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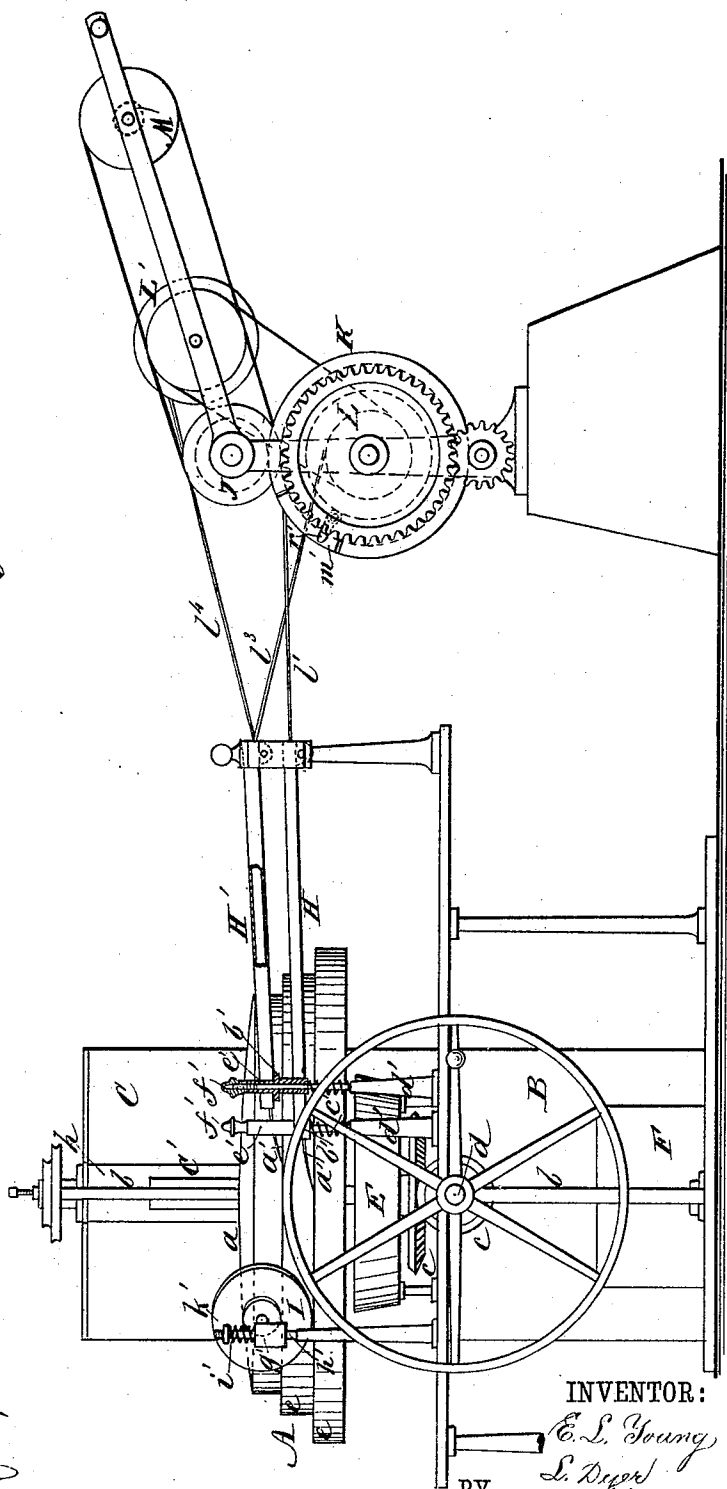
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E. L. YOUNG & L. DYER.

MACHINE FOR MAKING WIRE OR OTHER SOLDER.

No. 291,828.

Patented Jan. 8, 1884.



WITNESSES:

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C. Sedgwick

INVENTOR:

