(No Model.) 4 Sheets—Sheet 1.

E. NORTON & J. G. HODGSON.

CAN TESTING MACHINE.

No. 287,048. Patented Oct. 23, 1883.

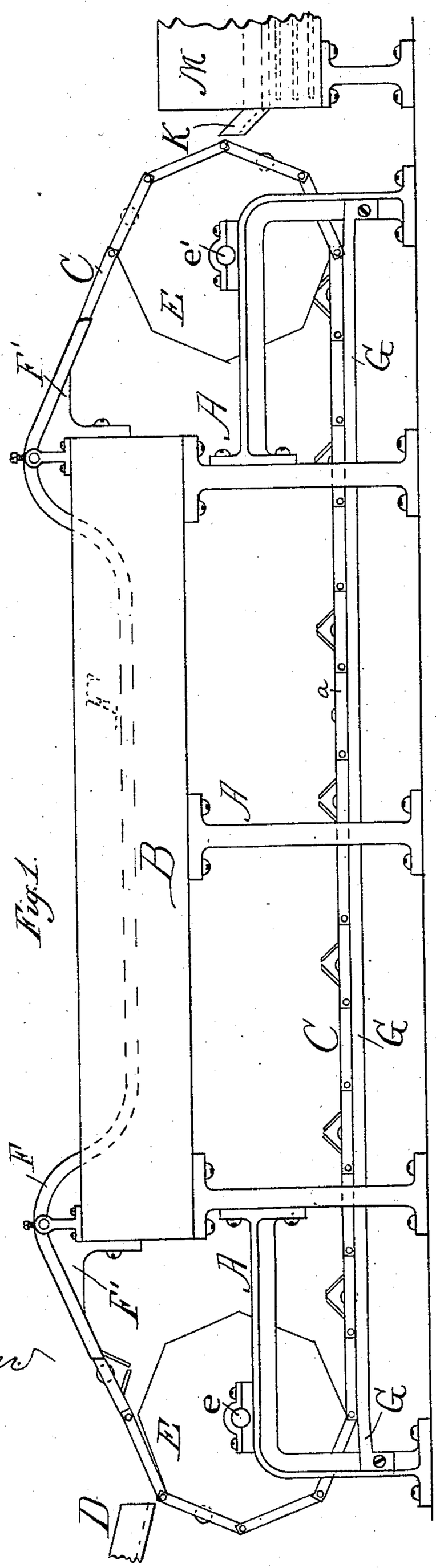

Fig. 1.

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4 Sheets—Sheet 2.

(No Model.)

