(No Model.)

H. SCHMIDT.

WIRE COILING MACHINE.

No. 264,046. Patented Sept. 5, 1882.

Fig 1.

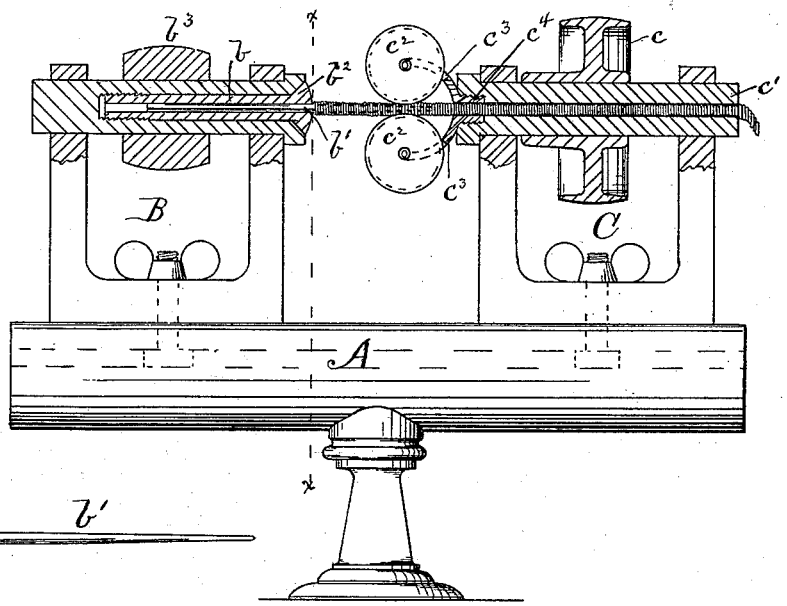


Fig 5.

Fig 2.

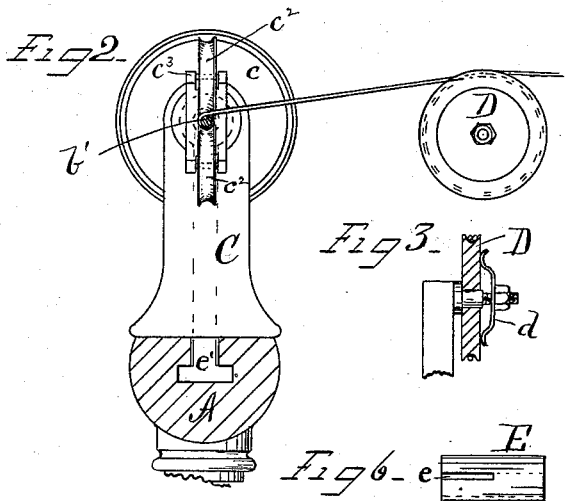
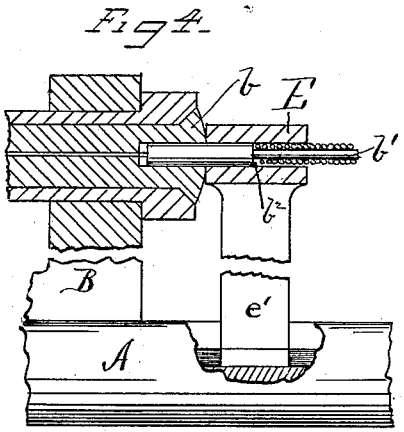


Fig 3.

Fig 6.

Fig 4.



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UNITED STATES PATENT OFFICE.

HUGO SCHMIDT, OF CHICAGO, ILLINOIS, ASSIGNOR TO THOMAS H. BALL, HERMAN PRENZLAUER, AND SIMON FLORSHEIM, OF SAME PLACE.

WIRE-COILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 264,046, dated September 5, 1882.

Application filed April 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, HUGO SCHMIDT, of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Machines for Coiling Wire, of which the following is a specification.

This invention relates to machines for coiling small wires in the production therefrom of spiral springs in considerable lengths.

In my newly-invented machine I employ two heads rotating in the same direction, one carrying a mandrel around which the wire is wound and the other having a hollow journal for the passage of the coil as it is made, and a friction device for rotating the coil with it. The mandrel is preferably a slightly-tapering pin, and is held in the head by a chuck or other holding device, which forms a shoulder and acts as a point of resistance upon one side of the incoming wire, whereby the said incoming wire is caused to exert a crowding or pushing force upon the already formed coil, which compels the latter to pass along and out of the machine. I also preferably employ as the friction-creating device for insuring the rotation of the coiled wire with the second head two grooved spring-rollers secured to said head and pressing the wire upon opposite sides, whereby the wire is sufficiently held for the purposes of rotation without interfering with its longitudinal movement through the machine. I also employ a tension device upon the wire fed to the machine, located so as to deliver the wire to the coiling-mandrel substantially at right angles to the latter and at a point next the shoulder, which causes the pushing of the coil along the mandrel. These and other features of the invention will be understood by reference to the accompanying drawings and the following description.

