(No Model.)

4 Sheets—Sheet 1.

W. D. BROOKS.

Can Making Machine.

No. 234,950. Patented Nov. 30, 1880.

Fig. 1.

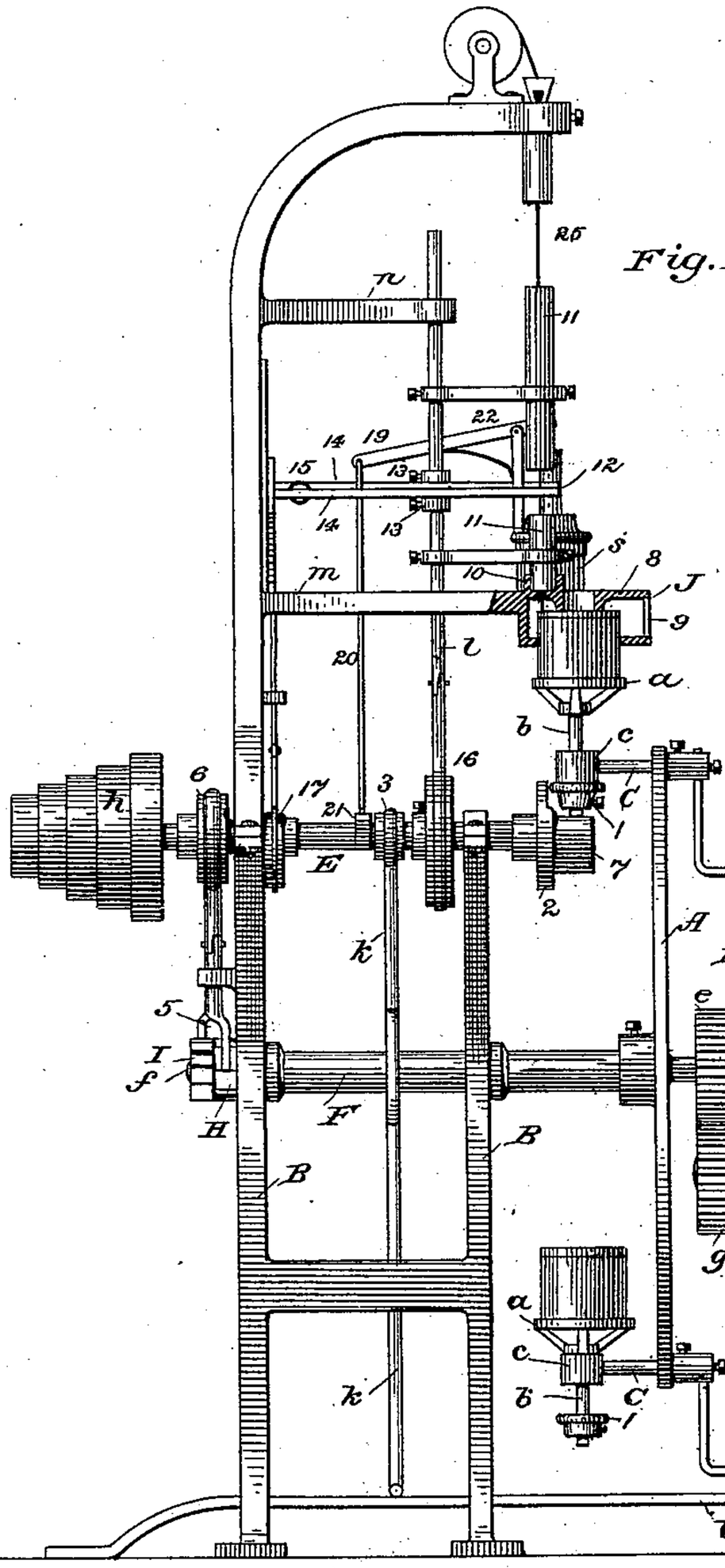
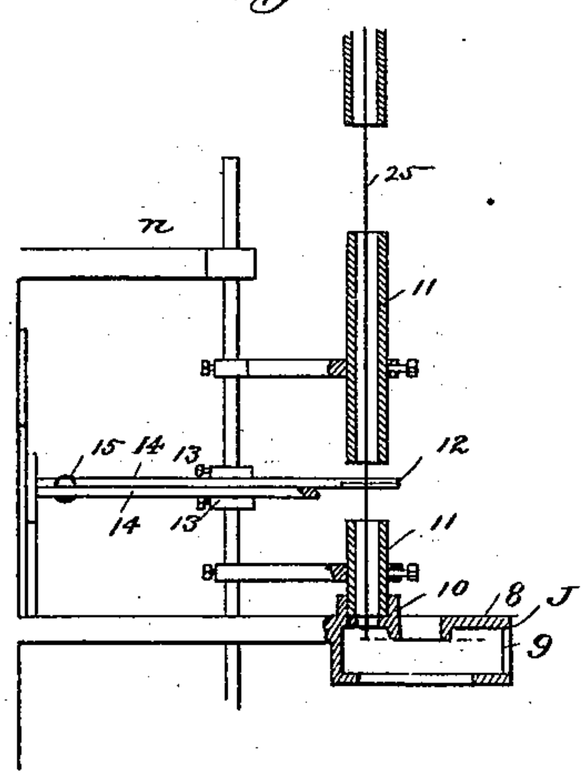


