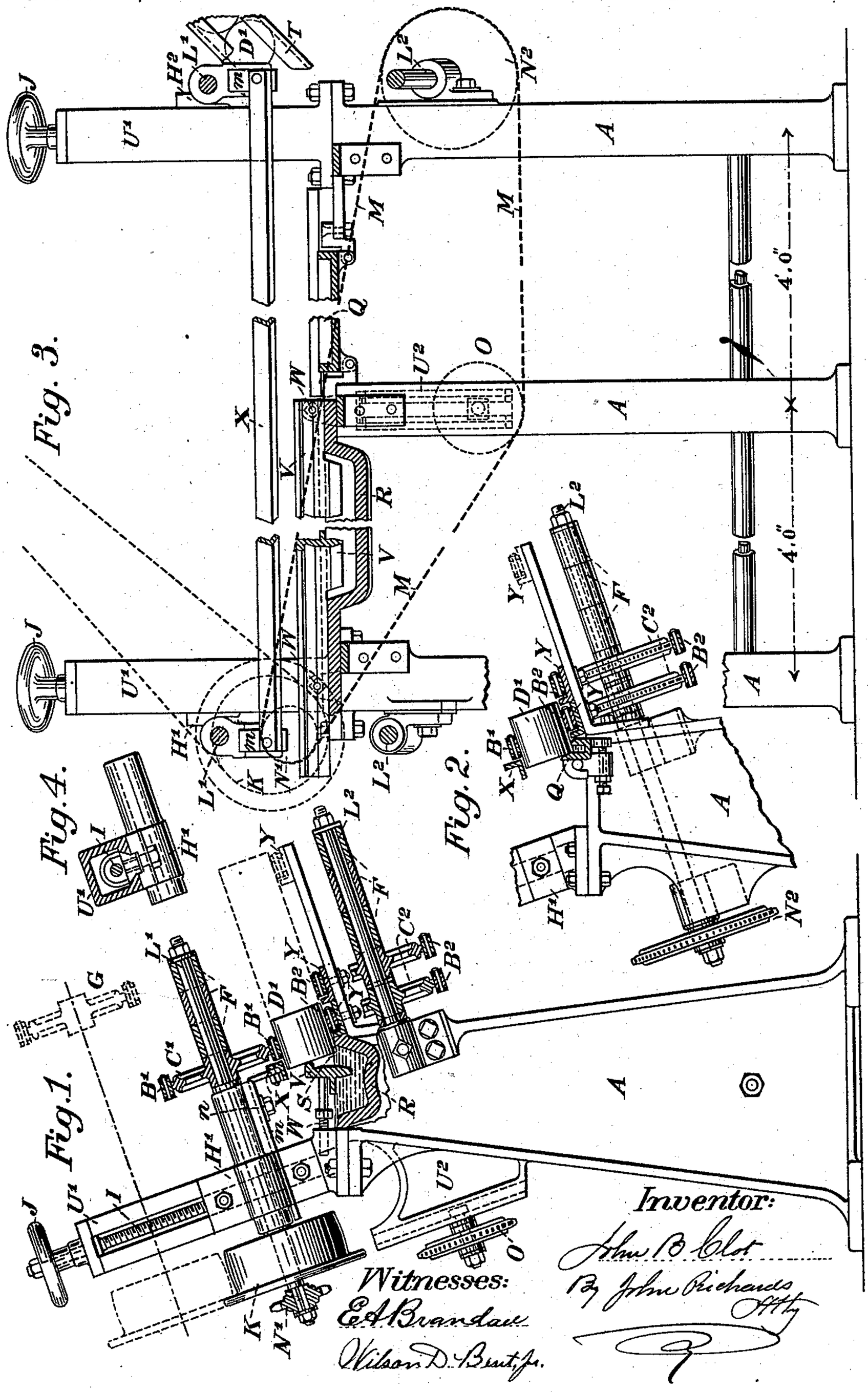
(No Model.) 3 Sheets—Sheet 1.

