No. 870,237. PATENTED NOV. 5, 1907.

R. L. HORSLEY.

WIRE COILING MACHINE.

APPLICATION FILED FEB. 10, 1906.

Fig. 1.

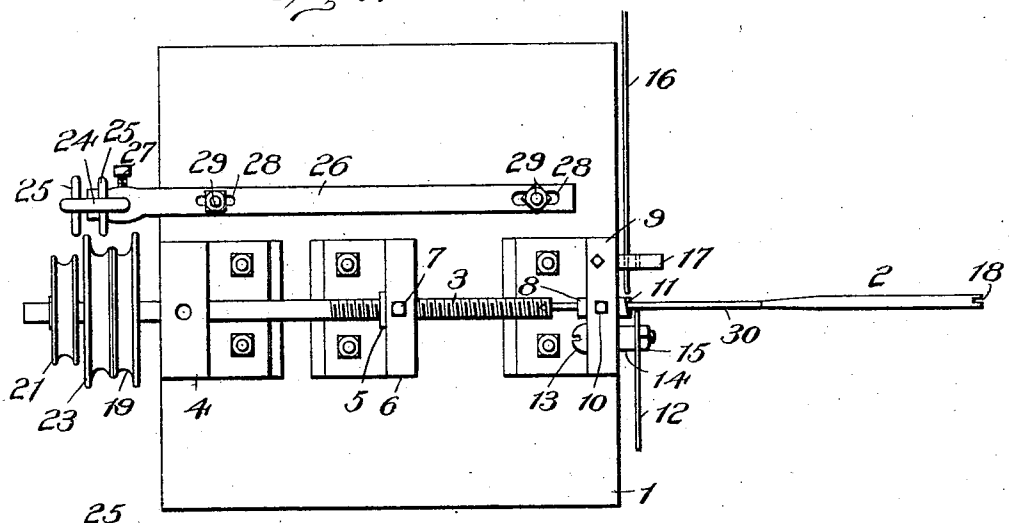


Fig. 2.

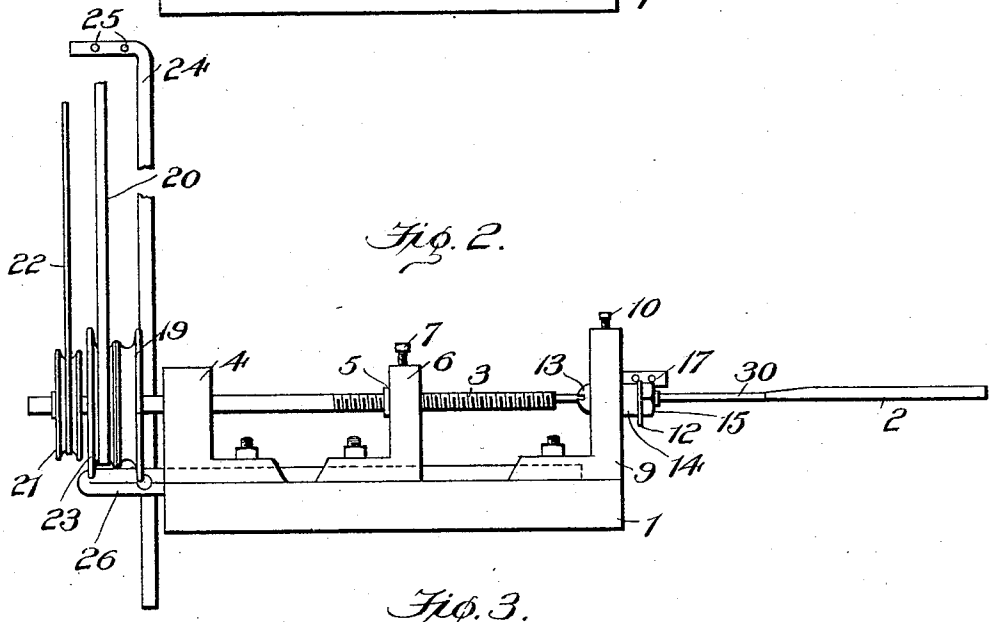
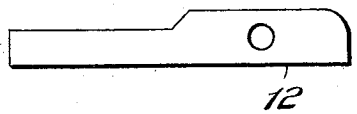


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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WIRE-COILING MACHINE.

