(No Model.)

C. COLLINS.

MACHINE FOR FORMING SPRINGS.

No. 603,175. Patented Apr. 26, 1898.

Fig. 1.

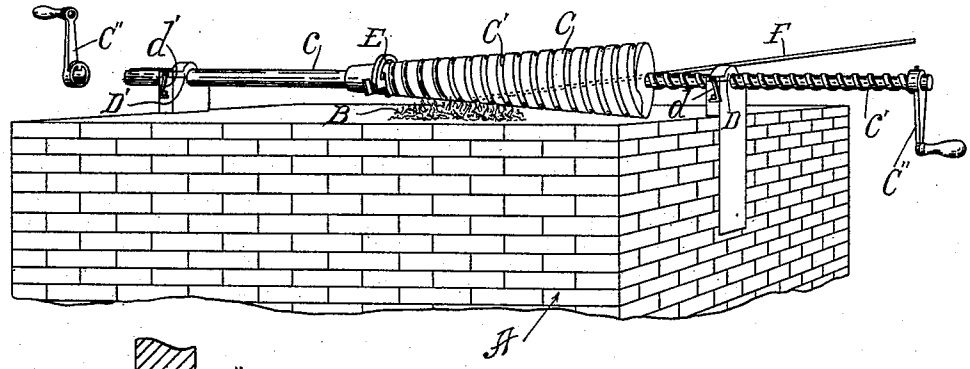


Fig. 2.

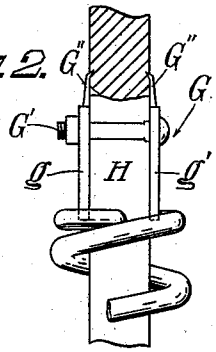


Fig. 3.

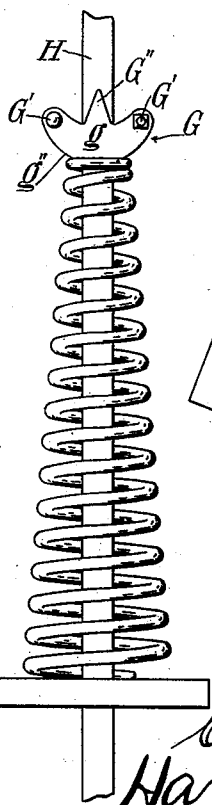


Fig. 5.

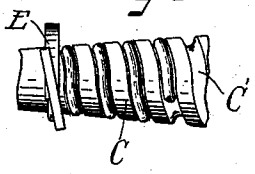


Fig. 4.

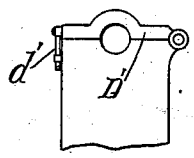
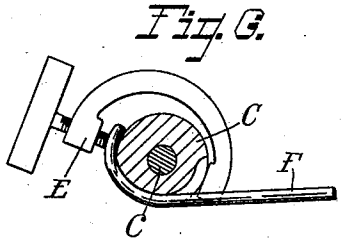


Fig. 6.



Witnesses
Percy Lingaman.
Alfred A. Townsend.

Inventor
Charles Collins, by
Hazard & Townsend
his attys.

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UNITED STATES PATENT OFFICE.

CHARLES COLLINS, OF LOS ANGELES, CALIFORNIA.

MACHINE FOR FORMING SPRINGS.

SPECIFICATION forming part of Letters Patent No. 603,175, dated April 26, 1898.

Application filed December 11, 1896. Serial No. 615,403. (No model.)

To all whom it may concern:

Be it known that I, CHARLES COLLINS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Machines for Forming Springs, of which the following is a specification.

My invention relates particularly to means for forming the springs which I manufacture and apply to windmills to sustain or balance the weight of the pump-rod, thus to practically avoid the loss of power ordinarily required to lift the rod, practically the only weight required to be lifted when my spring is employed being the weight of the water in the pump-stock above the piston. In manufacturing these springs it is necessary that steel rods of a large diameter be employed in order to make the springs of sufficient strength to support heavy pump-rods, such as mining-pump rods, and ordinarily such steel cannot be bent cold.

My improved machine is adapted to be employed upon a common forge for the purpose of manufacturing the springs and turning them out quickly and cheaply and in perfect form.