Fig. 13.



Attest:

R. F. Barnes

L. W. Seely

Inventor:

William D. Brooks

by Elec. Dean

Atty

(No Model.) 4 Sheets—Sheet 2.

W. D. BROOKS.

Can Making Machine.

No. 234,950. Patented Nov. 30, 1880.

Fig. 2.

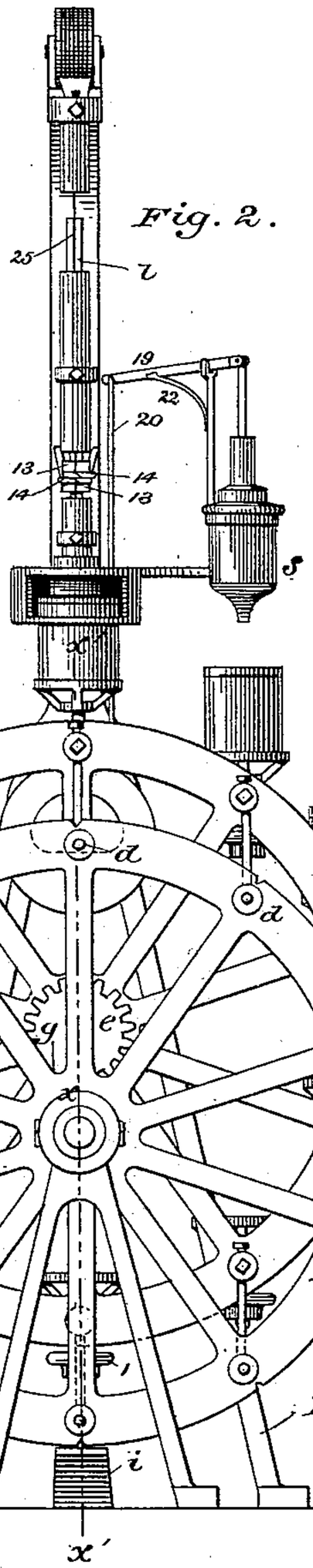


Fig. 3.