In said drawings, Figure 1 is a front view of my machine partly in section. Fig. 2 is a cross-vertical section of the same upon the line *x x* of Fig. 1. Fig. 3 is a sectional view of the tension device. Fig. 4 is a longitudinal vertical section of one of the heads, showing a modified form of part of the invention. Fig. 5 is a detail of the coiling mandrel or pin somewhat exaggerated in scale, and Fig. 6 is a detail of the bushing shown in Fig. 4.

Upon reference to said drawings, A represents the bed of the machine, whereon the two heads B and C are adjustably or otherwise secured. Of these heads the one at the left, B, is provided with a chuck, *b*, which holds a pin, *b'*, whereon the wire is coiled. The head of the chuck forms a shoulder, b^2, surrounding the pin at the point where the wire is fed to the machine. This head B is rotated by a belt upon the pulley b^3. The pin or mandrel *b'* projects toward the other head to a point within the grasp of the friction device borne on said other head, as hereinafter more fully explained, and as shown by the dotted lines in Fig. 1. Said pin is also preferably tapered toward said other head to permit the easy sliding thereon and therefrom of the coil. The second head, C, is rotated by the pulley *c* in the same direction as the head B, and preferably at a somewhat different or slower speed. Its journal *c'* is hollow throughout, and is so located as to receive the coiled wire directly from the mandrel. At the end adjoining the mandrel it carries two spring-rollers, c^2 c^2, borne in spring-arms c^3, projecting in opposite directions from a hub, c^4, secured in the journal. These rollers are grooved and set down upon the wire with sufficient pressure to insure its rotation with the head C; but they turn freely upon their axes, which are at right angles to that of the mandrel, so that the feed of the coil in its passage from the mandrel may take place without hindrance or unnecessary friction. In order that they may not crush or separate the coils from each other they are located so as to bear on the coils before the latter have passed beyond the mandrel.

The wire is fed to the machine over a tension-wheel, D, which is retarded by a compressible spring, *d*, and is located at the side of the machine in position to deliver the wire thereto in immediate proximity to the shoulder b^2. This tension device may, however, be constructed very differently from the manner shown, and I do not wish to be limited to any particular form thereof, the essential feature concerning it being that it should deliver the wire to the mandrel at the shoulder b^2.

This being the construction of the machine which I prefer, the operation thereof is as fol-

lows: The wire passes from the tension device to the mandrel at the shoulder b^2, and is there coiled on the mandrel, each coil being thus formed of the same diameter. The coils lie on the mandrel in close contact with each other, and are forced therefrom by the incoming wire, the shoulder b^2 acting as a point of resistance, enabling the wire to push against the already formed coils and effect the feed thereof. The rotation of the head C through the spring-rollers rotates continuously the coiled portions of the wire and effects the winding of the incoming wire. From the mandrel the wound wire passes into and through the journal c', and from thence out of the machine.

I have sometimes used with the mandrel a stationary bushing, E, (shown in Figs. 4 and 6,) and in such case the mandrel at its base is enlarged, so as to fill the bushing at one end and form the equivalent of the shoulder b^2, and the wire is fed into the bushing through a slot, e, at one side thereof. A portion of the coils (those last made) are thus confined in an annular chamber formed between the bushing and the mandrel, and prevented from climbing upon one another under the lateral crowding caused by the entrance of the new wire. The automatic feed of the wound wire may in this way be rendered certain; but where everything works smoothly this bushing may be dispensed with.

A leg, e', depends from the bushing to within the opening in the bed, as indicated in Fig. 4 and by the dotted lines in Fig. 2, and thus prevents its rotation. When the bushing is used the enlarged portion of the mandrel forms a shoulder which is the equivalent of the shoulder b^2.

Other friction devices which will allow the unimpeded passage of the wound wire through them may be substituted for the spring-rollers, if desired. I myself have used a split chuck instead of said rollers with very good results, and hence I do not wish to be limited in my claims, except where specific claim is laid to such rollers.

I claim—

1. The machine for coiling wire, consisting of two rotating heads, one carrying the mandrel around which the wire is wound, and having formed thereon a shoulder, b^2, at the point where the wire is fed, and the other head carrying a friction device for rotating the coiled wire, substantially as specified.

2. The combination of the following instrumentalities, viz: first, a rotating head carrying a mandrel, upon which the wire is wound, and having formed thereon a shoulder which acts as a point of resistance against which the incoming wire impinges at the point where it is fed to the machine; second, another rotating head carrying a friction device for rotating the coiled portions, and, third, a stationary slotted bushing, E, substantially as and for the purpose set forth.

3. The combination of the two rotating heads, one carrying the mandrel and the other a friction device for rotating the coiled wire, consisting of the two spring-rollers having their axes at right angles to that of the heads, substantially as specified.

4. The combination of a rotating mandrel and shoulder, a rotating friction device for rotating the formed coils, mechanism for imparting rotation to said parts, and a tension device delivering the wire to the mandrel at said shoulder, substantially as specified.

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