

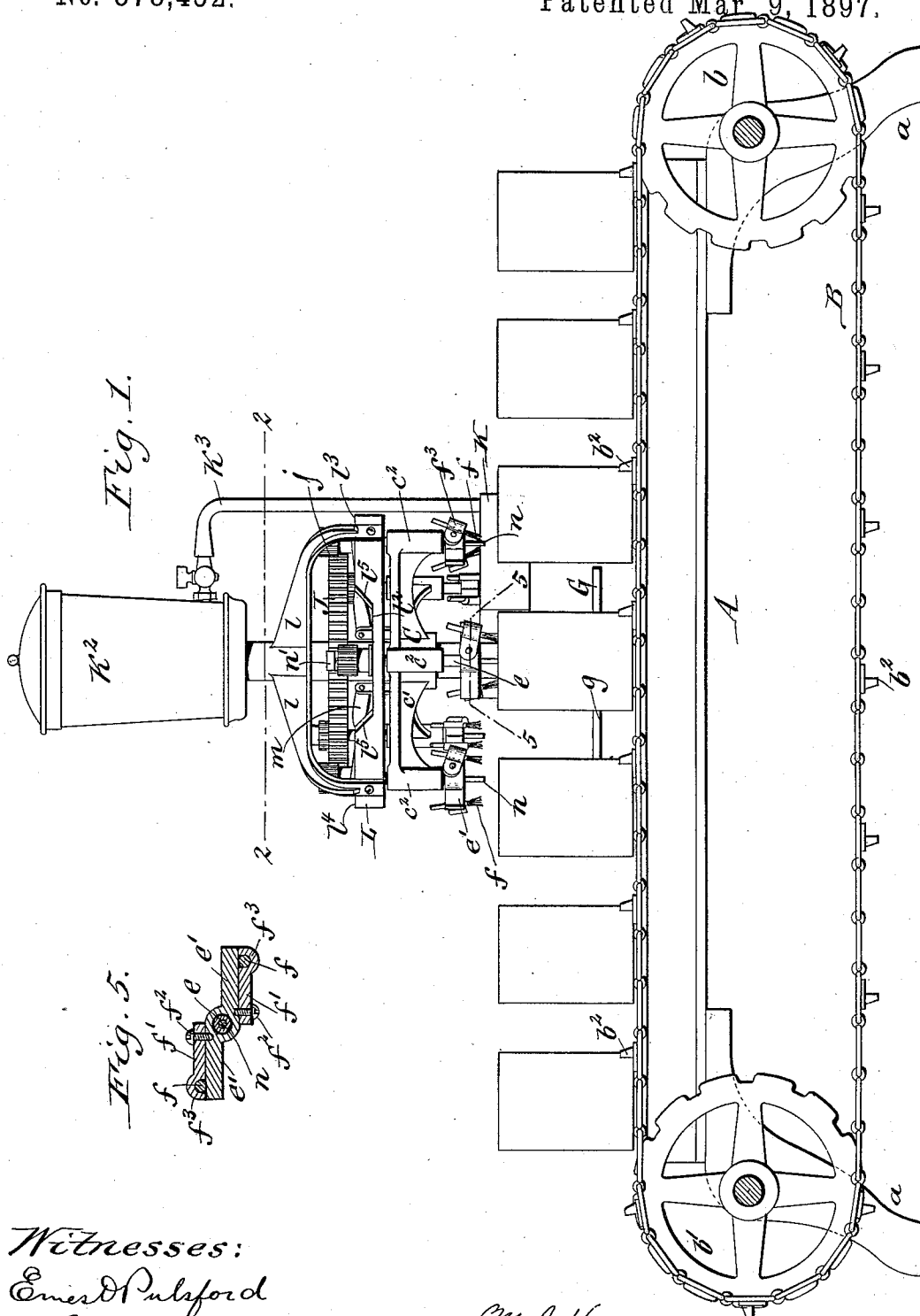
(No Model.)

