(No Model.)

5 Sheets—Sheet 1.

W. D. BROOKS.

CAN SOLDERING MACHINE.

No. 256,098. Patented Apr. 4, 1882.

Fig. 1.

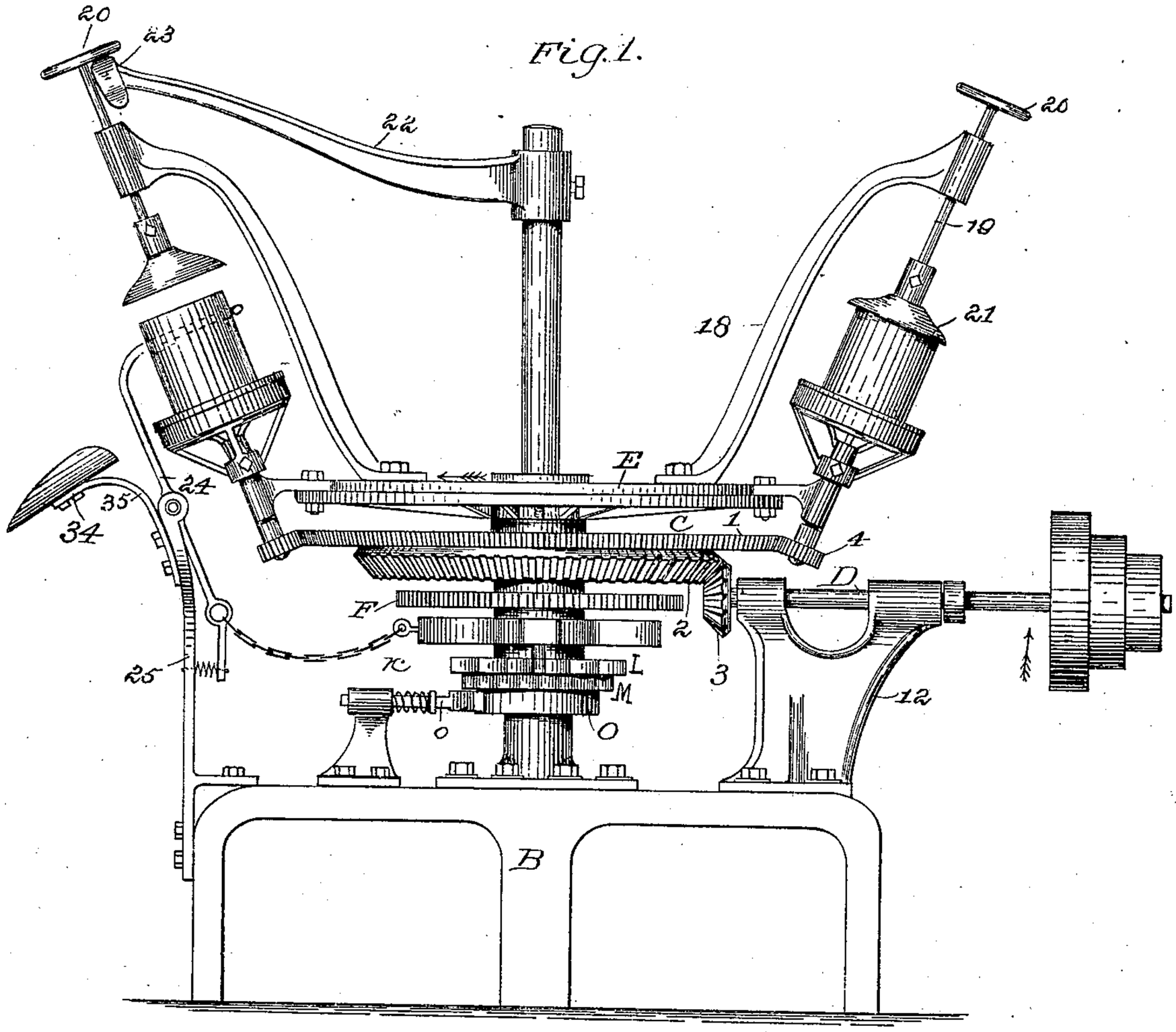
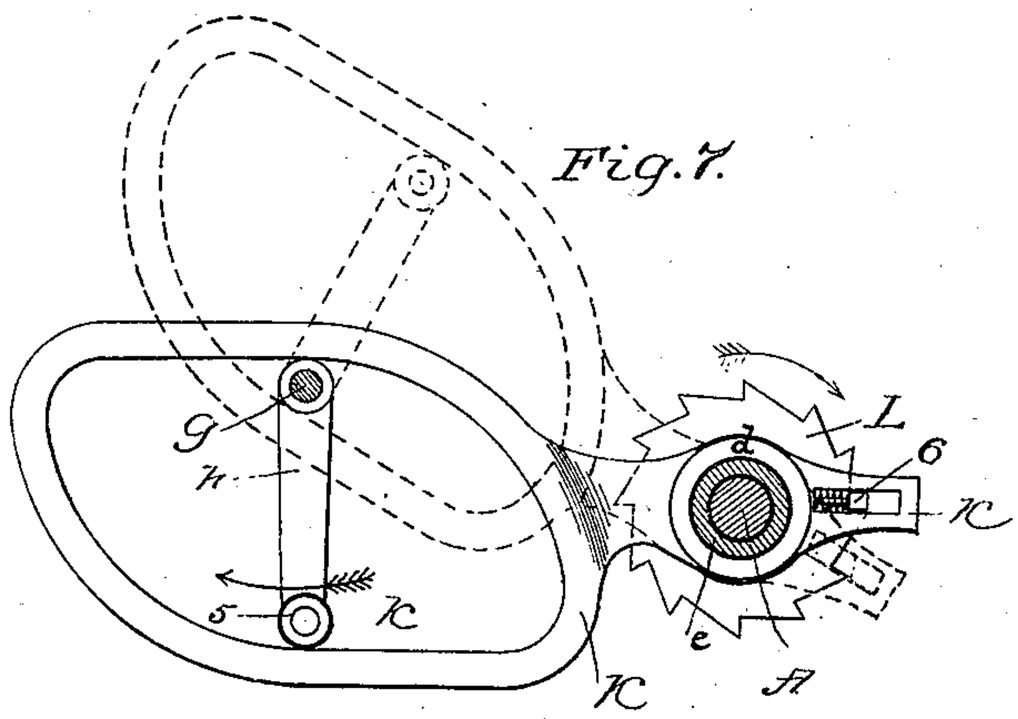


Fig. 7.



