No. 867,390. PATENTED OCT. 1, 1907.

M. C. LOVEJOY.

COILING MACHINE.

APPLICATION FILED FEB. 27, 1904.

Fig. 11.

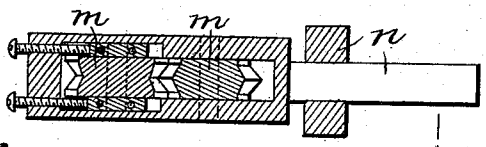


Fig. 1.

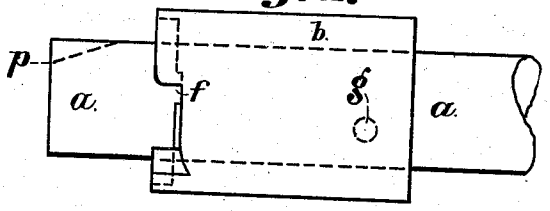


Fig. 2.

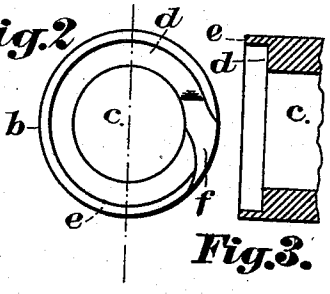


Fig. 3.

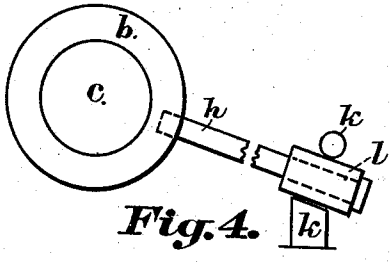
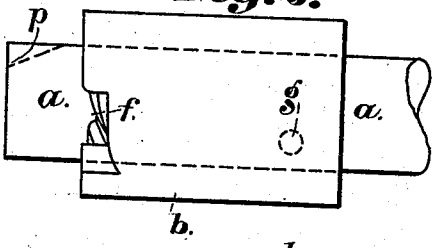


Fig. 4.

Fig. 5.



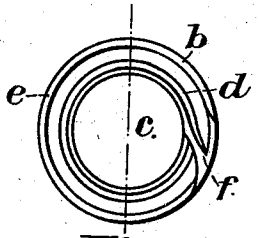


Fig. 6.

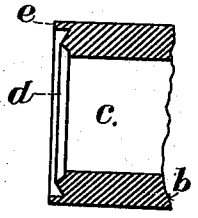


Fig. 7.

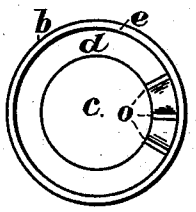


Fig. 8.

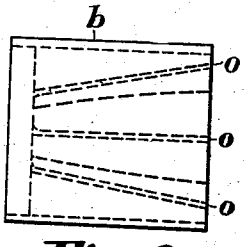


Fig. 9.

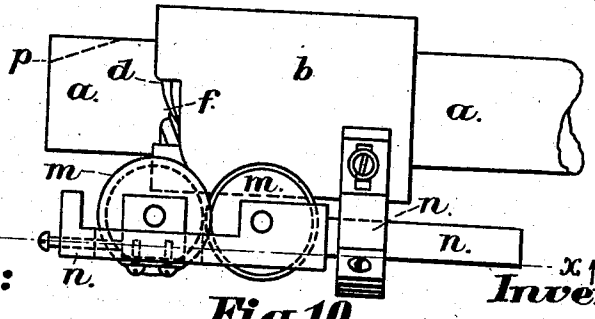


Fig. 10.

Witnesses:

A. C. Perry.

J. W. Anderson.

Inventor.

Marcellus C. Lovejoy

by Geo. E. Bird

Atty.

UNITED STATES PATENT OFFICE.

MARCELLUS C. LOVEJOY, OF PORTLAND, MAINE, ASSIGNOR TO EDWARD M. LANG, JR., OF PORTLAND, MAINE.

COILING-MACHINE.

No. 867,390. Specification of Letters Patent. Patented Oct. 1, 1907.

Application filed February 27, 1904. Serial No. 195,543.

