

(No Model.)

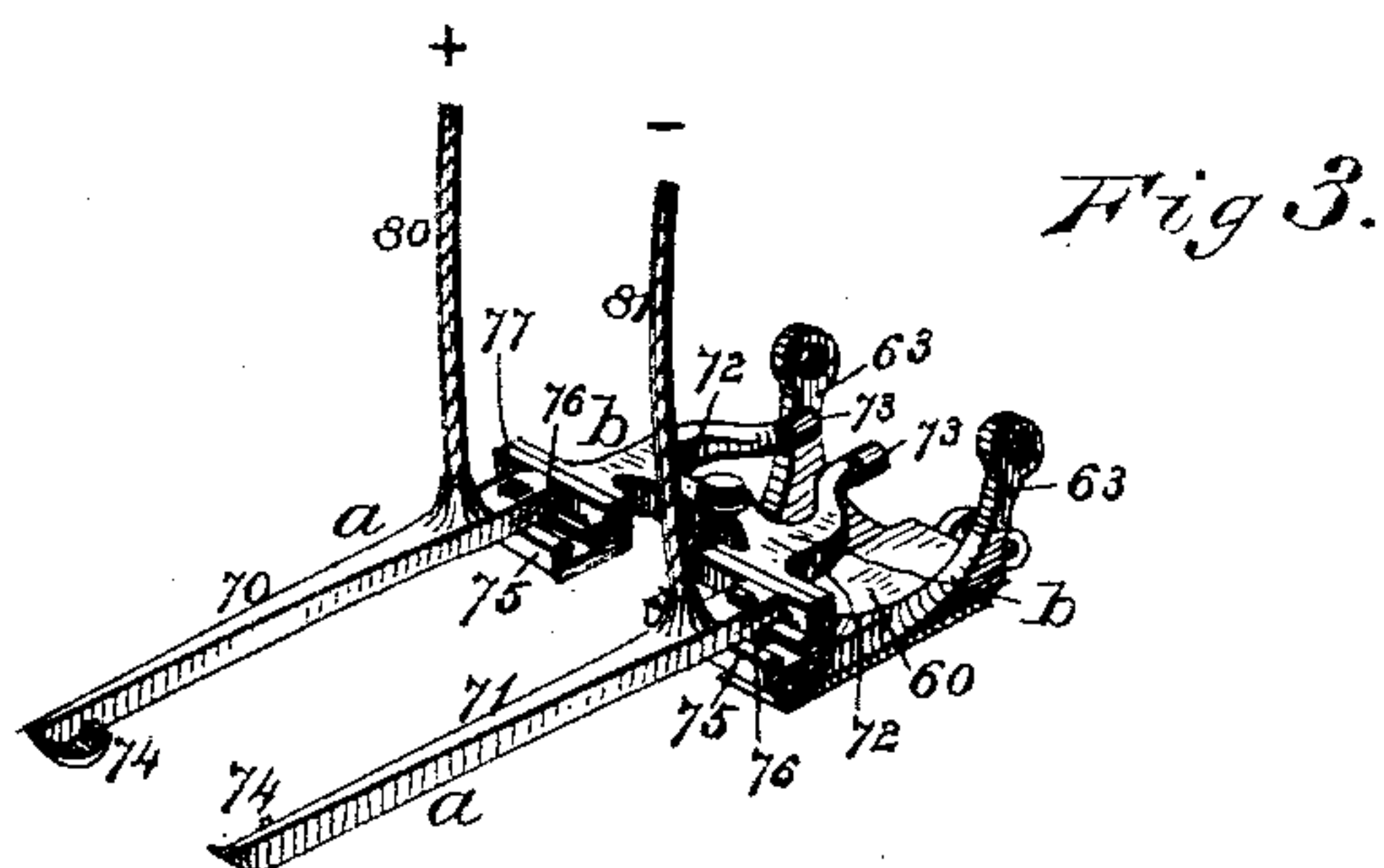
