

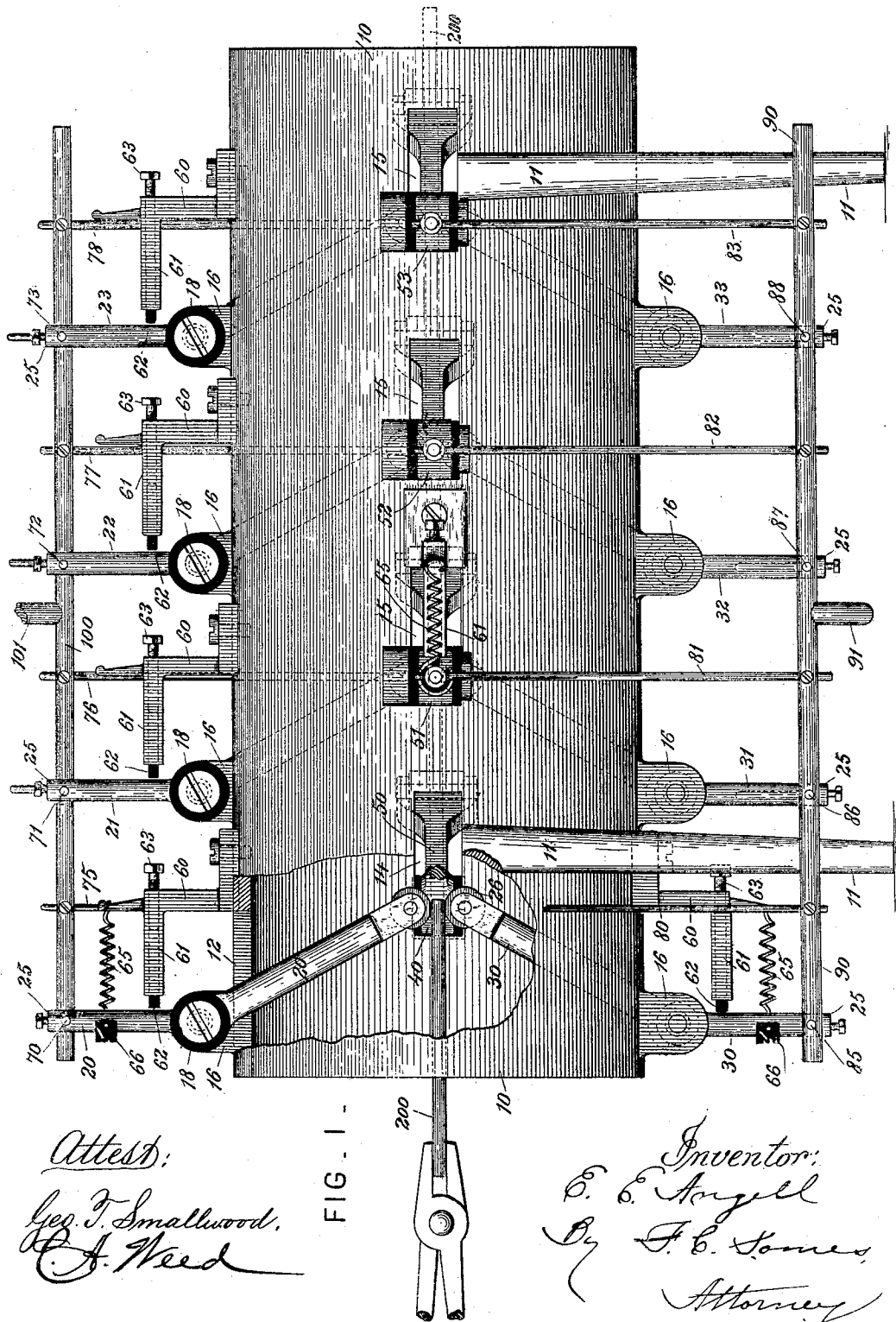
(No Model.)

2 Sheets—Sheet 1.

E. E. ANGELL.
ELECTRIC FORGE.

No. 466,132.