2 Sheets—Sheet 1.

M. J. HAWKINS.
FLUXING MACHINE.

No. 578,452.

Patented Mar. 9, 1897.



Witnesses:
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Theo. L. Popp.

M. J. Hawkins Inventor.
By Wilhelm Hornum Attorneys.

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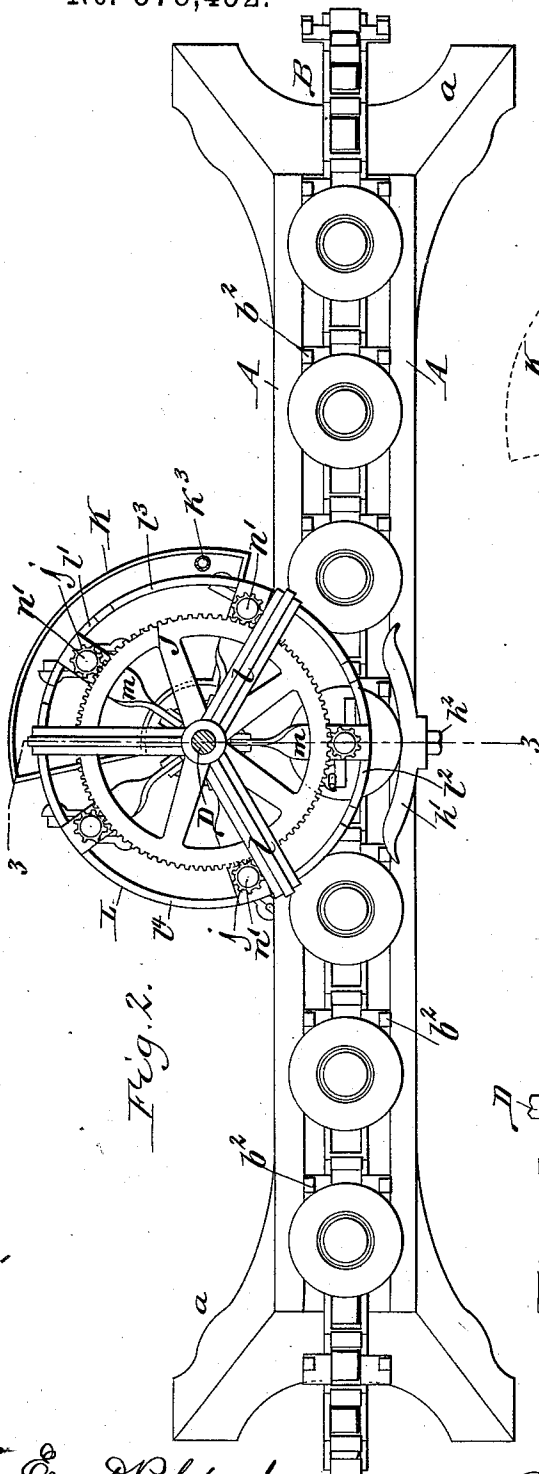


Fig. 2.

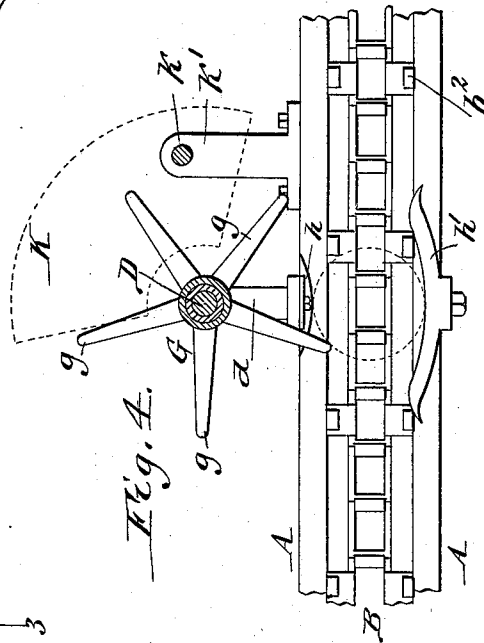


Fig. 4.

