

No. 707,006.

Patented Aug. 12, 1902.

G. F. PROSS & A. P. TUCKER.

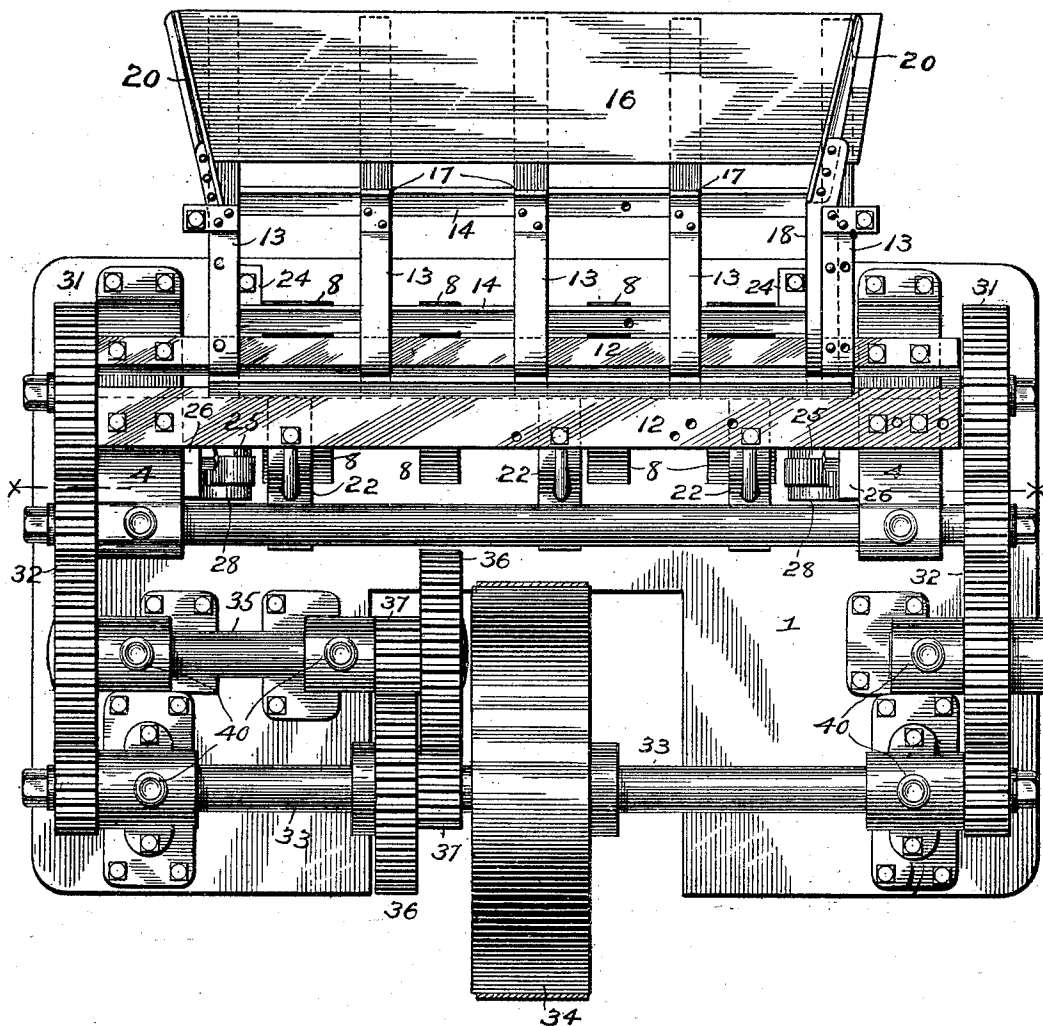
WIRE BENDING MACHINE.