No. 870,237. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed February 10, 1906. Serial No. 300,478.

To all whom it may concern:

Be it known that I, ROBERT L. HORSLEY, a citizen of the United States, residing at Fort Worth, Texas, have invented a new and Improved Wire-Coiling Machine, of which the following is a specification.

My invention relates to a machine for manufacturing coils of wire, and the object is to provide machines which will be efficient and inexpensive and easily operated.

Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application and specification.

Figure 1 is a plan view of the machine. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of the starting guide.

Similar characters of reference are used to indicate the same parts throughout the several views.

The mechanism is mounted on a suitable base 1. The machine is provided with an axially shiftable needle 2 which is carried by a screw shaft 3 which is provided with a bearing 4 through which the shaft freely moves. The screw shaft 3 moves axially by means of a threaded sleeve 5 which is rigidly mounted in a bearing 6 and the sleeve may be adjusted and held at different adjustments by a set screw 7. The needle 2 moves freely through a sleeve 8 which is secured in a bearing 9. The bearings 4, 6, and 9 are all secured to the base 1. The sleeve 8 is secured in the bearing 9 by a set screw 10. The sleeve 8 also serves as a starting guide for the wire to determine the flight of the coil. The means for feeding and starting the wire to form the coil are fully shown in Fig. 1.

The needle or spindle 2 carries the coil of wire. The sleeve 8 by reason of the cut-out 11 directs the wire as it is coming to the spindle, giving the wire the proper direction before it actually reaches the spindle and will thus aid in giving the coil the proper flight or pitch. The sleeve 8 performs another function hereinafter explained. The sleeve 8 is made adjustable for varying the flight of the coil. The blade 12 completes the starting of a coil. It prevents the coil from spreading as each portion of wire is making the first turn about the spindle or needle 2, or as each portion of wire is being bent around the spindle or needle. The guide 12 is mounted in the bearing 9 by means of a screw bolt 13 and is held on the screw bolt between a washer or collar 14 and a nut 15. The blade or guide 12 may be turned by hand when the wire is to be started around the spindle 2.

To commence making a coil, the wire 16 comes from a suitable spool and passes through a guide 17 which is adjustably mounted in the bearing 9. The wire is then bent down on the spindle between the sleeve 8 and the guide 12 and on around the spindle, passing on the outside of the guide 12 when it starts down around the spindle the second time. The wire is bent several times about the spindle and then secured in the slot 18 in the end of the spindle. After the coil is well started the part wound on by hand must be cut off so that the coil will pass on off the end of the spindle. The shaft 3 is rotated by the pulley wheel 19 and is moved for winding the wire on the spindle 2 by the screw portion of the shaft which turns in the threaded sleeve 5. The spindle thus travels for drawing and bending the wire on the spindle. The spindle is made to travel any convenient distance by rotating in the proper direction. The spindle is then drawn back through the coil by rotating the spindle in the opposite direction. The pulley wheel 19 is driven by the belt 20 for forming the coil, but is driven in the opposite direction by a pulley 21 which is driven by a belt 22 for drawing the spindle back through the coil to let the coil off the spindle. When the spindle is to be withdrawn from the coil the belt 20 is shifted to a loose pulley 23. This shifting of the belt 20 is accomplished automatically by a shifter 24 which is set so that when the spindle is fed to carry the coil forward the determined distance, one of the pins 25 on the shifter will shift the belt 20 to the loose pulley 23. The belt 22 will commence to turn the spindle in the opposite direction by reason of the spindle being rigid in the shaft 3. When the spindle has been drawn backward over the distance it has gone forward the other pin 25 shifts the belt 20 back on the pulley 19 and the spindle commences at once to form more wire coil. The machine thus operates automatically when once started. It requires very little power to turn the spindle backwards. For this reason the belt 22 may be a small cord and is never shifted from the pulley 21 but slides on the pulley when the spindle is being driven forward for forming coil. The shifter 24 is mounted in an adjustable bearing 26 and the shifter can thus be varied to change the time of the shifting of the belt 20 and the shifter is adjustable vertically in the bearing 26 and may be held at different adjustments by a set screw 27. The bearing 26 has slots 28 therein and is secured to the base 1 by bolts 29 which are provided with suitable nuts. The spindle 2 is adapted to grip the coil of wire for forming more coil and to release the coil at the moment the spindle is to be drawn back through the coil to let the coil off of the spindle. The spindle has large portion 2 and a small portion 30 and the large portion tapers to the small portion. When the spindle is turned in the direction to feed the coil

