(No Model.)

W. S. BACON.

CAN CAPPING MACHINE.

No. 415,160. Patented Nov. 12, 1889.

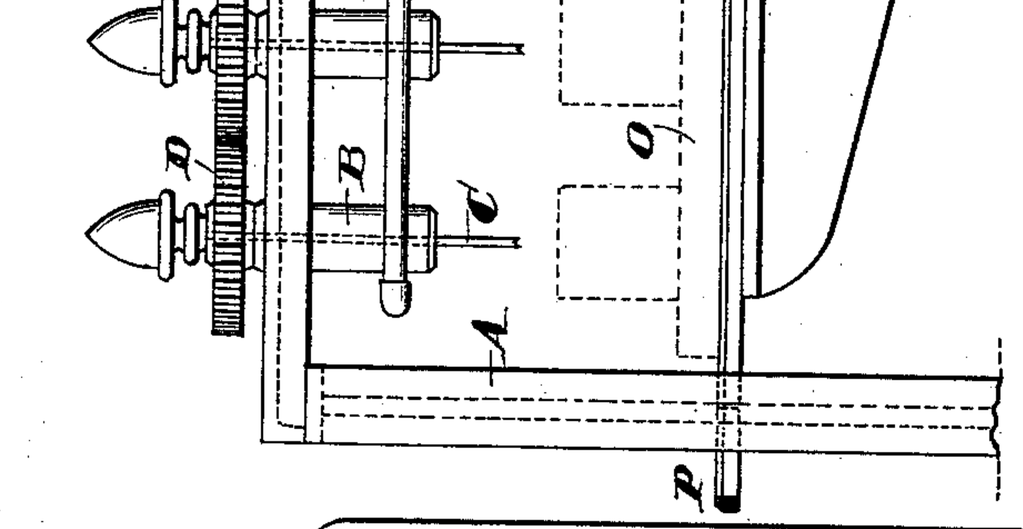

FIG. 2.

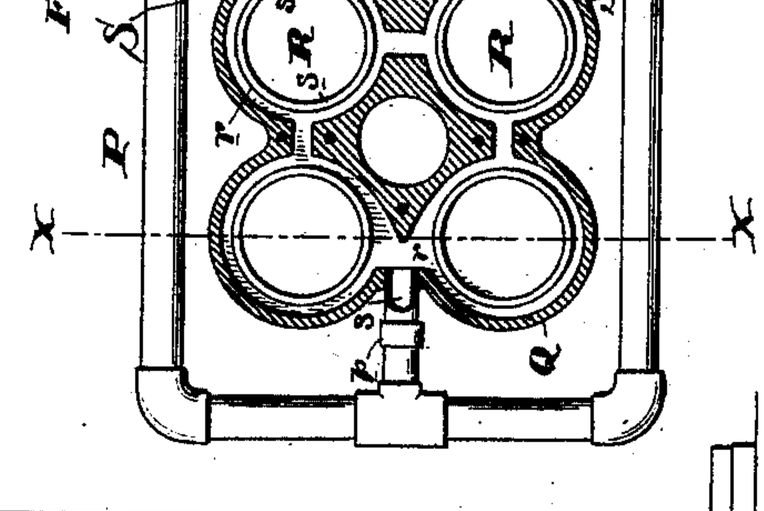

FIG. 3.