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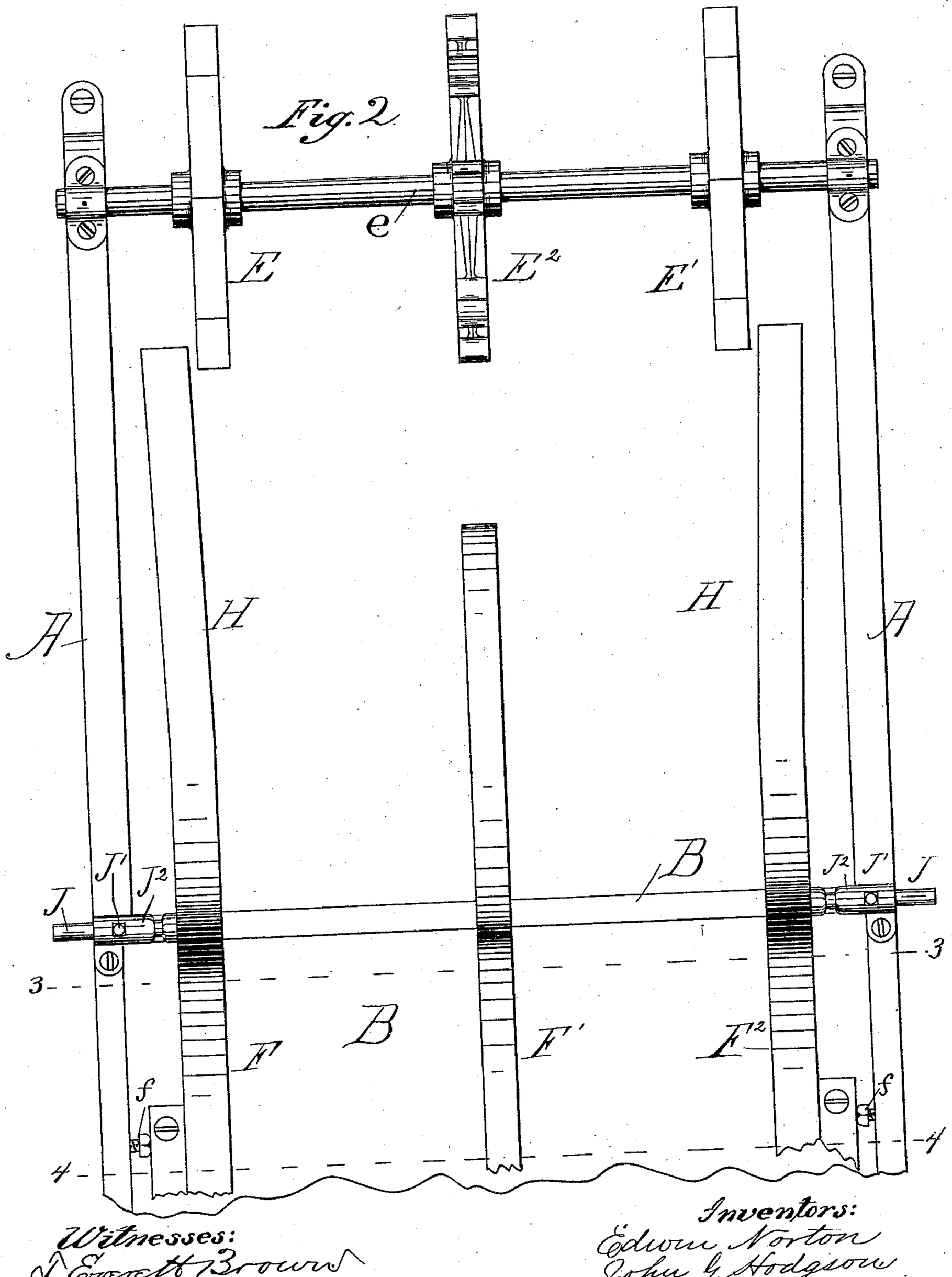
Fig. 2.



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(No Model.)

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Fig. 3.