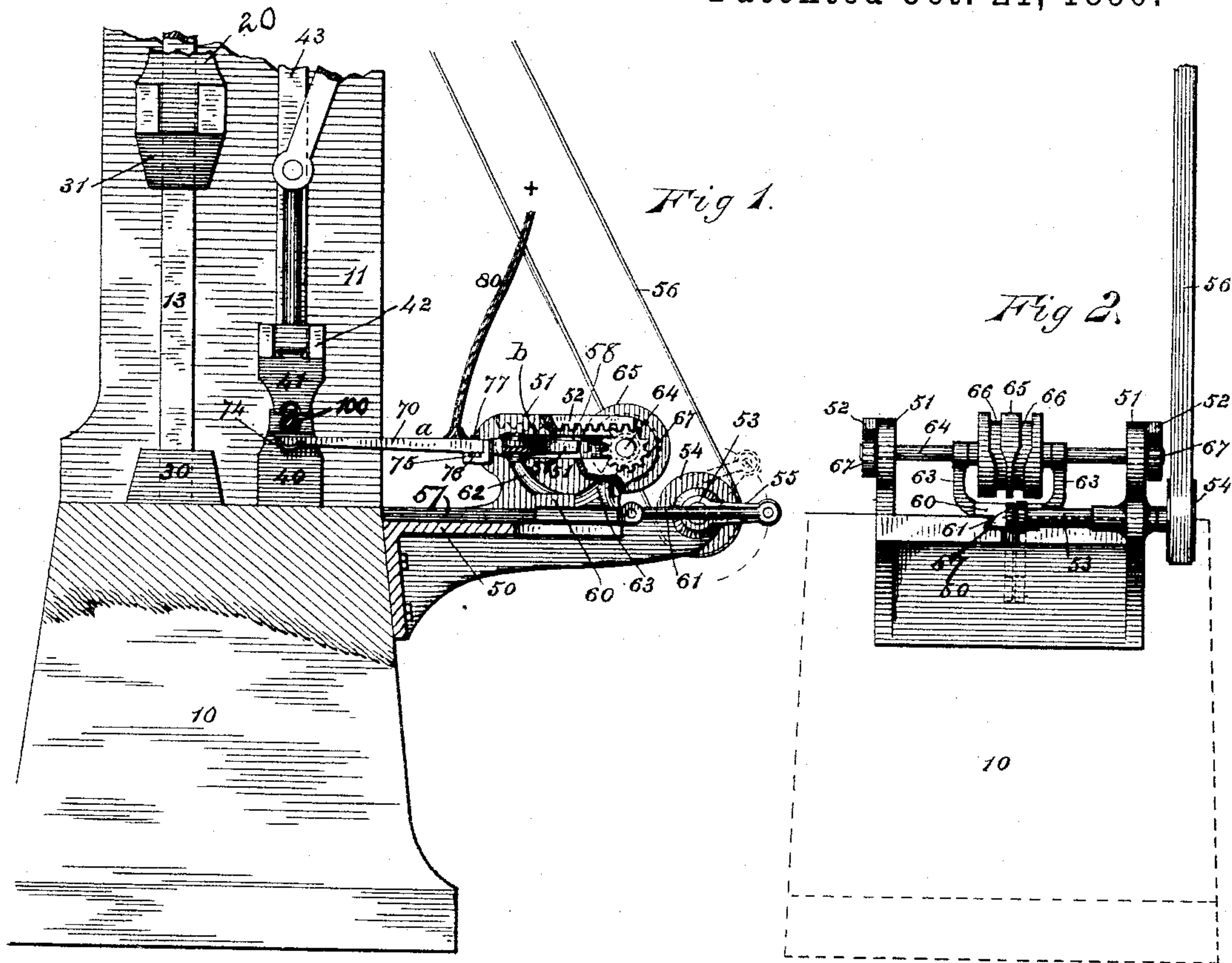
2 Sheets—Sheet 1.

