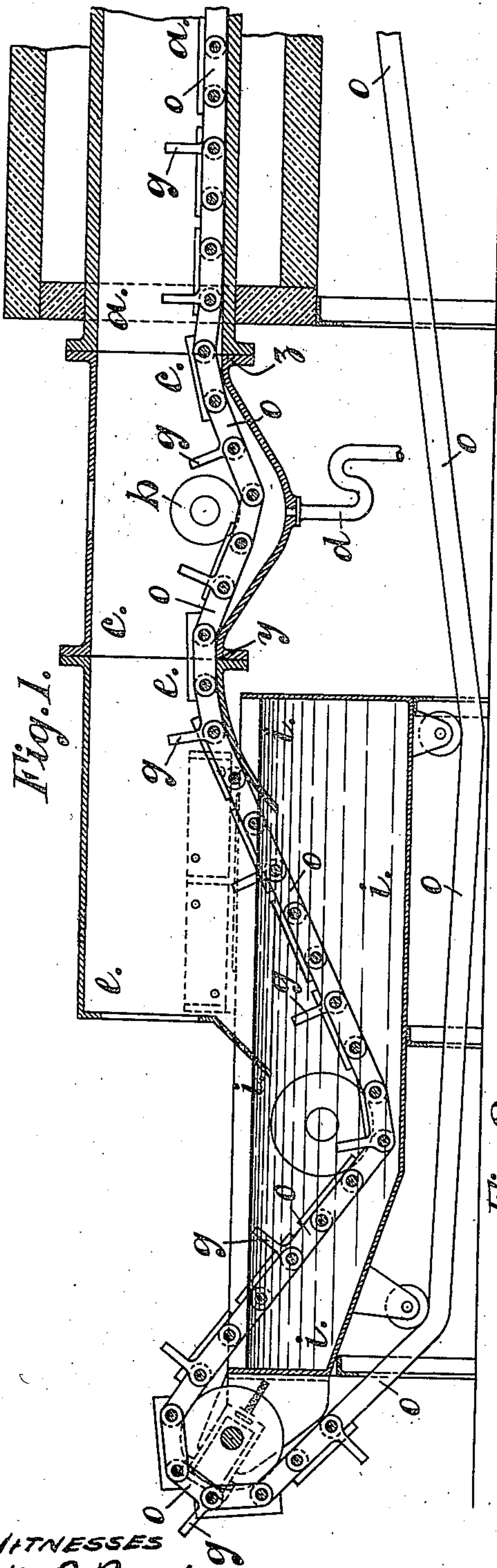


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