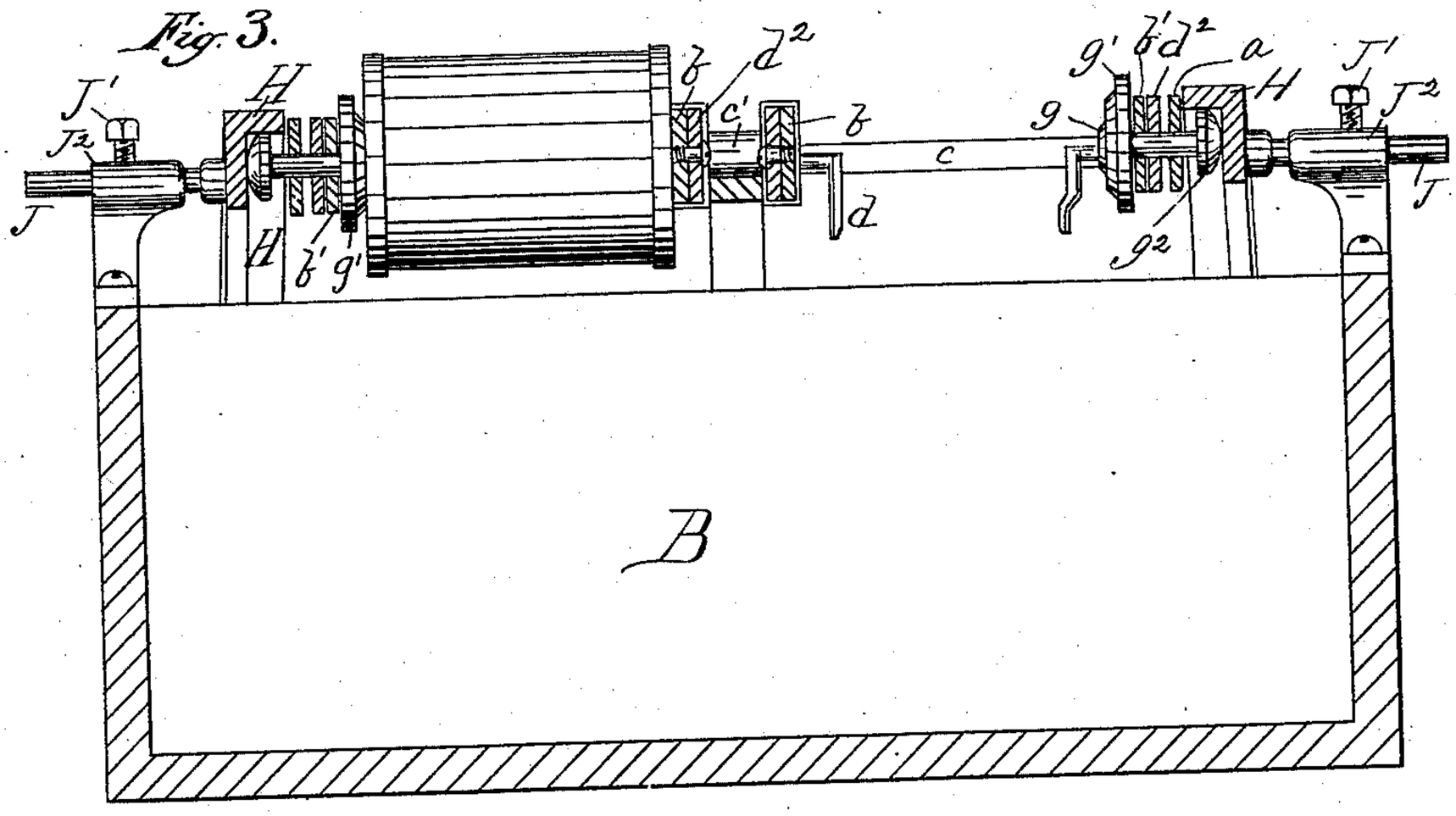