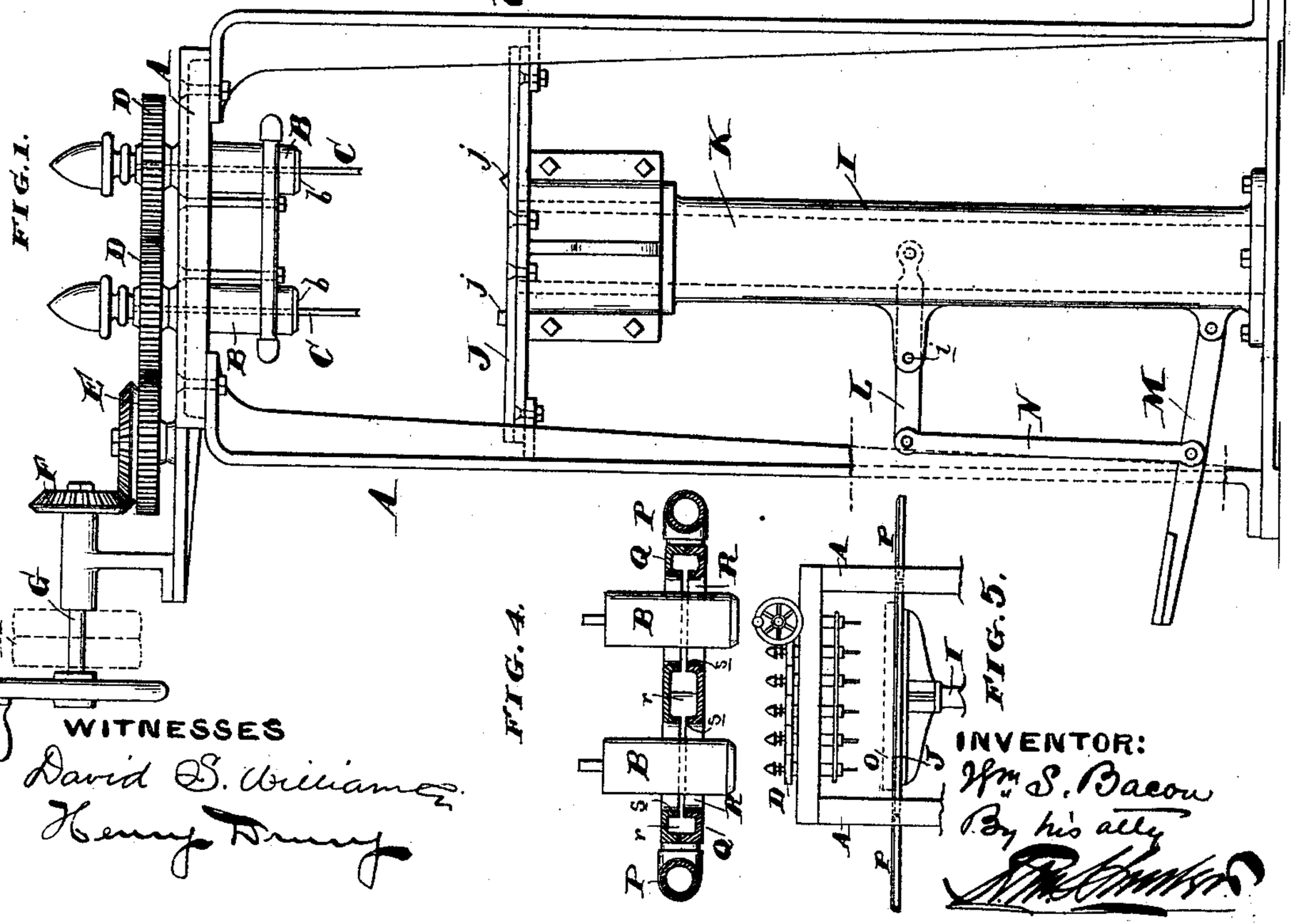

FIG. 1.

FIG. 4.

FIG. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

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CAN-CAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 415,160, dated November 12, 1889.

Application filed August 3, 1889. Serial No. 319,657. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BACON, of the city of Bridgeton, county of Cumberland, and State of New Jersey, have invented an Improvement in Can-Capping Machines, of which the following is a specification.

My invention relates to can-capping machines; and it consists of certain improvements, which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

It is the object of my invention to construct a convenient apparatus for soldering the caps upon tin cans with rapidity and precision, and so that a large number of cans may be capped simultaneously. One of the chief difficulties that has been met with in machines of this character is to accomplish an effective and convenient heating of the soldering-irons and to maintain them in an evenly-heated condition during the operation of the machine. Ordinarily the heat is applied in the form of a jet to one or more parts of the capping-iron, and is not uniform throughout the soldering-surfaces.

In carrying out my invention I supply the capping-irons, of which there may be any convenient number, with heat uniformly distributed about the soldering-surfaces and in such a way that an even temperature is maintained during the operation of the machine. I employ a series of rotatable capping-irons vertically supported in a suitable frame, under which the cans are held upon a vertically-movable table, which is raised to bring the cans into contact with the soldering-surfaces of the irons. The irons are heated by gas or other suitable medium supplied from a pipe arranged about the capping-irons, preferably so that each iron is encircled or surrounded by a supply-pipe from which the heat is supplied upon all sides, and preferably in the form of a continuous flame or sheet from a continuous annular opening in the supply-pipe about the iron. Thus the irons are heated in a constant and uniform manner. As my heating medium I prefer to use gasoline, because of its cheapness and availability in all places; but it is quite apparent that any other suitable heating medium may be employed. The cans are preferably supported upon trays, which may be moved upon the table and removed therefrom on convenient rails.