Witnesses

F. L. Middleton

Walter Donaldson

Inventor

William D. Brooks

by Ellis & Spear

Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 2.

W. D. BROOKS.

CAN SOLDERING MACHINE.

No. 256,098. Patented Apr. 4, 1882.

Fig. 2.

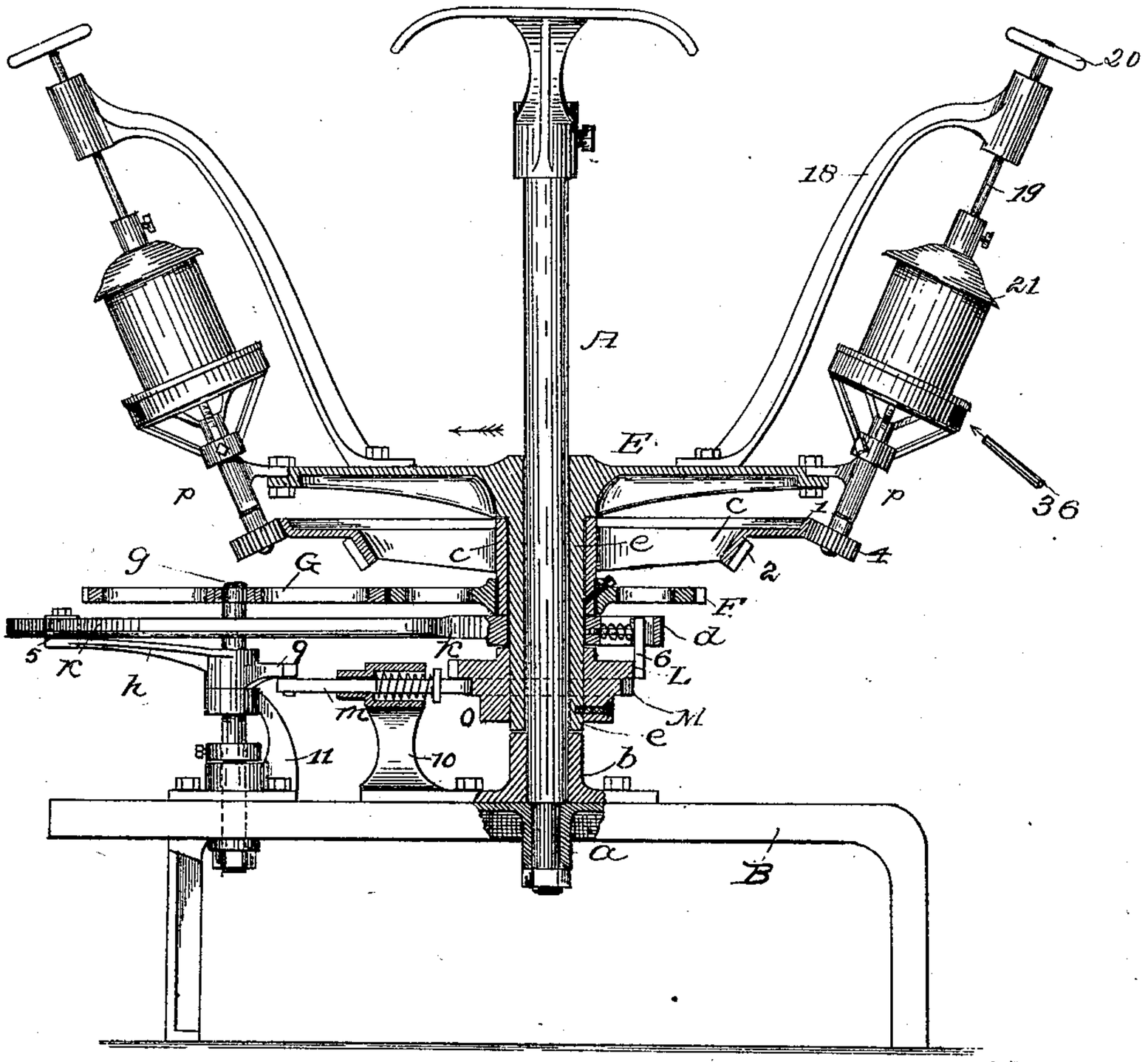


Fig. 10.

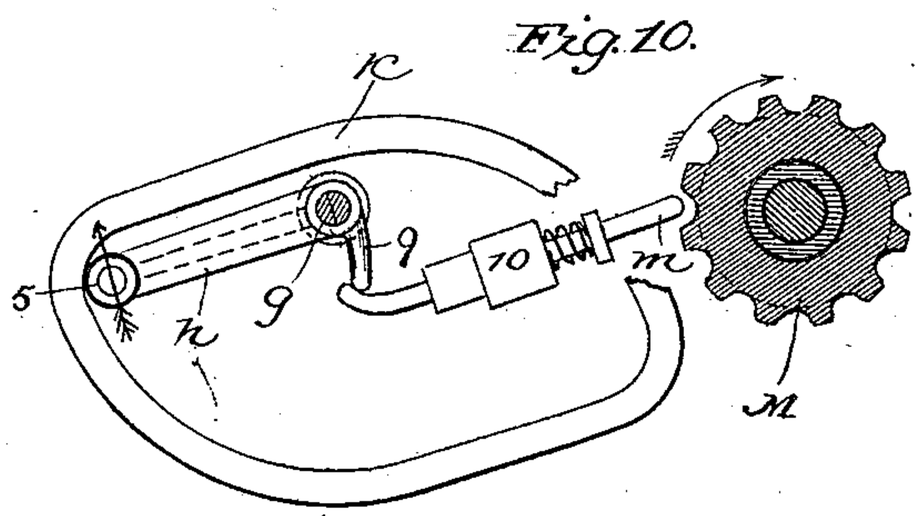


Fig. 14.

