V. CAMPBELL.

CAN CAPPING MACHINE.

APPLICATION FILED SEPT. 13, 1907.

912,539.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.

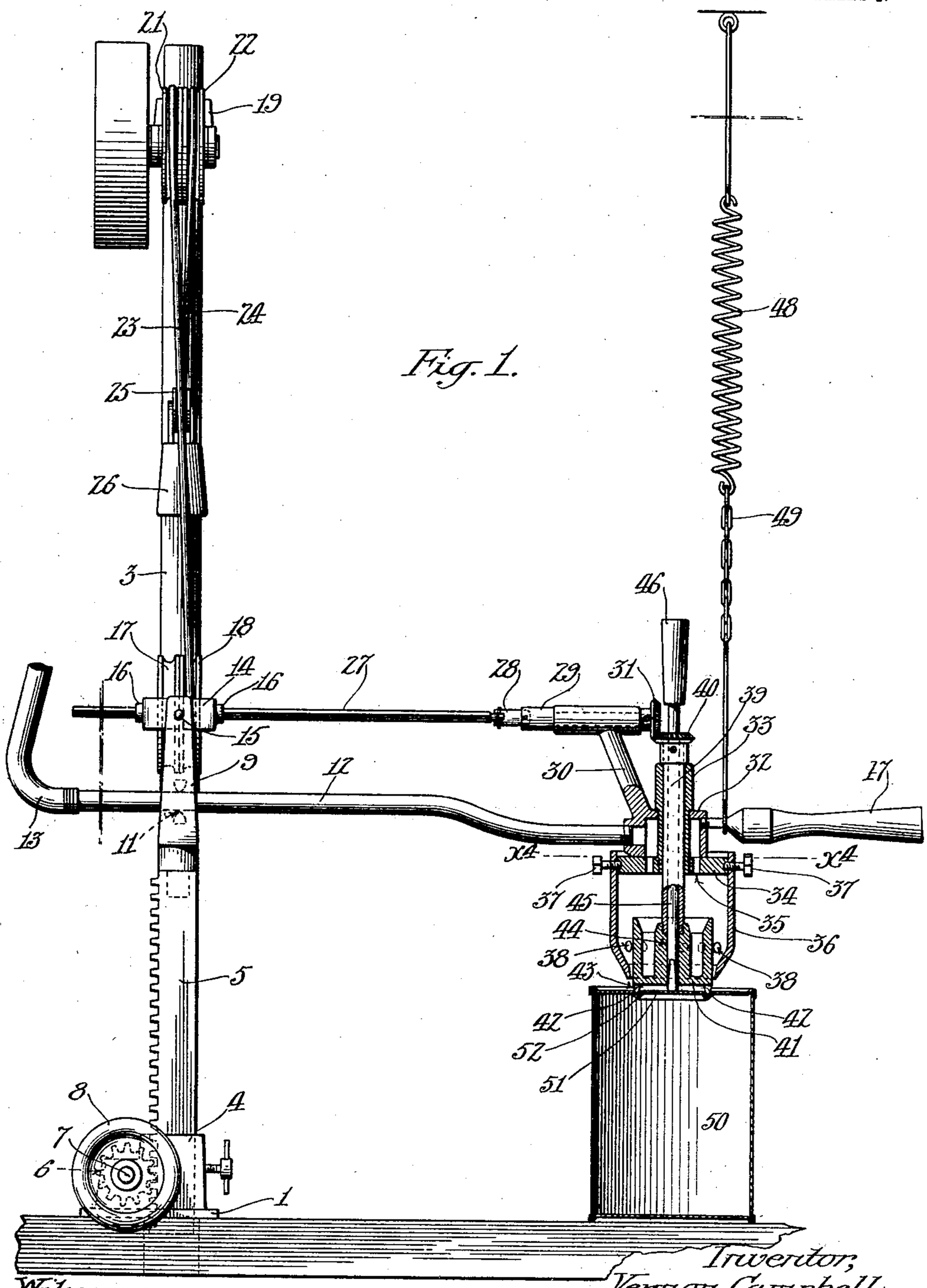

Fig. 1.

Witnesses:
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Louis W. Gray

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2 SHEETS—SHEET 2.

Fig. 2.

