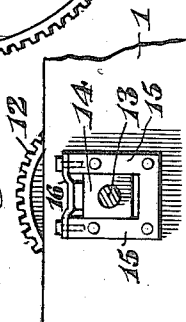


1,239,175.

2 SHEETS—SHEET 1.



BY

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1,239,175.

A. P. GILBERT.
WIRE STRAIGHTENING MACHINE.
APPLICATION FILED SEPT. 18, 1916.

Patented Sept. 4, 1917.
2 SHEETS—SHEET 2.

Fig. 3.

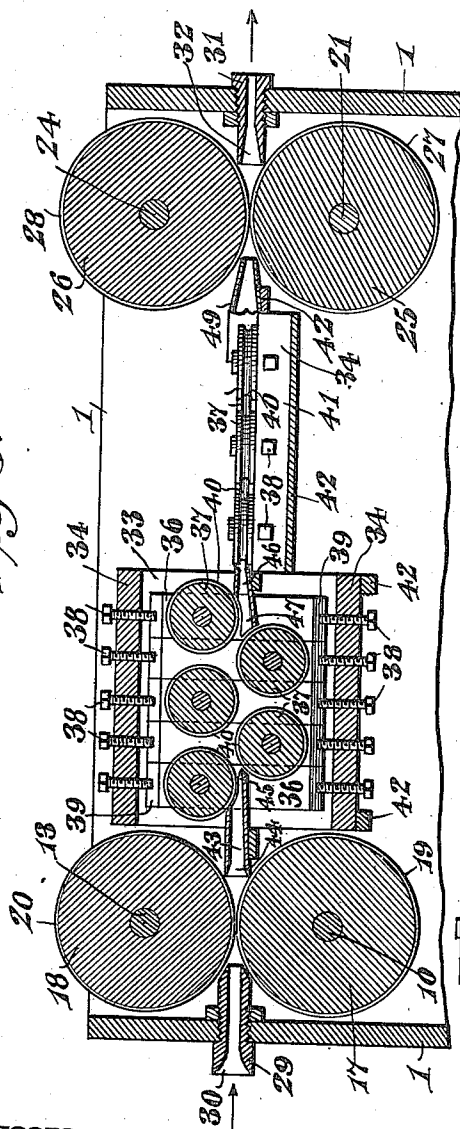


Fig. 4.

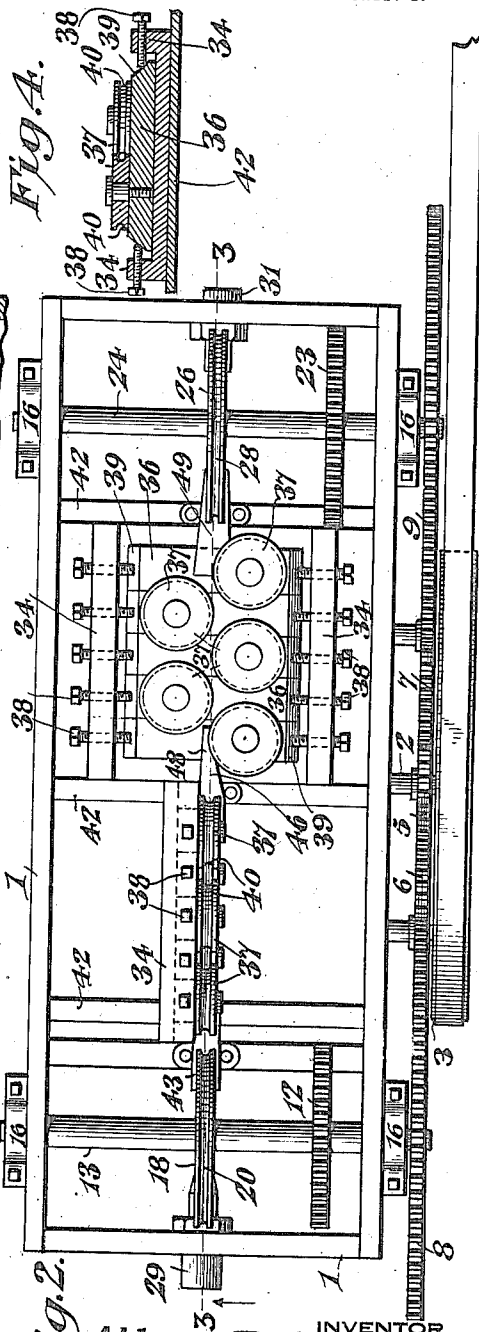


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALBERT P. GILBERT, OF DURHAM, NORTH CAROLINA.