E. L. Young

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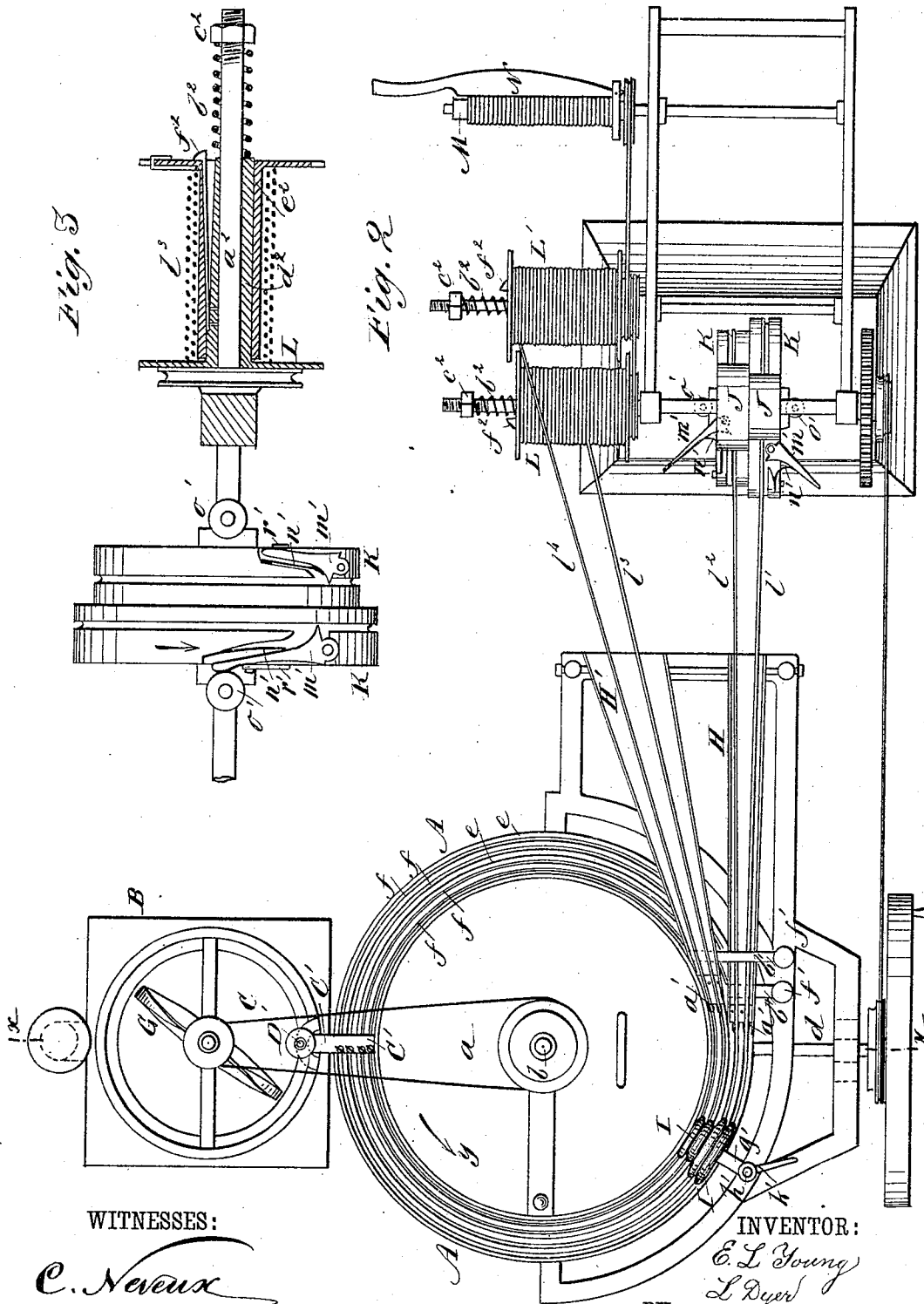
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UNITED STATES PATENT OFFICE.

EDMUND L. YOUNG AND LUCIUS DYER, OF MILLBRIDGE, MAINE.

MACHINE FOR MAKING WIRE OR OTHER SOLDER.

SPECIFICATION forming part of Letters Patent No. 291,828, dated January 8, 1884.

Application filed October 5, 1883. (Model.)

To all whom it may concern:

Be it known that we, EDMUND L. YOUNG and LUCIUS DYER, both of Millbridge, in the county of Washington and State of Maine, have invented certain new and useful Improvements in Machines for Making Wire and other Solder, of which the following is a full, clear, and exact description.

This invention relates to machines for running or casting wire-solder in which the molten solder is run into grooves upon a revolving mold and cooler and is picked up therefrom and afterward reeled or otherwise delivered for utilization either in the form of a coiled wire, sticks, or otherwise.

The invention consists in certain novel constructions and combinations of parts in that portion of the apparatus which relates to the delivery of the molten solder onto the grooved surface of the revolving mold or cooler that here is made to occupy a horizontal position, and may or may not be charged with water, and in the portion of the apparatus which relates to the holding and picking up of the wire and after preparation of it for the market to suit different demands or requirements, substantially as hereinafter described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a side elevation of the whole apparatus. Fig. 2 is a plan of the same. Fig. 3 is a sectional plan, upon a larger scale, of certain take-up and cutting mechanism or devices for the wire or wires as the same come from the rotating mold or pan. Fig. 4 is a vertical section upon the line *xx* in Fig. 2; Fig. 5, an enlarged vertical section of the distributing kettle to the rotating mold or pan; and Figs. 6 and 7, a vertical section and plan view, upon a larger scale, of certain details pertaining to said distributing devices.