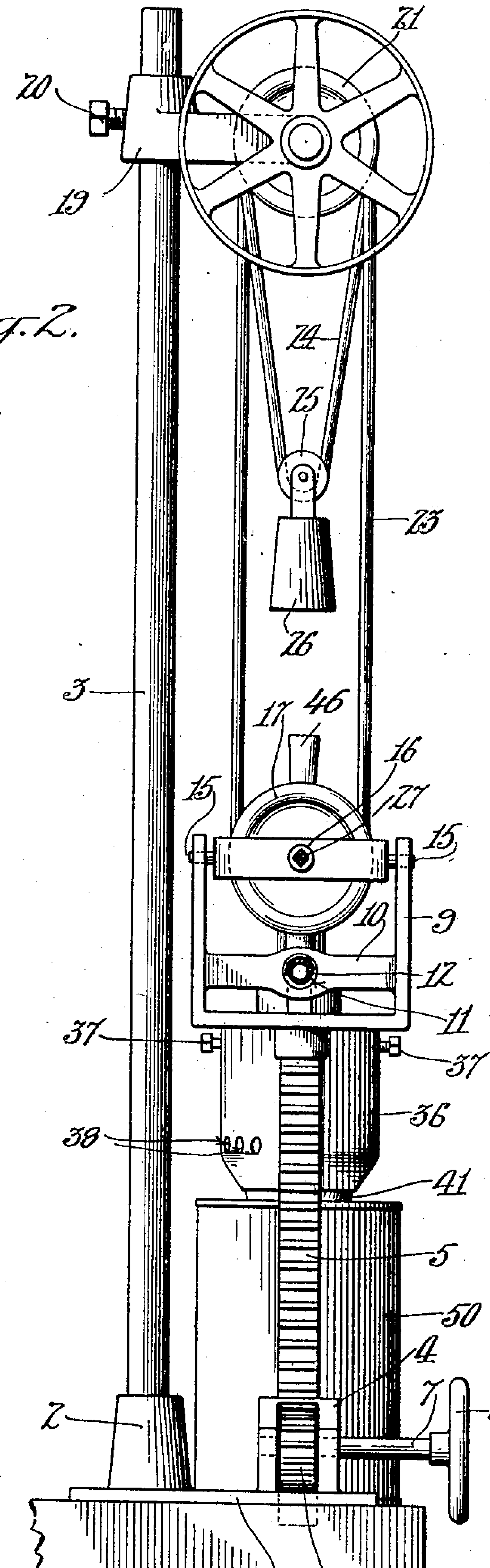


Fig. 3.

