

A. J. SPICER.
 APPARATUS FOR FORMING WIRE HOOPS.
 APPLICATION FILED DEC. 30, 1907.

931,970.

Patented Aug. 24, 1909.
 2 SHEETS—SHEET 1.

Fig - 1 -

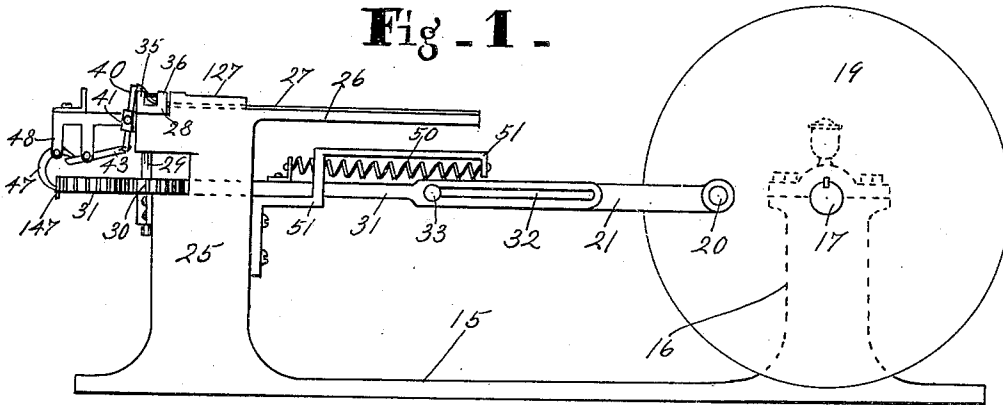


Fig - 2 -

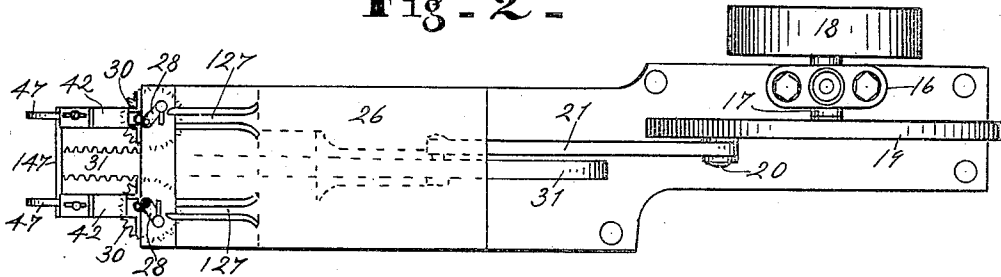
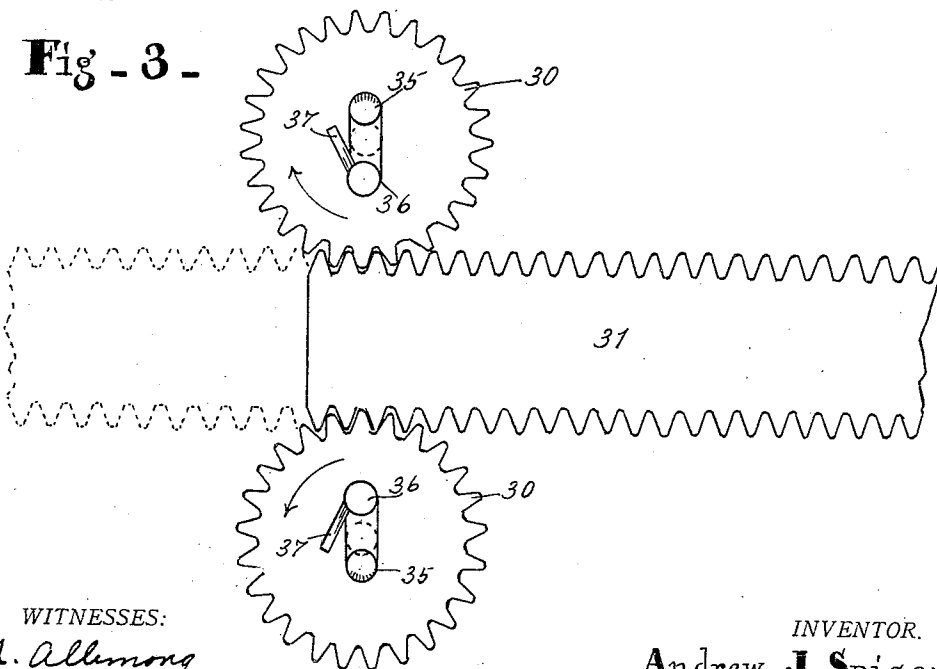


Fig - 3 -



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2 SHEETS—SHEET 2.

