

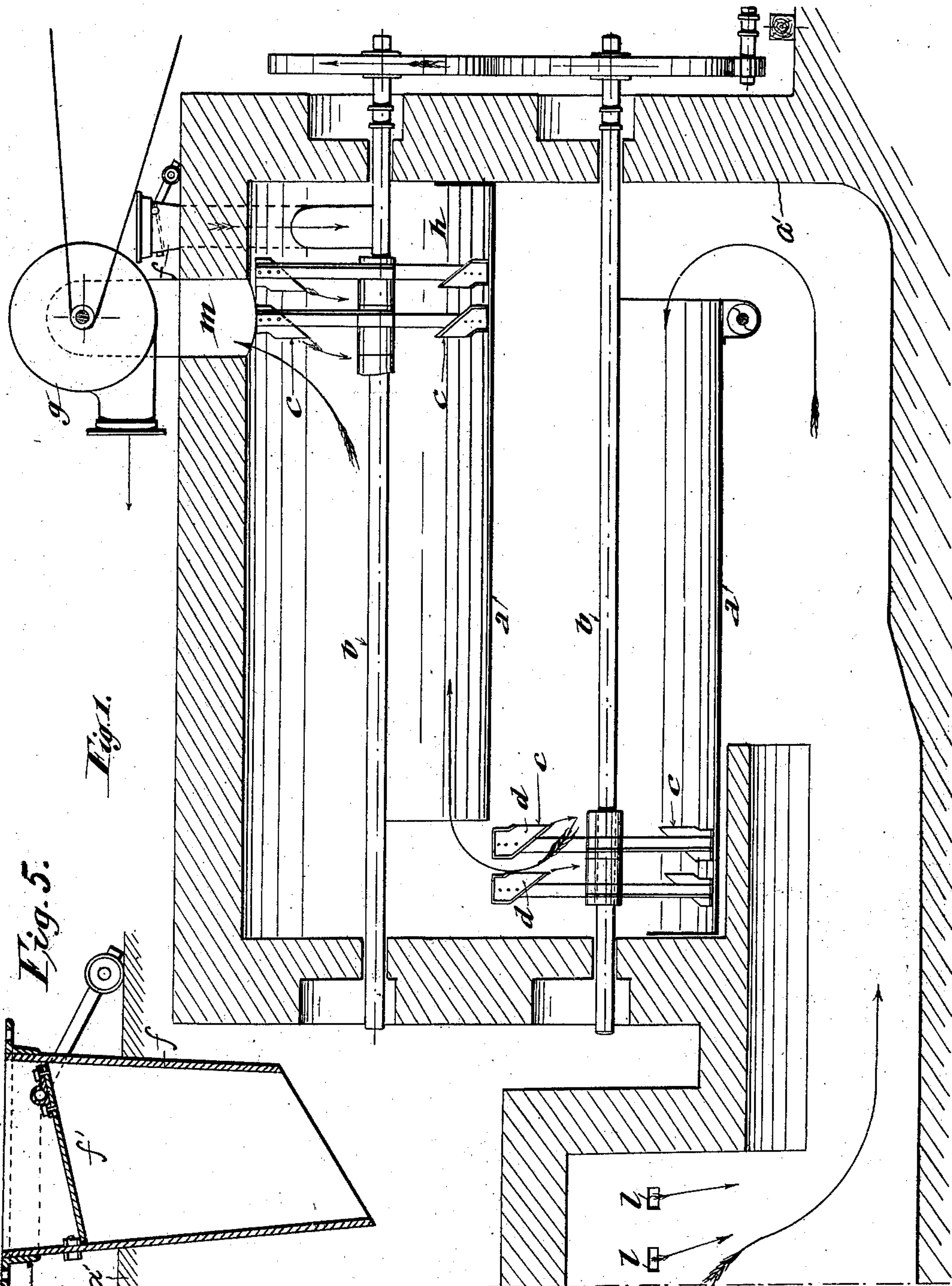
No. 698,635.

Patented Apr. 29, 1902.

H. DIEDRICH.
DRYING APPARATUS.
(Application filed Feb. 6, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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2 Sheets—Sheet 2.

Fig. 4.