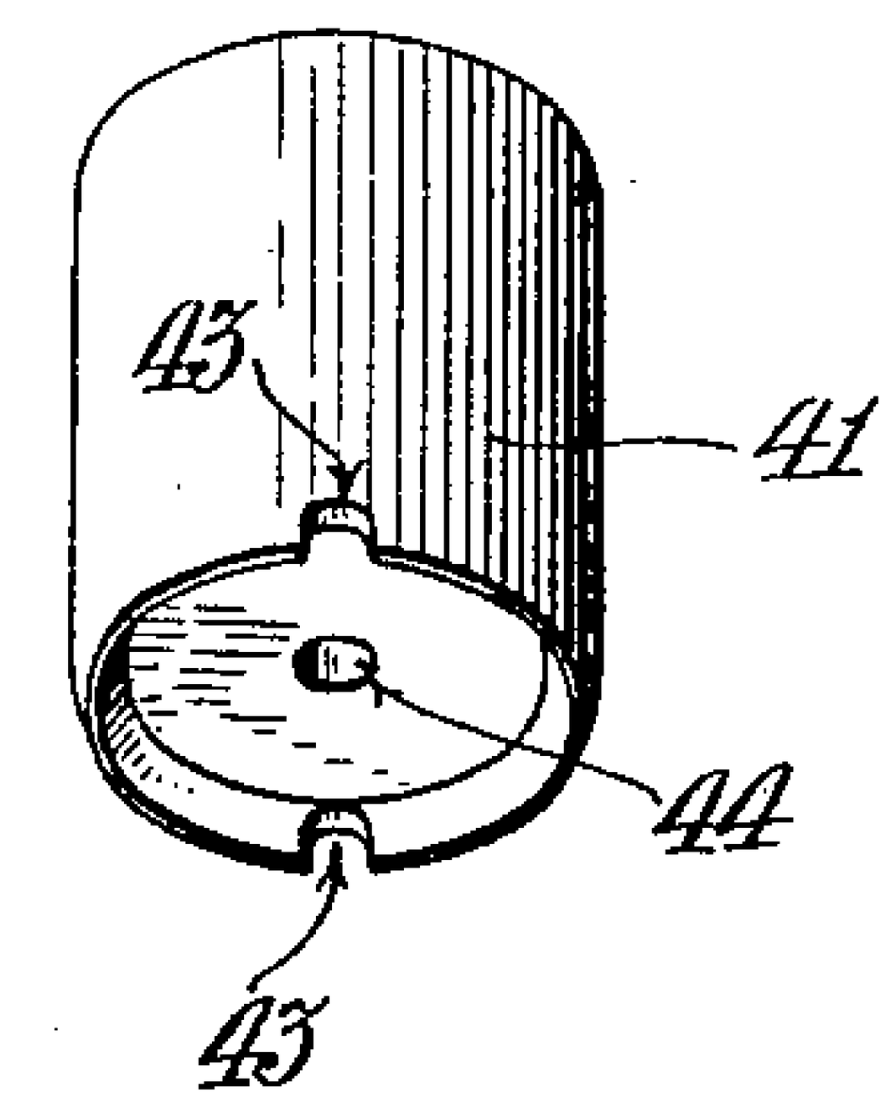
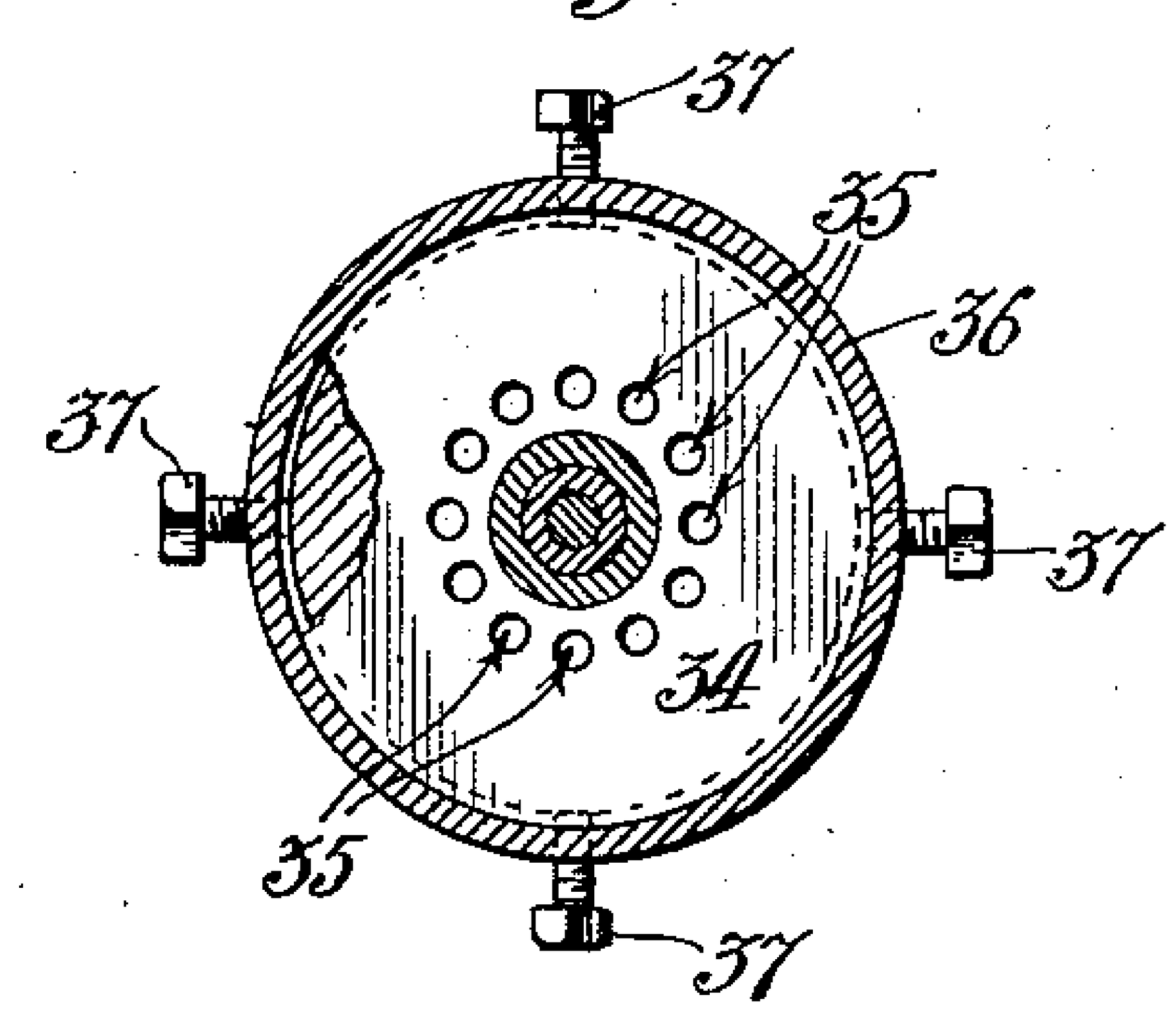