To all whom it may concern:

Be it known that I, MARCELLUS C. LOVEJOY, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented an Improvement in Coiling-Machines; and I hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines or tools for producing spirals or coils from continuous thin strips or ribbons of the softer metals and their alloys and it is my purpose to provide a machine which will effect this end in the most economical and expeditious manner.

My invention consists in a shaft, a former provided with a recess in the end adapted to receive the material and form the successive rings of the coil or spiral and also with an opening to receive the shaft, means whereby either the former or the shaft may be prevented from revolving while the other revolves, and suitable means for giving the material the required tension as it enters the device. The shape of the recess varies with the shape of the strip or ribbon of metal to be coiled; if a ribbon of flat metal, the face of the recess is plain, if V-shaped or circular, the face of the recess is shaped accordingly.

In the mechanism in which I have embodied my invention and which is hereinafter described, I have provided for the revolution of the shaft. In the description thereof reference is made to the drawings in which

Figure 1 is a side elevation of shaft and former; Fig. 2 is an end view of the front of the former; Fig. 3 is a vertical longitudinal section of the former; Fig. 4 is an end view of the rear of the former and holding device; Fig. 5 is a side elevation of the shaft and a modification of the former; Fig. 6 is an end view of the front of a modification of the former; Fig. 7 is a vertical longitudinal section of the former shown in Fig. 6; Fig. 8 is an end view of a further modified form of former; Fig. 9 is a side elevation of the former shown in Fig. 8; Fig. 10 is a side elevation of the former with the feed or tension device attached, and Fig. 11 is a section on the line *x*—*x*, Fig. 10, looking in the direction of the arrows.

The shaft *a* is of ordinary construction journaled preferably only at the end where power is applied. The former *b* has a longitudinal circular opening *c* sufficiently large to permit the shaft to revolve within it. The front end of the former *b* is provided with a recess *d* concentric with the center of the opening *c*, the outer side of the recess being formed by the circular shoulder *e* from which the recess extends inwardly to the opening *c*. The width of the recess *d* should be equal to the width of the material to be treated and its face conforms to the shape of such material as already stated: see Figs. 5, 6 and 7.

At some convenient point a diagonal slot is made in the wall *e* and the surface of the recess within the slot in the wall grooved, as shown in Figs. 1, 2, 5, and 6. The groove when the face of the recess is plain or flat as shown in Figs. 1 and 2 differs somewhat from the groove which is made use of when the surface of the recess is raised as shown in Figs. 5 and 6. In the former case the groove is made by removing the face of the recess within the slot in the walls to an extent equal to the thickness of the material to be treated, while in the latter case the raised face of the recess is cut diagonally by the groove and the raised portion of the face on one side of the recess slightly beveled as shown in Fig. 5. The slot in the wall and groove thus made constitute the opening indicated by *f* in the drawing.

Various means may be used to hold the former from revolving while left free to slide upon the shaft. The means which I have adopted, but to which I do not confine myself, are shown in Fig. 4. An opening *g* is made in the side of the former *b* into which is inserted a rod *h*, which at its outer end is so secured as to prevent any revolution of the former, while at the same time movement longitudinally upon the shaft *a* is permitted; as for example, and as shown in the drawing (Fig. 4), the outer end may slide between two rods or bars *k k* placed parallel with the shaft and to reduce friction the outer end of the rod *h* may be provided with a pulley or sleeve *l*.

Tension may be provided by means of rollers *m m* having shoulders and between the shoulders surfaces which conform to the shape of the strip of metal to be coiled, that is, plain when the metal is flat, V-shaped or semi-circular when the strips of metal are of those shapes, respectively. The rollers are journaled in a frame *n* which is fixed to the side of the former; see Fig. 10.