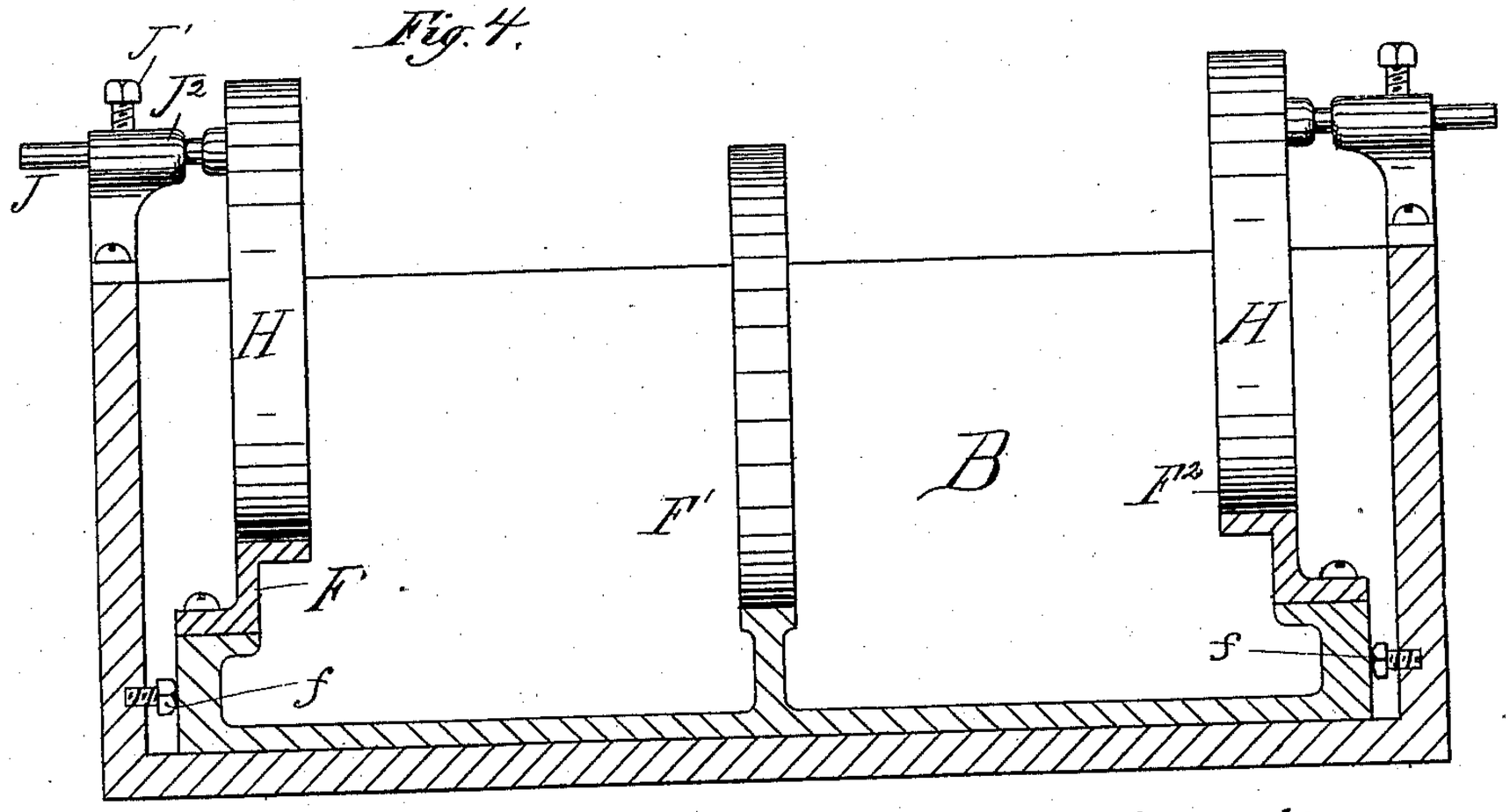


