(No Model.)

E. W. DURKEE.

WIRE COILING MACHINE.

No. 273,483. Patented Mar. 6, 1883.

Fig. 1.

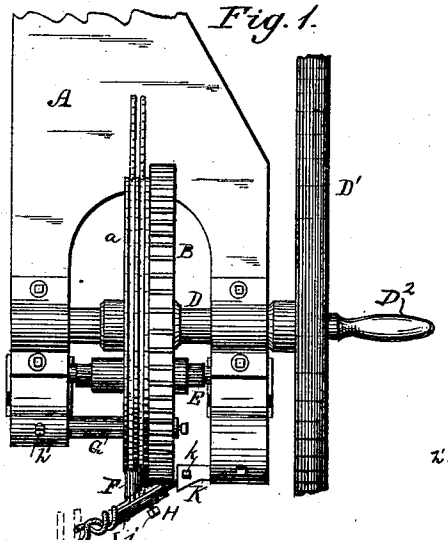


Fig. 2.

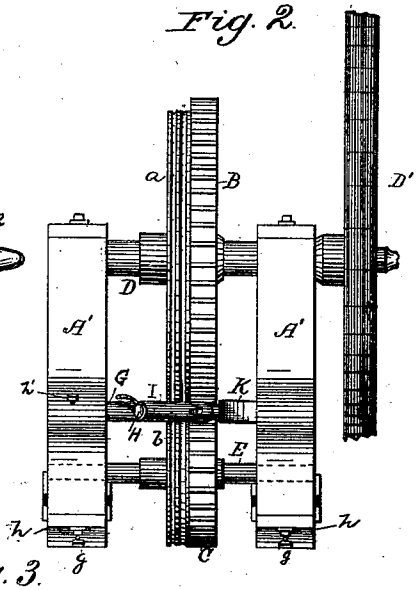


Fig. 4.

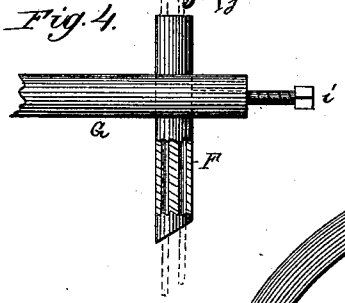


Fig. 3.

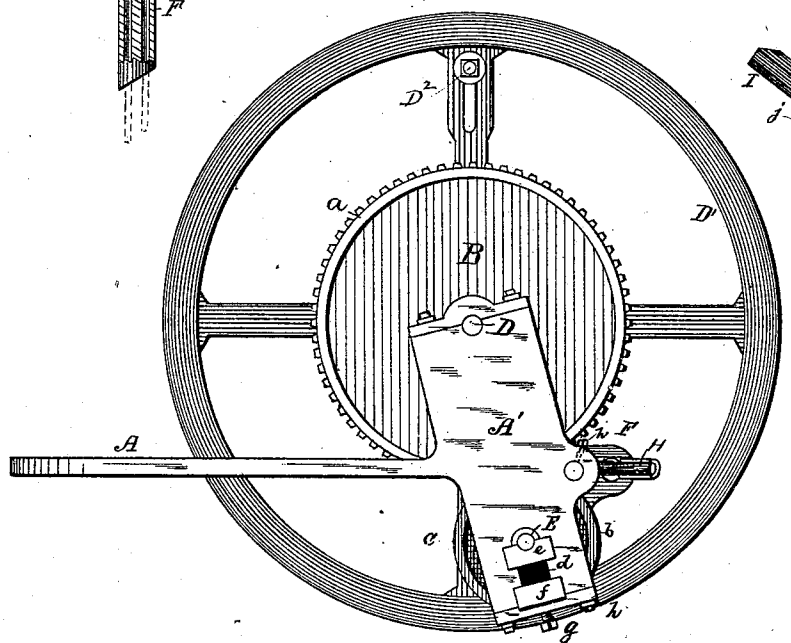


Fig. 5.

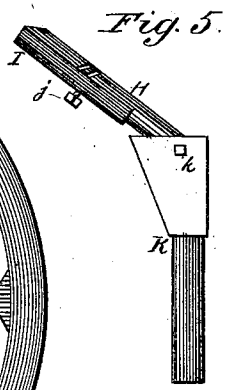


Fig. 6.

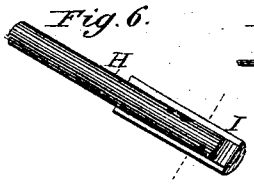
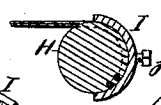


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD W. DURKEE, OF MASON, ILLINOIS.

WIRE-COILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 273,483, dated March 6, 1883.

Application filed November 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. DURKEE, of Mason, in the county of Effingham and State of Illinois, have invented a new and useful Improvement in Wire-Coiling Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improvement in the class of wire-coiling machines in which the wire is passed around a spirally-grooved former inclosed by a cylinder or sleeve.

The improvement relates to an improved substitute for such sleeve, the construction and operation of the same being as hereinafter described.

In the accompanying drawings I have illustrated a machine of which my improvement forms a part.

Figure 1 is a plan view, Fig. 2 an end view, and Fig. 3 a side view, of said machine. Figs. 4, 5, 6, 7 are detail views, illustrating more particularly the features of my invention.