The operation of the device will be readily understood. A continuous strip of metal of the required uniform shape, width and thickness having been provided, it is carried between the rollers *m m* and the end thereof may be secured in a slot *p* in the end of the shaft or otherwise temporarily secured thereto by a clamp or other means or may be secured to the shaft by several turns around the shaft and then brought within the opening *f* in the wall of the former *b*. It is now pressed either by hand or by a suitable instrument within and against the face of the recess, the shaft revolving slowly. As the shaft revolves, the metal is carried or drawn into the recess and is formed between the wall or shoulder *e* and the shaft *a* into a ring. After two or three rings of the coil have been formed, their grip

upon the shaft is such that their opposition suffices to keep the other material, as it is fed in, within and against the face of the recess *e*, when the desired speed is given the shaft. As the coils are formed, the former gradually retracts until the shaft has been filled when the spiral already formed may be removed and the process repeated.

What I claim is:

1. In a device of the character described, the combination of a shaft, a former adapted to slide upon said shaft, a track adjacent said shaft, and an anti-friction device carried by said former and engaging said track, substantially as described.

2. In a device of the character described, the combination of a shaft, a former adapted to slide upon said shaft and having a recess upon its periphery, an interlocking rod adapted to register with said recess, a track adjacent said shaft, and an anti-friction device whereby said rod may slide freely with said former and lock it against rotation, substantially as described.

3. In a device of the character described, the combination with a shaft having a slot therein adapted to temporarily hold the free end of the coil, of a former provided with a longitudinal opening to receive said shaft, and having a recess upon its periphery, an interlocking rod, one end of which is adapted to enter said recess, a sleeve disposed upon the other end, and a pair of parallel bars adjacent said shaft, between which said sleeve on said rod is adapted to travel, substantially as described.

4. In a device of the character described, the combination with a former having a recess in its face, of means jacent said shaft, between which said sleeve on said rod is for feeding the material into said recess under tension, comprising a frame secured to said former, a pair of rollers mounted in said frame, having oppositely disposed flanges, whereby the material is fed through between the faces of said rollers and the flanges, substantially as described.

5. In a device of the character described, the combination with a former having a recess in its face, of means for feeding the material into said recess under tension, comprising a frame secured to said former, a pair of rollers mounted in said frame having oppositely disposed flanges, and means for adjusting said rollers to regulate the tension, substantially as described.

6. In a device of the character described, the combination of a rotatable shaft having a central opening to receive said shaft, an annular recess in one end extending from said central opening to the exterior wall, said wall having an opening to admit the material to said annular recess and means whereby said former is prevented from revolving while free to slide upon said shaft, substantially as described.

7. In a device of the character described, the combination with a rotatable shaft, having a slot therein adapted to hold the free end of the material, of a former having a central opening to receive said shaft, and an annular recess in one end extending from said central opening to an exterior wall, said exterior wall having an opening to admit the material to said annular recess, means for admitting the material under tension, comprising a pair of suitably mounted rollers having oppositely disposed flanges, and means for adjusting said rollers to regulate the tension, substantially as described.

8. In a device for coiling a ribbon of solder upon its edge upon a shaft or mandrel, the combination with a rotatable shaft, of a former having a central opening to receive said shaft, and an annular recess in one end extending from said central opening to the exterior wall, said wall having an opening to admit the material to said recess, means for feeding the material under tension, comprising a pair of suitably-mounted rollers having oppositely-disposed flanges, and means for adjusting said rollers to regulate the tension, substantially as described.

9. In a device of the character described, the combination with a rotatable shaft, of a former having a central opening to receive said shaft, and an annular recess in one end extending from said central portion to the exterior wall of said former, said wall having an opening to admit the material to said recess, means for feeding the material under tension into said recess, comprising a pair of suitably-mounted rollers having oppositely-disposed flanges, and means for adjusting said rollers to regulate the tension of the feed, substantially as described.

In testimony, that I claim the foregoing as my invention I have hereunto set my hand this twelfth day of February, A. D. 1904.

MARCELLUS C. LOVEJOY.

Signed in presence of—
GEO. E. BIRD,
JAMES R. PARSONS.

Correction in Letters Patent No. 867,390.

It is hereby certified that in Letters Patent No. 867,390, granted October 1, 1907, upon the application of Marcellus C. Lovejoy, of Portland, Maine, for an improvement in "Coiling-Machines," an error appears in the printed specification requiring correction, as follows: On page 2, line 32 should be stricken out; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of November, A. D., 1907.

[SEAL.]

E. B. MOORE,

Commissioner of Patents.