By my invention the steel which I use may be shipped to the place of use in the shape of rods, which are easy to handle and very compact in shipment, in contradistinction to coiled springs, which are cumbersome and take up much room.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view showing my improved machine in operation upon a forge. Fig. 2 is a fragmental view, partly in section, showing an adjustable clamp which is to be secured upon a wooden pump-rod and to support the weight of the rod by resting upon the top of the spring. Fig. 3 is a fragmental side elevation of my spring applied to a windmill pump-rod. Fig. 4 is a fragmental side elevation showing one of the separable journals for journaling the cylinder-stem upon the forge. Fig. 5 is a fragmental view of the end of the former or cylinder, showing a portion of a spring coiled upon the cylinder. Fig. 6 is a sectional view of the same.

In the drawings, A represents a forge having thereon the customary fire B, which is arranged upon the fire-bed of the forge.

C is the spring-forming cylinder, which is preferably of conical shape, as shown, and is journaled transverse the fire-bed of the forge by means of journals D and D′, arranged upon suitable supports, which are provided upon opposite sides of the fire-bed. The journals are arranged to hold the cylinder suspended close to the fire, but at one side thereof, and at such a height as will allow the rod to be drawn through the fire as the cylinder is rotated to wind the rod thereupon. The cylinder is provided with a shaft *c*, one end of which, *c′*, is provided with screw-threads which screw through the journal D. The screw-threads are of the same pitch as the pitch of the spiral of the springs which it is desired to produce. The other end of the shaft is smooth and slides through the journal D′. The cylinder is preferably provided with grooves C′, into which the rod F takes as the cylinder is rotated. The journals D and D′ are each separable and secured in place by means of hasps *d* and *d′* or any other suitable means which may be quickly operated to release the screw from the box and allow the rapid return of the cylinder back to the point of beginning after each spring is completed. A further object of this is to allow the spring to be removed endwise from the shaft after forming.

E is a clamp which is used to clamp the end of the steel rod to the small end of the cylinder, so that as the cylinder is rotated the rod will be wound upon the cylinder.

In practice to operate the machine the rod has one end placed in the forge and heated so that it will bend, and this end is then clamped upon the small end of the cylinder. As fast as the rod becomes heated it is wound upon the cylinder by rotating it by means of the cranks C″ or any other suitable means, and as the cylinder is rotated the screw upon the screw-threaded end *c′*, being of the same pitch as the spiral of the spring, causes the cylinder to travel forward axially across the fire-bed, so as to always retain the rod in the same position relative to the fire. It will be understood that the cylinder is rotated slowly, so that the rod becomes sufficiently heated during its passage through the fire. After sufficient of the rod has been wound upon the

cylinder to form a spring the rod is cut off if too long, the clamp is unscrewed, the journal D′ is unhasped and opened, and the spring is removed from the cylinder and tempered and is then ready for use. In case it is found necessary in order to effect a convenient removal of the spring from the cylinder the spring may be held and the cylinder rotated to cause it to travel backward and unscrew out of the spring.

G is a clip formed of two members $g\,g'$, having crescent-shaped under faces g'', which fit into the upper end of the spring and center it about the pump-rod H. Each member is provided with a prong G″, which takes into the wood of the pump-rod when the bolts G′ are tightened to clamp the clamp upon the pump-rod.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination set forth of a forge provided with journal-bearings arranged upon opposite sides of the fire-bed; a spring-forming cylinder provided with a shaft or stem journaled in the bearings and adapted to travel axially across the fire-bed; means for clamping the end of a rod to the cylinder; and means for rotating the cylinder.

2. The combination set forth of a forge provided with journal-bearings arranged upon opposite sides of the fire-bed; a cylinder arranged above the fire-bed and provided with a shaft journaled in the bearings, one of such bearings being screw-threaded, and one end of the shaft being provided with screw-threads adapted to screw through the bearings; and suitable means for clamping the end of a rod to the cylinder.

3. The combination set forth of a spring-forming cylinder provided with a smooth shaft at one end and a screw-threaded shaft at the other end; a smooth bearing for the smooth end of the shaft arranged to allow the shaft to reciprocate axially therethrough; a screw-threaded bearing for the screw-threaded end of the shaft; the screw-threads being of the same pitch as the pitch of the spiral of the spring to be formed.

4. The combination set forth of a forge provided with journal-bearings arranged upon opposite sides of the fire-bed; a cylinder arranged above the fire-bed and provided with a shaft journaled in the bearings, such cylinder being provided with grooves, and one of the bearings being screw-threaded and one end of the shaft being screw-threaded and adapted to screw through the bearing, the pitch of the screw-thread of the shaft and of the grooves upon the cylinder being the same; and suitable means for clamping the end of a rod to the cylinder.

CHAS. COLLINS.

Witnesses:
ALFRED I. TOWNSEND,
JAMES R. TOWNSEND.