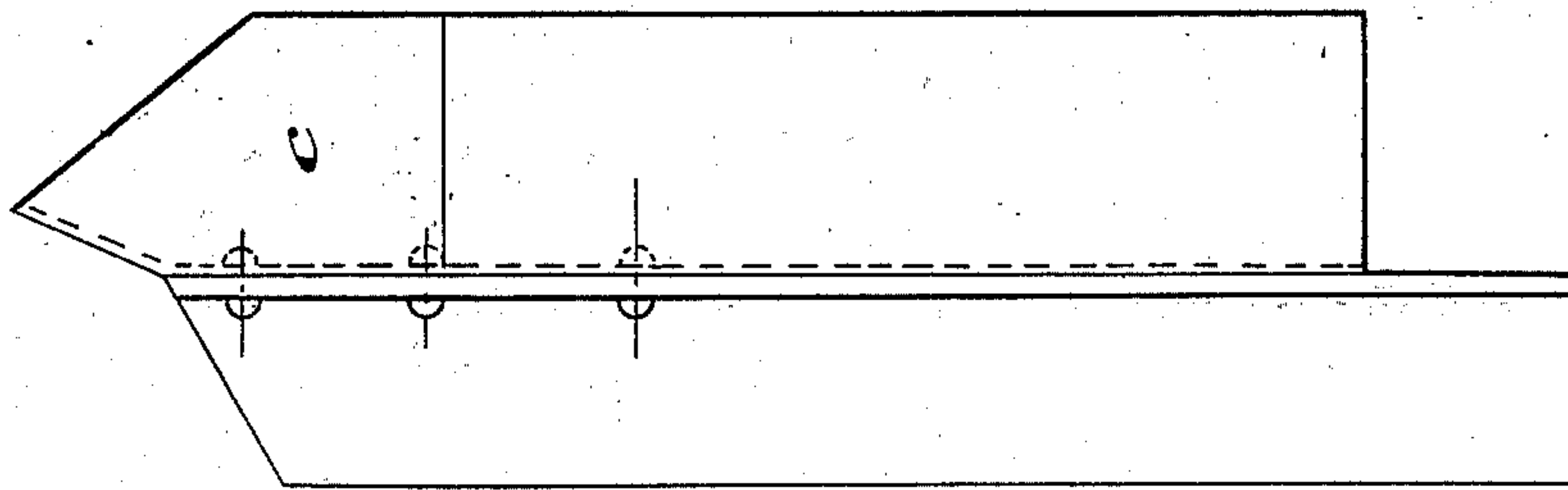


Fig. 5.