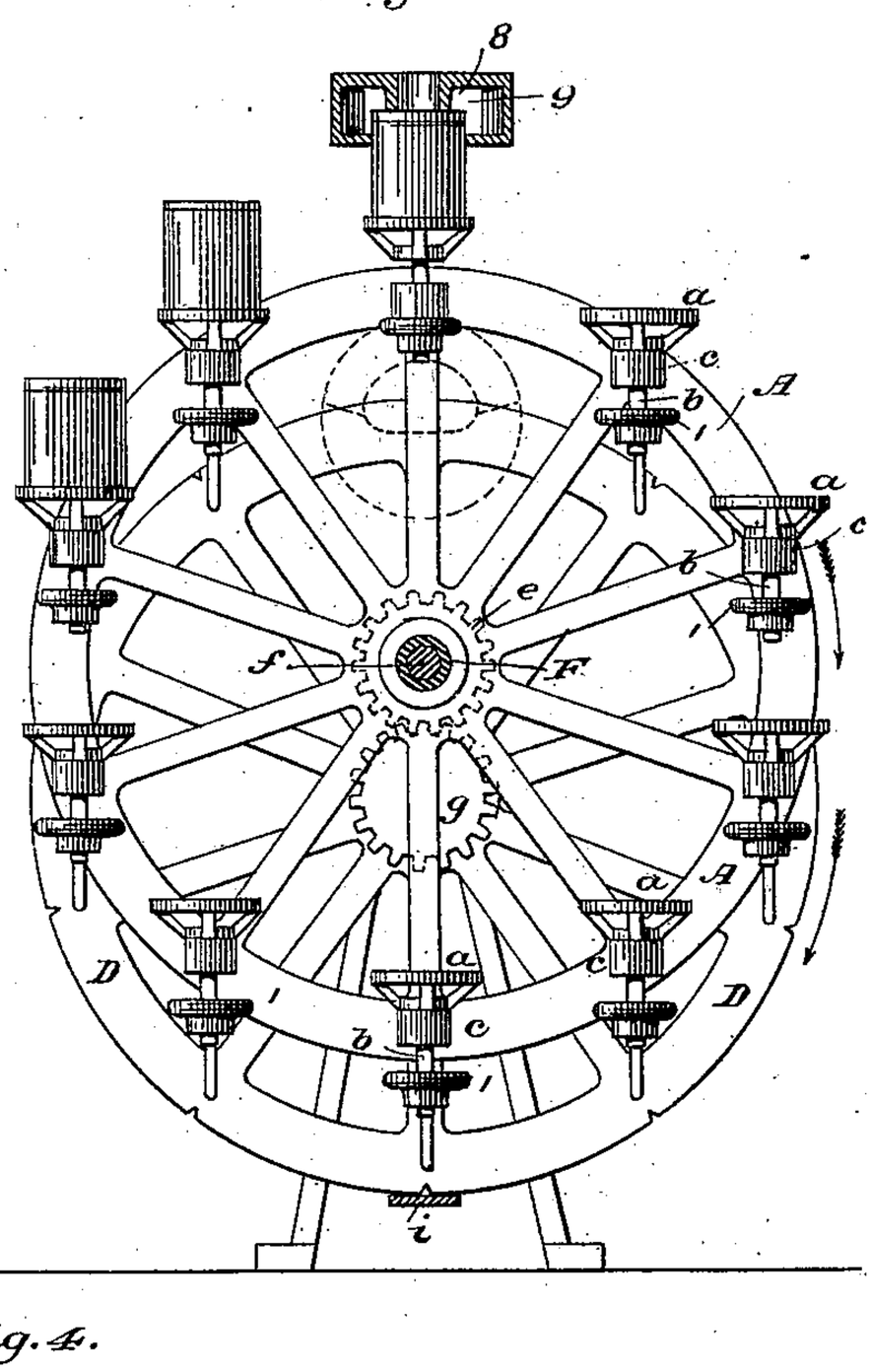
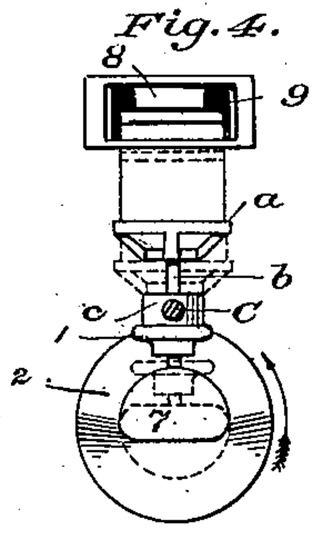


Fig. 4.



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(No Model.)

4 Sheets—Sheet 3.

W. D. BROOKS.
Can Making Machine.

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Fig. 5.

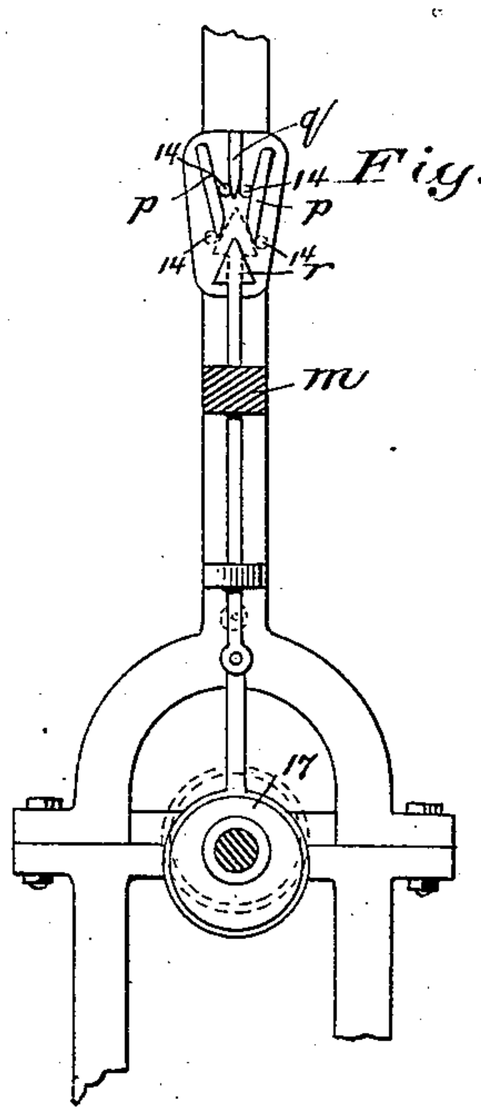


Fig. 6.