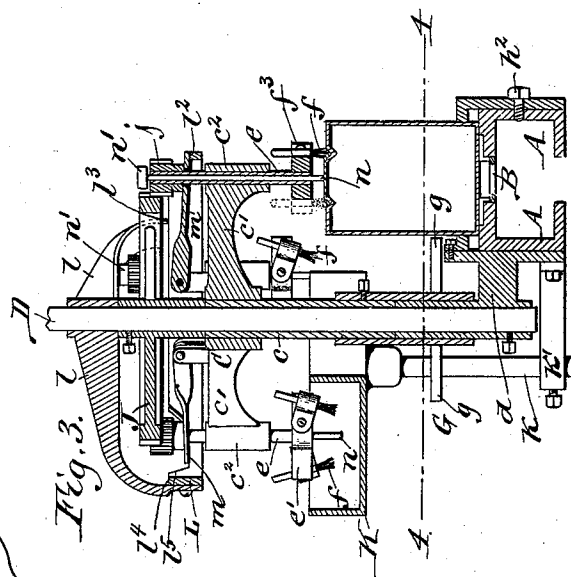


Fig. 3.

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UNITED STATES PATENT OFFICE.

MILLARD J. HAWKINS, OF FARNHAM, NEW YORK.

FLUXING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,452, dated March 9, 1897.

Application filed August 15, 1896. Serial No. 602,844. (No model.)

To all whom it may concern:

Be it known that I, MILLARD J. HAWKINS, a citizen of the United States, residing at Farnham, in the county of Erie, in the State of New York, have invented a new and useful Improvement in Fluxing-Machines, of which the following is a specification.

This invention relates to a fluxing-machine whereby a liquid flux or soldering acid is applied to cans and caps preparatory to soldering the same together.

The objects of my invention are to produce a machine in which the tool operating upon the cans is set in motion by the moving cans, so that the movement of the tool-carrier is derived from the moving cans and the carrier remains at rest when no can is fed past the tool; also, to so contrive the machine that the flux is applied to the cans uniformly, expeditiously, and without waste.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation, partly in section, of my improved fluxing-machine. Fig. 2 is a sectional top plan view thereof, the section being taken in line 2 2, Fig. 1. Fig. 3 is a vertical cross-section in line 3 3, Fig. 2. Fig. 4 is a fragmentary horizontal section in line 4 4, Fig. 3. Fig. 5 is a horizontal section, on an enlarged scale, in line 5 5, Fig. 1.

Like letters of reference refer to like parts in the several figures.

The supporting-table of the machine consists of two longitudinal bars or rails A A, which are provided at their ends with supporting-legs a.

B represents a conveyer whereby the cans are carried lengthwise over the table and past the fluxing devices. This conveyer consists, preferably, of an endless chain belt which passes around sprocket-wheels b b', journaled in bearings arranged in the legs and which is arranged with its upper or carrying portion between the upper portions of the supporting-bars. The cans are placed with their bottoms on the supporting-bars and are carried along on the same by means of wings or flights b², which are arranged on the conveyer-belt at intervals and engage with the rear sides of the cans.

C represents a horizontally-rotating carrier-head or spider, on which the fluxing-brushes