A is a circular or other suitably-shaped horizontal pan or vessel secured on an upright revolving shaft, *b*, which may be driven through bevel-gears *c c* by a horizontal shaft, *d*, or otherwise. This pan or vessel, which forms both the mold and cooler for the molten metal, is constructed with any number of flanges on its rim, preferably, however, a series of flanges,

e e, arranged in step form, as shown, and having one or more continuous grooves, *f*, in their upper surfaces, to receive the molten metal within them as the same is run from a corresponding number of tubes or spouts from the vessel in which the solder is melted, and whereby, as the pan revolves on or by its shaft, the solder is formed into a wire of the size and form required, and this may be regulated by making the grooves of different sizes and shapes.

B is the furnace for melting the solder, and which may be of any desired construction.

CC' is the melting-kettle, arranged over the furnace. This kettle is made in two parts—namely, a main portion or melting-chamber, C, which is made round, in order that the metal may be more easily stirred and mixed, and a smaller chamber, C', on the side next to the pan A, in order that the tubes D, which conduct the molten metal into the grooves *f* of the pan, may be arranged over said grooves when it is proposed to run more than one stream at the same time. This side chamber, C', which is supplied with any greater or less quantity of metal from the main chamber C by means of a regulating-tube, D', and spout *g* in a set-off, *h*, from the main chamber, is constructed with a depressed cup portion, *i*, arranged to project below the bottom of the chamber C, so that the whole of the molten metal, if desired, may be all run out of said main chamber C, also so that a portion of the metal may be run to encompass the tubes D and heat them. The construction of the kettle C with a side supply-chamber having an interposed regulating tube or valve also serves to govern the pressure of the metal to the tubes D, which supply the grooves *f* in the pan A.

The several tubes D D' are or may be constructed substantially as shown in Fig. 5 of the drawings, in which each tube is constructed of an outer perforated straining-tube, *k*, to keep dross and foreign substances from passing out along with the molten metal, a nozzle or spout, *l*, onto which the straining-tube screws at its lower end, and which is provided with a laterally-slotted upward extension, *m*, and a hollow valve, *n*, having an upper stem with handle on its top, and made to screw at its lower end over the slotted extension *m*, to open or shut off and regulate the discharge of the molten metal as required.

The pan A may be supplied with cold water

at or near the center of its top by a pipe, *o*, and is constructed so that the water will flow under the grooves *f* in the upper flanged surfaces of the pan, and should be of uniform thickness at such parts. Said pan is provided with a cover, *a*, and a central boss projecting upward from its bottom to near its top, to prevent the water from leaking out of it around its shaft *b*. It is also fitted with a draw-off cock or plug, *p*, and an overflow-pipe, *q*, which empties into a central waste-pan, *E*, from which the water may be discharged by a pipe, *s*, into a lower receiver, *F*.

The whole apparatus is supported upon any suitable frame or frames, and the main chamber *C* of the kettle may be provided with an oblique-vane stirrer, *G*, driven by band and pulleys from or by the shaft *b*.

The molten metal, as fed by the regulating-tubes *D* into the grooves *f* of the rotating pan *A*, which travels in direction of the arrow *y*, Fig. 2, is cooled and caused to set within said grooves or any of them by the water in the pan, and made to conform to the shape of said grooves, and after a certain length of travel is picked up out of the grooves *f* by knives *a'*, arranged to enter said grooves, and secured on the inner ends of conductors *H H'*, which are supported at their outer ends so that their inner ends are capable of rising and falling, to adapt the knives to the grooves or to lift them out of the same, as required, so as to avoid unnecessary wear. This adjustment of the knives *a'* and relief of said devices from bearing with objectionable pressure on the bottoms of the grooves *f* is effected by supporting the raising and lowering inner ends of the conductors *H H'* by arms *b'* on the springs *c'*, carried by stationary posts *d'*, on which said arms, by means of attached sleeves *e'*, are made capable of rising and falling, subject to the control, as against the upward lift of the springs *c'* of adjusting nuts or caps *f'*, which are arranged to fit a screw-thread on the upper end of either post *d'* and to bear down on the sleeves *e'*. The conductors *H H'* may be provided with lids or covers.