G. D. BURTON.

ELECTRIC BLANK HEATING AND FEEDING APPARATUS FOR
FORGING MACHINES.

No. 438,723.

Patented Oct. 21, 1890.



WITNESSES

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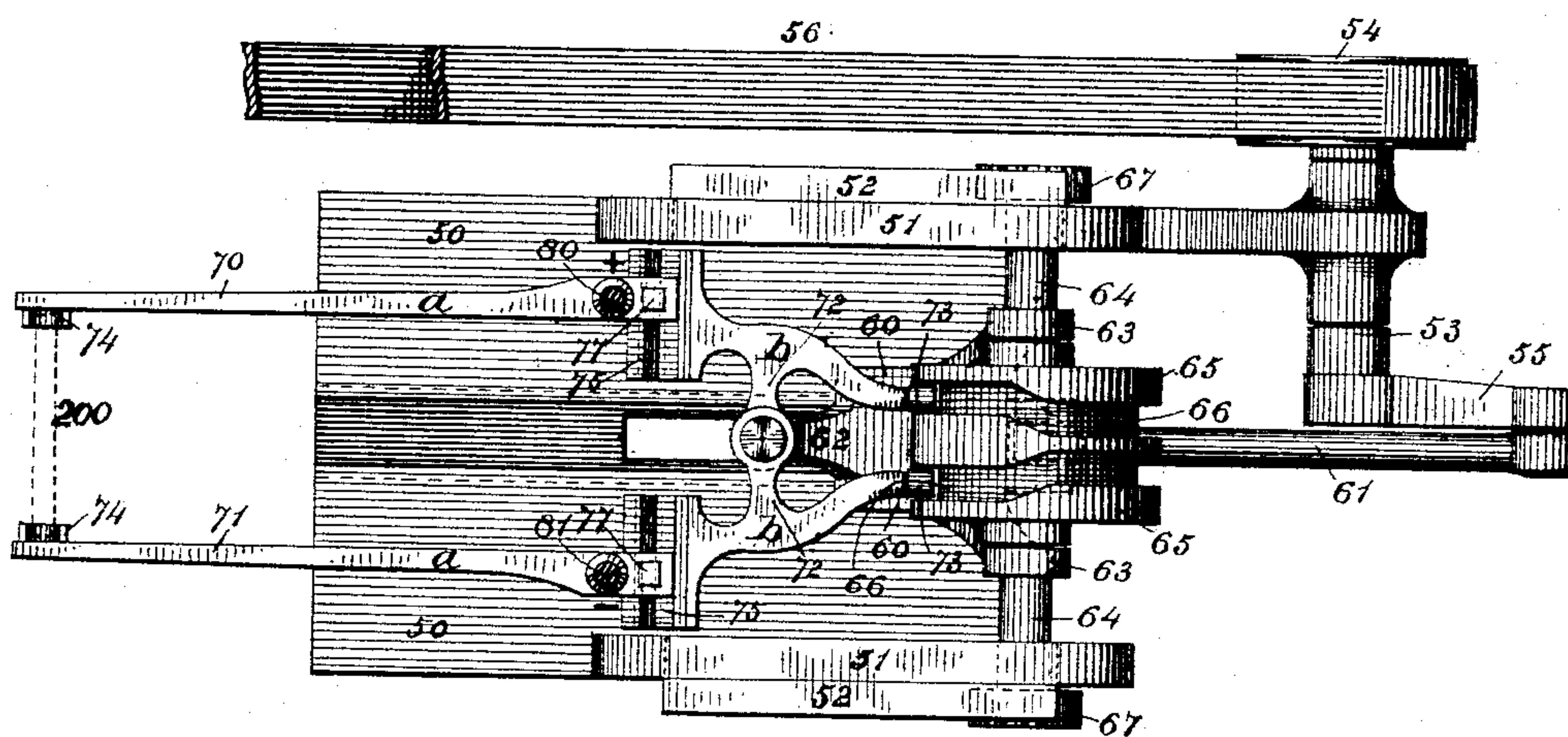


Fig 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE D. BURTON, OF BOSTON, MASSACHUSETTS.

ELECTRIC BLANK HEATING AND FEEDING APPARATUS FOR FORGING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 438,723, dated October 21, 1890.