Witnesses
F. L. Middleton
Walter Dallow

Inventor
William D. Brooks.
by Ellis Spear
Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.)

5 Sheets—Sheet 3.

W. D. BROOKS.

CAN SOLDERING MACHINE.

No. 256,098. Patented Apr. 4, 1882.

Fig. 3.

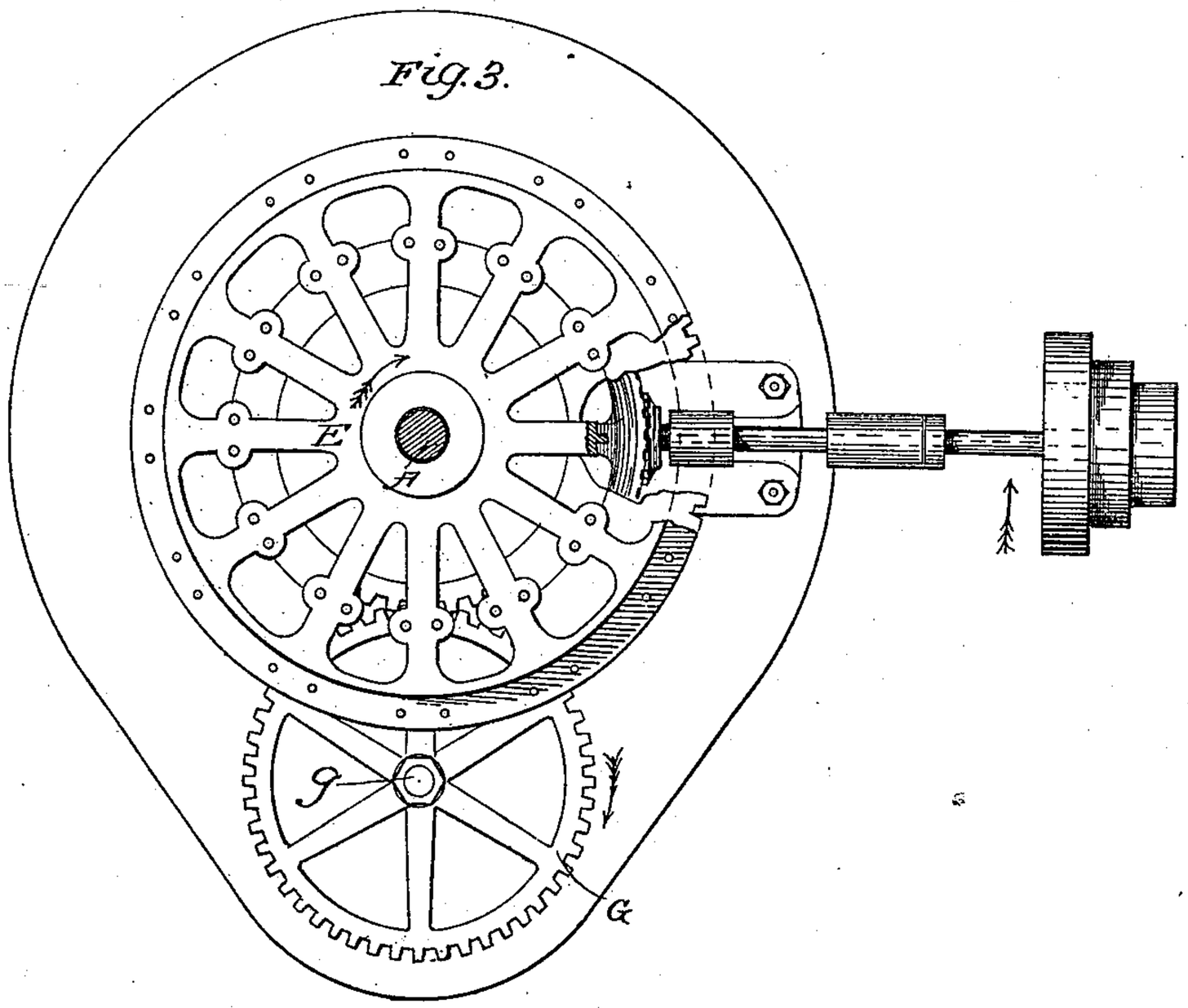


Fig. 16.

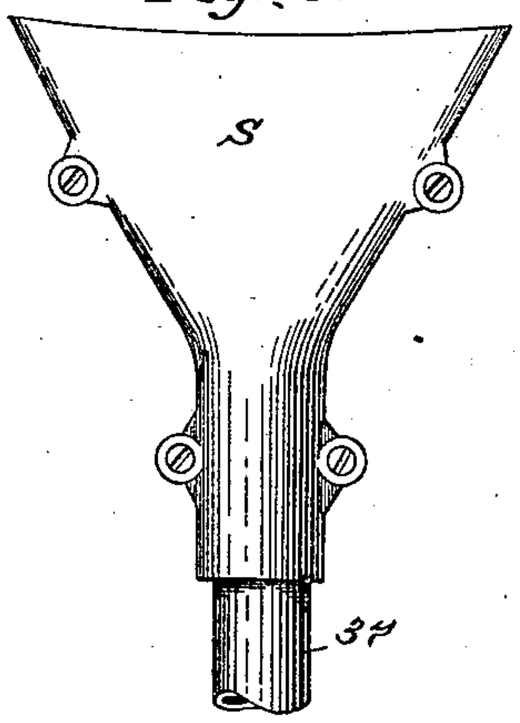


Fig. 15.