J. B. CLOT.

CAN SOLDERING MACHINE.

No. 559,073. Patented Apr. 28, 1896.



Witnesses:
E. A. Brandau
Wilson D. Bentjs.

Inventor:
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Atty

(No Model.) 3 Sheets—Sheet 2.

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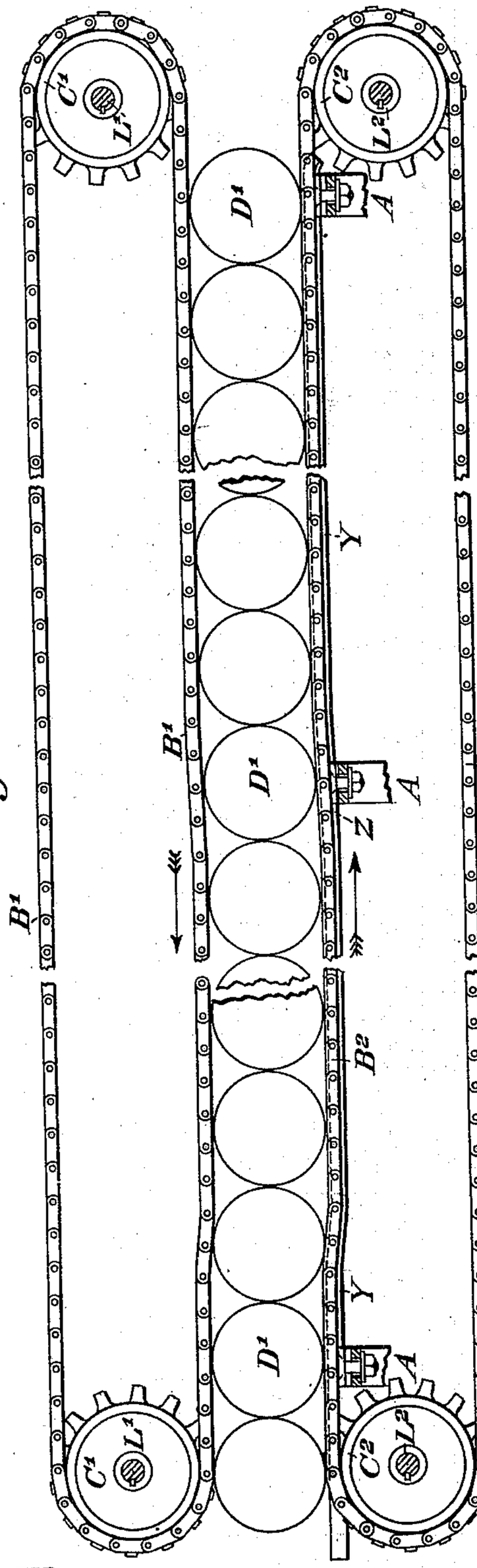

Fig. 5.