Patented Dec. 29, 1891.



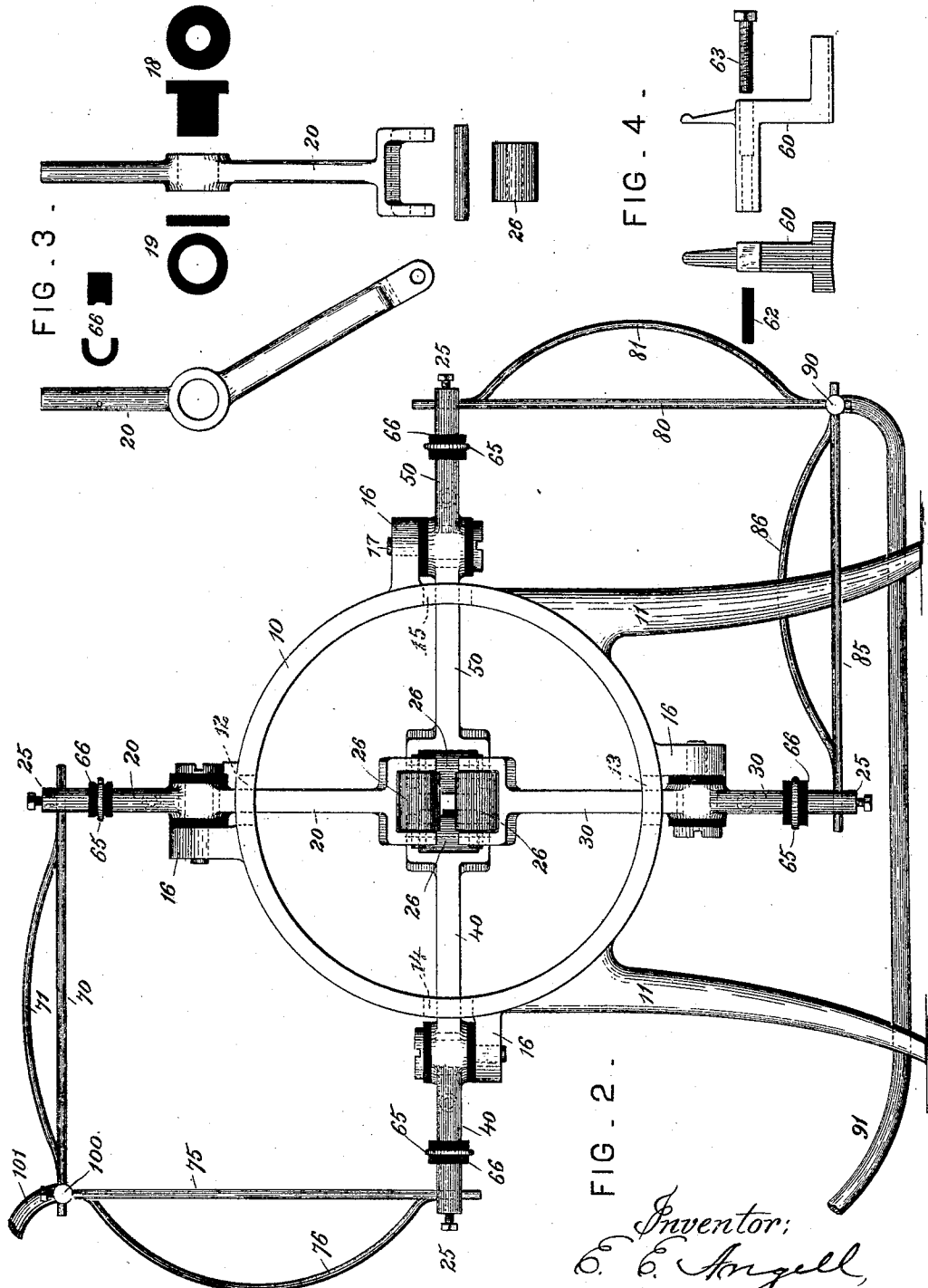
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ELECTRIC FORGE.