are mounted and which is secured with its hub to a sleeve c, journaled on a stationary arbor or standard D. The latter is arranged vertically in the rear of the supporting-bars and is secured with its lower end to the rear supporting-bar by a bracket d. The arms c' of the carrier-head, preferably five in number, are arranged equidistant and turn above the cans, and each of said arms is provided at its outer end with a vertical bearing c², in which a vertical brush-spindle e is journaled. The lower end of each spindle is provided with a pair of radial arms e', and to the outer end of each arm a brush f is fastened by means of a clamp consisting of a plate f', which is fastened to the vertical side of the arm by a horizontal screw f² and a jaw f³, which embraces the stock of the brush and presses the same against the supporting-arm. During the fluxing operation one of the brush-spindles is in line with the center of a can and the brushes on one of the spindles which have been previously dipped in acid are rotated in engagement with the groove in the top of the can and the marginal portion of the cap resting in the groove, whereby a coat of flux is applied to these parts. When the brushes become worn or when operating on cans in which the diameter of the cap-groove varies, the brushes can be adjusted by turning each clamp vertically on the screw, which fastens the same to the supporting-arm, thereby permitting the brush to be adjusted radially to the desired position. As the cans are propelled past the brush-carrying head the latter is turned so that the brushes on its arms are brought successively in engagement with the tops of the cans.

G represents a shifting or star wheel, which is secured with its hub to the lower portion of the sleeve c, carrying the brush-head and which has its arms g projecting successively across the path of the cans. As the latter are moved forward by the conveyer each can engages with one of the arms of the star-wheel and turns the brush-carrying head one-fifth of a revolution, whereby the respective arm is moved out of the path of the cans and the next following arm is moved in the path of the succeeding can. When the operator fails to place a can against one pair of the wings on the conveyer-belt, the particular arm of the

star-wheel which projects across the path of the can will not be disturbed, but will remain at rest together with the fluxing-brushes until a can is carried forward by the conveyer and brought into engagement with the arm. By this means the shifting of the fluxing-brushes is dependent on the presence of a can on the conveyer, whereby wasting of acid and unnecessary wear on the machine are avoided.

The relative position of the star-wheel and of the brush-carrying head is such that when a can engages with an arm on the star-wheel the can will be underneath and axially in line with the respective brush-spindle. In order to maintain the cans in axial alinement with the brush-spindles as the cans are carried past the fluxing mechanism, the lower portions of the cans are preferably guided between inner and outer guide-rails h h' , having curved faces which are arranged concentric with the axis of the brush-carrier head, whereby the brushes are permitted to remain in engagement with the cap and soldering-groove of the can during the fluxing operation. The outer guide-rail is secured to the front supporting-bar by a bolt h^2 , passing through a depending lug on the outer guide-rail, and the inner guide-rail h' is secured to an upwardly-projecting lug on the arbor-supporting bracket.

In addition to the rotary movement of the brushes around the arbor D each of the brush-spindles is rotated individually about its own axis for bringing the brushes in contact with all parts of the can-groove and margin of the cap when in engagement with the same. This movement is produced by a stationary gear-wheel J, which is secured horizontally to the upper portion of the arbor D and which meshes with gear-pinions j , secured to the upper ends of the brush-spindles, whereby the brushes are turned with the spindles by reason of the pinions rolling around the stationary gear-wheel.

K represents a flux or acid pan containing the fluxing solution or soldering acid in which the brushes are dipped during each revolution of the brush-carrier. This pan is arranged in rear of the supporting-bars below the path of the brushes and is provided with a depending stem k , which is adjustably connected to a bracket k' on the rear supporting-bar by a set-screw, as shown in Figs. 3 and 4.

k^2 represents a reservoir for the acid or flux mounted on the upper end of the arbor and provided with a delivery-pipe k^3 , which discharges into the acid-pan.

Each of the brush-spindles and connecting parts is moved toward and from the top of a can when the latter is underneath the brush and toward and from the flux-pan when the brush stands over the same by means of the following mechanism:

L represents a stationary guide-ring whereby the rising and falling of the brushes is controlled and which is supported concentrically by means of radial supporting-arms l , connected with the arbor above the station-

ary gear-wheel. The upper side of the guide-ring is provided with two horizontal depressed portions l' l^2 , arranged, respectively, over the can-conveyer and the acid-pan, and two intermediate elevated portions l^3 l^4 , which are connected at their ends with the adjacent ends of the depressed portions by inclines l^5 .

m represents lifting-levers whereby the brush-spindles are raised and lowered. One of these levers is arranged radially above each arm of the brush-carrying head and is pivoted with its inner end by a horizontal pivot to said arm and rests with its free outer end on the upper side of the guide-ring. The brush-spindle passes through an opening in the lifting-lever and its gear-pinion rests on top of the lever.