forward and form the coil the coil will engage the large portion of the spindle, but when the spindle is rotated in the opposite direction the coil will release the spindle and the spindle will move back through the coil. The sleeve 11 will prevent the displacement of the wire to be fed to the spindle so that the wire is always in position to be fed to the spindle at the moment when the spindle commences to turn in the direction to form more coil. It will be understood that when the spindle 2 is turned for making more coil it will be turning in the direction of the twist of the coil and the coil will grip the spindle, and that when the spindle is turned to be withdrawn from a portion of the coil it will be turning in the opposite direction to the twist of the coil and the coil will not grip the spindle. These operations are made positive by making the spindle smaller at a short distance from the end. The wire coil is formed on the small portion of the spindle, and when the tension is released, the resiliency of the wire will allow the coil to expand sufficient to receive the large portion of the spindle.

This machine dispenses with gripping and friction feeding rolls.

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

1. A wire coiling machine comprising a spindle, a sleeve bearing for said spindle, combined means for rotating said spindle and for reciprocating the same in said sleeve, said sleeve having an angular cut-out for directing the wire to be fed to said spindle, and an adjusting guide blade coöperating with said sleeve for determining the flight of the coil of the wire.

2. A wire coiling machine having a spindle, a sleeve bearing for said spindle, means for rotating said spindle and for reciprocating the same in said bearing, and means for directing wire to said spindle and for determining the flight of the coil of the wire, said spindle having a large portion for gripping the wire coil and a smaller portion whereon the coil is formed.

3. A wire coiling machine having a spindle, means for feeding wire to said spindle, means for rotating and axially moving said spindle to form wire coil, means for rotating and axially moving said spindle in the opposite direction to withdraw said spindle from portions of said coil whereby said coil is fed from said spindle, and means for regulating the flight of the coil.

4. A wire coiling machine having a rotatable and axially movable spindle, means for guiding wire to said spindle, means for regulating the flight of coils to be formed on said spindle, suitable bearings for said spindle, gearing for driving said spindle for forming wire coil, shifting means for releasing said gearing, means for varying the time for said shifting means to release said gearing, and gearing for rotating said spindle for feeding off wire coil from said spindle.

5. A wire coiling machine having a rotatable and axially movable spindle, means for guiding wire to said spindle, suitable bearings for said spindle, a spindle carrier, a forward driving pulley rigidly mounted on said carrier, an idler mounted on said carrier, a belt for driving said pulley, a shifter for shifting said belt from said pulley to said idler and from said idler to said pulley, means for setting said shifter at different longitudinal and vertical adjustments, and a backward driving pulley rigidly mounted on said carrier.

6. A wire coiling machine having a spindle, means for feeding wire to said spindle, and means for driving said spindle, said spindle having a small portion on which the coil is formed and a large portion for gripping the wire coil whereby the wire is drawn through the machine, the large portion of said spindle tapering to the small portion and the coil of wire being fed from the small portion to the large portion.

In testimony whereof, I set my hand in the presence of two witnesses, this 20th day of January, 1906.

ROBERT L. HORSLEY.

Witnesses:
A. L. JACKSON,
S. M. FRY.