Application filed August 22, 1890. Serial No. 362,734. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. BURTON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Blank Heating and Feeding Apparatus for Forging-Machines, of which the following is a specification.

10 This invention relates to an apparatus for use in connection with forging-machines in which electricity is employed as a heating agent for softening the blanks from which the forgings are made.

15 The object of the invention is to provide a simple and effective mechanism which will serve the double purpose of an electric heater for softening the blanks and a feeder for feeding them to the forging-dies or other metal-working mechanism.

Figure 1 of the accompanying drawings represents a longitudinal section of this improved blank heating and feeding apparatus in connection with a drop-press forging-machine. 25 Fig. 2 represents an end elevation thereof. Fig. 3 represents a perspective view of the carriage carrying the heating and feeding electrodes. Fig. 4 represents an enlarged plan view of the blank heating and feeding apparatus and that portion of the forging-machine illustrated in Fig. 1.

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

35 This improved blank heating and feeding apparatus is illustrated in connection with a drop-press forging-machine for producing drop-forgings; but it may be used in connection with any other forging-machine, to which it is a useful adjunct.

40 The parts of the drop-forging machine herein illustrated are the bed 10, portions of the upright standards 11, attached to said bed and provided with the vertical guideways 13, the plunger 20, movable in said guideways, the 45 fixed die 30, attached to said bed, and the upper die 31, attached to said plunger.

It is not deemed necessary to illustrate or describe herein the mechanism for actuating the plunger, as any ordinary mechanism 50 known to those skilled in the art may be employed for this purpose.

A bar-cutter for cutting off from the bar being worked the blanks to be forged is shown on the forging-machine, and comprises a fixed cutter-die 40, attached to the bed 10, and a 55 movable cutter-die 41, attached to cross-head 42, which moves vertically in ways 43 of the standards 11. Any suitable mechanism may be employed for reciprocating the cross-head and causing the cutters to act upon the bar 60 at the proper intervals of time. This improved bar heating and feeding apparatus operates upon the blank after it is cut off from the bar, heating it to a forging temperature and feeding it to the forging-dies. 65

A bracket-table 50, shown as attached to the bed 10, serves as a support for the heating apparatus. This bracket is provided with horizontal guideways 57 and on its opposite sides with upright webs 51. Each of these 70 webs is provided with a longitudinal slot 58 and with a flange 52 above the slot, the flange having teeth on its under side and constituting a horizontal rack. A transverse shaft 53 is supported in bearings at the outer end of 75 said bracket. This shaft is provided with a pulley 54 and a crank 55. A belt 56 extends from a pulley connected with the actuating mechanism (not shown) to the pulley 54 and imparts motion to the shaft. 80

A sliding carriage 60 is disposed on the ways of the support or bracket 50 and adapted to reciprocate thereon toward and from the cutter-dies. A pitman 61 connects the rear end of the carriage with the crank 55, whereby 85 the carriage is reciprocated. This carriage is provided with a central upright stud 62 and with upwardly-inclined bracket-arms 63 at its rear end. A transverse rock-shaft 64 is supported in said bracket-arms and projects 90 through the slots 58 of the webs 51. A cam 65, having peripheral cam-grooves 66, is centrally fixed on said rock-shaft. This shaft is also provided at its outer ends with pinions 67, which mesh with the fixed racks 52 of the 95 support 50. The positive and negative electrodes consist of two levers 70 and 71, which are provided near their outer ends with lateral lugs 72, which overlap each other and are pivoted on the upright stud 62 of the carriage. 100 These levers are provided at their outer ends with rounded projections or anti-friction roll-

ers 73, which engage the cam-grooves 66 of the cam 65, and at their inner ends with inwardly-projecting ledges 74, which support the blank between the cutter-dies and forging-dies. The electrode-levers 70 and 71 are insulated from each other, and electric cables 80 and 81, adapted for carrying currents of large volume, are connected to said levers. Each of these levers is preferably constructed in two parts, the longer part *a*, to which the cables are connected, being composed of copper or other good conductor of electricity, and the shorter part *b*, carrying the pivot-lugs 72, may be composed of iron or wood. The levers 70 and 71 are adjustable toward or from each other to adapt them for blanks of different lengths. For this purpose the shorter arms *b* may be provided at their inner ends with transverse boxes 75, having dovetail grooves, said boxes being composed of or lined with porcelain or other insulating material when the short arms are composed of metal. The outer ends of the copper arms *a* are provided with dovetail tongues 76, which fit the grooves of the boxes, and set-screws 77 may be employed for fastening said arms in the positions to which they may be adjusted.