In this apparatus it is not necessary to employ an enveloping case or cover about the capping-irons, and I prefer to dispense with it in order that the operation of the soldering-irons may be clearly seen by the operator during the working of the machine.

The particular features of my invention are hereinafter more fully set forth in the description of the drawings and specified in the claims.

In the drawings, Figure 1 is an end elevation of my improved can-capping machine. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view of the heating apparatus with the upper half thereof removed. Fig. 4 is a cross-sectional view of the same with the upper half in place, and showing the position of the capping-irons; and Fig. 5 is a front elevation of my improved can-capping machine on a reduced scale, showing the arrangement of the rails for moving the trays upon the table.

A is the main frame, having suitable supporting-legs and a flat top, in which are journaled a number of spindles or capping-irons B. These capping-irons are preferably constructed in the manner shown, consisting of the vertically-arranged metal spindles provided with beveled soldering-surfaces *b* and having weighted rods C projecting through them, adapted to rest upon the caps of the cans and hold them firmly in position during the soldering operation.

D are gear wheels or pinions carried by the spindles B and gearing with each other. In this machine I prefer to arrange the capping-irons in rows, as shown, though the particular arrangement and number of the capping-irons are immaterial.

E is a gear-wheel gearing with one of the pinions D, and thence transmitting a rotary motion to all of the irons.

F is a pinion on a shaft G, gearing with the wheel E. Power is applied to the shaft G either by hand through a handle *g* or otherwise by the pulley H. (Shown in dotted lines in Fig. 1.)

I is a hollow upright support under the capping-irons, supporting a table J. The table J is secured to a rod K, vertically movable

within the hollow support I and operated by a lever L, pivoted to the support I at *i* and moved by the foot-lever M through the connection or link N. By the operation of the foot-lever M the table J may be raised to bring the cans into operative position under the capping-irons B and then lowered after the caps are secured. The table J is preferably provided with rail *j j*, upon which a tray O is adapted to run. (See dotted lines of Fig. 2.) Upon this tray are placed the cans to be capped. The tray may be run from rails P P upon and off of the track *j j* of the table J. In this manner the machine may be operated with great rapidity. The trays O may be provided with anti-friction rollers adapted to run on the rails *j j*. I prefer to construct one of the rails *j* triangular and the other rectangular in cross-section, as shown in Fig. 1, to more firmly keep the tray O in position.

P is a gas-pipe by which the supply of gas or heating medium is supplied to the heating devices. These heating devices consist of two flat castings Q, provided with a number of apertures R, through which the capping irons or spindles B extend. Formed about each of these orifices within the castings Q are grooves or depressions *r*, connecting one with the other. One of the castings Q is superimposed upon the other, and the two are bolted or otherwise tightly secured together, the grooves or depressions *r* forming a passage-way for the gas or heating medium. These passage-ways extend about each of the apertures R and lead one into the other, and are so connected as to form a continuous passage-way for the gas throughout the heating devices and about each of the apertures R, through which the capping-irons extend.

S S are inlets for the gas, leading to the passage-ways *r*, and the heating devices as an entirety, consisting of the castings Q Q, are secured to the supply-pipe P by means of collars *p* at these inlets S S, through which the gas flows from the pipe P into the passage-ways *r* of the heating devices. The pipe P is preferably constructed continuous about the space occupied by the capping-irons for the purpose of better supporting the heating devices and of feeding the gas or heating medium to them. Those portions of the surfaces of the castings Q Q which are located immediately adjacent to the apertures R and bounded by the depressions or grooves forming the passage-ways *r* are slightly depressed or lowered, so that the castings are of less thickness or depth at these points, and when the two pieces Q Q are bolted or secured together there will be a continuous thin annular opening *s* from the passages *r* to the apertures R, (see Fig. 4,) through which the gas or heating medium issues in a continuous sheet or flame, entirely encircling the capping-irons. While I much prefer this construction by which a thin annular opening is made for the gas, it is apparent that in place thereof the inner faces of the heating devices adjacent to the capping-irons may be provided with perforations leading to the gas-passages *r* for the escape of the gas. The object of these heating devices is to supply heat uniformly around each of the capping-irons, and while the particular construction shown, consisting of the superimposed castings Q Q, having the gas-passages *r*, is much preferred by reason of its effectiveness of operation and cheapness of construction, it is apparent that a number of pipes surrounding each of the capping-irons and connected to the gas-pipe P might be employed.