Fig. 4.



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(No Model.) 4 Sheets—Sheet 4.

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CAN TESTING MACHINE.

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Fig. 5.

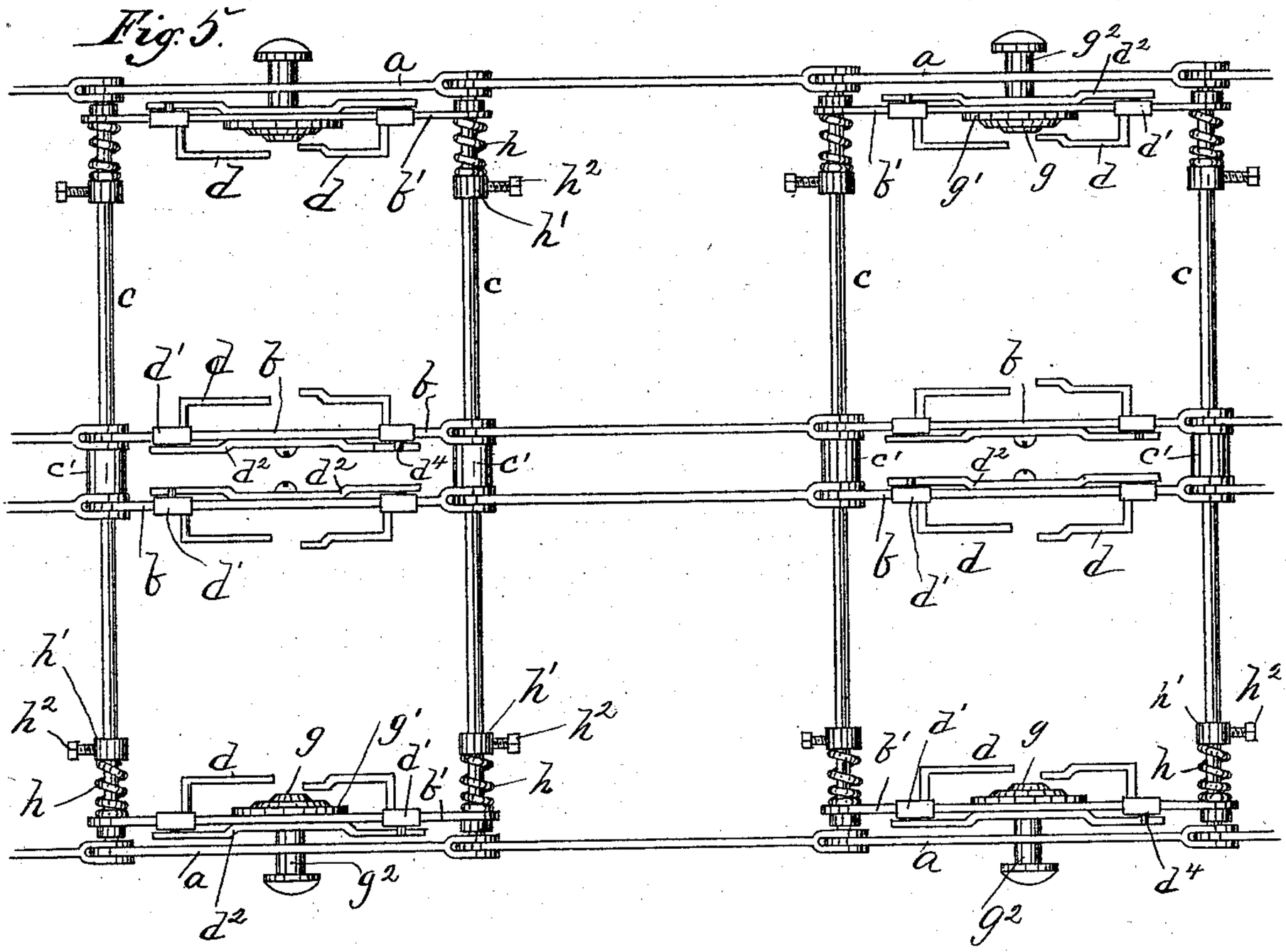


Fig. 6.