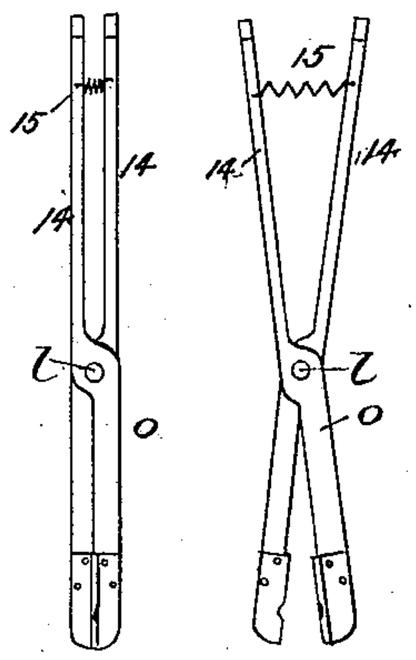


Fig. 7.

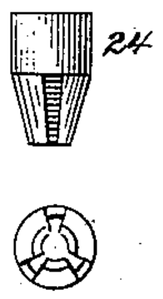


Fig. 8.

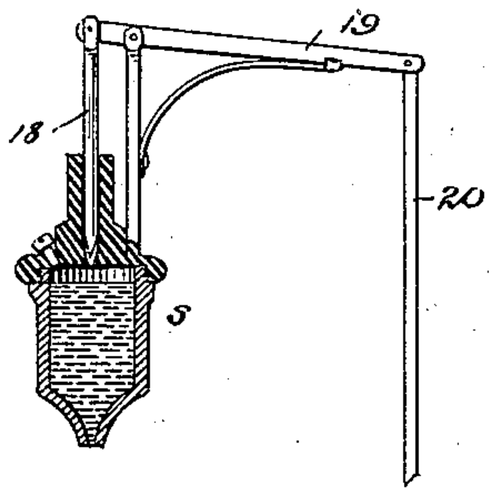


Fig. 9.

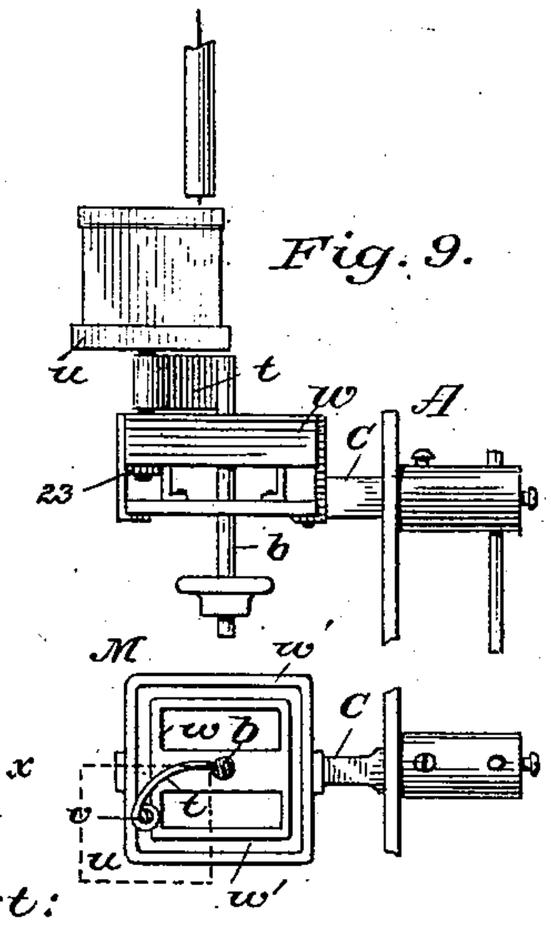
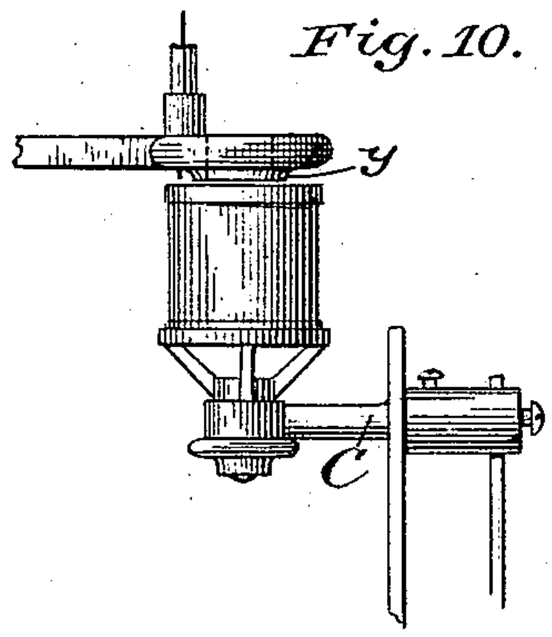