WIRE-STRAIGHTENING MACHINE.

1,239,175.

Specification of Letters Patent.

Patented Sept. 4, 1917.

Application filed September 18, 1916. Serial No. 120,788.

To all whom it may concern:

Be it known that I, ALBERT P. GILBERT, a citizen of the United States, residing at Durham, in the county of Durham and State of North Carolina, have invented a new and useful Wire-Straightening Machine, of which the following is a specification.

This invention has reference to wire straightening machines, and its object is to provide a machine for the purpose especially adapted for straightening relatively short lengths of wire.

Certain commodities in certain parts of the United States are shipped in barrels or bales with strips or staves held together by wire bands. It is the usual custom at the place where the material is to be used to cut the wire and discard it, the wire being in short lengths of but a few feet, but if straightened this wire has a commercial value.

With the present invention such relatively short lengths of wire may be readily straightened at a comparatively small installation cost and at a very small running cost, for cheap labor may be employed and the cost of power is wholly negligible in a factory.

In accordance with the present invention the machine comprises feeding rolls with a guide tube leading to them and another guide tube leading from them, a bank of straightening rolls into which the second guide tube discharges, another bank of straightening rolls arranged perpendicular to the first bank with a guide tube between the two banks, another guide tube leading from the second bank, other rolls constituting drawing rolls following the last-named guide tube, and a final guide tube through which the straightened wire passes from the machine. The feeding and drawing rolls are intergearing, while the straightening rolls rotate independently on the passage of the wire between them. The whole structure is inclosed in a suitable casing in which the various parts are mounted, while provision is made for the adjustment of the straightening rolls as may be needed.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming part of this specification, with the further understanding that while the drawings show a practical form of the invention, the latter is

not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications come within the scope of the appended claim.

In the drawings:—

Figure 1 is a side elevation of a wire straightening machine embodying the invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a cross-section of one of the banks of straightening rollers.

Fig. 5 is a detail view of one of the journal bearings for one of the feeding rolls.

Referring to the drawings, there is shown a casing 1 designed to inclose the working parts of the machine except certain gearing. Carried by the casing 1 is a stub shaft 2 on which is mounted a pulley 3 designed to be driven by a belt 4 coming from any suitable source of power, such, for instance, as an electric motor, which, however, is not shown in the drawings. The pulley 3 carries a pinion 5 meshing with idler pinions 6, 7, in turn meshing with respective gear wheels 8, 9. The gear wheel 8 is carried by a shaft 10 extending through the casing 1 and journaled in the walls thereof. On the shaft 10 is a pinion 11 meshing with another pinion 12 mounted on a shaft 13 extending through the walls of the casing and carried by journal boxes 14 slidable in guides 15 and urged in one direction by elastic members 16. On the shaft 10 and located about midway of the width of the casing 1 is a grooved roll 17, and mounted on the shaft 13 is a similar roll 18 matching the roll 17. Both rolls are peripherally grooved, as shown at 19, 20, respectively, the grooves being of a size adapted to the wire it is desired to straighten. In the particular instance assumed such wire may be taken as No. 9 wire, since in certain industries such size of wire is used for holding the containers together. The gear wheel 9 is mounted on a shaft 21 journaled in and extending across the casing 1, and on this shaft within the casing is a pinion 22 meshing with another pinion 23 carried by a shaft 24 extending across the casing and supported in journal blocks and guides like the blocks 14 and guides 15 carrying the shaft 13. The shaft 24 is elastically urged toward the shaft 21 in the same manner as described with reference to

the shaft 13. On the shafts 21 and 24 are rolls 25, 26, with peripheral grooves 27, 28, respectively. The meeting faces of the set of rolls 17 and 18 and the set of rolls 25 and 26 are in alinement, with the grooves of the rolls alining. The rolls 25 and 26 are, however, of slightly greater diameter than the rolls 17 and 18, and the gearing connections being the same in both instances the peripheral speed of the rolls 25 and 26 is greater than that of the rolls 17 and 18, this arrangement being for a purpose to be described. The rolls 17 and 18 are located within the casing near one end thereof, and the rolls 25 and 26 are located within the casing near the other end thereof, the two sets of rolls being spaced apart a sufficient distance to accommodate certain structures to be described.

Extending through one wall of the casing 1 is a guide tube 29 reaching close to the meeting portions of the rolls 17 and 18. The entering end of the tube 29 is flaring, as shown at 30. Extending through the opposite wall of the casing 1 is another guide tube 31 having a flaring entering end 32 within the casing in close approach to the meeting portions of the rolls 25 and 26.