Fig. 4.



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UNITED STATES PATENT OFFICE.

VERNON CAMPBELL, OF ALTADENA, CALIFORNIA.

CAN-CAPPING MACHINE.

No. 912,539. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed September 13, 1907. Serial No. 392,812.

To all whom it may concern:

Be it known that I, VERNON CAMPBELL, a citizen of the United States, residing at Altadena, in the county of Los Angeles and State of California, have invented a new and useful Can-Capping Machine, of which the following is a specification.

This invention relates to a can capping machine.

In the present invention the cans are assembled on the bench and need not be in any particular position nor be assorted as to size, height, etc., as must be done when using automatic machines having a gang of capping steels, for the capping steel can be readily applied to the cap of each can and brought into exact register for the perfect soldering thereof even though the cans are of different heights and although they may be tipped slightly one way or another. As the device utilizes a single capping steel it is possible to keep it at the proper heat and in working condition and thereby avoid the loss of time and material in recapping defective cans caused by steels that are out of order or are not properly heated, as frequently happens where a plurality of steels are used, as in automatic machines. Even where automatic cappers are employed, this machine is of great value in following up the automatic machine to patch caps which have been imperfectly soldered by the automatic machine, to fill leaks, etc. Inasmuch as the cans do not have to be absolutely level in order to be perfectly capped with this machine special iron trays are not required.

The accompanying drawings illustrate the invention, and referring thereto, Figure 1 is a side elevation of the invention, showing the capping steel and adjacent parts in vertical cross section with the capping steel applied to the cap of a can. Fig. 2 is a rear elevation of the device. Fig. 3 is a perspective view of the capping steel. Fig. 4 is a cross section on line x^4—x^4 Fig. 1.

1 designates a table plate provided with a socket 2 in which is supported a vertical standard 3. The table plate 1 is also formed with a box 4 in which a rack 5 is mounted to slide vertically. A pinion 6 meshes with the rack 5 and is mounted on a shaft 7 journaled in the box 4, shaft 7 having a hand wheel 8 for turning the same to adjust the vertical elevation of the rack 5. Swiveled on the upper end of the rack 5 is a yoke 9 having a web 10 perforated at 11 to permit the passage of a gas pipe 12, the edges of the perforation 11 being chamfered on both sides, as indicated by dotted lines in Fig. 1, to permit the gas pipe 12 to freely rock in all directions in the web 10. 13 is a flexible supply tube for admitting air and gas mixture to the gas pipe 12. Revolubly mounted in the arms of the yoke 9 is a loop 14 having trunnions 15 which are mounted in the arms of the yoke 9. Journaled on a shaft 16, which extends transversely through the loop 14, are grooved pulleys 17 and 18, the pulley 17 being loose on shaft 16 and pulley 18 being tight thereon. The shaft 16 is hollow and the bore thereof is square, as shown.

Slidably mounted on the standard 3 is a bracket 19 adjustably secured to the standard by a set screw 20, and journaled on the bracket 19 are pulleys 21 and 22. The belt 23 passes around one of the pulleys 17 or 18 and over both pulleys 21 and 22 and has a depending loop 24 in which hangs a tightener pulley 25 provided with a weight 26 by means of which the belt 23 is held tight, but is permitted the necessary extension so that it may be flipped by the hand from either pulley 17 or 18 or vice versa to start or stop revolution of shaft 16. Slidable in the hollow shaft 16 is a square spindle 27 which is connected by a universal joint 28 with a shaft 29 mounted in a bracket 30, the end of shaft 29 carrying a bevel gear 31. By reason of the yoke 9 being swiveled on the rack 5, and by reason of the loop 14 being pivoted to the yoke 9, the spindle 27 is permitted a universal movement with respect to the rack 5, and by reason of the sliding engagement of spindle 27 with shaft 16 the spindle may be moved in and out to carry the bracket 30 in all directions.