(Application filed Mar. 17, 1902.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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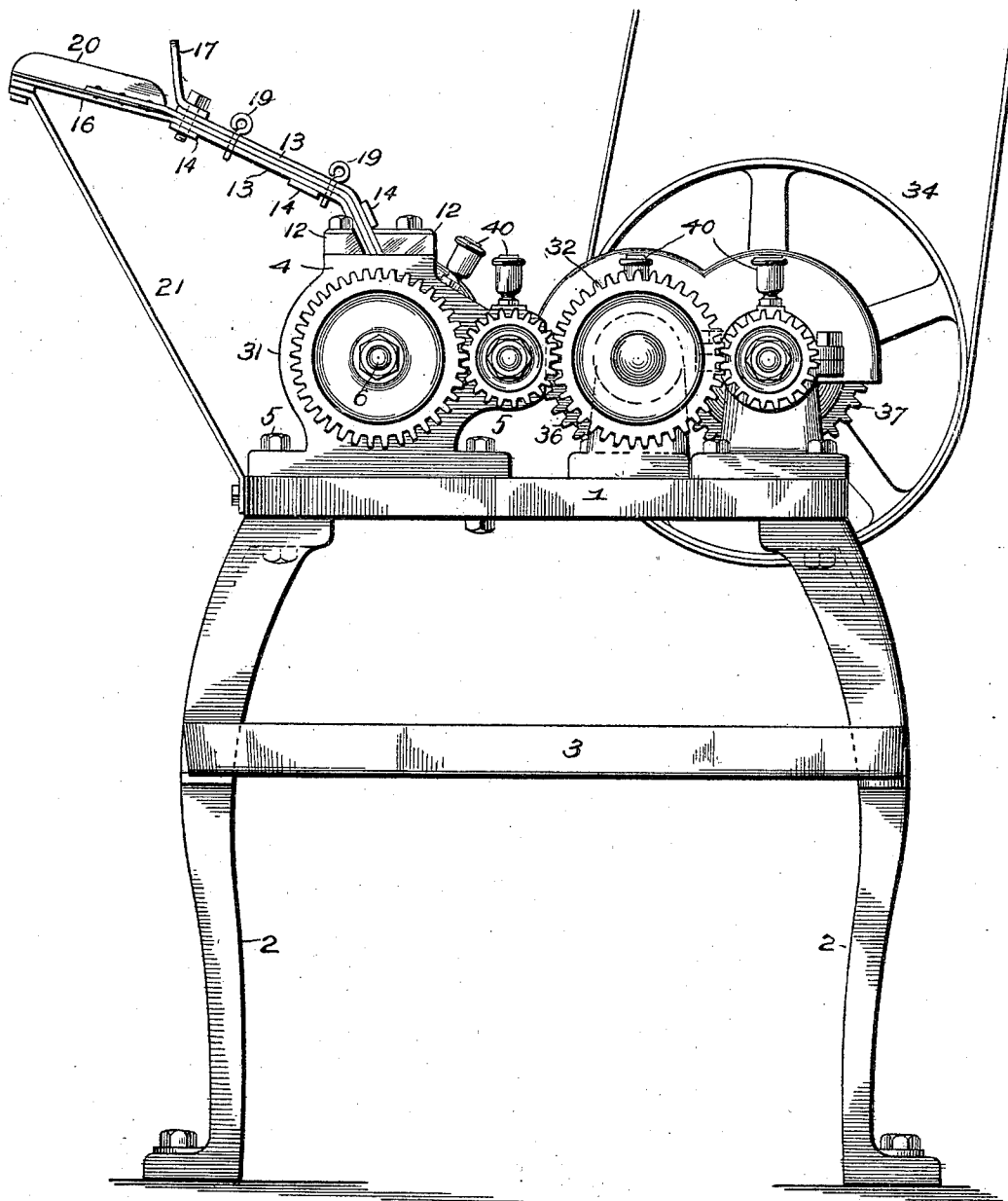