Fig. 10.



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Attorney.

(No Model.) 4 Sheets—Sheet 4.

W. D. BROOKS.

Can Making Machine.

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Fig. 11.

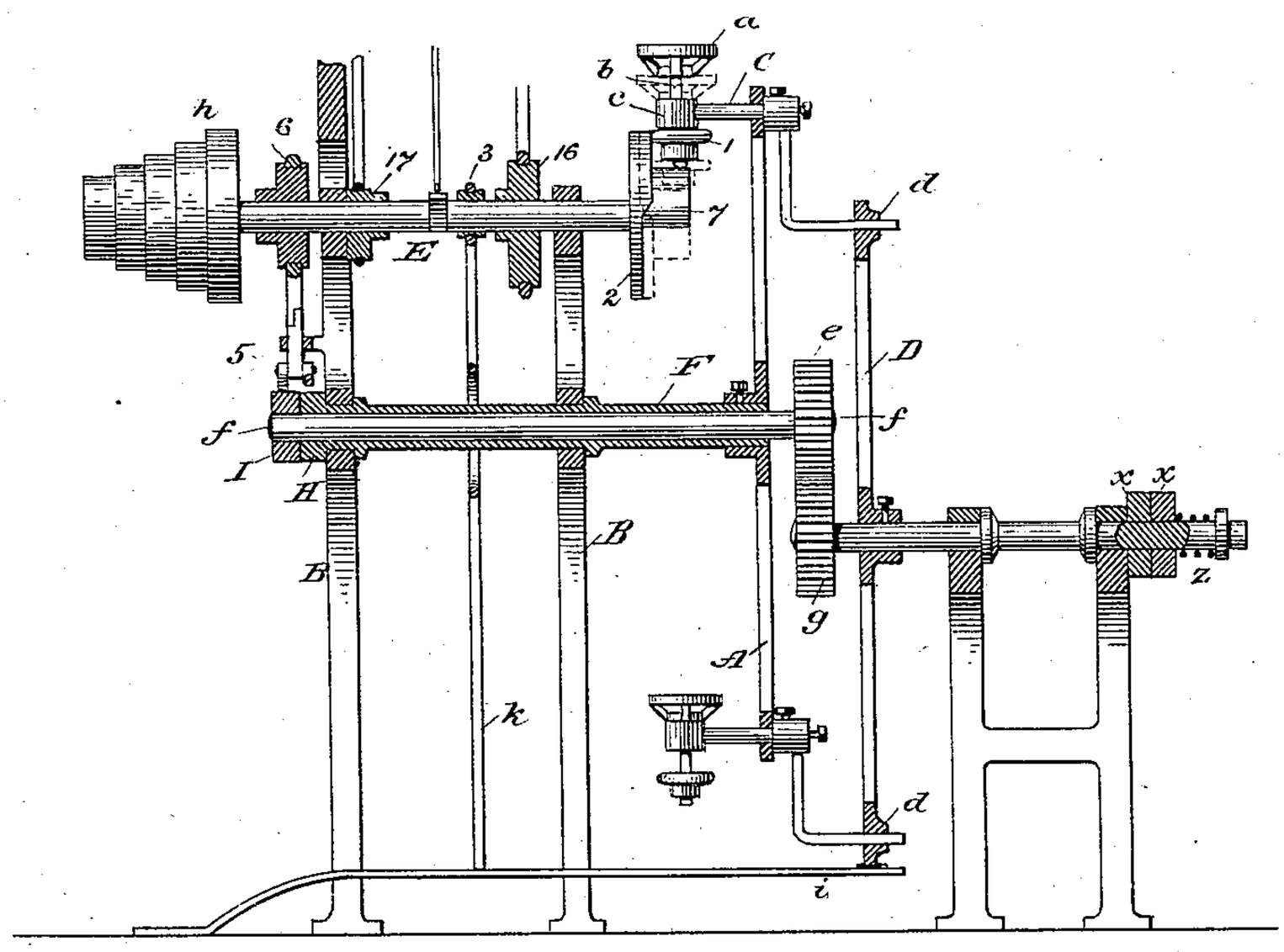
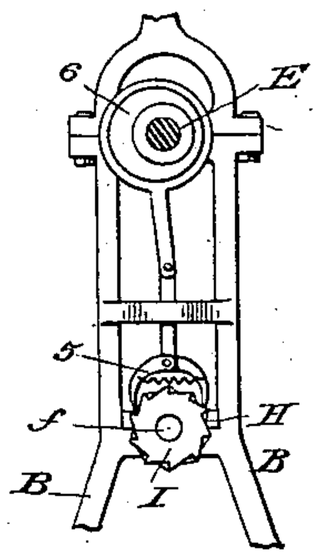