Fig. 4—

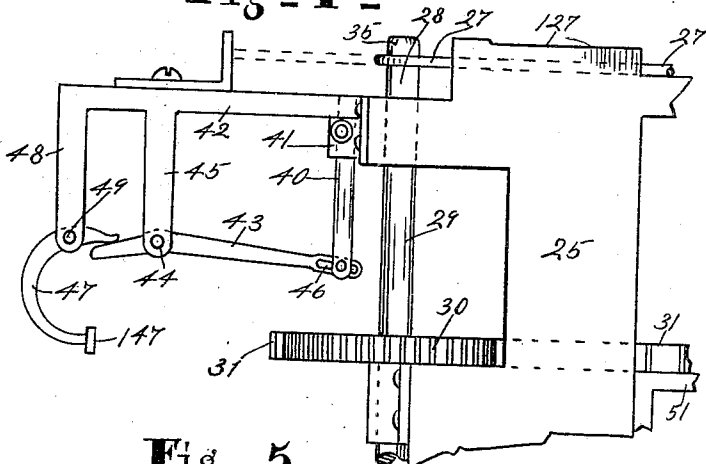


Fig. 6—

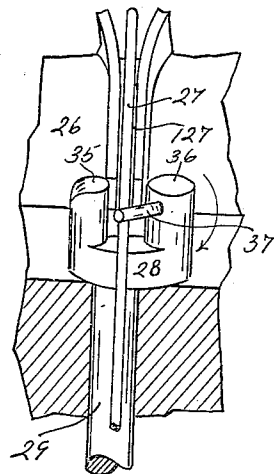


Fig. 5—

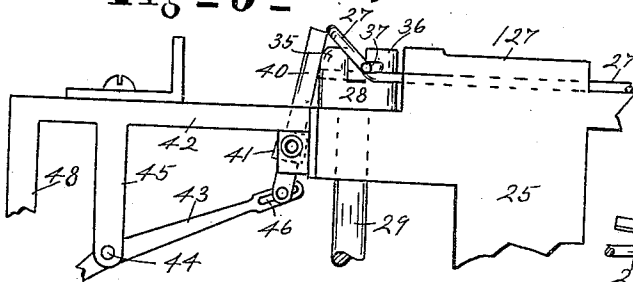


Fig. 10—



Fig. 7—

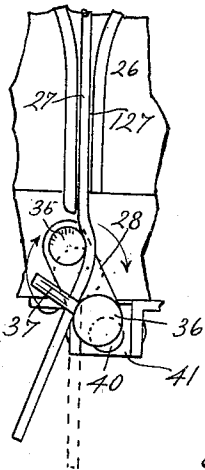


Fig. 8—

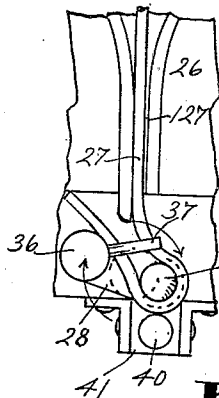


Fig. 9—

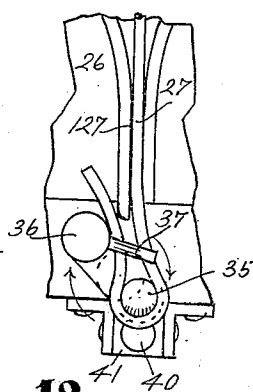


Fig. 11—

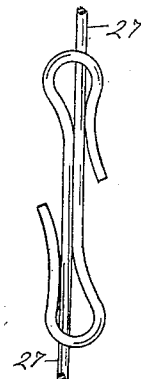


Fig. 12—



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UNITED STATES PATENT OFFICE.

ANDREW J. SPICER, OF FRANKLIN, INDIANA.

APPARATUS FOR FORMING WIRE HOOPS.

931,970.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed December 30, 1907. Serial No. 408,546.

To all whom it may concern:

Be it known that I, ANDREW J. SPICER, of Franklin, county of Johnson, and State of Indiana, have invented a certain new and useful Apparatus for Forming Wire Hoops and the Like; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

The object of this invention is to provide an apparatus for forming the ends of wires or the like for use in making hoops and the like.