FIG. 2 -

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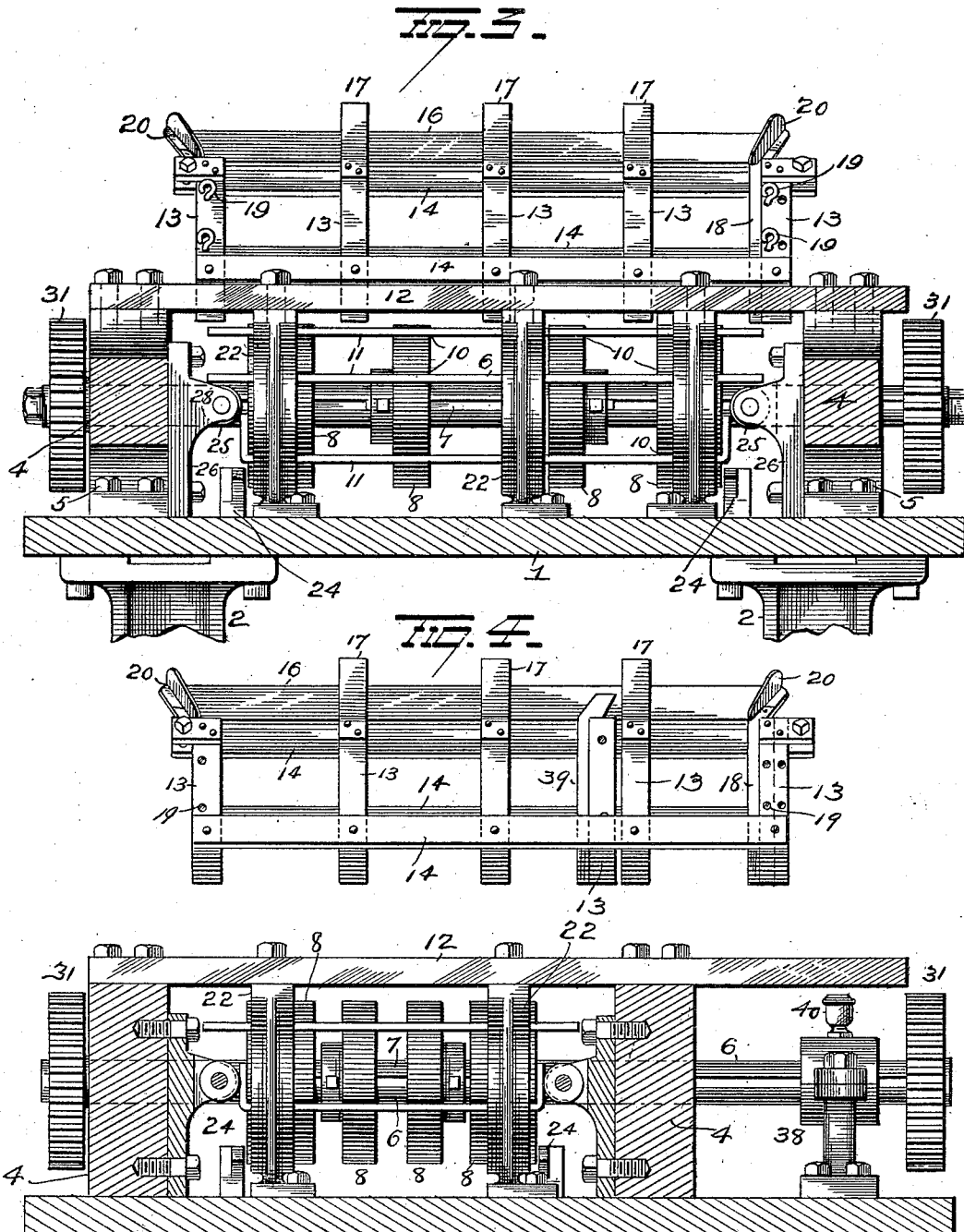
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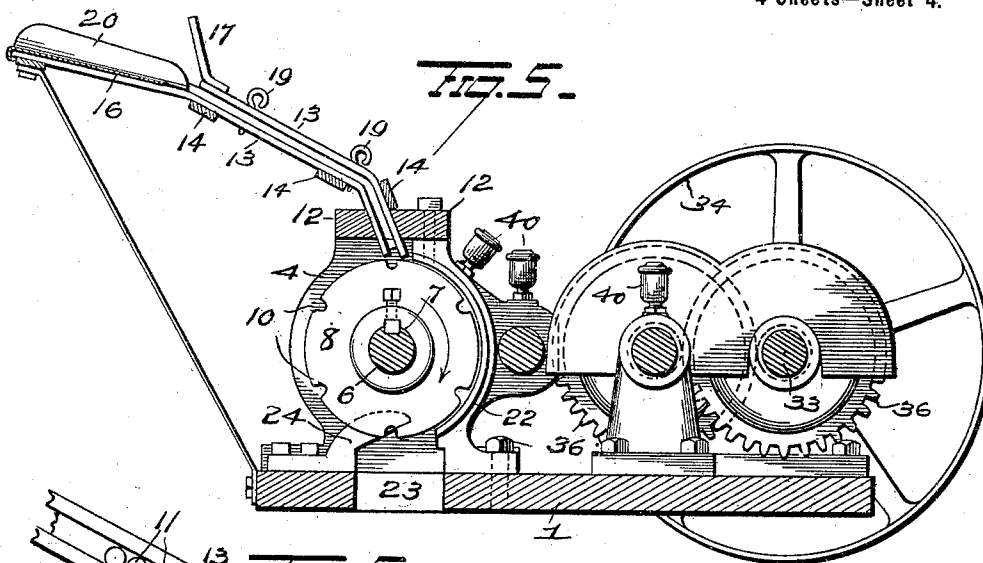