Fig. 12.



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L. C. Sully

Inventor:

William D. Brooks

by Ellis & Spear

Atty.

UNITED STATES PATENT OFFICE.

WILLIAM D. BROOKS, OF BALTIMORE, MARYLAND, ASSIGNOR TO HIMSELF AND D. D. MALLORY, OF SAME PLACE.

CAN-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 234,950, dated November 30, 1880.

Application filed March 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. BROOKS, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and useful Improvement in Machines for Making Cans; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to machines for soldering cans of that class in which the cans are held in place by a series of holders, and are brought in succession to another part of the apparatus, where they are soldered.

It consists, first, of an improved device for supporting the cans and moving them step by step, in order to bring them successively to the soldering device; second, in an improved construction and arrangement of driving mechanism, by which motion is imparted to the device which supports the cans; third, in improved mechanism for cutting and feeding the solder; fourth, in devices for applying the flux to the can; and, fifth, in certain details of construction relating to all the leading features, and in part serving to render their operation easy and effective in one machine.

The general object of the invention is to make the apparatus more compact, simple, and effective.

In the drawings hereunto attached, Figure 1 is a side elevation; Fig. 2, an end view; Fig. 3, a separate view of a can-carrying device; Fig. 4, detail view of devices for elevating and rotating the can. Fig. 5 shows the guides for the cutting apparatus; Fig. 6, a detail of the cutting apparatus; Fig. 7, a view of the frictional plug to hold the solder. Fig. 8 shows the flux-cap in section; Fig. 9, the holder for square cans; Fig. 10, a modification of devices for directing flame to the can; Fig. 11, a section on the line *x x* of Fig. 2; Fig. 12, a detail view of the double ratchet-wheel, and Fig. 13 a sectional view of the feeding-tubes.

In these drawings is represented a wheel, A, mounted upon the end of a horizontal hollow shaft, F, which has its bearings in the frame B B, and is driven by power applied by pawl and ratchet at the opposite end.

Near the periphery of this wheel are disks *a a*, fixed on the end of spindles *b b*, which spindles are supported and permitted to turn in eyes *c* in the ends of the shafts C. These shafts turn in bearings in the wheel A, so that as the wheel revolves the can-supporting disks *a a* may always maintain the same horizontal position.

The shafts C are provided on the rear side of the wheel A with cranks, the wrist-pins of which work in holes in a controlling-wheel, D. This wheel is of the same size as the wheel A, and the holes *d*, which receive the wrist-pins, correspond exactly in situation with those in the wheel A in which the shafts C turn.

The shaft of the wheel D rests in a bearing in the same vertical plane with the shaft of the wheel A, but at a distance below said shaft equal to the length of the webs of the cranks.

The wheel D, steadied by friction-plates *x x* and spring *z*, is driven by a small gear-wheel, *e*, on the end of the shaft *f*, which gear-wheel meshes into a pinion, *g*, axially fixed on the inner face of the wheel D. The shaft *f* passes through the hollow shaft of the wheel A and is driven by a pawl and ratchet, in the same manner as the hollow shaft F.

The relation of the described parts to each other is such that, both wheels being driven at the same speed and in the same direction, the spindles which carry the disks for supporting the cans are kept always in a vertical position in their revolution around the axis of the wheel which carries them.

The spindles *b* are each provided with a friction-wheel, 1, which, when the can is in position to be soldered, bears against the face of another friction-wheel, 2, upon the main driving-shaft E. This driving-shaft is supported in the frame B directly over the shaft F. Represented at *h* upon this shaft is a pulley adapted to receive a band, through which motion is imparted to the shaft E, and thence to the whole apparatus.