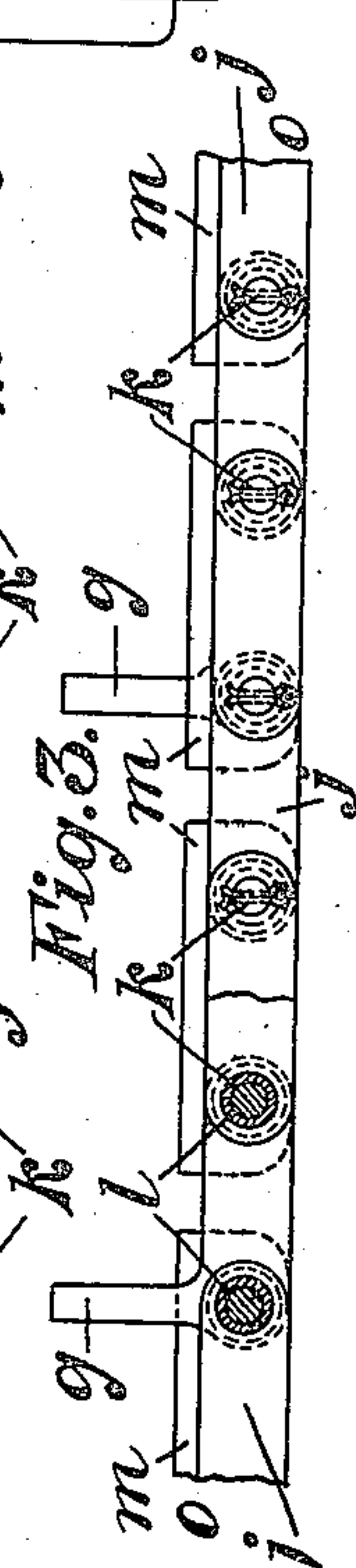
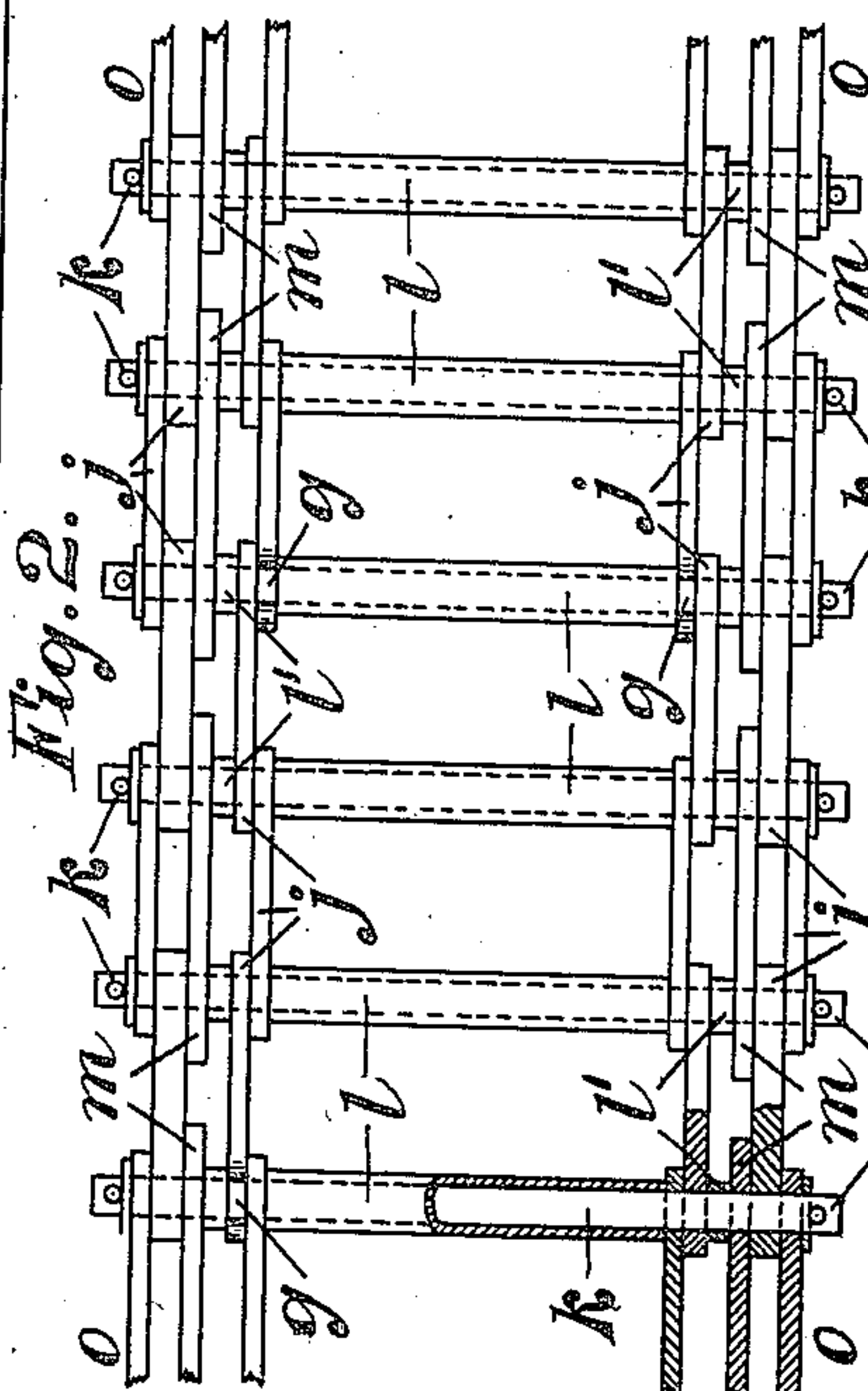