The bracket 30 carries the capping devices proper, being provided at its lower end with a hollow box 32 in which is arranged a vertical sleeve 33, the lower end of the sleeve being threaded. Screwed to the lower end of sleeve 33 is a disk 34 having several perforations 35. The disk 34 constitutes a fire-plate and depending from disk 34 is a bowl shaped fire-box 36 which is supported by means of set screws 37 which pass therethrough into a peripheral groove in the edge of the fire-plate 34. The lower end of the fire-box 36 is contracted and is provided with a series of air holes 38 which facilitate combustion. Extending through the sleeve 33 is a hollow shaft 39, the upper

end of which has a bevel gear 40 which meshes with the bevel gear 31. Screwed to the lower end of the shaft 39 is a capping steel 41, shown in detail in Fig. 3, and having a lower flange 42 which is provided with a pair of notches 43. The capping steel is also provided with a central bore 44 through which a cap holding rod 45 passes loosely, the upper end of the rod 45 having a handle 46. The capping steel 41 projects slightly below the lower end of the fire-box 36 but lies largely within the fire-box so that it is kept heated by the fire within the fire-box. Projecting from the box 32 is a handle 47, and a suspension spring 48 is connected by a link 49 with the handle 47, which spring is secured at its upper end to the ceiling or other suitable place and carries the weight of the capping steel and associated appliances.

50 designates a can having a cap 51. The cap 51 is to be soldered to the grooved rim 52 of the top of the can 50, and the flange 42 of the capping steel is adapted to fit in this groove. The capping steel being heated by the fire within the fire-box 36 is brought into position by means of the handle 47 against the cap to be soldered and the cap to be soldered is held securely seated by pressing down the rod 45 against the cap 51. The capping steel 41 is revolved through the medium of the shaft 39, gears 31 and 40, shaft 29, spindle 27 and pulleys 18 and 22, and by applying solder at the rim of the capping steel, adjacent the groove 52 of the cap 51, the head of the capping steel melts the solder, and almost instantaneously upon touching the solder to the steel the revolving steel carries a string of melted solder around the groove 52 which instantly solders the cap to the can. The cans may be arranged in rows, or promiscuously, on top of the bench and as one can is capped the handle 47 is manipulated to apply the capping steel to the next can and so on. The flexible connections between the capping device proper and standards permit of the universal adjustment of the capping steel, so that the capping steel may also be brought into perfect register and into perfect operative union with the cap to be soldered whether the can stands perfectly level or not, and thus the operation of capping may proceed with great despatch.

I have found in practice that with this device the average person can cap fifteen hundred cans per hour and expert operators can cap two thousand cans an hour.

What I claim is:—

1. In a can capping machine, a capping steel, heating means therefor, means for rotating the capping steel, and means for supporting the steel to permit of its being adjusted vertically, horizontally, and angularly to the vertical.

2. In a can capping machine, a rotating capping steel, yielding means for supporting and flexible means for actuating the same allowing it universal adjustment vertically, horizontally, and angularly to the vertical, whereby perfect operative union of the capping steel with a can cap is secured.

3. In a can capping machine, a rotating capping steel, yielding means for supporting and flexible means for actuating the same allowing it universal adjustment vertically, horizontally, and angularly to the vertical, whereby perfect operative union of the capping steel with a can cap is secured, and manually operated means extending through the capping steel for holding the cap of the can in position on the can.

4. In a can capping machine, a rotating capping steel, yielding means for supporting and flexible means for actuating the same allowing it universal adjustment and bodily adjustment, whereby perfect operative union of the capping steel with a can cap is secured, manually operated means extending through the capping steel for holding the cap of the can in position on the can, and manually operated means for manipulating the capping steel independently of the means for holding the steel.

5. In a can capping machine, a pivoted loop, a shaft journaled therein, a pulley on the shaft, a spindle slidable longitudinally of the shaft and rotating therewith, a swiveled yoke supporting said loop, vertically adjustable means supporting the yoke, a bracket, a fire-box connected to the bracket, a capping steel mounted to rotate in the fire-box and projecting therefrom, and gearing supported by the bracket intermediate the capping steel and spindle for driving the capping steel from the spindle.

