

(No Model.)

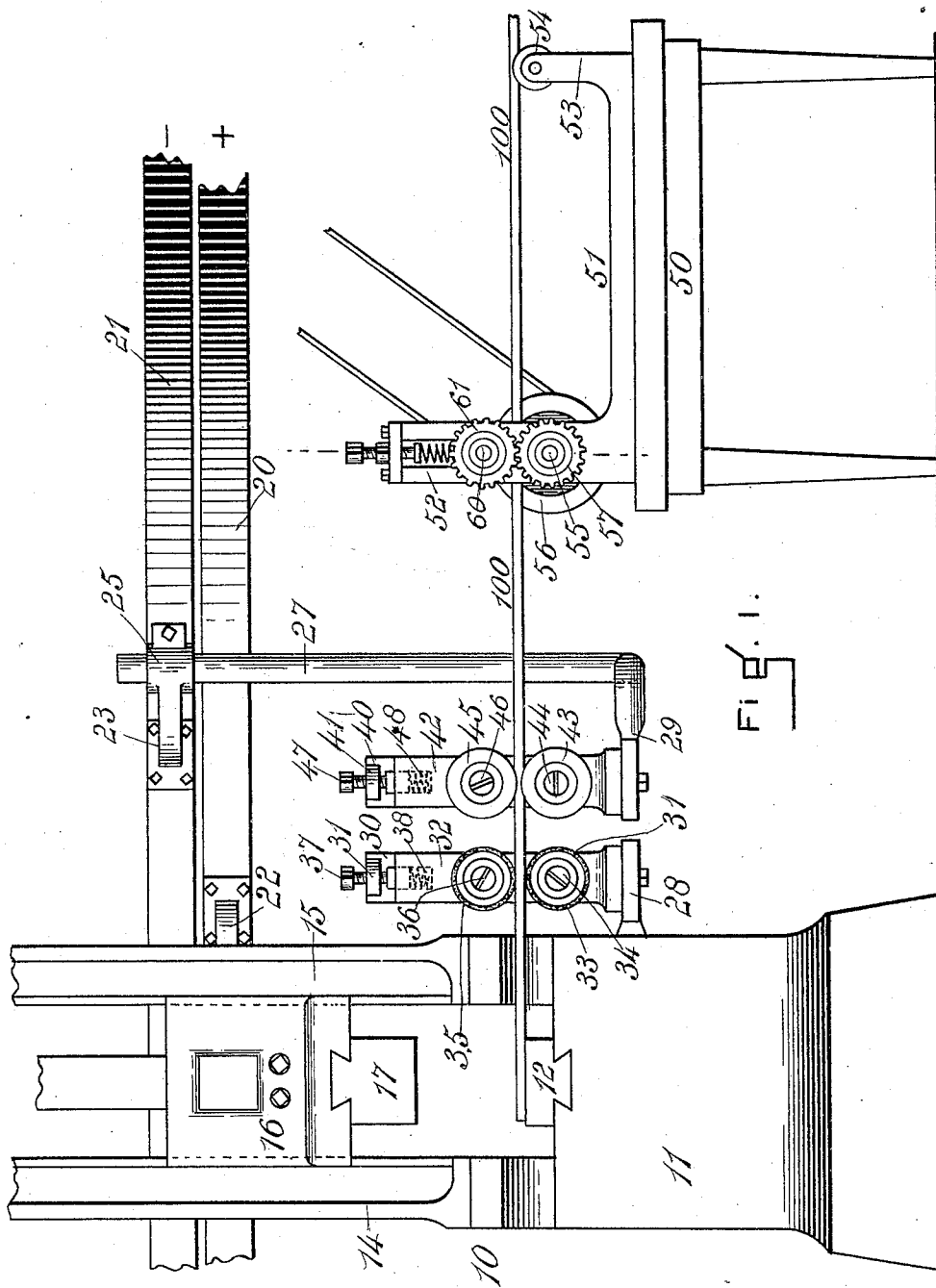
3 Sheets—Sheet 1.

G. D. BURTON & E. E. ANGELL.

ELECTRIC FORGING APPARATUS.

No. 486,626.

Patented Nov. 22, 1892.