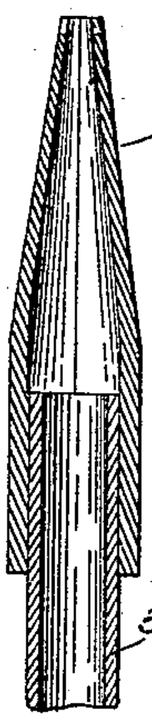


Fig. 17.

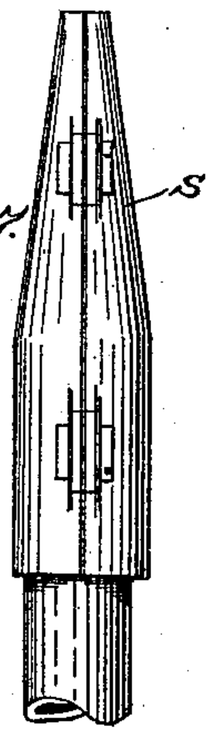
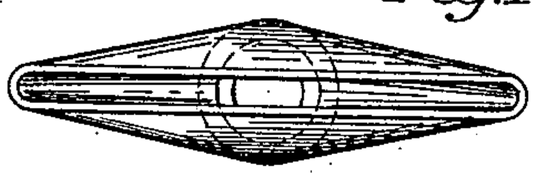


Fig. 18.



Witnesses:
F. L. Middleton
Walter D. Malcolm

Inventor
William D. Brooks
by Ellis & Spear
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

5 Sheets—Sheet 4.

W. D. BROOKS.

CAN SOLDERING MACHINE.

No. 256,098. Patented Apr. 4, 1882.

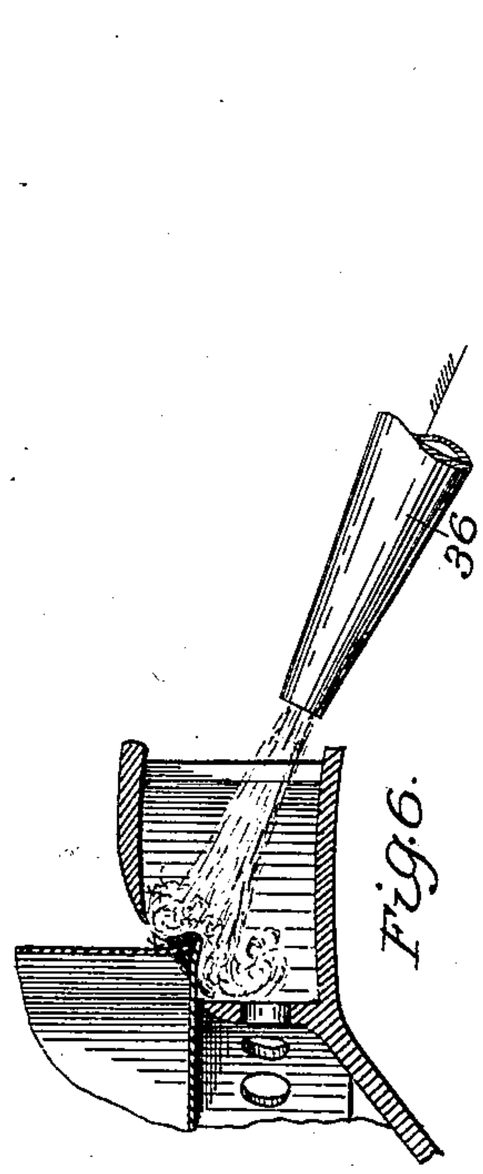


Fig. 6.

