Feb. 21, 1939. C. D. JOHNSON 2,148,357

WIRE STRAIGHTENING APPARATUS

Filed Sept. 24, 1936

Fig.1.

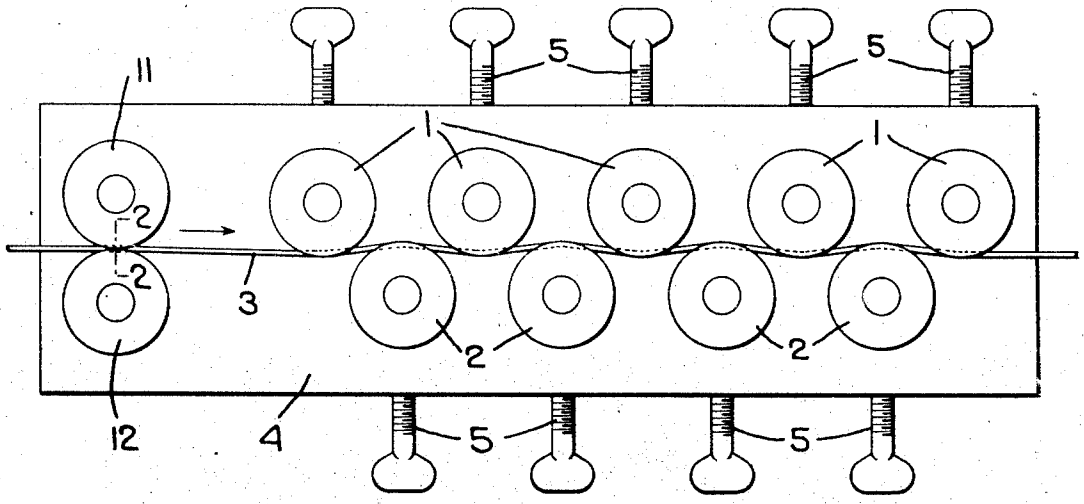


Fig.2.

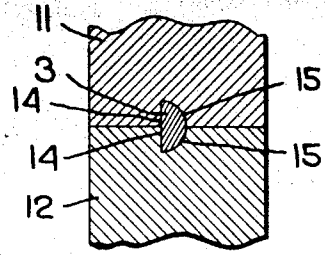


Fig.3.

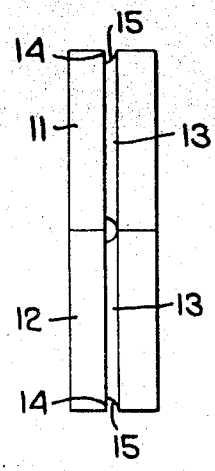


Fig.4.

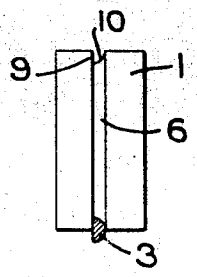


Fig.5.

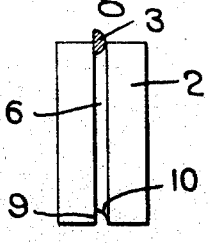
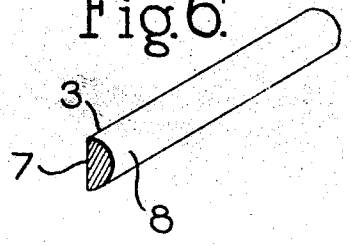


Fig.6.



Inventor.
Charles D. Johnson
by Kecard Smith & Tennant.
Attys.

Patented Feb. 21, 1939 2,148,357

UNITED STATES PATENT OFFICE

2,148,357

WIRE STRAIGHTENING APPARATUS

Charles D. Johnson, Worcester, Mass., assignor to Johnson Steel & Wire Company, Inc., Worcester, Mass., a corporation of Massachusetts

Application September 24, 1936, Serial No. 102,342

1 Claim. (Cl. 140—148)

This invention relates to wire-straightening devices, and one feature of the invention concerns a wire straightener designed to straighten wire which has a cross-sectional shape other than circular.

Another feature of the invention relates to a machine constructed to produce wire having a predetermined shape and to straighten the wire all in one operation.

The features wherein my invention resides will be more fully hereinafter set forth and pointed out in the appended claim.

In the drawing;

Fig. 1 shows a view of a wire-forming and straightening device embodying my invention;

Fig. 2 is a section on the line 2—2, Fig. 1;

Fig. 3 is a view of the two shaping rolls;

Fig. 4 is a view of one of the upper straightening rolls showing the shaped wire passing thereover;

Fig. 5 is a view of one of the lower straightening rolls showing the wire in contact therewith;

Fig. 6 is a sectional perspective view of the wire.