Upon revolving the carrying-head each lifting-lever is brought successively into engagement with the elevated and depressed portions of the guide and alternately raised and lowered. The levers are lowered by the weight of the brush-spindles and the parts connected therewith and raised by engagement with the inclines connecting the rear ends of the depressed portions with the front ends of the elevated portions. Each lifting-lever while moving forward in engagement with the depressed portion l' is lowered so as to dip its brushes into the fluxing fluid in the flux-pan, and during the continued forward movement the lever is raised by the succeeding incline onto the next following elevated portion l^3 , whereby the brush is raised and held in this position until the brush stands over a can on the conveyer. The brush is now lowered by its lifting-lever, leaving the elevated portion l^3 and dropping onto the depressed portion l^2 of the guide-ring, whereby the brush is brought in contact with the cap and can and a coat of flux is applied thereto. When the fluxing operation is completed, the brush is again raised by reason of its lever being lifted upon the next following elevated portion l^4 of the guide-ring. The lever is held in this elevated position until the carrying-head has been turned sufficiently to bring this lever into engagement with the depressed portion l' of the ring, whereby the brush is again dipped into the fluxing solution. The stationary gear-wheel and the gear-pinions on the brush-spindles are of sufficient width to permit the brush-spindle to rise and fall the requisite distance without disengaging these parts.

n represents retaining-rods whereby the caps are prevented from rotating with the brushes when the latter bear on the caps and cans, so as to insure coating the entire marginal portion of the cap with flux. One of these rods is arranged to slide vertically in each brush-spindle, and each rod is provided at its upper end with a weight n' . In its normal inoperative position the lower end of the retaining-rod projects downwardly below the lower end of the brushes of its respective spindle, and its weight rests on top of the

gear-pinion and spindle and limits the downward movement of the rod. Upon lowering the brush-spindle when the same stands above a cap and can the lower end of the retaining-rod bears upon the cap and holds the same just before the brushes come into engagement with the cap and can. After the retaining-rod bears against the cap its downward movement is arrested, and the brush-spindle finishes its downward movement independent of the retaining-rod, whereby the support is removed from underneath the weight on the retaining-rod, and this weight is brought to bear entirely on the cap, thereby holding the same against turning by frictional contact with the rotating brushes.

I claim as my invention—

1. The combination with a can-conveyer, of a movable brush-carrier provided with an actuating device which is engaged by the moving cans and receives its motion therefrom, whereby the carrier is driven from said conveyer through the intervention of the cans and remains at rest when no can engages with the actuating device, substantially as set forth.

2. The combination with the can-conveyer, of a movable brush-carrier provided with a number of fluxing-brushes which are engaged successively with the cans on the conveyer, and a movable shifting-arm connected with the brush-carrier and adapted to project into the path of the cans so that the brush-carrier is operated by the forward movement of the cans, substantially as set forth.

3. The combination with the can-conveyer, of a rotary brush-carrier provided with brushes which are engaged successively with the cans on the conveyer, and a rotary star-wheel connected with said carrier and having its arms moved successively into the path of the cans on the conveyer, substantially as set forth.

4. The combination with a can-conveyer, of a rotary carrier provided with a brush which is adapted to engage with a can, and a guide whereby the can is caused to move in the same arc in which the brush moves while the latter is in engagement with the can, substantially as set forth.

5. The combination with a can-conveyer, of a rotary carrier provided with a brush which is adapted to engage with a can, and guide-rails arranged on opposite sides of the can-conveyer and adapted to engage with opposite sides of the can and cause the same to move forward in the same arc in which the brush moves while the latter is in engagement with the can, substantially as set forth.