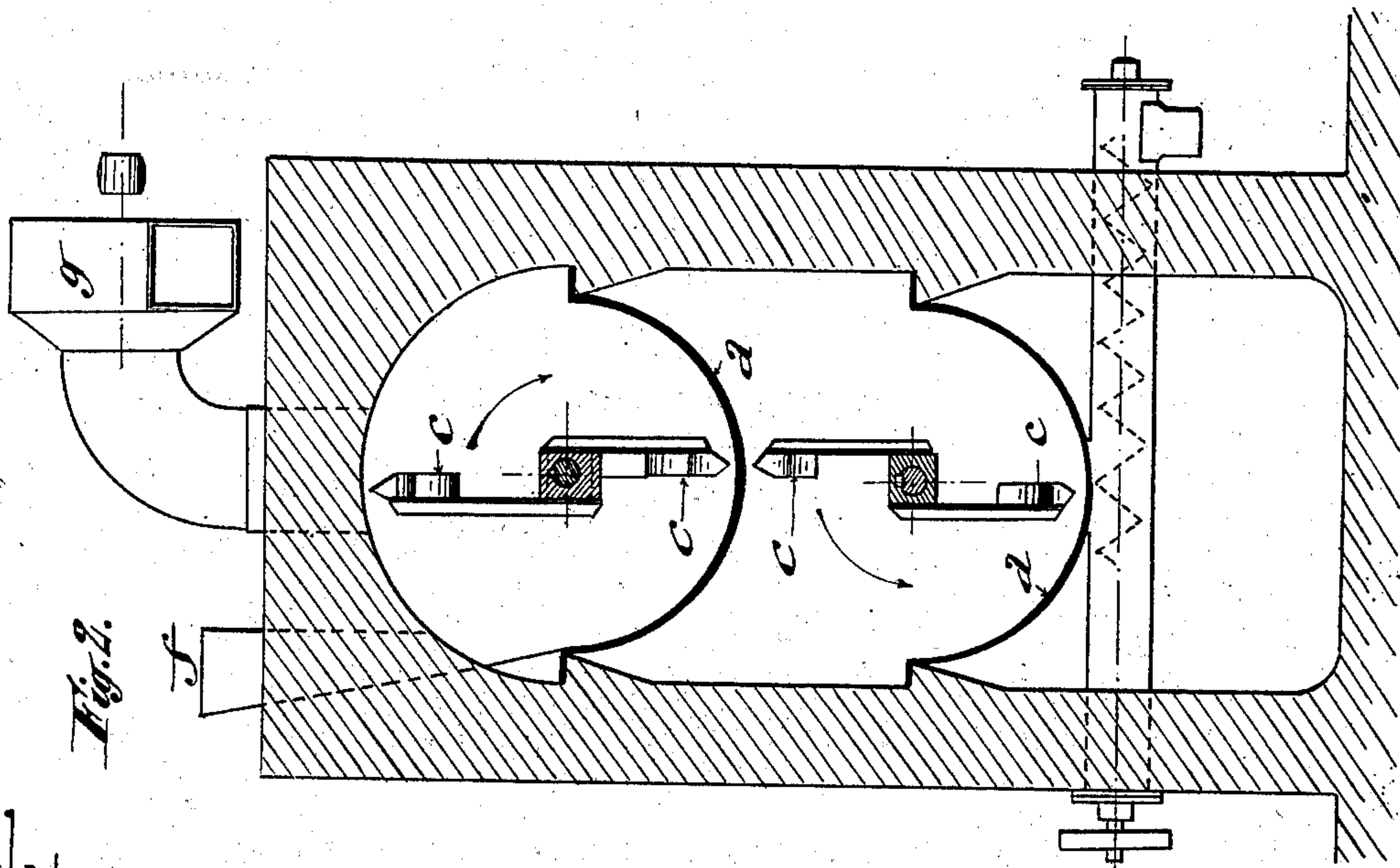
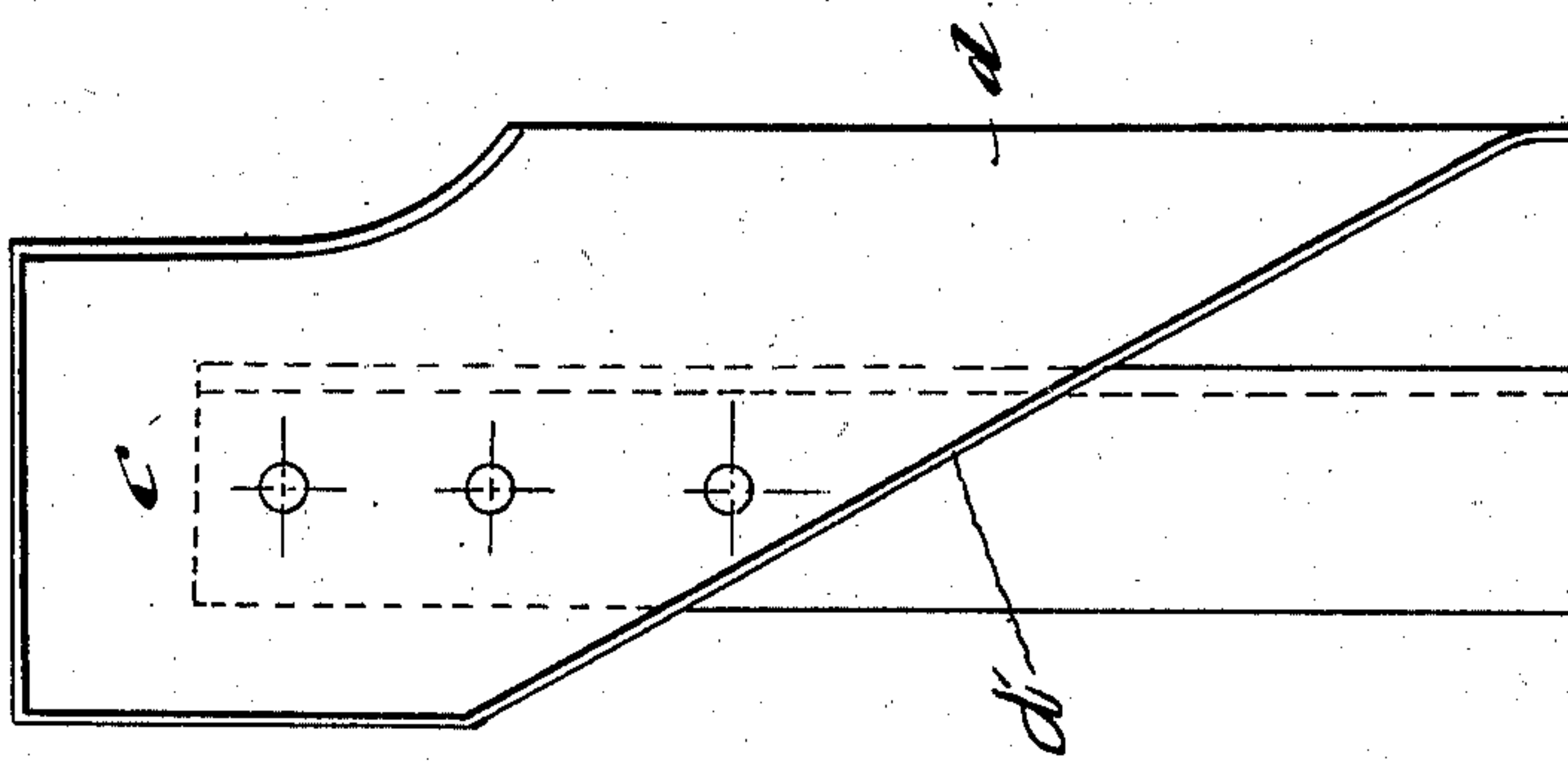


Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY DIEDRICH, OF PARIS, FRANCE.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 698,635, dated April 29, 1902.