The periphery of the wheel D is notched at proper points adapted to receive a catch, *i*, and the notches are so located that when the catch is in place one of the disks *a* is held in line with the can-soldering devices, so as to

operate properly in connection therewith. The catch *i* is thrown upward into the notch by a spring, or by its own elasticity, and is pressed down out of connection at the proper time to permit the wheel A to start by means of a rod, *k*, operated by an eccentric, 3, on the shaft E.

The ratchet-wheel H upon the shaft F and the ratchet-wheel I on the shaft *f* are both driven by a double pawl, 5, but in opposite directions, operated from an eccentric, 6, also on the shaft E. This double pawl is arranged to impart motion to the wheels A and D through their respective shafts as soon as the catch *i* releases the wheel D.

The face of the friction-wheel 2 upon the end of the shaft E is cut away in part, so that only a part of it may bear against the edge of the wheel on the spindle *b*. The arrangement of the part cut away is such that only a complete revolution is imparted to the spindle *b*, and thereby to the can, and this revolution begins as soon as the can has reached its place beneath the heating-chamber. On the outer surface of this wheel 2 is a cam, 7, projecting into the path of the spindle *b*, which extends a short distance below the friction-wheel fixed thereon, said cam being so arranged in relation to the friction-wheel, to which it is attached, as to lift the spindle, with its disk, and hold it in an elevated position while the can is rotated. This elevation of the can-carrying disk causes the can to enter the flame-chamber J, where the solder is applied. This flame-chamber (represented in Fig. 1) is cylindrical and shallow, with an opening in the bottom sufficiently large to admit the can and allow it to rotate freely. It is slightly enlarged within to permit the flame to play around the sides of the can near the end, and provided with a hollow stud, 8, opening through the top, and extending inward far enough to afford a rest for the top of the can and to keep the same at a distance below the inner surface of the flame-chamber, to allow the flame to pass around the edge of the top of the can as well as around the side. The flame-chamber has an opening, 9, on the front, adapted to admit the flame. On the top a short tube, 10, is fixed in line with, and is adapted to receive, the lower end of the guide-tube 11, which conducts the solder to the flame-chamber. This guide-tube is carried upon a rod, *l*, adapted to slide vertically in arms *m n* of the main frame. A section of the guide-tube is cut out at 12, to leave space for the operation of the cutting apparatus *o*. This cutting apparatus consists, essentially, of a pair of shears pivoted on the rod *l* between two nuts, 13 13. Each blade of the shears is provided with an arm, 14 14, Fig. 6, extending to the rear, and connected by a spring, 15, adapted to draw them together.

The rod *l*, which carries the shears as well as the guide-tubes, is moved vertically at the proper moment by means of an eccentric, 16, on the shaft E, to which it is connected by a strap and pitman. In the upward movement of this rod *l* the arms 14 14 of the shears are carried outside of spreading-guides *p p*, Fig. 5, by means of which the shears are opened. As soon as the arms 14 14 pass the top of the guides *p p* they are drawn together by the spring and gripe the solder-wire between them. They are then carried down by the descent of the rod *l* between these guides *p* and a central guide, *q*. Having passed the lower end of guide *q*, the converging guides *p* force the shear-blades together and separate a small length of wire, which rests on the heated can in the flame-chamber. The shear-blades, continuing their descent, are turned outward by a switch, *r*, which carries them outside the edge of the guides *p p*. At this instant, and a little before the upward movement of the rod commences, the switch *r* is lifted so as to fill the V-shaped space between the lower inclined ends of the guides *p p*, so that the arms of the shears are compelled to pass outside as they ascend. The switch *r* is lifted by an eccentric, 17, on the shaft E. The solder-wire 25 is fed from a bobbin through a fixed section of guide-tube in the top of the frame, and thence passes through the movable guide-tubes, heretofore described, into the flame-chamber. Any suitable tension device (not shown) can be provided to prevent any backward movement of the wire. The piece of solder cut from the wire is brought in contact with the heated and rotating can, and as it melts is applied to the circumference of the can, the movement of the parts being so timed that the solder shall be cut and fed to the can as soon as that has been brought into place by the movement of the wheel A. Upon the arm *m*, which supports the flame-chamber, is fixed also an arm carrying a cup, *s*, Fig. 8, adapted to hold any kind of flux. This cup is provided with a valve on the end of the rod 18. The discharge-opening of the cup *s* is in line with some part of the groove or depression in the top of the can as the can is carried along by the revolution of the wheel A on its way to the flame-chamber. The valve on the end of the rod 18 closes the top of the flux-cup, so that no air can enter until it is lifted. It is lifted at the instant when the can passes under the cup by means of a lever, 19, arm 20, and cam 21 on the shaft E. A spring, 22, returns the valve instantly to its place, but it is lifted long enough to allow a drop to escape.