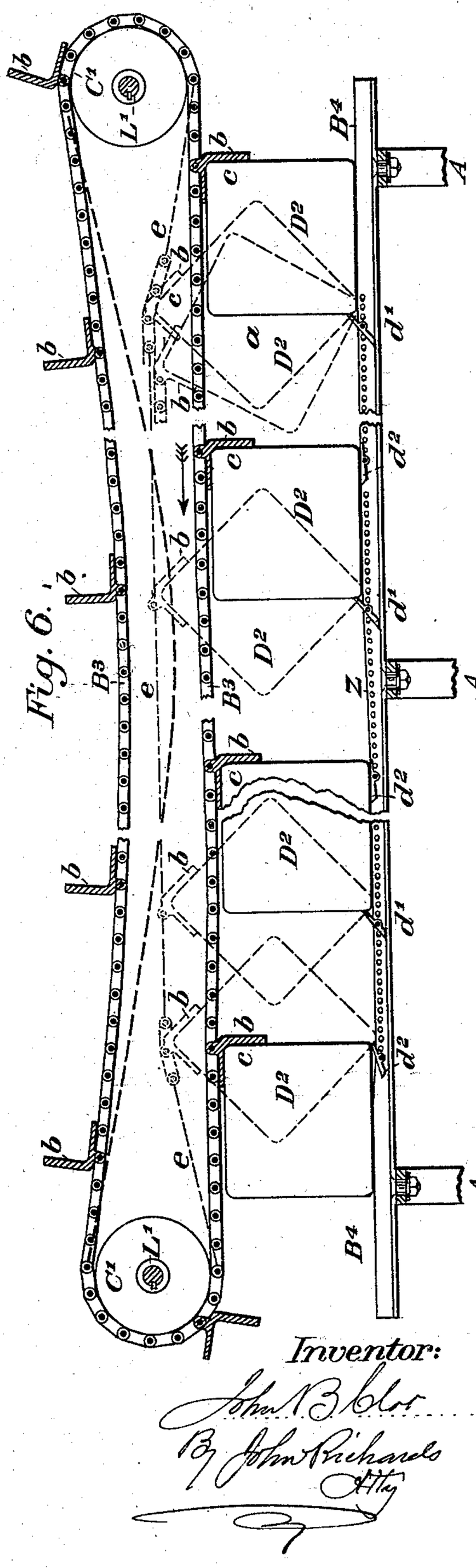

Fig. 6.

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(No Model.) 3 Sheets—Sheet 3.

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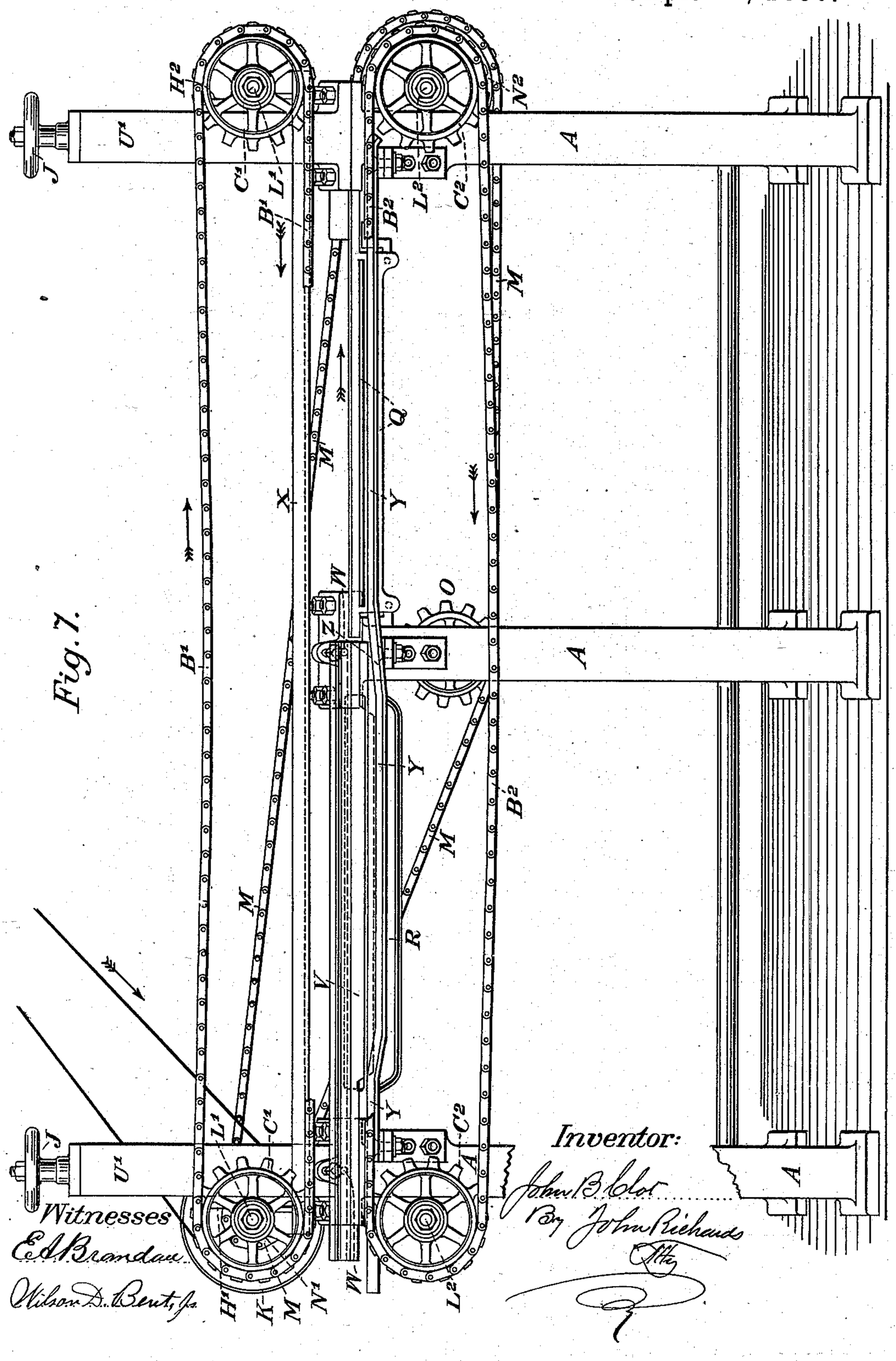