The operation is as follows: The bar 100 is fed to the bar-cutter at proper intervals, preferably by means of a suitable intermittent mechanical bar-feeder, such as that described in my application, Serial No. 361,778, or the equivalent thereof. The bar-cutter then severs from the bar a blank of the proper length for the article to be forged. When the blank is cut off, the electrodes 70 and 71 are in the position shown in Fig. 1, and the blank falls upon the ledges 74 thereof and immediately closes the electric circuit, whereby a current of large volume is passed through the blank. Then the action of the crank 61 pushes the carriage 60 toward the forging-dies, and the electrodes attached thereto carry the blank 200 to said dies. The pinions 67 on the shaft 64, meshing with the stationary racks 52 on the bracket 50, cause the rotation of said shaft and its cam 65 during the movement of the carriage. When the carriage has moved a sufficient distance toward the dies to locate the blank 200 over the lower forging-die 30, the cam 65 causes the short arms of the lever-electrodes to move toward each other and the long arms thereof carrying said blank to spread apart. The blank is thereby dropped onto the stationary forging-die 30, and the electrodes swing away from the face of said die. The thrust of the carriage is slightly in excess of the distance between the cutters and the die to continue the operation of the cams for completing the dropping and swinging operation, and the plane of motion of the electrodes is such that the ledges 74 ride over the surface of the lower die 30 without contact therewith. The upper forging-die 31 then comes down and forges the blank into the desired shape. While the blank is supported

by the electrodes it is heated to a forging temperature, owing to its resistance to the electric current being greater than that of the electrodes, and when it is dropped the circuit is broken. A suitable circuit-breaker may be disposed in the circuit within reach of the operator, so that he can shut off or otherwise control the current, if necessary, before the blank is dropped from the electrodes. The degree of heat may be varied by varying the volume of the electric current. During the return movement of the carriage the electrodes are brought back, and under the action of the cam they are closed toward each other in position to receive another blank from the cutter.

To adapt the electrodes to blanks of different lengths the blank-carrying arms thereof may be adjusted laterally in the boxes 75 or otherwise.

I claim as my invention—

1. In an electric blank-heater for heating blanks to be forged, the combination of a sliding carriage, oscillating electrodes supported thereon, a support for said carriage, means for reciprocating said carriage to shift said electrodes for feeding the blank, and means for oscillating said electrodes to release the blank, substantially as set forth.

2. In an electric blank-heater for heating blanks to be forged, the combination of two pivoted levers and arms composed of conductive material laterally adjustable on said levers, said arms being provided with blank-supporting faces or ledges, substantially as set forth.

3. In an electric blank-heater for heating blanks to be forged, the combination of a sliding carriage, a support therefor, a fixed rack adjacent to said carriage, a cam-shaft on said carriage provided with a cam and with a pinion for engaging said rack, electrode-levers pivoted to said carriage and engaging said cam, said levers being provided with blank-supporting faces or ledges, and means for reciprocating said carriage.

4. The combination of the support 50, provided with the slotted webs 51, having the rack 52, the crank-shaft 53, journaled in said support, the carriage 60, adapted to reciprocate on said support, the pitman 61, connecting said carriage with the crank of said crank-shaft, a cam-shaft 64, supported on said carriage and extending through the guide-slots of said webs, a cam 65 on said shaft, pinions 67, engaging said racks disposed on said cam-shaft, and the lever-electrodes 70 and 71, engaging said cam and provided with blank-supporting holders, substantially as set forth.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

GEO. D. BURTON.

Witnesses:

J. C. MOORE,
CHESTER MARR.