The disk which is shown is adapted to carry round cans, and is not new; but in order to render the machine complete for the different kinds of work required of it, it is necessary that some apparatus should be provided for supporting square cans and for presenting them on all sides to the action of the flame.

Such a device I have shown in Fig. 9. It consists of a square frame, M, fixed upon the shaft C. The spindle *b* passes through the

center of this frame, and has fixed upon its upper end a broad thin spring, *t*, which supports at its outer end the plate *u*, which carries the can. This plate is attached to the end of the spring by means of a small post, *v*, which extends below the bar *w*, and is provided with a nut, 23, to keep it from rising. The post *v* is square in that part which travels in the rectangular track *w'*, and is held in place and guided within this track, the supporting-spring yielding sufficiently to allow it to pass around freely with the rotation of the spindle *b*. The square post moves accurately in the track *w'*, and carries and turns the can with precision. The post, being fitted exactly in the guideways, does not turn therein, and the upper part, being rounded, turns freely in its round bearings in the end of the spring. The flame being applied at any given point, (as, for example, at *x*,) by the revolution of the spindle *b* all the sides of the can (represented in lower part of Fig. 9 in dotted lines) are brought in succession into line with this flame, whether it be directed transversely or upward. This device for supporting square cans is to be mounted upon shafts C, and is carried in the same manner as the support for round cans, heretofore described. That part of the support immediately adapted to receive the can, in both cases, is made with a socket, into which the can is placed, and which is adapted to hold it securely.

The movement of the cans on the wheel A is such that they are not liable to be disturbed, and they do not need to be held down by any pressure above them, as is the case with the revolving tables, but rest steadily in the recess in the supporting-plate.

An improvement in the device for directing the flame upon the can is shown in Fig. 10. It consists of a solid disk, cut away on its lower face, so as to leave a boss, *y*, and, when the can is in place, an annular space between the disk and top of the can. The flame is therefore directed against the top of the can, near the edge, and the central part prevented from scorching. A hole in the center, through the boss, allows the air to escape from the top of the can. With this device the lifting device (shown at 7, Fig. 1) is not needed, as the can passes thereby under the disk and the flame is directed around it.

A hollow plug, 24, is shown in Fig. 7, conical and split at its lower end, for holding the solder. It is inserted in the upper end of the fixed part of the guide-tube. The solder-wire passes through it and is held by the split lower end, compressed by the tube in which it is inserted.

Having thus described my invention, what I claim is—

1. In a can-soldering machine, the carrying-wheel A, in combination with the can-holder, the shafts C, and the controlling-wheel, the said shafts being connected to the controlling-wheel, as and for the purpose set forth.

2. The combination of the shafts C, having a crank and wrist pin, with the can-supporting spindle *b*, disks *a*, and wheels A and D, as set forth.

3. The combination of the wheels A and D and the can-supporting devices with the hollow shaft F, the shaft *f*, the connecting-gearing, and the pawl and ratchet, as set forth.

4. In combination with the shaft E, the cam-faced friction-wheel 2, the cam 7, the friction-wheel 1, and means for successively bringing said friction-wheel 1 in contact with 7 and 2, as and for the purposes set forth.

5. In combination with the wheels A D, provided with can-holding devices, the spring-catch *i*, the rod *k*, and the cam 3 on the shaft E.

6. The rod *l*, carrying the sections of guide-tube 11 and the cutting apparatus, in combination with the cam 16 on the shaft E and the connecting devices, as set forth.

7. The combination, with the arms 14 14 of the cutting apparatus, connected by a spring, of the guides *p p* and the switch *r*, the parts being adapted to operate as set forth.

8. The combination of the flame chamber, and devices for supporting and revolving the can therein, with the flux-cup *s*, the valve 18, the cam 21 on shaft E, and suitable connecting mechanism for transmitting motion to the valve.

9. The square can-support consisting of the square frame having the track *w'*, the spindle *b*, the spring *t*, carrying the can-holder, and the guide-post, the parts being constructed and operating in the manner set forth.

10. The flame-directing device shown in Fig. 10, consisting of the disk having the hollow boss, and adapted to leave an annular space around the top of the can, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM D. BROOKS.

Witnesses:

L. WARREN SEELY,

FRANK MIDDLETON.