6. The combination with the can-conveyer and the rotary carrier, of an annular row of rotary fluxing-brushes journaled in said carrier, the several brushes being turned with the carrier for bringing them successively into engagement with the cans and each brush being capable of rotation about its own axis,

for distributing the flux on the cans, substantially as set forth.

7. The combination with the can-conveyer and the rotary carrier, of an annular row of brush-spindles journaled in said carrier so as to rotate bodily around the axis of the carrier, and a stationary gear-wheel which meshes with gear-pinions on the brush-spindles and whereby each of the latter is caused to rotate individually about its own axis while rotating with the carrier, substantially as set forth.

8. The combination with a can-conveyer and a rotary carrier arranged above the same, of brushes mounted in said carrier and capable of vertical movement independent of each other while rotating with said carrier, and shifting mechanism whereby each brush is lowered when it has arrived over a can to apply the flux and is raised from the can after the flux has been applied, substantially as set forth.

9. The combination with a can-conveyer and a rotary carrier arranged above the same, of brushes mounted in said carrier and capable of vertical movement independent of each other while rotating with said carrier, and a guide-ring provided with a depression over said conveyer, whereby the brushes are successively lowered and raised as they pass over the conveyer and the cans carried thereby, substantially as set forth.

10. The combination with a can-conveyer, a rotary carrier, and a brush mounted in said carrier and capable of vertical movement while rotating therewith, of a flux-pan arranged underneath the path of the brush, and shifting mechanism whereby the brush is lowered into the pan to receive the flux and raised out of the pan while being carried over the same, substantially as set forth.

11. The combination with a can-conveyer, a rotary carrier, and a brush mounted on said carrier and capable of vertical movement while rotating therewith, of a flux-pan arranged underneath the path of the brush, shifting mechanism whereby the brush is lowered into the pan to receive the flux and raised out of the pan while being carried over the same, and shifting mechanism whereby the brush is lowered when it has arrived over a can to apply the flux and is raised after the flux has been applied, substantially as set forth.

12. The combination with a can-conveyer, a rotary carrier, and a brush mounted in said carrier and capable of vertical movement while rotating therewith, of a flux-pan arranged underneath the path of the brush, and a guide-ring provided with a depression over said pan and with a depression over said conveyer, whereby the brush is raised and lowered in passing over said pan and subsequently in passing over said conveyer, substantially as set forth.

13. The combination with the can-conveyer,

of a rotary carrier, a brush mounted in the same and capable of vertical movement, a lifting-lever connected with said brush and pivoted on the carrier, and a stationary guide
5 engaging with the lifting-lever and provided with elevated and depressed portions whereby the brush is raised and lowered while rotating with the carrier, substantially as set forth.
10 14. The combination with the can-conveyer and the flux-pan, of a vertical arbor arranged adjacent to said conveyer and pan, a horizontally-rotating carrier journaled on said arbor and arranged to swing over said conveyer and
15 pan, an annular row of vertical spindles journaled in said carrier and provided with fluxing-brushes, a stationary gear-wheel secured to the arbor and meshing with pinions on the upper ends of the spindles, lifting-levers
20 loosely connected with the spindles and piv-

oted with their inner ends on the carrier, and a guide-ring connected with the arbor and provided with a bearing-surface on which the outer ends of said levers are supported, said bearing-surface having depressed portions 25 over the conveyer and pan and elevated portions between the depressed portions, substantially as set forth.

15. The combination with the spindle provided with a laterally-projecting arm, of a 30 clamp pivotally secured to said arm by a transverse screw and provided with a recessed jaw and a brush clamped between said jaw and arm, substantially as set forth.

Witness my hand this 28th day of July, 35 1896.

MILLARD J. HAWKINS.

Witnesses:

THEO. L. POPP,
PHILIP H. GREENE.