The wire-straightening feature of my invention is of that familiar type which comprises two sets of wire-straightening rolls 1 and 2 between which the wire 3 to be straightened passes, said rolls having peripheral wire-receiving grooves and having the usual staggered arrangement so that as the wire passes between the rolls it will have a slightly sinuous course.

The wire-straightening rolls 1 and 2 are shown as mounted on a suitable support 4, and the rolls of the two series are supported so that they can be adjusted relative to each other thereby to give the wire a greater or less sinuous course. The rolls may be mounted in the support 4 in any usual way so as to provide for the desired adjustment, and as herein shown each roll is independently adjustable, and its position with relation to the rolls of the other series is determined by an adjusting screw 5.

Each of the wire-straightening rolls 1 and 2 is provided with a peripheral groove 6 having a shape to fit the wire 3 so that as the wire passes over any straightening roll its shape is preserved, and it is prevented from twisting on spiralling so that the wire emerges from the straightening device with the same shape it had when it entered and without any spiral or twist.

The invention is adaptable for straightening wire having any cross-sectional shape other than circular. Merely as illustrating the invention I have shown it as adapted for straightening wire having the cross-sectional shape shown in Fig. 6, that is, wire having a general D shape in cross section and presenting a flat face 7 and the rounded face 8. The groove in each of the straightening rolls is shown as having the flat face 9 extending at right angles to the axis of the roll to fit the flat face 7 of the wire and the rounded face 10 to fit a portion of the rounded face 8 of the wire. The grooves in all the straightening rolls have an identical relation to the roll axis or the periphery of the roll, that is, the groove in each of the rolls has its flat face 9 extending at right angles to the roll axis. The identical grooves in the rolls 1 of the upper set have a cross-sectional shape complemental to and of a size to fit the cross-sectional shape of the portion of the wire engaging said rolls 1, and the identical grooves of the rolls 2 of the lower set also have a cross-sectional shape complemental to and of a size to fit the cross-sectional shape of the lower part of the wire that engages said rolls 2. Hence, as the wire passes through the grooves of the series of straightening rolls said wire will be prevented from twisting and will not only be straightened in the sense that kinks are removed but will be held from turning on its axis during the straightening process, thereby producing wire without any twist in it.

Another feature of the invention relates to a machine adapted to form wire, that is, to give wire a predetermined cross-sectional shape and to straighten the formed wire, all in one operation. For this purpose I propose to mount on the support 4 a pair of wire-shaping rolls 11, 12. These rolls have peripheral wire-shaping grooves 13 therein, each groove having a shape corresponding to one-half the cross-sectional shape of the wire. In the present instance, each shaping groove 13 is formed with the flat side 14 and the rounded side 15. These shaping rolls operate in substantially peripheral contact with each other, and as a round wire 3 is fed through said rolls it is shaped thereby and emerges therefrom with the cross-sectional shape produced by the grooves 13. As the wire leaves the shaping rolls it passes immediately to the straightening rolls 1 and 2 where it is straightened, and thus the wire-forming and wire-straightening operations are performed simultaneously.

If it is desired to subject the wire to a two-way wire-straightening operation, then the wire, after emerging from the straightening rolls 1 and 2, will be passed between two other sets of straightening rolls operating at right angles to the

straightening rolls 1 and 2 and also having grooves of a shape to fit the wire so that the shape of the wire is not disturbed or changed by its passage between two sets of rolls of the second straightening device.

I claim:

A machine of the class described comprising a pair of shaping rolls having mating grooves forming together a non-circular opening through which the wire passes and by which it is given the desired cross-sectional shape, wire straightening means situated closely adjacent the shaping rolls on the delivery side thereof and comprising an upper set of straightening rolls with which the upper side of the wire contacts and a lower set of straightening rolls having a staggered relation to the rolls of the upper set and with which the lower side of the wire contacts, the rolls of the upper set having in their peripheries identical grooves of a cross-sectional shape complemental to and of a size to fit the cross-sectional shape of the upper portion of the wire, and the rolls of the lower set also having in their peripheries identical grooves of a cross-sectional shape complemental to and of a size to fit the cross-sectional shape of the lower portion of the wire, the grooves in all the rolls of each set having an identical relation to the axis of the roll, and the rolls of one set having such relation to the rolls of the other set that the wire is given alternate opposite bends as it passes between the two sets of rolls, the grooves of the straightening rolls holding the wire from turning on its axis as it passes between them and is being straightened.

CHARLES D. JOHNSON.