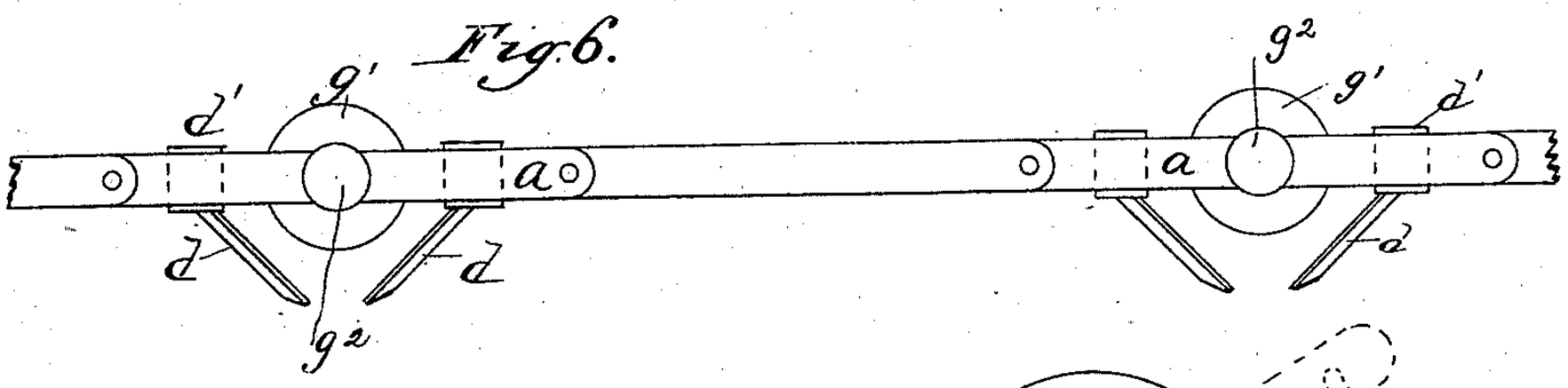
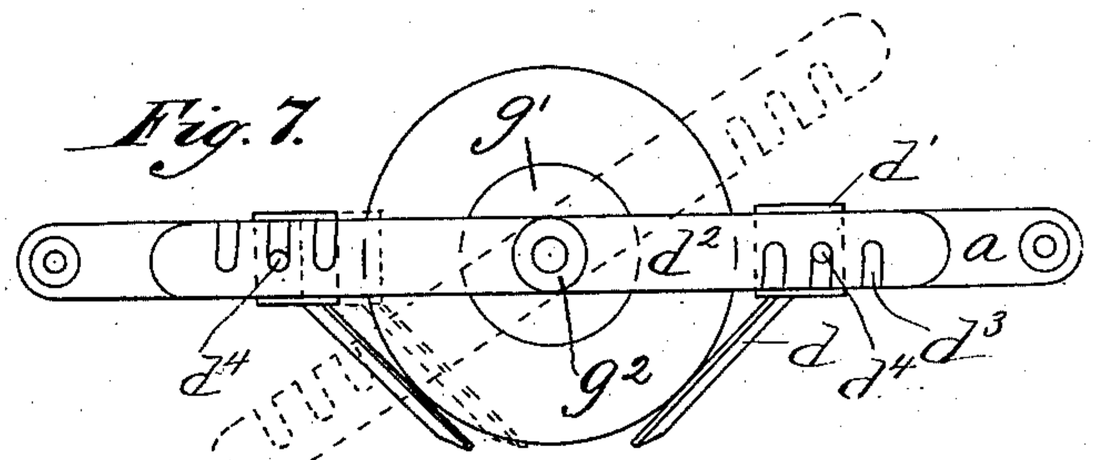


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWIN NORTON AND JOHN G. HODGSON, OF CHICAGO, ILLINOIS, ASSIGNORS TO SAID NORTON AND OLIVER W. NORTON, OF SAME PLACE.

CAN-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 287,048, dated October 23, 1883.

Application filed November 23, 1882. (No model.)

To all whom it may concern:

Be it known that we, EDWIN NORTON and JOHN G. HODGSON, citizens of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Testing Cans, of which the following is a specification.

The object of the present invention is to provide an automatic machine for testing cans, to discover if there are any leaks in the same.

The invention consists in submerging in and conveying the cans through a bath of hot water by means of an endless chain or carrier, to which the cans are delivered, the same having a device for closing the mouth or opening in the can while so submerged. The bath of hot water is of sufficient length, so that each can as it passes through is kept in the water long enough to expand the air therein, and thus cause bubbles of air to escape and arise therefrom through the water if there should be any leaks, by which it may be detected and marked for rejection by an attendant. A chute or equivalent device is provided for delivering the cans automatically to the carrier, and after the cans come from the bath they are automatically delivered from the carrier into a heating or drying trough or passage, by which the cans are quickly and effectually dried, and discoloration or tarnishing of the tin by the moisture thereby prevented. By this means the cans pass automatically into the apparatus and out of the same properly dried and ready for packing, so that the attention of the only operator required may be exclusively directed to watching the cans in their passage through the water, and to the discovery and rejection of the imperfect ones.