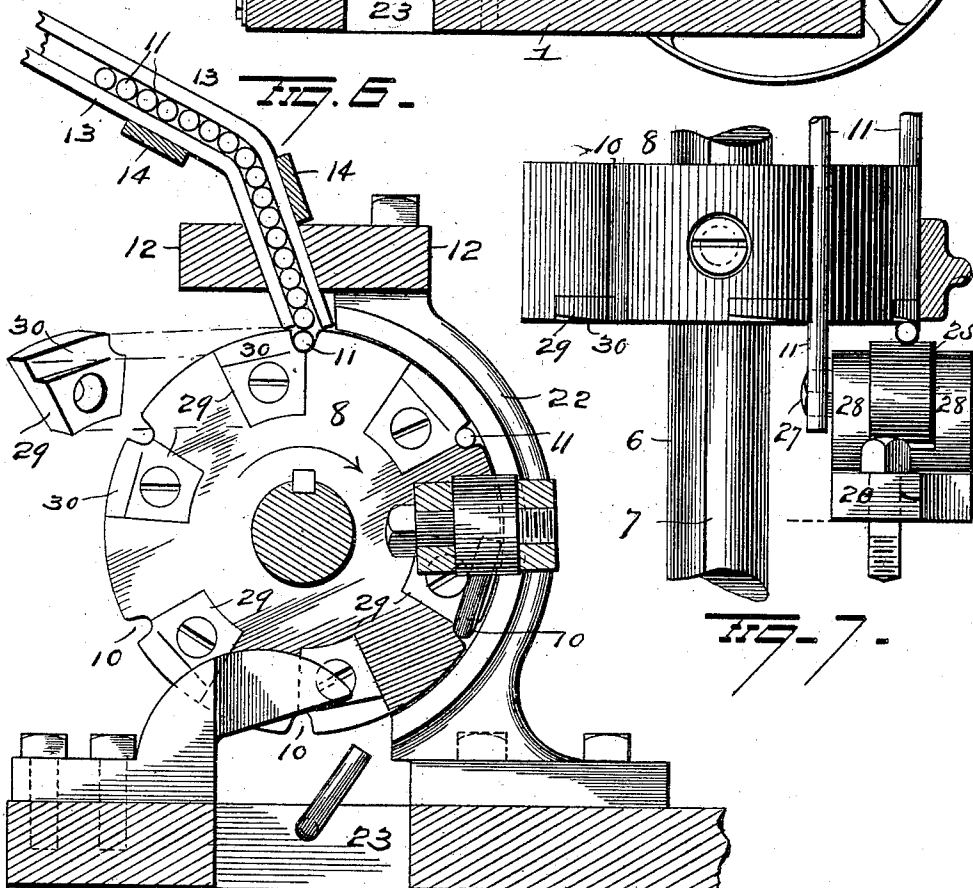
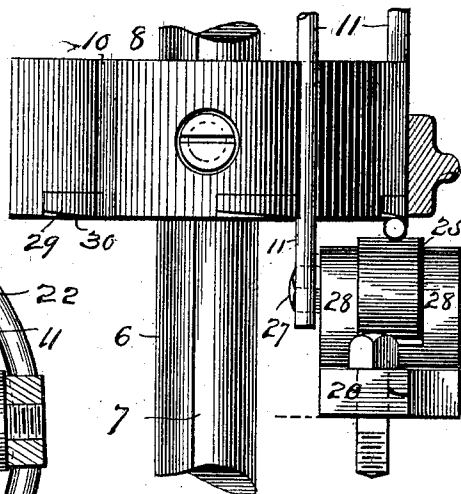
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UNITED STATES PATENT OFFICE.