6. In a can capping machine, a pivoted loop, a shaft journaled therein, a pulley on the shaft, a spindle slidable longitudinally of the shaft and rotating therewith, a swiveled yoke supporting said loop, vertically adjustable means supporting the yoke, a bracket, a fire-box connected to the bracket, a capping steel mounted to rotate in the fire-box and projecting therefrom, gearing supported by the bracket intermediate the capping steel and spindle for driving the capping steel from the spindle, a gas pipe for conducting fuel to the fire-box, one end of said gas pipe having universal connection with said yoke.

7. In a can capping machine, a pivoted loop, a shaft journaled therein, a pulley on the shaft, a spindle slidable longitudinally of the shaft and rotating therewith, a swiveled yoke supporting said loop, vertically adjustable means supporting the yoke, a bracket, a fire-box connected to the bracket, a capping steel mounted to rotate in the fire-box and projecting therefrom, gearing supported by the bracket intermediate the capping steel

and spindle for driving the capping steel from the spindle, a gas pipe for conducting fuel to the fire-box, one end of said gas pipe having universal connection with said yoke, and a spring suspending said fire-box, capping steel and gearing.

8. In a can capping machine, a pivoted loop, a shaft journaled therein, a pulley on the shaft, a spindle slidable longitudinally of the shaft and rotating therewith, a swiveled yoke supporting said loop, vertically adjustable means supporting the yoke, a bracket, a fire-box connected to the bracket, a capping steel mounted to rotate in the fire-box and projecting therefrom, gearing supported by the bracket intermediate the capping steel and spindle for driving the capping steel from the spindle, a standard adjacent said yoke, a bracket adjustable on the standard, tight and loose pulleys journaled in the bracket, a belt extending over the latter pulleys and around one of the first named and having a depending loop, and a weighted tightening pulley resting in said loop.

9. In a can capping machine, a bracket, a fire-box supported thereby, a sleeve in said bracket, a hollow shaft journaled in the sleeve, a capping steel fastened to the lower end of said hollow shaft, a bevel gear on the upper end of the hollow shaft, a horizontal shaft in said bracket having a bevel gear meshing with the first named bevel gear, a spindle having a universal connection with said horizontal shaft, a fuel pipe supported on means allowing it universal movement for conducting fuel to the fire-box, and a cap holding rod extending loosely through the first named bevel gear and hollow shaft, and through the capping steel.

10. In a can capping machine, a bracket, a fire-box supported thereby, a sleeve in said bracket, a hollow shaft journaled in the sleeve, a capping steel fastened to the lower end of said hollow shaft, a bevel gear on the upper end of the hollow shaft, a horizontal shaft in said bracket having a bevel gear meshing with the first named bevel gear, a spindle having a universal connection with said horizontal shaft, a fuel pipe supported on means allowing it universal movement for conducting fuel to the fire-box, a cap holding rod extending loosely through the first named bevel gear and hollow shaft, and through the capping steel, a handle on the upper end of the cap holding rod, a handle projecting laterally from the bracket, and yielding means for carrying the weight of the capping steel, fire-box and associated devices.

11. In a can capping machine, a table plate, a rack vertically slidable therein, a pinion meshing with the rack and journaled in the table plate, a hand wheel for operating said pinion, a yoke swiveled on the upper end of said rack, a loop with trunnions pivoted in the yoke, a hollow shaft journaled in the loop, tight and loose pulleys on the shaft, a spindle slidable through the hollow shaft, a standard parallel with the rack, a bracket vertically adjustable on the standard, tight and loose pulleys mounted on said bracket, a belt extending over the latter pulleys and having a depending loop, a weighted tightener pulley hanging in the belt loop, the yoke having a perforated web, a gas pipe loosely passing through the web, a fire-box, a perforated fire-plate at the upper end of the fire-box, a bracket having a box at its lower end to which said fire-plate is attached, said gas pipe extending to the box, a shaft journaled in said bracket and having a universal connection with said spindle, a sleeve extending vertically through said box and screwed to the fire-plate, a hollow shaft journaled in the sleeve, a capping steel screwed to the hollow shaft, bevel gears on the two respective latter shafts meshing together, a cap holding rod extending loosely through the vertical hollow shaft, a handle on the end of said rod, a handle projecting from said box, and a coil spring connected with the latter handle for supporting the weight of the capping steel, fire-box and associated devices.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 30th day of July, 1907.

VERNON CAMPBELL.

In presence of—
GEORGE T. HACKLEY,
FRANK L. A. GRAHAM.