The operation of my apparatus is as follows: Upon the tray O on the rails P are arranged a number of cans to be capped, having the caps in place and a piece of solder laid on at the seam. The tray may be provided with depressions to receive the cans and hold them in exact position. The tray O is moved forward upon the table J, sliding on the rails *j* until it is moved into proper position, so that each of the cans is under a soldering-iron. The foot-lever M is then operated and the table J is raised, bringing the can in contact with the irons B, the weighted rods C of which hold the caps in position. Immediately that the soldering-irons touch the cans the handle *g* is operated, which rotates simultaneously all of the soldering-irons in contact with the surfaces of the cans and distributes the solder about the seams. The table is then lowered and the tray moved off upon the rails P upon the opposite end of the machine, while another tray O with a new supply of cans to be capped is moved upon the table, as before. Thus the replenishment of the supply of cans under the capping-irons and the operation of soldering the caps may be performed with great rapidity. It will be seen that the capping-irons may be rotated in either direction.

It is a great advantage in machines of this kind to employ capping-irons supported against vertical movement and to raise and lower the can-support to bring the surfaces of the cans in contact with the irons, because in such a construction the capping-irons are not moved away from the heating devices, as is the case in machines in which the irons are lowered to the cans.

While I prefer the details of construction which are here shown, I do not limit my invention to them, as it is apparent that they may be varied in many ways without departing from the principles of the invention.

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

1. In a soldering-machine, the combination of a vertically-movable support for the articles to be soldered, soldering devices arranged above said vertically-movable support, and a stationary support arranged in substantially the same plane with said vertically-movable support when it is lowered.

2. In a can-capping machine, the combination, with a number of rotatable soldering-irons, of a vertically-movable can-supporting

table under said soldering-irons, supporting-rails at each end of said table in substantially the same plane therewith when the table is lowered, and trays for the cans to be capped, whereby a tray of cans to be capped may be moved from the supporting-rails at one end upon the table and then moved off upon the rails at the other end after the capping operation has been performed.

3. In a can-capping machine, the combination, with a number of rotatable soldering-irons, of a vertically-movable can-supporting table under said soldering-irons provided with guide-rails, supporting-rails on each end of said table in substantially the same plane therewith when the table is lowered, and trays for the cans to be capped, whereby a tray of cans to be capped may be moved from the supporting-rails at one end upon the table and then moved off upon the rails at the other end after the capping operation has been performed.

4. In a can-soldering machine, the combination of a vertically-movable support for the articles to be soldered, soldering devices arranged above said vertically-movable support, supporting devices independent of said vertically-movable support arranged in substantially the same plane therewith when it is lowered, and trays for the articles to be soldered movable to and from said independent supporting devices upon the vertically-movable support.

5. In a can-capping machine, the combination of a number of vertically-arranged soldering-irons, a separate heat-supplying device for each of said soldering-irons extending about them to supply heat on all sides thereof, and a continuous main supply-pipe surrounding said separate heat-supplying devices to supply the heating medium to them.

6. In a can-capping machine, the combination of a number of vertically-arranged soldering-irons, a separate heat-supplying device for each of said soldering-irons extending about them and provided with a continuous thin annular aperture adjacent to the irons to supply heat on all sides thereof, and a main supply-pipe supplying the heating medium to said separate heat-supplying devices.

7. In a can-capping machine, the combination of a number of vertically-arranged soldering-irons, heat-supply devices consisting of two similar superimposed castings provided with apertures through which the soldering-irons extend and having passages for the heating medium about each of said apertures, and openings from said passages opening into said apertures for the escape of the heating medium.

8. In a can-capping machine, the combination of a number of vertically-arranged soldering-irons, heat-supplying devices consisting of two similar superimposed castings provided with apertures through which the soldering-irons extend and having circular passages for the heating medium about each of said apertures, and having their surfaces between said circular passages and apertures depressed or lowered to form a thin continuous annular opening for the escape of the heating medium in a continuous sheet adjacent to and about each of said soldering-irons.

9. The combination, with a number of soldering devices, of a main supply-pipe for the heating medium and a heater provided with an aperture for each of said soldering devices, said heater being removably supported by said main supply-pipe and receiving the heating medium therefrom, whereby said heater as an entirety may be removed from the machine without dismantling it.

In testimony of which invention I have hereunto set my hand.

WILLIAM S. BACON.

Witnesses:
ERNEST HOWARD HUNTER,
S. T. YERKES.