GEORGE F. PROSS AND ANDREW P. TUCKER, OF CINCINNATI, OHIO,
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WIRE-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 707,006, dated August 12, 1902.

Application filed March 17, 1902. Serial No. 98,647. (No model.)

To all whom it may concern:

Be it known that we, GEORGE F. PROSS and ANDREW P. TUCKER, of Cincinnati, in the county of Hamilton and State of Ohio, have
5 invented certain new and useful Improvements in Wire-Bending Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to
10 which it appertains to make and use the same.

Our invention relates to an improvement in wire-bending machines, the object of the invention being to provide a machine of this character which will automatically bend at
15 right angles both ends of wires continuously fed thereto, and so construct the machine as to permit the attendant at all times to view the feeding and bending operation, and, further, to provide a wire-bending machine which
20 will be extremely simple in construction and strong and durable when in operation.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of
25 parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view illustrating our improvements. Fig. 2 is a side view of the machine. Fig. 3
30 is a view in section on the line *xx* of Fig. 1. Fig. 4 is a view illustrating the machine adjusted to bend short wires. Fig. 5 is a view in section at right angles to Fig. 3, and Figs. 6 and 7 are enlarged views illustrating details
35 of construction.

1 represents a bed-plate, preferably supported on legs 2, secured to the floor, and for convenience a tool-tray 3 is supported on the legs below the bed-plate.

40 Near one end of the bed-plate 1 and at opposite sides thereof standards 4 are secured by bolts 5, as shown, and in these standards and projecting beyond the same at both ends a shaft 6 is mounted to revolve. This shaft
45 6 is made with a longitudinal groove or keyway 7, and corresponding grooves or keyways are provided in disks or cylinders 8, mounted on the shaft for the reception of keys 9 to lock the disks and shaft together. The intermediate disks 8 are preferably made with

hubs having set-screws therein to lock the keys in position, while the end disks are made wider than the intermediate disks and have their adjusting set-screw in the body of the disks, as clearly shown in Fig. 7. As
55 many of these disks or cylinders may be provided as desired, four being shown in the drawings; but more or less than four may be employed, as is found most desirable.

All of the disks or cylinders 8 are provided
60 in their peripheries with alined notches or pockets 10 to receive wire blanks 11, fed thereto, as will now be explained.

Connecting the upper ends of standards 5 are cross-bars 12, having inclined parallel
65 edges and spaced apart, as shown, and between these bars 12 the lower ends of guide-strips 13 project. These guide-strips 13 are disposed parallel and just the proper distance apart to permit the free passage of the
70 wires between them, and the series of guide-strips 13 are connected by bars 14, the lower guide-strips of the series being longer than the upper strips to support an inclined tray or platform 16, while the upper strips have
75 secured at their ends inclined tongues 17 to guide the wires between the strips. Between the guide-strips at the sides of the machine guide-bars 18 are secured by pins 19, the bar
80 18 at one side of the machine being adjustable in the guide-strips to accommodate various lengths of wires to be bent, and to the upper ends of these bars 18 wings 20 are secured and project over tray or platform 16 and constitute, in effect, a hopper to guide the
85 wires into the guide-strips, down which they pass to the disks or cylinders 8, and suitable brace-rods 21 are preferably provided to strengthen this hopper, as clearly shown in
Fig. 5.