Adjacent to the discharge side of the feeding rolls 17 and 18 is a base plate 33 with opposite edge flanges 34 and constituting a supporting frame for a series of blocks 36. Each block 36 carries a peripherally grooved roller 37 and the blocks are held to the base plate 33 by set-screws 38 engaging opposite bevel edges 39 of the blocks. Each roller 37 has a peripheral groove 40 matching the peripheral grooves of the other rollers, and the base plate 33 carries a bank of rollers with their supporting blocks 36. There is another base plate 41 carrying a similar bank of rollers each mounted on a block and held and adjusted by set-screws like the similar parts of the base plate 33, and consequently the same reference numerals apply to the parts of and carried by the plate 41 as are applied to the parts of and carried by the plate 33. The two plates are supported by bars 42, with one plate at right angles or perpendicular to the other plate, so that the rollers of one plate lie in a plane at right angles to those of the other plate. The rollers 37 of both banks are idler rollers, that is, they are free to rotate without any special driving mechanism for them.

At the entering end of the bank of rollers next to the feed rolls 17 and 18 is a guide tube 43 having the end toward the feed rolls expanding, as shown at 44, and the other end formed with a nose 45 extending beyond the adjacent portion of the first roller of the bank into close relation to the second roller thereof in the order of travel of wire through the bank. At the discharge end of the plate 33 with its bank of rollers is an-

other guide tube 46 having a relatively wide entering end 47 and having an outlet end 48 similar to the outlet end 45 of the tube 43. At the discharge end of the second bank of rollers is another guide tube 49 discharging close to the receiving portion of the rolls 25 and 26, which, because of their somewhat greater peripheral speed, tend to stretch or render taut the wire passing between them.

When a piece of wire to be straightened is introduced through the tube 29 to the rolls 17 and 18, it is gripped thereby and directed into the guide tube 43, issuing therefrom into the first bank of rollers 37, passing between them in succession, being engaged at short intervals by the rollers so that any bends or kinks in the wire in the plane of the rollers are removed. The advancing end of the wire after leaving the first bank of rollers enters the guide tube 47 and is directed to the second bank of rollers to receive the same treatment, except in a plane at right angles to the first plane, whereby all bends or kinks not eliminated by the first set of rollers are eliminated by the second set of rollers. Leaving the second bank of rollers, the straightened wire passes through the tube 49 and is directed to the stretching or second set of feeding rolls 25, 26, where it is put under longitudinal tension and is drawn through the straightening rollers even after leaving the feeding rolls 17 and 18. The straightened wire issues from the casing 1 by way of the guide tube 31 and may then be disposed of in any desired manner.

The machine of the present invention is particularly adapted for acting upon relatively short pieces of wire of only a few feet in length. Such pieces of wire in the condition in which they are removed from the bundles of material are bent and kinked and otherwise distorted, but leave the machine in a straight condition. Such straightened pieces of wire may then be bundled and sold for a great variety of uses ranging from bundling purposes to cement reinforcement.

The machine is readily operated by unskilled and therefore cheap labor, and where the factory is supplied with electric current the cost of operation is negligible. Where other power is available the pulley 3 may be driven thereby.

The feeding and the stretching or delivery rolls have their grip on the wire regulated by the tension of the elastic means 16 and the weight of the parts. The straightening rollers 37 are adjusted relative to each other and are held in place by the set-screws 38 engaging the beveled edges 39 of the blocks 36, so that the action of the staggered rollers may be regulated at will.

What is claimed is:—

A wire straightening machine comprising

a casing, a pair of grooved feeding rolls arranged at one end of the casing, a pair of grooved delivery rolls arranged at the other end of the casing, gearing connecting the feeding and delivery rolls to rotate them at the same rate of speed, the delivery rolls being of greater diameter than the receiving rolls, two independent banks of straightening rolls mounted in the casing, one bank being arranged perpendicularly to the other so as to dispose the rolls of one bank in a horizontal plane and the rolls of the other bank in a vertical plane, each bank of rolls being provided with means for adjusting

the rolls individually, a guide tube connecting the banks of rolls, other guide tubes connecting each bank to the receiving and delivery rolls respectively, and supporting guide tubes, one leading into the receiving rolls and the other leading from the delivery rolls.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALBERT P. GILBERT.

Witnesses:

A. M. WORTH,
I. F. HILL.