UNITED STATES PATENT OFFICE.

JOHN B. CLOT, OF SAN FRANCISCO, CALIFORNIA.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 559,073, dated April 28, 1896.

Application filed May 17, 1894. Serial No. 511,510. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. CLOT, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Machines for Soldering the Ends of Metal Packing-Cans, of which the following is a specification.

My invention relates to the manufacture of metallic cans by machine processes, and to the soldering of the ends of such cans, both of round and angular section and of various dimensions.

My improvements consist especially in a method of controlling the movement of the cans while being soldered within a convenient limit of traversing movement and space, so as to more effectually expose them to the melted solder, and in various devices to accomplish a more effectual and rapid performance of the processes, as will be set forth in connection with the drawings herewith and the claims at the end of this specification.

Figure 1 is an end elevation, partially in section, of one of my improved can-soldering machines arranged for cylindrical cans. Fig. 2 is another partial end view in another plane of the same machine, showing the acid or cleaning bath. Fig. 3 is a partial front view of the same machine, showing various details thereof in the opposite plane to Figs. 1 and 2. Fig. 4 is a detail of Fig. 1, showing the main bearing of the top spindle of the machine partially in section. Fig. 5 is a view in flat vertical projection of various parts of the machine, including the feeding or impelling chains to move cylindrical cans. Fig. 6 is a similar view of the impelling devices for cans of angular section. Fig. 7 is a front elevation of the main frame of my improved can-soldering machine in flat projection, with the impelling-chains in place.

Similar letters of reference are employed to denote like parts throughout.

In the operation of soldering packing-cans by machine processes the custom is to roll the cans on a fixed bed or way, so the corners to be soldered will pass through or be immersed in a bath of melted solder, the bath being not only long enough to permit one rolling revolution of the can, but two or more revolutions, so as to insure perfect soldering of the joints.

In the present invention the cans to be soldered are given a rotary movement and also a progressive or forward movement by means of two chains, one on the top and the other on the bottom of the cans. When the latter are laid in a substantially horizontal position, the chains move in opposite directions at different rates of speed, so that the cans in addition to revolving are moved slowly along in the direction of the fastest moving chain. In this manner the cans may be exposed to the melted solder for one or several revolutions, the length of the solder-bath being no longer than required for the largest rectangular cans, and with other elements of the machine can be made much shorter than hitherto required.

Referring to the drawings, A A A are pedestals forming a main supporting-frame. B′ B^2 are the impelling-chains to move or roll the cans when of cylindrical form, and C′ C^2 sprocket-wheels by which the chains B′ B^2 are supported and driven.