In the accompanying drawings, which form a part of this specification, we have shown what we deem one of the best forms of our invention.

In said drawings similar letters of reference indicate like parts wherever used, and Figure 1 is a side elevation of a machine embodying our invention. Fig. 2 is an enlarged plan view of one end of the machine, the chain or carrier device being removed. Figs. 3 and 4 are cross-sections through the tank on lines 3 3 and 4 4, respectively, of Fig. 2. Fig. 5 is a detail plan view of a short section of the chain or carrier, and Fig. 6 is a side view of the same. Fig. 7 is a side view of the chains, showing the method of adjusting the can pockets or receptacles to cans of different sizes.

In the drawings, A represents the frame of the machine; B, the hot-water bath or tank, and C the endless chain or carrier, to which the cans are delivered from the chute D. The carrier C is supported upon and driven by sprocket wheels or pulleys E E′ F² on shafts *e* and *e′* at each end of the machine. The shafts *e* and *e′* are journaled in suitable bearings on the frame of the machine, and one of said shafts is provided with a driving-pulley, by which power is communicated to the apparatus. This pulley, however, is not shown in the drawings. The upper part of the carrier rides upon curved ways F F′ F², which extend down into and up out of the water bath or tank at the ends thereof, and the lower part of the carrier rides upon straight ways or guides G, extending between the sprocket wheels or pulleys to support the carrier. The carrier C is composed of links or bars *a a* and *b b*, hinged together by cross-rods *c*. The cans are supported in the chain by depending arms *d d*, adjustably secured to the links *b* at one end of the can receptacle or pocket, and to a sliding cross-bar or link, *b′*, at the other end. The arms *d* are secured to sleeves *d′*, which slide on the link-bars *b b′*, and are adjusted for cans of different sizes by means of a pivoted bar, d^2, provided with notches d^3, which engage with pins or projections d^4 on the slides *d′*. The mouth or stud-hole of the can is closed by a conical rubber head, *g*, on the disk *g′*, which is secured to a pin, g^2, rigidly fixed to the bar *b′*, at its middle. This pin g^2 is the pivot on which the adjusting-bar d^2 turns, and it reciprocates back and forth in a suitable hole or bearing in the link-bar *b*. The head *g*, which is preferably made of rubber, is pressed against the can, so as to close the opening therein air-tight before the can reaches the hot-water bath by means of a curved cam, H, extending down into and through the water bath, with which the head or end of the pin g^2 comes in contact. This cam H is preferably made of angle-iron,

so that the upper leg or flange of the same may project over the head of the pin g^2 and serve to curve and hold the can-carrier down in the water if the weight of the same should not be sufficient to overcome the buoyancy of the cans. By the cams H the cans are securely held or clamped between the rubber heads g and the opposite link-bars, b. The cams H, one on each side of the apparatus, as will be observed from the plan view, Fig. 2, which, however, shows one end of the apparatus only, approach or are inclined toward each other at the entrance to the tank, so as to force the pins g^2, which carry the rubber heads g inward, and thus close the cap or opening in the can. The portions of the cams H which extend through the tank are parallel to each other, so as to keep the heads g pressed tightly against the cans while they are submerged in the water. At the opposite end of the tank the cams H again incline outward or away from each other, so that the rubber head g may be withdrawn, to release the cans from the carrier. These opposite link-bars may, if preferred, be provided with a flat disk, for the end of the can to bear against; but if the links b are made of flat bars there will be no danger of injury to the ends of the cans from the pressure. The heads g are retracted, so as to release the cans after they are conveyed out of the bath, and the pin g^2 reaches the inclined part of the cam H at the opposite end of the apparatus by means of spiral springs h on the rods c, pressing against the bars b'. The collar h', against which the other end of the springs h press, may be adjusted, to regulate the tension of the springs, by means of the set-screws h^2.