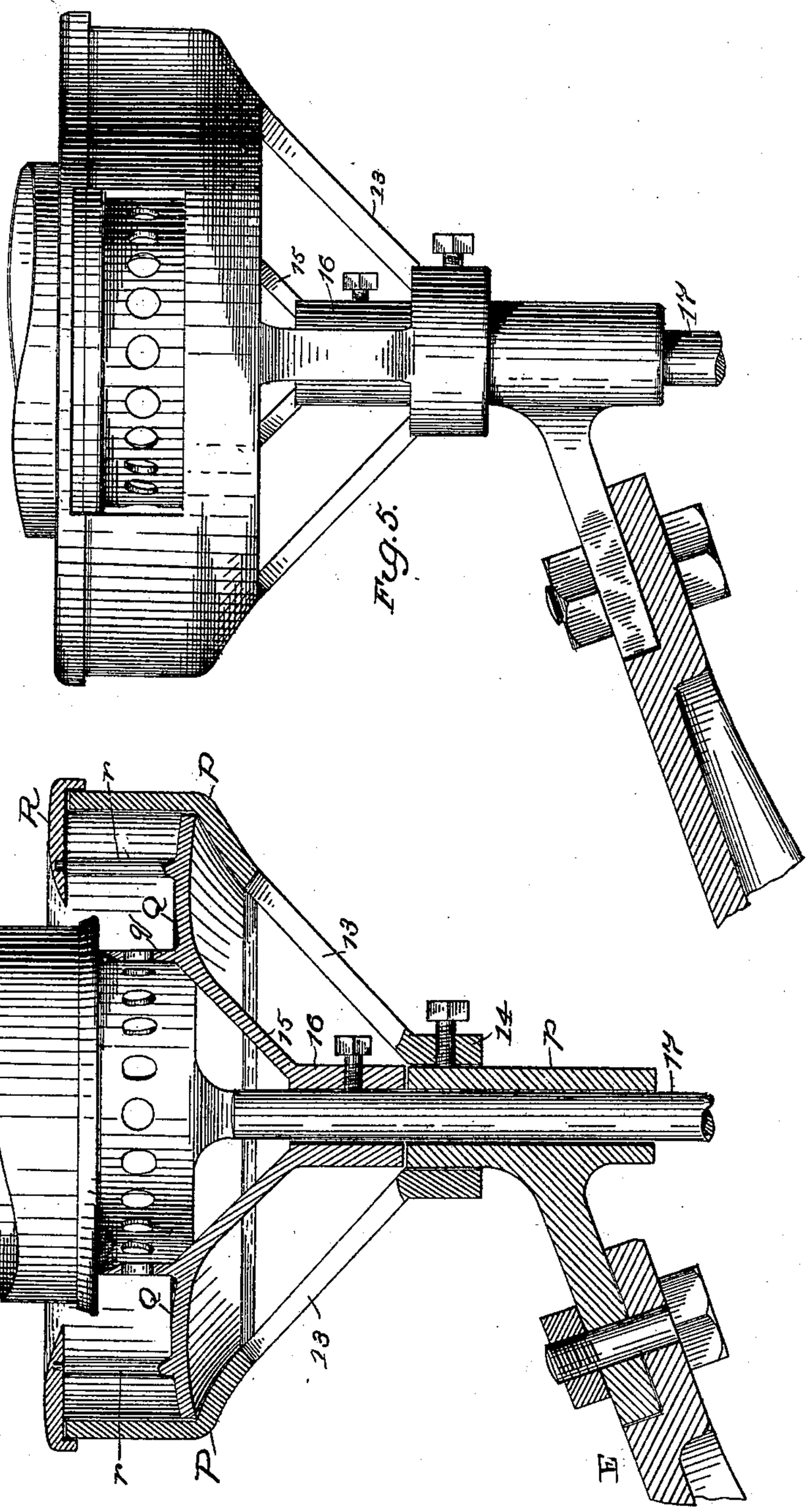


Fig. 5.

Fig. 4.

Witnesses
F. L. Middleton
Walter Dowdon

Inventor
William D. Brooks
by Ellis Spear
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 5.

W. D. BROOKS.

CAN SOLDERING MACHINE.

No. 256,098. Patented Apr. 4, 1882.

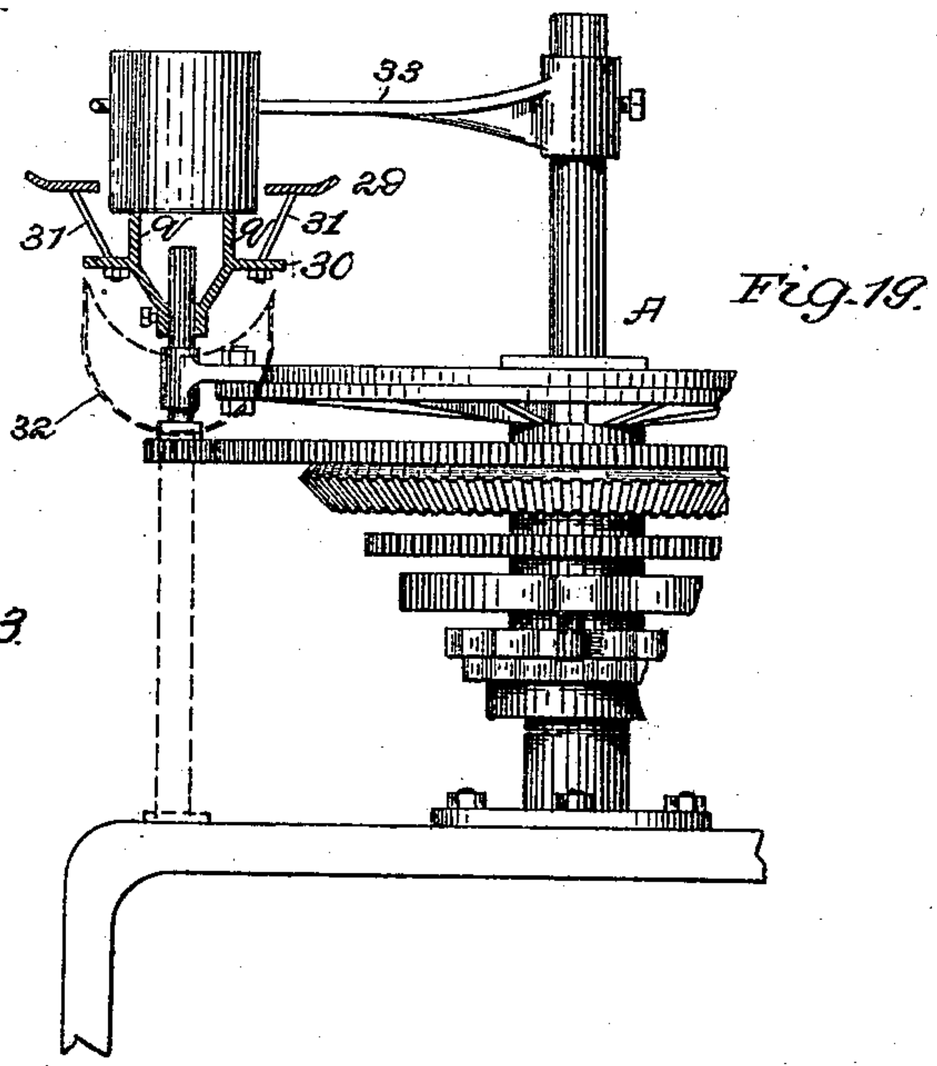


Fig. 19.