When the cans D′ are of small diameter, only the top chain B′ is driven, the cans rolling on the lower chains B^2 or on a fixed bed and making several revolutions while traversing the length of the solder-bath; but for larger cans the chains B′ B^2 are moved differentially, as will now be explained.

The outer of the chains B^2 and the top chain B′ are so arranged as to be adjusted laterally outward by means of the loose collars F, which can be transposed from one side to the other of the outer wheels C^2 and the upper wheels C′ to intermediate points or to the extreme positions for the longest cans.

A guide-bar X is provided for the bottom part of the chain B′ to keep it in a straight line, and this bar X is also adjusted laterally with the wheels C′ and chain B′ by means of the sliding brackets *m m*, held by the screws *n*, as seen in Figs. 1 and 3.

The varying diameter of the cans D′ D^2 is accommodated by raising the top wheels C′ and the chain B′ by means of the sliding saddles H′ H^2, mounted on the standards U′, and

raised and lowered by means of the screws I and hand-wheels J.

Driving power for the chain B′ is applied on the pulley K on the shaft L′, and from there transmitted by a driving-chain M from the wheel N′ on shaft L′ to the wheel N^2 on the shaft L^2, (seen on the right in Fig. 3,) so the rate of revolution between the wheels N′ N^2 and the relative speed of the top and bottom chains B′ B^2 is as the diameter of the wheels N′ and N^2.

A set of wheels of different diameters is provided, and relative speed of the chains B′ and B^2 can be varied as the size or diameter of the cans D may demand.

As the wheel N′ is raised and lowered with the saddle H′, provision must be made to maintain a constant tension of this driving-band and also to accommodate the chain M, this latter being done by means of an idle intermediate pulley O, running on a stud and arranged to be moved up and down and be clamped at any point on the bracket U^2, as shown in Figs. 1 and 3.

Q is an acid-trough through which the rims or joints to be soldered first pass, so as to clean the surfaces and remove oil or grease. R is a solder-bath heated to the melting-point by a furnace or any suitable means, preferably by gas or gasolene burners, the bath being kept full or to one level, so the joints of the can D will be immersed uniformly, as seen at S, Fig. 1. The solder-bath R and acid-bath Q are made only long enough to accommodate the largest cans of rectangular section, as will be explained in a future place.

The cans D′ are fed to the machine by a gravity-chute T, as shown in Fig. 3, and are discharged in any convenient manner after soldering.

Referring next to the manner of soldering cylindrical cans, the bottom chains B^2 are separated laterally to suit the length of the cans by means of the shifting-collars F, and the top chain B′ is set by means of the hand-wheels J, so as to rest upon the top of the cans D′. The wheel N′ on the shaft L′ is then selected from a series of different diameters and in such relation to the wheel N^2 that the chains B′ B^2 will move at different velocities in opposite directions, as indicated in Fig. 7, and as the relative sizes of the wheels N′ N^2 may determine.

The cans D′, being fed in from the chute T, are embraced between the chains B′ B^2 and set in revolution by friction of the two chains, but as the top one B′ is moving at a more rapid rate than the one B^2 the cans are rolled slowly forward and at the same time turned about on their own axes, so the corner or seam to be soldered will revolve in the solder-bath R at a velocity corresponding to the chain B′, but progressing forward only as the difference between the rate of the two chains B′ and B^2. In this manner it may be seen that cans of large diameter can be soldered in a short bath and the seams or joints exposed to the melted solder as long or for as many revolutions as is required to secure perfect work, thus saving dimensions, details, and heat, and shortening the machine as a whole and rendering the operations more compact; also permitting immersion of the joint or seam in the solder-bath as long as may be necessary or desirable.

Behind or at the inner ends of the cans D′ is placed a guide-bar V, adjustable by means of the screws W and extending the length of the solder-bath to keep the cans D in alinement and adjusted while passing through the melted solder.

The platen or support Y is depressed at Z, Fig. 7, so the cans D′ and the inner one of the chains B^2 will sink slightly at this point and permit the corner or seam of the cans to dip into the solder-bath R, as shown at S, Fig. 1. This completes the operation of soldering the ends in cylindrical cans.