The hoop wire referred to has reversely extending loops formed on the two ends thereof and bent and adapted to interlock to form a wire hoop. To enable the same to be readily and practicably interlocked, the loop on one end of the wire is formed by bending the end around to the left, and the loop on the other end of the wire is formed by bending the end around to the right, and the end of one loop is bent outwardly, while the end of the other loop is bent inwardly so that they will come together right in interlocking, and will make a tight tie when the loop is formed without much drawing. The loops on the ends of the wire, therefore, are given by the machine their final form as the same exists after the hoop is formed and in place.

Another feature of this invention is the provision of a plurality of wire-forming parts actuated by a single means so as to form oppositely extending loops.

The nature of this invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Figure 1 is a side elevation of the device. Fig. 2 is a plan view thereof. Fig. 3 is a detail showing in plan the twisting wheels and the rack bar for twisting them, the latter being partly broken away and one extreme position thereof being indicated by dotted lines. Fig. 4 is a side elevation of the upper left-hand part of the machine as shown in Fig. 1, showing on an enlarged scale the means for forming a loop in the wire, said parts being partly broken away and being shown in their positions at the beginning of the operation of the device. Fig. 5 is the same at the end of the loop-forming operation, parts being omitted. Fig. 6 is a perspective view of the loop-forming wheel and adjacent parts with the wire in place to be looped. Fig. 7 is a plan view thereof showing the wire partly looped. Fig. 8 is

the same showing the loop nearly completed. Fig. 9 is the same showing the loop completed. Fig. 10 is a side elevation of the looped ends in their position when completed and prior to interlocking. Fig. 11 is a plan view of the same during the interlocking of the loops. Fig. 12 is a plan view of the loops interlocked.

The machine is provided with a suitable base or foundation 15 that has at one end a stand 16 in which a short shaft 17 is transversely mounted. Said shaft carries at one end a pulley 18 driven by a belt from some source of power, and a shaft on its other end carries a driving wheel 19 which has a wrist pin 20 eccentrically mounted to which a connecting bar 21 is pivoted at one end. At the other end of the base or foundation there is a stand 25 upon the upper end of which there is a horizontal table 26 upon which the wires 27 are placed by hand for treatment. Said wires are inserted between the guides 127 on the table 26. There are two sets of guideways 127 in alinement with two twister heads 28 that are each secured on the upper end of a shaft 29 carrying gear wheels 30, said shafts being suitably mounted vertically in the upper part of the stand 25.

There are two wheels 30, one for each twister head, as seen in Fig. 3, oppositely located and actuated by a single rack bar 31 movable between them, said rack bar having at one end a slot 32 through which a pin 33 in the connecting bar 21 loosely projects. The length of said slot 32 is less than the diameter of the path of movement of the wrist pin 20 so that the connecting bar 21 gives the rack bar 31 movement only at the end of its forward stroke, said bar 31 being withdrawn by a spring 50 connected at one end with a bracket 51 and at the other end to said bar 31, as seen in Fig. 1, and in the meantime ample opportunity is furnished while the machine is continuously running for the proper manipulation of the wires. When the driving wheel 19 is in the position shown in Figs. 1 and 2, it has moved the rack bar from its inner limit of movement, as shown in Fig. 3 to its outer limit of movement. Such movement, of course, operates the twisting wheels 30 in opposite directions.

On the twister head 28 there are two upwardly extending pins 35 and 36 on opposite sides of the center of the wheel 30, and the latter pin 36 has a horizontally extending arm 37 therefrom at a point above the sur-

face of the twister head and projecting at an inclination to a straight line between the two pins 35 and 36 substantially as shown to prevent the upward movement and escape of the wire while between the pins and being looped. The rack bar 31 has sufficient throw to give said twister wheels about three fourths of a revolution and thus form the loop shown in which the end of the wire is turned around almost against the body of the wire, that is against one side of the guide 127, so as to leave a slot between the end and the body of the wire.