The letter A indicates the horizontal iron bed-plate, and A′ A′ the uprights or parallel portions of the frame of the machine, all of which are cast solid or in one piece. To said uprights A′ A′ all the operative or working parts of the machine are applied, as follows: Letters B and C indicate respectively a large and small spur-gear, which are mounted on horizontal shafts D E and arranged in the same vertical plane, the larger gear, B, being placed above the other, C, with which it meshes, as shown, so that they will rotate simultaneously in opposite directions. The shafts D E of said gears are journaled respectively in the upper and lower ends of the uprights A′ A′, and rotated by hand-power applied to the handle D^2 of a balance-wheel, D′, fixed on one end of the shaft D. Said handle is made adjustable radially to the shaft by means of a slot in one of the arms of wheel D′, for the purpose of varying the force applied and speed derived therefrom as may be required.

The wire to be coiled is passed between the circular bosses or rims *a b*, which are formed on one side of the gears B C, as shown, and by friction therewith it is drawn forward and forced into the coiler, hereinafter described.

In practice the wire is found to vary slightly in size or thickness, and to allow the machine to compensate for such variation the bearings of the lower gear, C, are made elastic or yielding. For this purpose elastic blocks *d* are placed between the brasses *e* and a plate, *f*, supported by a screw, *g*, that passes through the cap *h* of the bearing. The elasticity of said blocks *d* holds the rims *a b* pressed tightly on the wire, so that as the wheels B C rotate it is carried forward; but while the pressure suffices for this purpose, however small the wire may be, it is never so excessive as to flatten wire of unusual thickness, as would be the result if the bearings of the feed-wheels were unyielding.

The wire-guide F is affixed to a holder consisting of a bar, G, which is secured in a socket by means of a clamp-screw, *h′*, Figs. 1 and 2, said socket being formed in one of the parts A′ of the frame. This construction and combination of parts enable the holder G to be adjusted longitudinally, so that the guide F may be moved laterally, as may be required, in order to secure the nice relation that must exist between it and the wire-coiler or former H. The guide F is also adjustable lengthwise in the holder G, being clamped by means of a screw, *i*, as shown in Fig. 4. The former or wire-coiler H has spiral grooves, and a cap, I, is attached to the outer side of the same by means of a screw, *j*. This cap is in the form of a thin hollow semi-cylinder or half-sleeve, and is adapted to fit somewhat closely around the former H. The latter is placed at a slight angle to the axis of the guide F, and secured by a clamp-screw, *k*, in a holder or bar, K, that is held in a socket in the frame A′. The arrangement is such that the point or outer end of the guide F is close to the former H, just below the upper edge of the cap I, and near its right-hand end, as seen in Fig. 1.

I find it practicable to coil two wires simultaneously, and hence the machine does double the work of those ordinarily employed. The bosses *a b* have two grooves side by side, and two longitudinal holes are formed in guide F to receive the wires.

The operation is as follows: Upon rotating the gear B the wires are carried forward, (by the clamping action of the bosses *a b* thereon,) forced through the guide F, and beneath the

cap I into the spiral grooves of the former H, around which they pass, and are delivered off the end of the same in continuous spiral coils.

The advantages of the cap I, as compared with the cylinders or sleeves usually employed heretofore, will be sufficiently apparent from the following statement:

In the case of such cylinders as are loose or free to revolve around the former the wire, when forced into the grooves of the former, pushes or crowds with considerable force against the inner side of the cylinder—that is to say, against the side which is farthest from the guide—and thus brings the opposite inner side of the cylinder into hard frictional contact with the adjacent side of the former, so that the cylinder and former are eccentric to each other, being separated by a wider space on one side than the other. The friction of the wire, in following the spiral groove on one side of the former, is thus increased, and the tendency to wear and damage the wire is correspondingly great, while increased power is required to drive the machine. A more serious difficulty is, however, involved in the tendency of the wire to slip out of the groove on the side of the former, where the space between it and the adjacent inner portion of the cylinder is greatest, and when this happens the wire becomes wedged between the opposing concentric surfaces, so that the operation of the machine is arrested and considerable time and labor required to put it again in working order, besides cutting or abrading action on the wire.

In the case of machines having fixed cylinders, or cylinders that do not revolve around the former, the friction and wear and tendency of the coils to become distorted are but little less than in machines having revolving cylinders.

In my machine the power required to drive it is considerably less, since the friction is much reduced and the coils made more easily. The machine is also less liable to get out of order and will last a much longer time. The cap I may be fitted to the spirally-grooved former so perfectly and tightly that there is absolutely no space between them, and hence the wire cannot slip out of the groove and traverses the side of the cap but once; whereas in the case of the complete cylinders, more especially such as revolve, some space must be left between it and the former, so that the wire is not confined in the groove so closely as desirable, and the coils are not made so perfectly, besides other undesirable results before stated.

What I claim is—

In a wire-coiling machine, the combination, with the wire feeding and guiding devices and the spirally-grooved former, of the cap I, having the form of a segment of a hollow cylinder, and fitted to the former and tightly secured thereto, as shown and described.

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Witnesses:
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