To keep the wires from falling out of the grooves *f* or from being lifted out of them by the knives *a'* till within a suitable distance of the knives and from being forced back by the knives, we arrange at a proper distance from the front ends of the knives rollers *I I*, which bear down on the wires in the grooves with a spring-pressure, that, combined with the rotating action of the rollers, provides for an easy run of the wires under the rollers, and avoids all excessive pressure on the wires. To these ends said rollers are carried by an arm, *g'*, which is made capable of sliding up and down a stationary post, *h'*, subject to the control of a spring, *i'*, bearing down on said arm *g'*, and having its pressure adjustable by a nut, *k'*, arranged on an upper screw-threaded portion of said post.

The solder wires, of which there may be any

number, but of which there are here shown four, *l'*, *l*, *l'*, and *l'*, after they leave the conductors *H H'*, are passed onto reels or other take-up devices. These wires may be of different sizes and shapes, where the machine, as here shown, is made to produce a number of wires, and some of these it may be desirable to cut off into sticks of a given length, while others, to suit the market, may be wound in a continuous manner into coil or reel form, and others again be wound and cut up into rings of a given size, suitable for capping or soldering tin cans. Thus the solder wires *l' l'* may be of large dimensions suitable for cutting into sticks of any desired length, and be passed between upper and lower rolls, *J K*, mounted in a suitable frame, and the lower ones, *K*, of which have pivoted on or in depressed portions of their peripheries, so as to rotate with them, lever-knives *m' m'*, held back or out from cutting-contact by springs *n' n'*, as shown in Fig. 2. These cutters are so arranged in relation to the feed of the wires between the rolls *J K* that a certain length of wire will be passed by said rolls before the knives or cutters are brought into cutting action; but on reaching this point the backs of the knives, as the rolls continue to rotate, come in contact with rollers or stops *o' o'* on the fixed frame of the take-up and cutting apparatus and sever the wires, which action, however, by reason of the lever-like construction of the knives, does not take place until the rolls have got a sufficient hold upon the following-up or remaining portions of the wires to continue their feed, to be again cut when the knives come round once more, and so on indefinitely, or as long as it is required to cut the wires into sticks of the required length. In Fig. 3 the knife on the left-hand side thereof is represented as being forced inward to effect the cut. When a continuous delivery or feed of the wires, or either of them, by the rolls is required without cutting the wire up into sticks, then a catch, *r'*, on either roll *K* (see Figs. 1 and 3) may be turned up or adjusted to hold the knife or knives from being acted upon by the rollers *o'*, as shown at the right hand of Fig. 3, the traveling wire in this case leaving the groove and riding over the side faces of the knife or knives. The rolls *K* may be armed with any number of knives, so as to cut more frequently than once during each revolution, if required to deliver the solder in shorter sticks or drops, and any other system of cutters may be adopted, if desired. The wires *l' l'*, which are or may be of smaller dimensions, may be taken up by a winding or reeling mechanism—as, for instance, by two reels, *L L'*, the one, *L*, of which is represented as carried by an extension of the shaft of the roll *K*, and the other, *L'*, as driven by band and pulleys from the first-named reel; and here it may be observed that the rolls and reels of the take-up mechanism may either be arranged to rotate vertically, horizontally, or

otherwise, and that the take-up mechanism may be driven by belt and pulley from the main or pan portion of the apparatus, so as to act in concert with the rotating pan A.

5 The reels L L' may be made of wood or any other suitable material, and should be loosely fitted on the spindles or shafts which carry them, and so that they are driven through said spindles by friction grip or hold. This
10 is necessary to relieve the solder of excessive and variable strain upon it, as the reels fill up or the rolls of wire upon them increase in diameter. They therefore should be made free to slip or give back during their rotation with their
15 spindles. Thus, as shown in Fig. 3, for the one reel, L, the inner head of either reel, which fits loosely on its spindle a^2 , is forced up with friction-hold against the pulley which drives it by a spring, b^2 , arranged around the outer
20 end of said spindle and adjustable by a screw-nut, c^2 , to give it more or less pressure on or against the outer end of the reel, and so provide for adjusting the capacity of the reel to yield or slip back, as required.

25 As in some cases it is necessary to market the wire in its reeled form, provision should be made for readily slipping it off the reel. This we propose to do by constructing the reel-body, as shown in Fig. 3, in two concentric
30 sections, d^2 e^2 , arranged to fit one within the other, and having the heads of the reel fast to them, respectively, and locking the two sections together by a spring-catch, f^2 . Upon releasing this catch from its hold on the outer
35 reel-head of the exterior section, e^2 , said section, with the wire reeled upon it, may be slipped off from the other section, d^2 , and the reeled wire then be slid off from the reel-section which carries it.