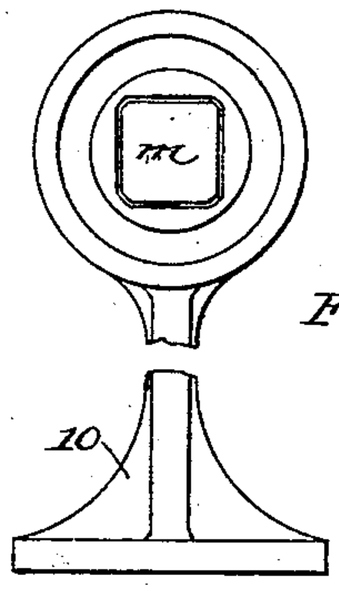


Fig 13.

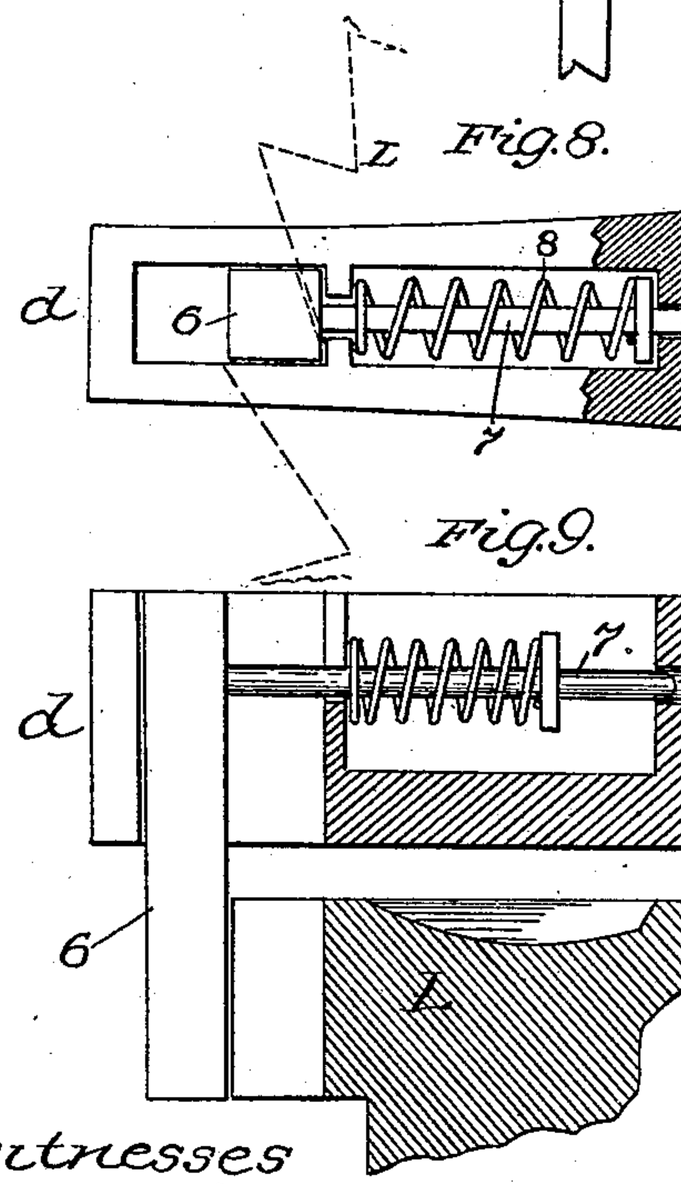


Fig. 8.

Fig. 9.

Fig. 11.

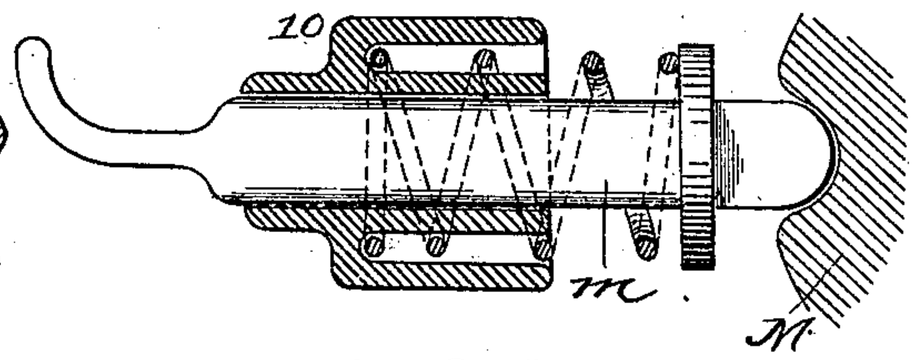


Fig. 12.

Witnesses
F. L. Middleton
Walter D. Maldow

Inventor
William D. Brooks
by Ellis Spear.
Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM D. BROOKS, OF BALTIMORE, MARYLAND.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 256,098, dated April 4, 1882.

Application filed February 16, 1882. (No model.)

To all whom it may concern:

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

My invention relates to can-soldering machines, and is an improvement upon the form of machine shown in Letters Patent of the United States, granted me on the 30th day of November, 1880, No. 234,948.

It consists first, of improvements in the various devices for communicating motion to the different parts of the machine; second, in improvements upon the can-holder and flame-chamber; third, in improved devices for removing the cans after they have been soldered; fourth, in a spring stop-bolt automatically operated from the driving mechanism.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 represents the same apparatus, partly in side elevation and partly in section, in position one-half turn from Fig. 1. Fig. 3 is a plan view of the table. Figs. 4, 5, and 6 represent the can-holder and flame-chamber. Figs. 7, 8, and 9 represent details of the devices used for imparting intermittent motion to the table. Figs. 10, 11, 12, and 13 represent details of the stop mechanism. Fig. 14 is a detached view of the arm which lifts the can-holding disk. Figs. 15, 16, 17, and 18 represent the flame-tube or burner. Fig. 19 is a view of a modified form of can-seat and the discharging-arm.

