends to produce a vacuum in the tube *a* behind the fine material therein, causes the material in the hopper *d* to be fed downward into the tube, and to afford a constant supply of material through the tube into the retort as long as the fluid pressure is maintained. As soon as the particular retort being charged is filled to the required degree with the material, the fluid pressure is shut off, and the charging apparatus moved into position to charge the next retort in the series. The hopper, of course, is kept supplied with the comminuted material, and by removing the apparatus from one retort to another, the said retorts may be quickly filled with the necessary charge and the same thoroughly compacted therein, owing to the impulse given the material by the fluid pressure jet.

The apparatus has been found particularly effective in charging zinc furnaces, gas producers, and retorts of like character, and actual experience has demonstrated that a saving of three-fourths of the time now required to charge a retort by the hand scoop method, may be accomplished, and that the material so charged is more evenly compacted and distributed than is possible of attainment by the old method.

What I claim and desire to secure by Letters Patent, is:—

In a portable apparatus for charging retorts and the like, the combination of a tube having a discharge opening at one end, a fluid pressure supply nozzle at the other end, and a hopper for delivering the material to the tube intermediate the ends thereof, whereby a space is left in the tube behind the material delivered by the hopper and said material is discharged from said tube in a substantially uniform compact stream.

In testimony whereof I affix my signature, in presence of two witnesses.

LEOTIS W. KIRK.

Witnesses:
W. L. HARTMAN,
C. A. BALLREICH.