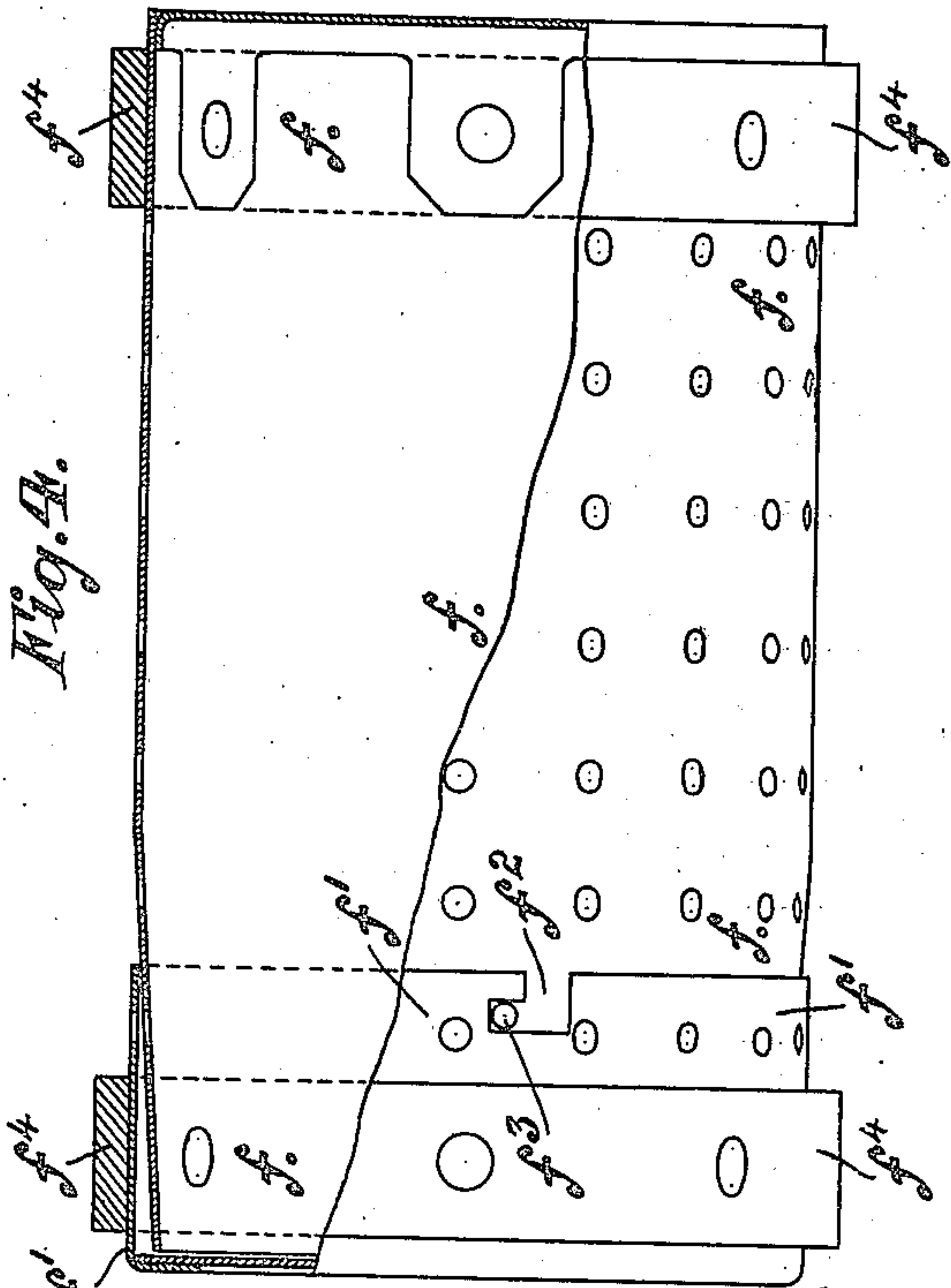
PATENTED OCT. 15, 1907.