In these drawings, B represents a table supported upon suitable legs, and preferably made of cast-iron. In the center of this table is mounted a post, A, consisting of a single cylindrical shaft of metal seated within a tubular socket, *a*, and supported against any lateral swing by a collar, *b*. Upon this shaft is mounted the table E. It is supported upon a collar or sleeve, *e*, fitted accurately to the shaft A and adapted to turn thereon, and resting at its lower end upon the collar *b*. The sleeve *e* forms a part of or is firmly fixed to the table E. The table may be either a solid circular table, or may be composed of radial arms, or radial arms with a suitable rim, as shown in Figs. 1 and 2. It will be understood that this table carries the can-holders, and requires intermittent or step-by-step movement in the same manner as described in my said patent, and, further, as described in that patent, the can-holders require a constant rotary motion on their own axis in addition to the step-by-step motion of revolution around the central shaft; but I communicate these motions by greatly simplified mechanisms.

Just below the table E is a wheel, C. It is fixed to a sleeve, *c*, which bears upon the hub of the lever K and turns upon the sleeve *e*, over which it snugly fits. The wheel C is a beveled gear with two sets of teeth. (Shown at 1 and 2 in Figs. 1 and 2.) Into the lower beveled gear, 2, meshes a beveled gear, 3, fixed upon the main driving-shaft D. The upper gear, 1, meshes into the pinions 4, which are fixed upon the lower end of the spindles of the can-holders, and thus the power is directly applied through the wheel C, communicating constant rotary motion to the said holders. The next point to be gained is the communication of power from this constantly-rotating wheel to give the proper intermittent motion to the table E. This table carries twelve can-holders. The number is not material; but this has been found convenient. It is necessary, therefore, in order that all the cans may be brought successively to any given point or points and there arrested for a brief period, that the table should perform one complete revolution by twelve equal and successive impulses, moving at each impulse one-twelfth of its circumference. This motion I impart by means of a gear-wheel, F, which is fixed upon the sleeve *c*, so as to revolve with the wheel C. The wheel F gears into a wheel, G, which is fixed upon a shaft, *g*, supported in bearings in the table, as shown in Fig. 2. Upon this shaft *g* is fixed an arm, *h*, having on its free end an anti-friction wheel, 5. The arm revolves within a cam-shaped loop, *k*, of a lever, K, which is pivoted upon the sleeve *e*, as shown in Fig. 2. The lever rests upon a boss of the ratchet-wheel L and carries a pawl, 6, working in a slot in the end of the lever, and projecting downward, as shown at 6 in Figs. 2 and 9, so as to engage with a tooth of the ratchet L. The pawl is mounted upon the spindle 7, pressed in by a spring, 8, as shown

in Fig. 8, said spring holding it into engagement with or permitting it to pass over the teeth of the ratchet, according to the direction of the movement of the lever K. The shaft *g* moves in the direction of the arrow, Fig. 7, and the parts are so adjusted to the size of the table that a half-revolution of the shaft *g* will move the table one-twelfth of its circumference, while the completion of the revolution of the shaft *g* carries back the lever, and with it the pawl, for engagement with another tooth.

It is necessary that the table should be held accurately and steadily at the stopping-points. For this purpose I form with or attach to the ratchet L a pawl-wheel, M, as shown in plan in Fig. 10. It is provided with twelve rounded indentations, in which fits a spring-pawl, *m*, Figs. 1, 2, and 10. The spring carries the pawl into engagement with the wheel. It is drawn out of engagement just before the lever K moves the ratchet-wheel by means of a spur, 9, fixed on the shaft G, and engaging with the curved end of the pawl *m*. The parts are so arranged that the pawl is withdrawn long enough to allow the notch from which the pawl is withdrawn to turn out of line therewith.

In order to give steadiness to the whole, I provide a brake, *o*, Fig. 1, which bears upon a wheel, O, affixed to or forming a part of the ratchet and pawl wheels. The pawl *m* is supported in a standard, 10, fixed to the table. A standard, 11, gives steadiness to the shaft *g*, which passes through a boss in the head of said standard.

The main driving-shaft D is supported upon a bracket, 12, on the other side of the table.

The can-holders are supported in sleeves *p*, fastened to the table by means of arms, as in my patent heretofore referred to. They are shown as inclined; but the inclination is not necessary, since the rotation of the can-holder is sufficient to keep the solder, when melted, against the side of the can by centrifugal force alone without any inclination of the can.

I have modified the form of the can-holder and flame-chamber and the supporting-bracket by which the presser-disk or top of the can is supported.

Figs. 4 and 5 show, upon an enlarged scale, the form of can-holders shown in Figs. 1 and 2 in their proper condition. In these figures, P represents the outside of the flame-chamber. It is cylindrical in the main part, and slightly tapering below, and is supported upon braces 13, which terminate in a ring, 14, and held rigidly to the sleeve *p* by a set-screw, or in any convenient way. This outer shell, P, does not therefore revolve. Within it is a plate, I, which forms the bottom of the flame-chamber. It is supported upon arms 15, which terminate in a collar, 16, held by set-screw to the spindle 17. This spindle passes down through the sleeve *p*, and has a pinion, 4, fixed to its lower end, by means of which the plate I is rotated. The plate is provided with a perforated flange, *q*, on which the can is set. The top of the flame-chamber is formed by an annular plate, R, which is supported on posts *r*, fixed in the plate I, so that the plate R revolves with the can. The parts are so adjusted, as shown in Fig. 4, that a proper amount of the side and bottom of the can is exposed to the action of the flame.

An opening, as shown in Figs. 5 and 6, admits the flame through the flame-chamber, which, as in my said patent, is annular, and the parts are so adjusted that the opening is brought to a proper position when the table is arrested. As the flame-chamber and can-seat are all supported upon the sleeve which is directly attached to the edge of the wheel or radial arm, no bracket is needed, except for the support of the presser-disk, when such a disk is used.