Application filed February 6, 1901. Serial No. 46,190. (No model.)

To all whom it may concern:

Be it known that I, HENRY DIEDRICH, engineer, a citizen of France, residing at 89 Rue d'Hauteville, Paris, in the Republic of France, have invented a new and useful Drying Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to apparatus for drying powdered finely-powdered pulpy and other substances, such as phosphates, superphosphates, chemical products, various manures, ores, charcoal, iron, clay, bruised malt, pulpy matters, chickory roots, &c.

The invention will be found fully illustrated in the accompanying drawings, wherein corresponding letters of reference indicate like parts, and wherein—

Figure 1 is a longitudinal vertical sectional view of the apparatus. Fig. 2 is a vertical transverse section of the apparatus, and Figs. 3, 4, and 5 are enlarged detail views of the invention.

In said drawings, *a* designates substantially cylindrical sheet-metal troughs arranged the one above the other and sustained in a casing *a'* of preferably masonry. The number and size of these troughs may vary according to the output.

In the casing and over each trough is journaled a shaft *b*, such shafts being connected up outside of the casing and rotated from any suitable means. They carry buckets or shovels *c* (best shown in Figs. 3 and 4) and each having one wall *d'*, thereof (which is the wall adjacent the shaft) disposed obliquely to the shaft and having a discharge-opening *d* in one of its side walls and adjacent the inner end of wall *d'*, through which the material after being scooped up by the buckets or shovels and when the latter have rotated far enough is discharged. These shovels or buckets are arranged on each shaft in the path of the material as it falls into the next subjacent trough.

The casing *a* may have communication with a furnace in the usual manner, the products of combustion from which furnace being adapted to follow the course indicated by the arrows shown in the drawings—that is to say, back and forth over the several troughs. The products of combustion are adapted to

escape from the casing through an opening *m*, where a blower *g* is arranged so as to draw them through the apparatus at considerable velocity.

The material is adapted to be fed into the casing through a hopper *f*, having a balanced valve *f'*, such valve being desirable so as to obviate cold air entering the apparatus.

Before the gases and other products of combustion from the furnace pass through the casing they are caused to be mixed with atmospheric air, which will be drawn in through ducts or intakes *l*. (See Fig. 1.)

The shafts being rotated, the blower operated, and the material being supplied to the apparatus from the hopper *f*, it will fall into the upper trough *a* and by the inclined walls *d'* of the rotating buckets or shovels will be continually fed along or advanced until it is discharged from the free end of said trough into the next subjacent one, to be again advanced or fed along in the same manner. Being thus continually agitated and, as it were, kept in the form of a stream by being lifted by and discharged from the peculiarly-constructed shovels or buckets, it is in condition to best release its moisture, which the mixture of the products of combustion or gases from the furnace and the air immediately carries off.

It will be observed that one end of each trough is spaced from the adjacent wall of the casing and that such spacing alternates, being first between one wall of the casing and the adjacent end of the lower trough and then between the opposite wall and the adjacent end of the next trough. By this arrangement and the consequence that the heated air is made to pass, as already intimated, back and forth over the several troughs the material being treated is subjected to said heated air under conditions of the latter which are gradually improving in point of dryness and increased heat.

It is of importance that the air be admitted to the apparatus to cooperate with the gases or products of combustion in carrying off the moisture of the material being operated on, for it not only acts to keep down the temperature in the casing, and thus avoid damage to the apparatus, but materially enhances the evaporating action. The increased sup-

ply of air does not effect a corresponding increase in consumption of the fuel, for the reason that it is fed to the apparatus beyond the grate.

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

In a drying apparatus, the combination, with a suitable casing having an inlet-opening for
10 the gases and other products of combustion from the furnace, a discharge-opening for said gases, and a supply for the material to be dried, of a plurality of substantially parallel
15 troughs disposed between said openings, said troughs having communication with their subjacent spaces alternately at their oppo-

site ends, a rotary shaft arranged over each trough longitudinally thereof, and agitating buckets or shovels arranged on each shaft at the receiving end of the trough, said shovels 20 or buckets each having side walls, and also a back wall disposed obliquely to the shaft, and an opening arranged adjacent the inner or rearmost end of said back wall, substantially as described. 25

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY DIEDRICH.

Witnesses:

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