For cans of square or rectangular section the chains B^2 are removed and a fixed rack B^4 substituted, as shown in Fig. 6, which will next be referred to, the parts being shown enlarged, so as to admit of plainer explanation.

The top chain B^3 is provided with jaws *b*, that are loosely pivoted on the rivets or cross-pins in the chain, so arranged that when hanging free on the lower or operating side of the chain they will take the position and engage the cans D^2, as shown at *c*, Fig. 6.

In the rack B^4 is mounted a series of hinged pawls *d′* d^2. These pawls are pivoted near the middle, but so proportioned in section that when free they swing into the position shown at *d′*, and when covered by the cans D^2 will lie flat or parallel to the rack-bar B^4, as shown at d^2. These pawls *d′* d^2 can be adjusted to various distances between them by means of a series of holes in the rack B^4, as shown in the drawings, and as the length of the sides or the size of the cans D^2 may require.

The operation is as follows: The cans D^2 are fed into the machine by hand, so that each of the jaws *b* will engage a can. The can then slides along on the rack-bar B^4 until it comes in contact with one of the pawls *d′*, and is rolled over, as shown at *a*, Fig. 6, and dips into the acid-bath Q and the solder-bath R. Each time the can D^2 is thus turned the jaw *b* is released, and the can pauses for a time in the solder-bath until the next succeeding jaw *b* engages the next can. In this manner the period in which the can is still and exposed to the solder is dependent upon the spaces between the jaws *b* on the chain B^3. In this manner there is a pause, exposing the seam to be soldered for a brief period to the melted solder in the bath R until the next succeeding jaw *b* moves along, and the can is again turned one-fourth of a revolution and another seam or joint is immersed in the melted solder.

The pawls *d′* d^2 are adjustable by means of series of holes in the rack B^4, as shown in

Fig. 6, and can be so spaced that cans of any dimensions can be thus soldered.

The dotted line *e* in Fig. 6 indicates the upper position of the chain B^3 as the cans D^2 are rolled or turned. It will thus be seen how the space between the jaws *b* result in giving pauses in the time of movement of the cans.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a can-soldering machine, a solder-bath in which the end seams of the cans are immersed, and in combination therewith two impelling-chains, one on the top and one on the bottom side of the can, moving in opposite directions, to roll and at the same time retard the forward movement of the cans, substantially as described.

2. In a can-soldering machine, a solder-bath in which the seams or joints to be soldered are immersed; impelling-chains on the top and bottom sides of the cans, moving at a different speed in an opposite direction, the lower or bed chains in two sections, one capable of adjustment laterally, so cylindrical cans of various lengths can be supported and rolled when the seams are being soldered, in the manner substantially as described.

3. In a can-soldering machine, the combination of the feeding-chains for the cans, two bottom or supporting chains for cylindrical cans, the sprocket-wheels supporting these chains, and a series of transferable collars on the shafts or studs of these wheels whereby the wheels and chains may be adjusted laterally to suit cans of various lengths, substantially as described.

4. In a can-soldering machine, impelling-chains for the top and bottom of the cans, moving in opposite directions and at different rates of speed to revolve and at the same time retard the forward movement of the cans, the top chain with its supporting-wheels and connected parts adjustable vertically or normally to the lower or bed chains, so cans of various diameters can be accommodated between the chains and rolled in contact with the melted solder throughout distances shorter than their perimeter, in the manner substantially as and for the purposes specified.

5. In a can-soldering machine, the combination of solder-baths, impelling-chains to roll cylindrical cans and immerse their seams or end joints in the solder-baths, in the manner described, gearing adapted to vary the relative speed of the top and bottom impelling-chains, thus retarding the forward movement of the cans, and allowing of the reduction in length of the solder-baths, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

JOHN B. CLOT.

Witnesses:
ALFRED A. ENQUIST,
WILSON D. BENT, Jr.