I contemplate using a presser-disk when making larger cans, where there would be a liability that the bottom would warp and spring upon the application of the heat. To support this I use a simple bracket, 18, attached to the table, one for each can-holder. Through a sleeve in the top passes a rod, 19, having a button, 20, upon its top and a concave disk, 21, at its lower end. The weight of this is sufficient to hold the can down, the rod being adapted to slip freely in its bearings in the upper end of the bracket. In order to lift this at the proper instant to discharge the can, I place opposite the point where the can is to be discharged an arm, 22, which carries upon its outer end a curved track, 23. (Shown more clearly in Figs. 1 and 2.) This is curved at the ends, so as readily to pass under the button 20, and is long enough to hold up the presser-disk while the can is discharging. For discharging the can I use a lever projecting into the path of the cans at the discharging-point, and adapted to strike the can and throw it out. When making large cans I form the discharging-hook as shown in Fig. 1. This consists of a pivoted lever, 24. It is pivoted upon a standard, 25, so as to move radially outward from the table. The upper end is bent at right angles inwardly, and again bent horizontally at right angles to pass partly around behind the can. The lower end is attached by a light spring to the standard 25, so as to hold the upper end of the lever normally pressed inward; but the lower end is attached by a short chain to the loop of the lever K, whereby when the lever is moved backward in order to take a new hold on the ratchet-wheel it pulls upon the chain, throws the upper end of the lever 24 outward, and tips off the can.

When smaller cans are to be soldered I may also use a different form of can-holder, such as that shown in Fig. 19, in which an upper and lower flange (marked respectively 29, 30) constitutes the upper and lower parts of the flame-chamber, the inner part being the ordinary vertical flange, *q*. This differs from the form first described principally in the omission of the

outer fixed shell, P. The upper flange or annular plate is supported upon the lower by means of posts 31. In this the whole flame-chamber revolves and no provision is made for holding down the can, as in small cans there is no tendency of the bottom to warp by the heat.

The discharge-chute 32 is placed by the side and in front of the path of the can, and on the other side a horizontal arm, 33, projects into the path of the cans, so that each can in succession as it strikes it is knocked off and falls upon the chute, which gives it the proper direction. The chute for the tipping-lever first described is shown in Fig. 1 at 34, and is supported upon an arm, 35, fixed to the bracket 25.

I have somewhat modified the form of burner or discharge-piece. This is shown in Figs. 15, 16, 17, and 18. It consists of a flattened terminal piece, S, fixed to the tube 37 and provided with an elongated slot or opening preferably slightly curved, as shown in Fig. 16, whereby the flame is discharged in a horizontal sheet against the edge of the can. The width of this discharge-piece is slightly less than the opening in the front of the flame-chamber.

I contemplate using the ordinary gasoline or other like burner, into which the flame is driven under pressure, and the narrow horizontal sheet is caused to impinge directly against the joint, so as to concentrate the heat there as much as possible.

In operating the machine the attendant sits at the side of the table with his right arm nearest the discharge-chute. He takes a segment of solder wire, drops it in the can, and places said can in the can-holder during the brief interval while the table is at rest. Then the table moves one step to the left and stops at a second station which has no burner. At the third, fourth, and fifth stations it stops with the can in front of a burner, and at the fifth station, or before, the solder is melted.

A burner is also in front of the sixth station, by means of which the solder is thoroughly distributed and sweated into the seam. At the seventh, eighth, ninth, and tenth stations I place air-tubes, as shown at 36 in Fig. 2, adapted to blow cold air into the flame-chamber and around the edge of the can in order to cool the solder. At the eleventh station there is no tube, and at the twelfth station the button rides up upon the circular track 23 and the can is discharged. The button still rests upon the track until the operator puts another can in place, and the operation is continued as described.

Having thus described my invention, what I claim is—

1. In a can-soldering apparatus, the combination, with the table and the supporting-post, of the revolving table E, carrying the can-holders, suitable mechanism for imparting step-by-step motion to the same, rotary can-holders having pinions upon the lower end of the spindles thereof, and wheel C, adapted to mesh into said pinions, and provided with teeth gearing directly into a pinion upon the main driving-shaft, substantially as described.

2. In a can-soldering apparatus, the combination of the revolving table E, carrying the revolving can-holders, and provided with a sleeve, *e*, a ratchet fixed thereto, a wheel, C, driven directly from the main shaft and driving the pinions of the can-holders, and gear-wheel F, connected with said wheel C, and through intermediate mechanism, as described, operating the moving pawl of the ratchet-wheel, whereby the table E receives intermittent motion from the wheel C, substantially as described.

3. The combination, in a can-soldering machine of substantially the form described, of the pinions F G, receiving motion from the wheel C, the lever K, provided with a cam-loop, the shaft *g*, and the arm *h*, the spring-pawl, and ratchet-wheel, whereby step-by-step motion is imparted to the table E, all substantially as described.

4. In combination with the table E in the described machine and the sleeve *e*, the ratchet L, the lever K, with its spring-pawl engaging with said ratchet, the wheel M, fixed to said ratchet, pawl *m*, and spur 9 upon the shaft *g*, the parts being constructed and operating substantially as described.

5. The combination, in a can-soldering apparatus, of the outer shell, P, provided with braces 13, connected rigidly to the sleeve *p*, the annular plates Q and R, supported upon and in combination with the spindle 17, said spindle being connected to the rotating mechanism, substantially as described.

6. In combination with the revolving table and rotating can-seats, the lever 24, pivoted upon the bracket 25, and connected to the lever K, substantially as described.

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

WILLIAM D. BROOKS.

Witnesses:
L. W. SEELY,
F. L. MIDDLETON.