WITNESSES

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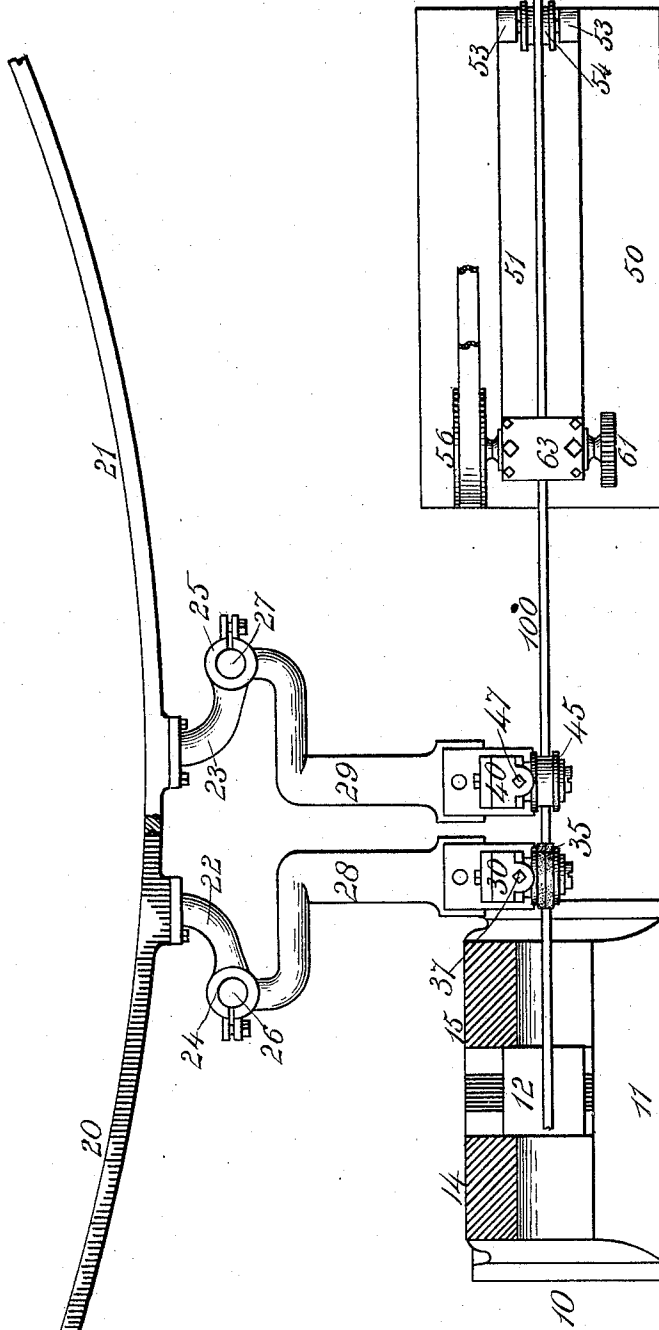
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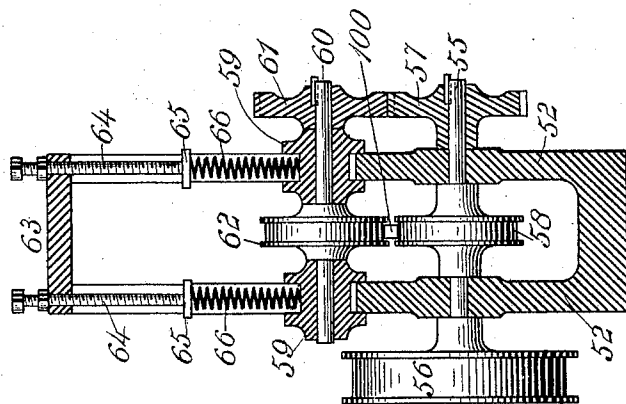


FIG 3

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UNITED STATES PATENT OFFICE.

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ELECTRIC FORGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 486,626, dated November 22, 1892.

Application filed January 13, 1892. Serial No. 417,952. (No model.)

To all whom it may concern:

Be it known that we, GEORGE D. BURTON, residing at Boston, in the county of Suffolk, and EDWIN E. ANGELL, residing at Somerville, in the county of Middlesex, State of Massachusetts, citizens of the United States of America, have invented certain new and useful Improvements in Electric Forging Apparatus, of which the following is a specification.

This invention relates to an electric metal-working apparatus in which a bar of metal from which articles are to be forged or shaped is mechanically fed between rollers through which a current of electricity is passed and then forged or shaped into the desired form.

The object of the invention is to provide a forging apparatus which will be effective for automatically feeding the bar, heating a moving section thereof to a forging temperature by an electric current, and shaping it into the desired form while it retains the heat developed by said current.

Figure 1 of the accompanying drawings represents a front elevation of this improved forging apparatus. Fig. 2 represents a plan thereof. Fig. 3 represents a vertical section of the bar-feeder constituting a part thereof.

Similar numerals of reference indicate corresponding parts in the different figures.

The forging-machine constituting a part of this apparatus is illustrated in the form of a drop-press 10 for producing drop-forgings; but any other forging or shaping machine may be substituted therefor. The drop-press 10 comprises a base 11, having a dovetailed recess on its upper face. A bed-die 12, provided with a dovetailed tongue adapted to fit the recess, is supported on said base. Two standards 14 and 15 are attached to the base 11 and provided on their inner faces with guideways, on which a plunger 16 is adapted to move. This plunger is operated by any suitable means (not shown) and carries at its lower end a movable die 17.