90 A series of ribbed concaves 22 are secured to the forward cross-bar 12 and bed-plate 1, three of said concaves being provided, a concave located in close proximity to the end disks or cylinders 8 and one concave located
95 at a suitable point between the end concaves and adapted to hold the wires in the pockets of the disks or cylinders and prevent their escape until the ends of the wires are bent. To the bed-plate 1, at the rear of slot 23 therein, 100

through which the bent wires are dropped or ejected, inclined fingers 24 are secured and are so located to compel the wires to be presented to the inclined face of the fingers and
5 eject the bent wires from the pockets if they should stick therein.

To bend the ends of the wires, which, it will be seen, project beyond the end disks 8, an abutment 25, which is preferably a roller, is
10 provided in the path of the ends of the wires, and these rollers are mounted on removable pintles 27 and between parallel ears 28 on brackets 26, secured to standards 4, and are adapted to be struck by the protruding ends
15 of the wires, and as the disks are rotated, carrying with them the main portion of the wires, the ends will be bent upward at right angles and against the end disks 8 before they will be free to pass the rollers 25, thus effectually
20 bending both ends of the wires at right angles before they are ejected from the disks.

The rollers 25 are preferably composed of hardened steel to withstand the wear thereon, and to prevent wear of the end disks
25 where the great bending strain is applied a series of removable hard-metal blocks 29 are secured in correspondingly-shaped recesses in end disks 8 at the notches or pockets therein, and these blocks are preferably grooved in
30 one side, as shown at 30, to permit a certain amount of play of the ends of the wires during the bending operation, and it will be seen that these blocks can be removed when worn and replaced by new blocks.

35 Gear-wheels 31 are secured on shaft 6 at its ends and mesh with chains of gearing 32, operated by drive-shaft 33, on which latter a drive-pulley 34 is mounted at the center of bed-plate 1 and connected by a belt 34 with
40 any suitable power.

On drive-shaft 33 and on a short shaft 35, carrying a gear-wheel of one chain of gearing, large and small gears 36 and 37 are provided and intermesh, the gears on said shafts
45 being of relatively the same size, the smaller gears meshing with the larger gears and serve to steady the machine.

While we might of course apply power directly to shaft 6, still we prefer to employ
50 chains of gearing, as shown, to steady the machine and compensate for the shock of the wires coming in contact with the roller-abutments 25.

When it is desired to bend shorter wires
55 than those for which the machine is set in Figs. 1 and 3, the standard 4 at one side of the machine is released and moved toward the center of the machine, as shown in Fig. 4, and secured in such position by the bolts
60 5, used for its attachment in the former position. The disks or cylinders 8 are of course moved toward each other, and an additional bearing 38 is secured in place to support the protruding end of shaft 6. An additional
65 guide 39 is now secured at the proper position between cross-bars 14, and the machine is ready to bend wires of short length. The

machine may be permitted a great many such adjustments, and suitable oil-cups 40 are provided for lubricating the various bearings of
70 the machine.

The operation of our improvements is as follows: The wire blanks 11 are fed to the tray or hopper 16 and pass down in single
75 file through the guide-strips 13, from which they fall into the pockets 10 of the revolving disks or cylinders 8 and are held in said pockets by concaves 22 until the ends of the wires are bent by being brought into contact with
80 roller 25 and reach a position to be dropped down through the opening in bed-plate 1. The attendant can see the wires at all times, and if anything should happen to affect the perfect operation of the machine or if the supply of wire blanks becomes exhausted
85 from the guide-strips and hopper he can ascertain this at a glance.

A great many slight changes might be resorted to in the general form and arrangement of the several parts described without
90 departing from our invention, and hence we do not wish to be limited to the precise construction set forth, but consider ourselves at liberty to make such slight changes and alterations as fairly fall within the spirit and
95 scope of our invention.