40 When it is desired to market the wire in a cut-ring form, then, instead of removing the filled reel or detachable section thereof, the wire on it may be spirally wound in a single layer upon a rotating mandrel, M, Fig. 2, driven by band and pulley, or otherwise, and after
45 said mandrel has been thus covered by the wire and any further supply of wire stopped by cutting it, then a knife, N, of the length of the mandrel, is manipulated to make a longitudinal
50 cut throughout the coil of wire thereon, when the wire will fall from the mandrel in broken circular detached pieces or rings suitable for sealing tin cans, the mandrel being made of a proper diameter to suit. When it is thus de-
55 sired to produce the wire in broken ring form and the apparatus has more than one reel receiving wire from the rotating pan, the reels may be successively filled and worked, so that as one reel is filled the wire may be taken from
60 it to supply the rotating mandrel and an empty reel, from which the wire has been previously taken for the same purpose, be put into receiving action with the rotating pan.

The apparatus may be operated either by
65 hand or by any other suitable power.

In conclusion, we would observe that while

our apparatus is applicable to making solder or solder wire of different shapes, it has the capacity of making round solder, which is generally preferable to solder of flat form. 70

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In wire-solder machines, the combination, with a round melting-chamber, C, of a side
75 chamber, C', tubes D D', and spout g , arranged as shown and described.

2. In apparatus for running solder, the regulating discharge-tubes D D' for the molten solder, or either of them, constructed of an
80 outer straining-tube, k , receiving and discharge nozzle l m , and a hollow screw-valve, n , essentially as shown and described.

3. In apparatus for running solder wire, the combination, with a horizontally-rotating mold
85 having one or more upper exposed grooves in or around its rim, of one or more knives, d' , and conductors H or H', for picking up and passing off the wire from the mold, and one or more spring-pressure rollers, I, for bearing
90 down on the wire in the mold in proximity to the knife or knives, substantially as specified.

4. In combination with the horizontally-rotating mold or pan A, having one or more
95 upper exposed grooves, f , in or around its rim, one or more conductors, H or H', each fitted with a knife or knives at its receiving end and constructed to rise and fall at said end, and spring-adjusting means for giving an
100 easy contact of the knife or knives with the bottom of the groove or grooves in the mold, and for relieving the knife or knives from such contact when required, substantially as specified.

5. The combination of the posts d' , the
105 springs c' , the sleeve-arms b' , and adjusting-nut f' , with the raising and lowering conductor H or H', having an attached knife or knives, a' , and the horizontally-rotating mold or pan A, having one or more upper exposed grooves
110 in or around its rim, essentially as and for the purposes herein set forth.

6. In apparatus for running solder wire, the horizontally-rotating rim-flanged pan A, adapted to hold water, having a central upwardly-
115 projecting boss on its bottom for reception of its shaft, an overflow-pipe, q , and a series of upper exposed grooves, f , in its flanges e , substantially as specified.

7. In apparatus for running solder wire, the
120 combination, with a rotating mold and means for picking up and passing off the molded wire, of the rolls J K, having attached knives or cutters m' , and means for throwing said knives in and out of action during the rotation
125 of the rolls for cutting the wire or wires into measured lengths, essentially as described.

8. The combination, with the wire-delivering rolls J K, of the lever-knives m' , arranged within recesses in the sides of the lower rolls,
130 K, the springs n' , and the rollers or stops o' , substantially as specified.

9. In apparatus for making solder wire, the combination, with the rotating grooved mold or pan A, and devices for passing off the wire therefrom, of one or more take-up reels, L or L', and means for driving the same by friction, with provision for slipping as the roll of wire increases in diameter on the reels, and whereby undue strain is taken off the solder wire, essentially as described.

10. In take-up devices of apparatus for casting solder wire, the combination, in a take-up reel, L or L', of the sectionally-constructed and concentrically-arranged body parts $d^2 e^2$, having the reel-heads respectively attached to them, and a fastening device for holding said

sections in place, substantially as and for the purpose herein set forth.

11. The combination, in a take-up reel for the wire in an apparatus for making solder wire, of the concentric body parts $d^2 e^2$, having the reel-heads respectively attached to them, the spring-catch f^2 , the friction-producing spring b^2 , and adjusting-nut e^2 , substantially as and for the purposes herein described.

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LUCIUS DYER.

Witnesses:

JAMES H. WALLACE,
LYCURGUS WASGATT.