After the loop has been formed by turning the end of the wire around beside the body thereof, it is necessary to bend the loops at an angle of about 30° from the horizontal. This is done while the loop is still in place on the twisting wheel 30 by an upwardly movable loop-bending bar 40 slidable vertically in a guideway 41 connected with a bar 42 that is secured to the front face of the upper part of the stand 25. The loop-bending bar 40 is moved upwardly by a lever 43 fulcrumed at 44 to the lower end of an arm 45 that extends downwardly from the bar 42. The inner end of the lever 43 is slotted at 46 and pivotally connected with the lower end of the loop-bending bar 40. The lever is actuated by a semicircular bar-like piece 47 that is fulcrumed at 49 in the lower end of the bar 48 that extends down from the bar 42 parallel with and of the same length as the bar 45. The actuators 47 are connected by a bar 147 that extends across the path of the rack bar 31 and are actuated by engagement therewith of the outer end of the rack bar 31 as the latter moves from the position shown in Fig. 3 to the position shown in Fig. 1.

The machine is a continuously operating one, that is, the drive wheel 19 and the connecting bar 21 are in continuous movement, the latter reciprocating while the rack bar 31 has intermittent movement at the extreme throws of the bar 31. The wires are put in place on the loop-forming head as shown in Fig. 6 when the rack bar is in the position shown in Fig. 3, the wire lying under the arm 37. As the twistors 30 move from the direction indicated by the arrows in Fig. 3, the loop-forming head will be turned gradually to the position shown in Fig. 7 and then to that shown in Fig. 8, and further movement will bring the turned end of the wire beyond the position shown in Fig. 9. Then the outward limit of movement of the rack bar is reached, and, as has been explained, that operates the loop-bending bar 40 that is forced upwardly into the position shown in Fig. 5 to bend the loop at about an angle of 30° from a horizontal line. Then the parts of the machine are reversed and the wires removed.

One side of the machine makes right-hand loops and the other side left-hand loops, and both sides can be operated simultaneously

on different wires. After the loops have thus been formed on a number of wires at each side of the machine, the two bundles of wires are exchanged and put on the opposite sides of the machine, and the other ends of these wires looped, as has been explained. This causes each wire to have right and left-hand loops, and the ends of the two loops are reversely bent with reference to each other. The wires when thus formed are ready for shipment in bundles of suitable size to the place for use, where they may be put on barrels, tubs, and the like.

At the place for use the looped ends of each wire are brought together so that they will overlap each other. Since the turned end of each loop is separated somewhat from the body of the wire, when the loops are placed in overlapping position, the body of the wire at each end will slip through the slot in the mouth of the loops and then nothing further is necessary except to draw the loops together. This is a very easy and simple way for uniting the loops, and this is the result of having the ends of the wires bent on opposite sides of the body of the wire and spaced therefrom somewhat. And since the loops are bent, when they are drawn together in interlocked position, they remain in that bent condition and form at once a tight connection that cannot be lengthened or drawn out so as to give much, when the hoop is driven in place on a barrel or tub.

What I claim as my invention and desire to secure by Letters Patent is:

1. A machine of the kind described, including an oscillatory loop-forming head having a pair of pins on opposite sides of the axis of the loop-forming head, and a guideway in line with the space between the pins, whereby the wire is inserted between the pins and held in position while the end is being looped.

2. A machine of the kind described, including an oscillatory loop-forming head having a pair of pins on opposite sides of the axis of the loop-forming head, a guideway in line with the space between the pins whereby the wire is inserted and held in position while the end is being looped, and an arm extending from one of said pins for preventing the escape of the wire while being treated.

3. A machine of the kind described, including a pair of oppositely located gear wheels, a rack bar movable between them for turning them in opposite directions, a shaft extending from each gear wheel with a loop-forming head on the end thereof, a pair of pins on the loop-forming head, a guideway in line with each pair of pins for guiding and holding the wires while being treated, and continuously driving means for actuating said rack bar intermittently.

4. A machine of the kind described, including an oscillatory loop-forming head pro-

vided with a pin about which a loop is formed
on the end of a wire, means for holding the
wire down while being looped, and means for
engaging the extreme outer end of the loop
5 after it has been formed and bending it
against the holding action of said holding
means.

10 5. A machine of the kind described, in-
cluding a pair of oppositely located gear
wheels, a rack-bar movable between them
for operating them in opposite directions, a
shaft extending from each gear wheel with a
loop-forming head on the end thereof, a pair
of pins on the loop-forming head, a guide-

way in line with each pair of pins for guiding 15
and holding the wires while being treated,
means for bending the ends of the loops, and
means engaged and actuated by said rack-
bar for causing the operation of said loop-
bending means. 20

In witness whereof, I have hereunto affixed
my signature in the presence of the witnesses
herein named.

ANDREW J. SPICER.

Witnesses:

N. ALLEMONG,

W. M. GENTLE.