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

1. The combination of a movable blank-re-
100 ceptacle and a rigidly-supported abutment adjacent to the end of the blank-receptacle and normally in the path of the protruding end of a blank carried by said receptacle, against which abutment, said protruding end
105 of the blank is bent as the receptacle moves.

2. The combination of a rotary blank-receptacle and a rigidly-supported abutment at one end of said receptacle, against which the protruding end of the blank is bent as the
110 receptacle rotates.

3. The combination of a rotary blank-receptacle and a rigidly-supported roller at one end of the receptacle against which the protruding end of the blank is bent.
115

4. The combination with a rotary blank-receptacle, of means for feeding blanks of greater length than the receptacle thereinto, and rigidly-mounted abutments at the ends of said receptacle against which the blank is
120 bent as the receptacle rotates.

5. The combination with a rotary disk or cylinder having a blank-receptacle in its periphery, of a concave in proximity to said cylinder or disk and an abutment in the path
125 of the blank and against which the blank is bent by the rotary disk or cylinder.

6. The combination with a rotary disk or cylinder having blank-receptacles in its periphery, of a concave in proximity to said
130 cylinder or disk, a rigidly-supported abutment at one end of the cylinder or disk and in the path of the protruding ends of the blanks in said receptacles to bend said blanks

as the receptacle or cylinder rotates and means for feeding the blanks to the cylinder or disk.

7. In a wire-bending machine, the combination with a shaft, of a series of disks or cylinders secured thereon and having alined notches or pockets in their peripheries to receive wire blanks, means for feeding the blanks to said pockets, concaves to hold the blanks in the pockets, and an abutment in the path of the protruding ends of the blanks against which the ends are bent by the turning of said disks or cylinders.

8. In a wire-bending machine, the combination with a shaft, of a series of disks or cylinders keyed to said shaft and having alined notches or pockets in their peripheries to receive the wire blanks and project the ends thereof beyond the end disks or cylinders, concaves in close proximity to the disks or concaves to hold the blanks in the pockets, and rollers mounted in the path of the protruding ends of the blanks and against which the blanks are bent.

9. In a wire-bending machine, the combination with a bed-plate, standards thereon, a grooved shaft mounted in the standards and means for driving said shaft, of a series of disks or cylinders keyed to said shaft and having alined notches or pockets in their peripheries to receive wire blanks and project their ends beyond the end disks or cylinders, brackets secured to the standards, rollers mounted to revolve in the brackets and located in the path of the protruding ends of the wires, concaves to hold the wires in the pockets, and guide-strips to direct the wires into the pockets.

10. In a wire-bending machine, the combination with a bed-plate, standards thereon, a shaft mounted in the standards, means for driving the shaft, means for permitting the adjustment of the disks or cylinders and one

standard and the disks or cylinders provided with alined notches or pockets to receive wire blanks, of cross-bars connecting the standards and spaced apart, concaves secured to the bed-plate and one cross-bar and located in close proximity to the disks or cylinders, abutments carried by the standards against which the ends of the wires are bent, guide-strips projecting between the cross-bars to direct the wires into the pockets, guide-bars connected to the strips to guide the ends of the wires, a platform or tray carried by said strips, and a removable guide-bar and strips to be secured between the first-mentioned guide-bars to accommodate short wires.

11. In a wire-bending machine, the combination with a disk or cylinder having notches or pockets in its periphery for wire blanks and means for turning said disk or cylinder, a concave to hold the wires in the notches or pockets, an abutment beside the disk or cylinder and against which the wires are bent and hard-metal blocks secured in recesses in the disks or cylinders at the notches or pockets therein and having grooves in one side to permit play of the bent ends of the wires.

12. In a wire-bending machine, the combination with a rotary disk or cylinder having pockets therein for wire blanks, of a concave to hold the blanks in the pockets, an abutment in the path of the protruding ends of the wires against which the wires are bent, and inclined fingers to eject the wires from the pockets after the wires have passed the concave.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

GEORGE F. PROSS.
ANDREW P. TUCKER.

Witnesses:

CHARLES E. PFAU,
GEO. W. CORMANY.