D. BATES & G. W. PEARD.
ANNEALING OR HEATING OF METALS.

APPLICATION FILED MAR. 9, 1907.



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DARWIN BATES AND GEORGE WORDSWORTH PEARD, OF HUYTON, ENGLAND.

ANNEALING OR HEATING OF METALS.

No. 868,154.

Specification of Letters Patent.

Patented Oct. 15, 1907.

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To all whom it may concern:

Be it known that we, DARWIN BATES and GEORGE WORDSWORTH PEARD, both subjects of the King of England, residing at Huyton, in the county of Lancaster, England, have invented new and useful Improvements in or Connected with the Annealing or Heating of Metals, of which the following is a specification.

This invention has reference primarily to the annealing or heating of metals, and more particularly hollow metal articles in or by apparatus or plant of the type wherein the passage of the metal articles into the annealing or heating chamber or retort takes place, by means of a conveyer, through a liquid, and a mouth on the said retort dipping into such liquid, in which passage the hollow articles take up some of this liquid, and are liable therefore to convey it into the annealing or heating retort or chamber; and if this takes place and the liquid were carried by them into the annealing or heating chamber, it would have to be evaporated before the annealing could take place. This obviously would result in uneven and unequal treatment of the different articles passed through the chamber or retort, and would cause a waste of fuel, and render the operation slow.

The objects of using a closed or sealed apparatus, in the manner referred to, is, primarily, to prevent articles having bright or burnished surfaces from becoming discolored, oxidized, or detrimentally affected, and to deliver same from the furnace or apparatus, still bright, having a good appearance, and being at the same time soft; this being accomplished by the exclusion, by means of the liquid seal, of air or oxidizing or discoloring atmosphere from the chamber or retort, by the introduction and presence of an atmosphere which will not cause oxidation or discoloration. In the case of the articles being made of brass, and other similar alloys, steam will serve well as the artificial atmosphere.

The present invention has mainly for its objects and effects to provide improvements in or in connection with such processes and apparatus, whereby the hollow articles are caused to empty themselves of any water or liquid they may take up in passing through the water forming liquid seal or closure at the entrance of the retort or chamber, prior to their actual entry into the annealing retort or chamber. At the same time it is to be understood the apparatus herein described and covered may be used for annealing or heating other than hollow articles.

The invention is illustrated in the annexed drawings, and it will be described with reference to them; the novel characteristics of it being set out in the claiming clauses concluding the specification.

In the drawings, Figure 1 is a longitudinal section showing the entrance portion of the annealing or heating apparatus, the apparatus being of a type wherein

the articles are conveyed through the chamber or retort on an endless conveyer; and the discharge end of the retort or chamber may be assumed to be of any known kind which will permit of the metal articles being discharged or withdrawn without admitting outside atmosphere. Fig. 2 is a plan, partly in section, and Fig. 3 is a longitudinal elevation, partly in section, showing the conveyer in detail; and Fig. 4 is a longitudinal elevation, partly in section, showing the construction of box in which the articles are carried, when being passed through or treated in the apparatus.

Referring now to the drawings, and more particularly to Fig. 1, *a* represents the annealing or heating chamber or retort; *e* is the mouth piece or entrance; *i* is a tank or vessel containing the liquid into which the lower open end of the mouth *e* dips; and *o* is the endless conveyer or chain by which boxes containing the articles are carried through the water in the tank *i*, and the annealing chamber.

In connection with the entrance of the retort or chamber, that is between the retort or chamber and the mouth *e*, the conveyer *o* is caused to give or make a sharp angle descent, and ascent, the effect of which on the boxes containing the hollow articles—say, cartridge cases or similar hollow ware—is to move them in such a manner, that the articles are moved or tipped to such a degree as to discharge their contents, and empty themselves prior to going into the chamber *a*. This descent and ascent is effected in the apparatus shown, by passing the conveyer or sides of same under a pulley *b* or the like, between points in front of and behind it, over which the conveyer *o* passes, the lower part of which pulley is below these points.

In the case shown, a box or chamber *c* is provided between the mouth *e* and retort or chamber *a*, forming part of the annealing apparatus on the inside of which the pulleys *b* are mounted; and the lower part of which is inclined or dropped as shown, and is provided with an outlet aperture *d*,—suitably trapped to prevent the entrance of air—through which the water emptied from the cartridges or hollow articles, passes from the apparatus. This canting or tipping of the hollow articles is produced by this ascent and descent of the conveyer *o*, as it causes the boxes *f*, in which the articles are contained, to run rapidly down the inclined part in the chamber *c*, and then back again, the motion being limited backwards and forwards, so as to insure the box and articles being revolved a quarter of a revolution, when descending and ascending the slopes. This limitation of movement is effected by stop-pegs *g* on the conveyer, placed at the required intervals apart, and they also serve the further purpose of actually carrying or elevating the boxes through the liquid, and the various parts of the apparatus or machinery.