No. 466,132.

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Attest { Geo. T. Smallwood.
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UNITED STATES PATENT OFFICE.

EDWIN E. ANGELL, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO THE
ELECTRICAL FORGING COMPANY, OF MAINE.

ELECTRIC FORGE.

SPECIFICATION forming part of Letters Patent No. 466,132, dated December 29, 1891.

Application filed March 18, 1891. Serial No. 385,567. (No model.)

To all whom it may concern:

Be it known that I, EDWIN E. ANGELL, a citizen of the United States, residing at Somerville, in the county of Middlesex, in the State of Massachusetts, have invented a new and useful Improvement in Electric Forges, of which the following is a specification.

The object of this invention is to provide a simple and convenient electric forge for heating bars of metal for forging, hardening, drawing the temper, or other purpose.

Figure 1 of the accompanying drawings represents a side elevation of this improved electric forge, a part of the cylindrical frame being broken out. Fig. 2 represents an elevation of the front end thereof. Fig. 3 represents details of the electrodes and their insulating bushings and rings. Fig. 4 represents details of the brackets containing stops for the electrode-levers.

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

The frame of this electric forge consists, preferably, of a hollow cylinder 10, supported upon four legs 11. This cylinder is provided at its top with a series of slots 12, at its bottom with a corresponding series of slots 13 diametrically opposite the slots 12, at one side with a series of slots 14, disposed slightly in rear of the slots 12 and 13, and at the other side with a corresponding series of slots 15, diametrically opposite the slots 14. The cylinder is provided with external lugs 16 adjacent to the several slots. Electrode-levers 20, 21, 22, and 23, disposed in a vertical plane, are pivoted to the lugs 16 at the upper side of the cylinder 10, their long arms extending downward through the slots 12 into the cylinder to points near the axis thereof, and similar electrode-levers 30, 31, 32, and 33, also disposed in a vertical plane, are pivoted to the lugs at the under side of the cylinder, and their long arms extend upward through the slots 13 into the cylinder to points near the axis thereof opposite the ends of the upper series of electrode-levers. Electrode-levers disposed in a horizontal plane are pivoted to the lugs at one side of the cylinder 10, their long arms extending inward through the slots 14 into the cylinder to points near the axis

thereof in rear of the terminals of the several pairs of the vertical electrode-levers. The first of this series of levers, the one nearest the mouth of the forge, is numbered 40 in the drawings, and the other levers of this series do not appear in the views represented. Horizontal electrode-levers 50, 51, 52, and 53, disposed in a horizontal plane, are pivoted to lugs at the opposite side of the cylinder, their long arms extending inward through the slots 15 to points near the center of the cylinder opposite the inner ends of the electrode-levers of the other horizontal series. These levers are insulated from their pivots 17 and from the lug 16 by means of flanged bushings 18 and rings 19, composed of insulating material. The inner arms of the electrode-levers are inclined rearward and the outer arms extend radially outward from the cylinder. These levers are provided at their outer ends with binding-posts 25 and at their inner ends with anti-friction rolls 26, composed of conductive material, the fusing-point of which is above that of the bar to be heated. Brackets 60 are severally attached to the cylinder 10, immediately in rear of the slots therein, and are provided with horizontal tubular arms 61, which extend forward toward the radial arms of the electrode-levers. Adjustable stops 62, composed of insulating material, are disposed in these horizontal arms and project slightly beyond the front ends thereof in position to serve as stops or abutments to determine the oscillation of the electrode-levers and prevent contact of the inner ends of anti-friction rollers of companion electrodes. These stops are regulated by adjusting-screws 63. Springs 65 connect the outer arms of the electrode-levers with the brackets 60 and tend to throw the inner end of said levers toward each other for grasping a bar to be heated. These springs are insulated from the electrodes by means of insulating-plates 66. Conducting-wires 70, 71, 72, and 73 are connected at their inner ends to the binding-posts of the electrode-levers 20, 21, 22, and 23, respectively, and at their outer ends with a distributing-wire 100, and conducting-wires 75, 76, 77, and 78 are connected at their lower ends to the binding-posts of