Two rings 20 and 21, whereof segments only are represented in the drawings, constitute the positive and negative poles of an electric-current converter which need not be fully illustrated or described in this case. A

bracket 22, composed of copper or other suitable conductive material or composition, is attached to the ring 20, and a bracket 23, also composed of conductive material, is attached to the ring 21. The outer ends of these brackets are provided, respectively, with clamps 24 and 25. Vertical rods 26 and 27, also composed of conductive material, are vertically adjustable in the clamps 24 and 25. These rods carry at their lower ends horizontal inwardly-bent arms 28 and 29, which terminate adjacent to each other, preferably in the same horizontal plane. A standard 30, also composed of conductive material, is supported at the outer end of the arm 28, and a standard 40, composed of conductive material, is supported at the outer end of the arm 29. These standards are provided at their upper ends with lugs 31 and 41 and with sliding blocks 32 and 42. Rollers 33 and 43 are journaled on fixed studs or screws 34 and 44, attached to said standards, respectively, and rollers 35 and 45 are journaled to fixed studs 36 and 46 on the sliding blocks 32 and 42. A spring 38 permits roller 35 to have a yielding pressure in conjunction with the roller 33, and an adjusting-screw 37 in the lug 31 serves to adjust or regulate the pressure of said roller 35. A similar spring 48 and a similar adjusting-screw 47 regulate the pressure of the roller 45, which operates in conjunction with the roller 43. These rollers may be composed of copper or of carbon or other suitable conductive material, or one pair may be composed of copper and the other of carbon.

A bar-feeder for feeding a bar of metal to the rollers to be heated is disposed adjacent thereto. The bar-feeder herein illustrated comprises a stand or table 50, a base-plate 51, supported thereon and provided at its rear end with a pair of tall vertical standards 52 and at its front end with a pair of short vertical standards or lugs 53. A feed-wheel 54 is journaled to the front standards. A driving-shaft 55 is journaled to the rear standards and provided at one end with a driving-pulley 56, at its opposite end with a pinion 57, and between the standards with a grooved feed-wheel 58. The vertical standards 52 are provided with vertical slots, in which jour-

nal-boxes 59 are adapted to slide. A shaft 60 is supported in these adjustable journal-boxes and provided at one end with a pinion 61, which meshes with the pinion 57. A feed-wheel 62 is also fixed to the shaft 60 between the standards above the feed-wheel 58. These feed-wheels are preferably grooved on their peripheries to receive the bar which passes between them. The standards 52 are connected at their upper ends by a cross-bar 63 and adjusting-screws 64, passing downward through said cross-bar, and are provided at their lower ends with plates 65. Springs 66 are disposed between the plates 65 and the journal-boxes 59 to permit the said boxes to rise and fall for the feeding of bars of different thicknesses. Adjustable gearing may be employed when the rollers are separated so far as to prevent the intermeshing of the teeth of the gears 57 and 61.

In the use of this improved forging apparatus a bar, as 100, is passed over the feed-roller 54 and between the feed-rollers 57 and 61 of the mechanical bar-feeder, thence between the rollers 45 and 43, which are connected with the negative pole of the electric converter, thence to and between the rollers 33 and 35, which are connected with the positive pole of the converter, and thence to the forging-machine 10. In passing between the pairs of rollers connected to the positive and negative poles a current of electricity is conveyed through that portion of the bar which spans the space between said pairs of rollers, and this portion of the bar becomes heated to

a forging temperature. As the bar is fed forward the heated portion thereof comes between the forging-dies and is shaped or forged into the desired form. The bar is thus automatically fed through the heater to the forger or shaper continuously, and various small articles may be struck from the heated end thereof.

We claim as our invention—

1. In an electric forging apparatus, the combination of an electric converter provided with two converter-rings constituting positive and negative poles, conductive brackets attached thereto, standards connected with said brackets, two pairs of rollers journaled in said standards, and a mechanical bar-feeder for feeding a bar between said rollers.

2. In an electric forging apparatus, the combination of two converter-rings constituting opposite electric poles, two standards, conductors connecting said standards with said rings, respectively, two pairs of contact-rollers disposed, respectively, on said standards, a pair of feed-rollers disposed adjacent to said contact-rollers, and a driving-pulley on the shaft of one of said feed-rollers.

In testimony that we claim the invention above set forth we affix our signatures in presence of two witnesses.

GEO. D. BURTON.
EDWIN E. ANGELL.

Witnesses:

CHAS. F. ADAMS,
CHESTER MARR.