In passing through the apparatus, the circular boxes

f carrying the articles to be annealed are placed on the conveyer *o* leaning against stop-pegs *g*; then descend through the water in the tank *i*, and are conveyed up through it into the entrance mouth *e* leaning against a pair of stops; and then when they arrive at the point *y* in the emptying chamber *c*, they run quickly forward on the conveyer from the stop-pegs behind them to the stops next in front of them, making in this movement about a quarter of a revolution, this part revolution being sufficient to upset the position of the cases or articles holding water, and to completely empty them. As the chain conveyer *o* proceeds to ascend again on the other side of the rollers *b*, the box slowly revolves back until the back stop-pegs *g* again come in contact with it, and carry it up the slope again to the point *z*, where it enters the heating or annealing chamber proper.

With regard to the boxes *f* these are perforated, and provided with a detachable lid *f*¹ at one end, the lid being fastened in position by a bayonet joint, namely, by angle shape notches, as *f*², in it, which fit over and fasten upon pins *f*³ on the body of the box. The boxes *f* are provided with tires *f*⁴ which run on links on the conveyer chain *o*.

When the articles being annealed or heated are cartridges or the like, they are filled pell-mell into the boxes, so that some will be in one position and some in others; but no matter what the position may be, in the quarter revolution of the box, any that contain water when they arrive at the point *y* will be emptied before they enter the retort.

The conveyer *o* is made up of a double set of links *j* on each side, held together by rods *k*, which extend from side to side of the conveyer and passing through eyes in the link ends, form hinges to them. The links and parts are kept at the required distances apart by the distance tubular pieces *l*, *l*¹; and the inner sets of these links serve as runner links, upon which the tires *f*⁴ of the boxes *f* rest and run.

Between the inner and outer set of links *j*, there are special links *m* carried by the rods *k*, which serve as fence links, standing higher than the other links, and prevent the boxes or articles from moving laterally.

What is claimed is:—

1. In apparatus for annealing or heating metal articles, a heating or annealing chamber; a liquid containing vessel at the entrance to the said chamber; a conveyer;

and means between the said water containing vessel and the heating chamber, adapted to cause said conveyer to take a course out of the normal plane in which said conveyer lies and moves; substantially as set forth.

2. In apparatus for annealing or heating metal articles, a heating or annealing chamber; a liquid containing vessel at the entrance to the said chamber; a conveyer; means between said water containing vessel and the heating chamber, adapted to cause said conveyer to take a course out of the normal plane in which it lies and moves; and a case for containing the articles to be annealed or heated adapted to be carried on the conveyer with its axis transversely across same; substantially as set forth.

3. In apparatus for annealing or heating metal articles, a heating or annealing chamber; a liquid containing vessel at the entrance to the said chamber; a conveyer; and means between said water containing vessel and the heating chamber adapted to cause the conveyer to take a downward and then upward course; substantially as and for the purposes described.

4. In apparatus for annealing or heating metal articles, a heating or annealing chamber; a liquid containing vessel at the entrance to the said chamber; a conveyer; means between said water containing vessel and the heating chamber adapted to cause the said conveyer to take a course out of the normal plane in which said conveyer lies and moves; a case containing the articles to be annealed or heated having its axis adapted to be carried on the conveyer; and projections, as *g*, on said conveyer, spaced apart a distance greater than the width of the cases containing the articles, and between which said cases are adapted to be capable of moving; substantially as set forth.

5. In apparatus for annealing or heating metal articles, a conveyer; a round case containing the articles to be annealed or heated having its axis adapted to lie transversely across the conveyer, and be carried and roll thereon; and projections, as *g* on the conveyer spaced apart a distance greater than the diameter of the case; substantially as set forth.

6. Apparatus for annealing or heating hollow metal articles, an annealing chamber; a liquid trapped inlet; an endless conveyer arranged and adapted to pass into the apparatus and down and up through the liquid trapped inlet; a chambered part between the said inlet having at its bottom a depressed part lying below the level of the inlet bottom, and liquid drawing off means in said depressed part; substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

DARWIN BATES.
GEORGE WORDSWORTH PEARD.

Witnesses:

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WALTER M. HARRISON.