the horizontal electrode-levers 40, 41, 42, and 43, respectively, and at their upper ends with said distributing-wire 100. The branches 71 and 72 76 and 77 are longer than the branches 5 70 and 73 75 and 78 in order to equalize the distance which the currents have to travel to reach the electrodes. The distributing-wire 100 is connected centrally of its length with a positive conductor 101, which is connected 10 to a dynamo or current-transformer. Similar wires 80, 81, 82, and 83 connect the horizontal electrode-levers 50, 51, 52, and 53 with a distributing-wire 90, disposed at the opposite side of the apparatus. The wires 85, 86, 15 87, and 88 connect the vertical electrode-levers 30, 31, 32, and 33 with the last-named distributing-wire. These connecting or branch wires also vary in length to equalize the currents. The distributing-wire 90 is connected 20 centrally of its length to a negative conductor 91 leading to a dynamo or transformer. The terms "positive" and "negative" are used for convenience. Alternating currents will usually be employed.

25 In the use of this apparatus a bar, as 200, to be heated may be grasped at one end by a pair of tongs and thrust into the forge between the rolls of the pair of electrodes 20 and 30. The metal of the bar closes the current between the rolls and causes a transverse 30 current to pass vertically through the bar. As the bar is thrust farther into the forge it passes between the rolls of the horizontal electrode-levers 40 and 50, and a transverse 35 current is caused to pass horizontally through the bar. When short bars are to be heated or a bar is to be heated a short distance at one end, one or two pairs of electrodes only may be utilized, the other electrodes remain- 40 ing idle; but in heating a long bar the entire series of electrodes may be brought into play. The bar will be reciprocated by the operator or by mechanical means while it is between the rolls, so as to distribute the heat throughout its length. The inner arms of the electrode-levers are sufficiently inclined to prevent the binding of the rolls upon the rods in 45 withdrawing the bar. The springs 65 cause the electrodes to yield and automatically adjust themselves to bars of different sizes. If 50 it be desired to pass currents longitudinally through the bar, the wiring to the electrodes may be changed, so that all the vertical electrode-levers will be connected with the posi-

tive pole and all the horizontal electrode-levers with the negative pole. 55

I claim as my invention—

1. In an electric forge, the combination of two electrode-levers pivoted at opposite points and inclined rearwardly toward each other, 60 the inner ends of said levers being adapted to receive between them a bar to be heated.

2. In an electric forge, the combination of two pairs of pivoted electrode-levers disposed at an angle to each other, the levers of each 65 pair being inclined toward each other and their inner ends adapted to receive between them a bar to be heated.

3. In an electric forge, the combination of a hollow cylinder provided with slots at diametrically opposite points, electrode-levers 70 disposed in pairs and pivoted to said cylinder adjacent to said slots, said levers extending inward to near the axis of the cylinder at an incline thereto, their inner ends being adapted 75 to receive between them a bar to be heated, stops for regulating the oscillation of said electrode-levers on their pivots, springs for actuating said levers, and electric connections 80 for said levers.

4. In an electric forge, the combination of a hollow cylinder provided with slots and lugs adjacent thereto, electrode-levers pivoted in pairs on said lugs and projecting through 85 said slots, brackets attached to said cylinder in rear of said slots and provided with adjustable insulating-stops, springs connecting the outer ends of said levers with said brackets, and electric connections for said levers.

5. In an electric forge, the combination of 90 two electrode-levers pivoted at opposite points and inclined toward each other, the inner ends of said levers being provided with conductive anti-friction rollers to receive between them a bar to be heated. 95

6. In an electric forge, the combination of two pairs of electrodes, one pair being disposed in advance of and at an angle to the other pair, the ends of said electrodes being adapted to engage opposite sides of the metal 100 to be heated, and electric conductors connected with said electrodes and adapted to convey a heating-current.

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Witnesses:

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