It will be observed that the apparatus we have shown in the drawings is double, or adapted to carry two rows of cans, side by side, through the bath, and this we deem the preferable construction; but obviously the apparatus may be adapted to carry one or more rows, if desired. The outside pulleys, E and E', are preferably made polygonal in form, to correspond to the length of the links of the chain, and the middle pulleys, E^2, are preferably spider-wheels, with arms having notches therein, to fit the sleeve c' on the rods c between the link-bars.

K is the chute, by which the cans are delivered from the carriers to the drying trough or passage M, which is provided with steam-coil or other heating apparatus, by which the cans are thoroughly dried after coming from the bath.

The water in the tank may be kept hot by any suitable means—as, for example, by circulation through a heating-pipe, or by steam-coil immersed therein.

The device for carrying the cans through the bath may of course be made of various constructions without departing from the principle of our invention. We however prefer to use the can-carrying device shown. Of course it will be understood that the can-supporting arms are to be so adjusted as to bring the mouth or opening in the can opposite the rubber head. If preferred, the heads for closing the openings in the cans may be secured to the fixed link-bar b at the opposite end of the can pocket or receptacle, instead of to the movable bar b'. In that case of course the cans would be delivered to the carrier with their ends reversed.

The machine may also be used for testing cans which have no openings. In that case of course the device for closing the openings need not be used.

Instead of an endless chain, as shown, for carrying the cans, the can-carrier device may consist of a revolving wheel or other movable device adapted to submerge the cans in the hot-water bath.

The cams H H are adjusted by means of the pin J, set-screw J', and bracket J^2, which is secured to the tank B. The ways or tracks F, F', and F^2 may be adjusted by the screws $f f$.

We claim—

1. The combination of a hot-water bath or tank with an endless-chain can-carrier provided with devices for clamping the cans therein and closing the openings in the cans, a cam for operating said clamping device, and a chute for delivering the cans to the carrier, substantially as specified.

2. In a can-testing machine, the combination of a tank with a can-delivery chute, a can-carrier provided with pockets adapted to automatically receive the cans as they roll from said chute and convey them through said tank, and a device for closing the openings in the cans as they are conveyed, substantially as specified.

3. In a can-testing machine wherein a bath of hot water is employed for testing the cans, the combination of a tank with a can-submerging carrier for conveying the cans through said tank of hot water, a device for closing the openings in the cans while being submerged, a heated trough or passage for drying the tested cans as they come hot from the bath, and a chute for delivering the cans from the carrier to the drying trough or passage, whereby tarnishing and discoloration of the tin is prevented, as the cans coming hot from the bath are immediately dried, substantially as specified.

4. The combination of a tank, a can-carrying device extending through said tank, a chute for delivering the cans thereto, a device for closing the openings in the cans, and a chute for delivering the cans from the carrier, substantially as specified.

5. The combination, with a tank, of a can-carrier provided with a device for clamping the cans therein, ways or tracks for supporting said carrier, extending into and out of said tank, and a curved cam or guide for operating the clamping devices and keeping the can-carrier submerged, substantially as specified.

6. The combination of the tank, curved

cam, can-carrier provided with adjustable can-supporting arms, movable clamping-bar, and a head for closing the opening in the can, substantially as specified.

7. The combination of link-bars *a a* and *b b*, cross-rods *c*, movable link-bars *b'*, adjustable can-supporting arms *d*, head *g*, pin g^2, cam H, and tank B, substantially as specified.

8. The combination of link-bars *a a* and *b b*, cross-rods *c*, movable link-bars *b'*, springs *h*, adjustable can-supporting arms *d*, pin g^2, and adjusting lock-bar d^2, substantially as specified.

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