No. 628,782. Patented July 11, 1899.

J. J. FAULKNER.

ELECTRIC FURNACE.

(Application filed Nov. 12, 1898.)

(No Model.) 2 Sheets—Sheet 1.

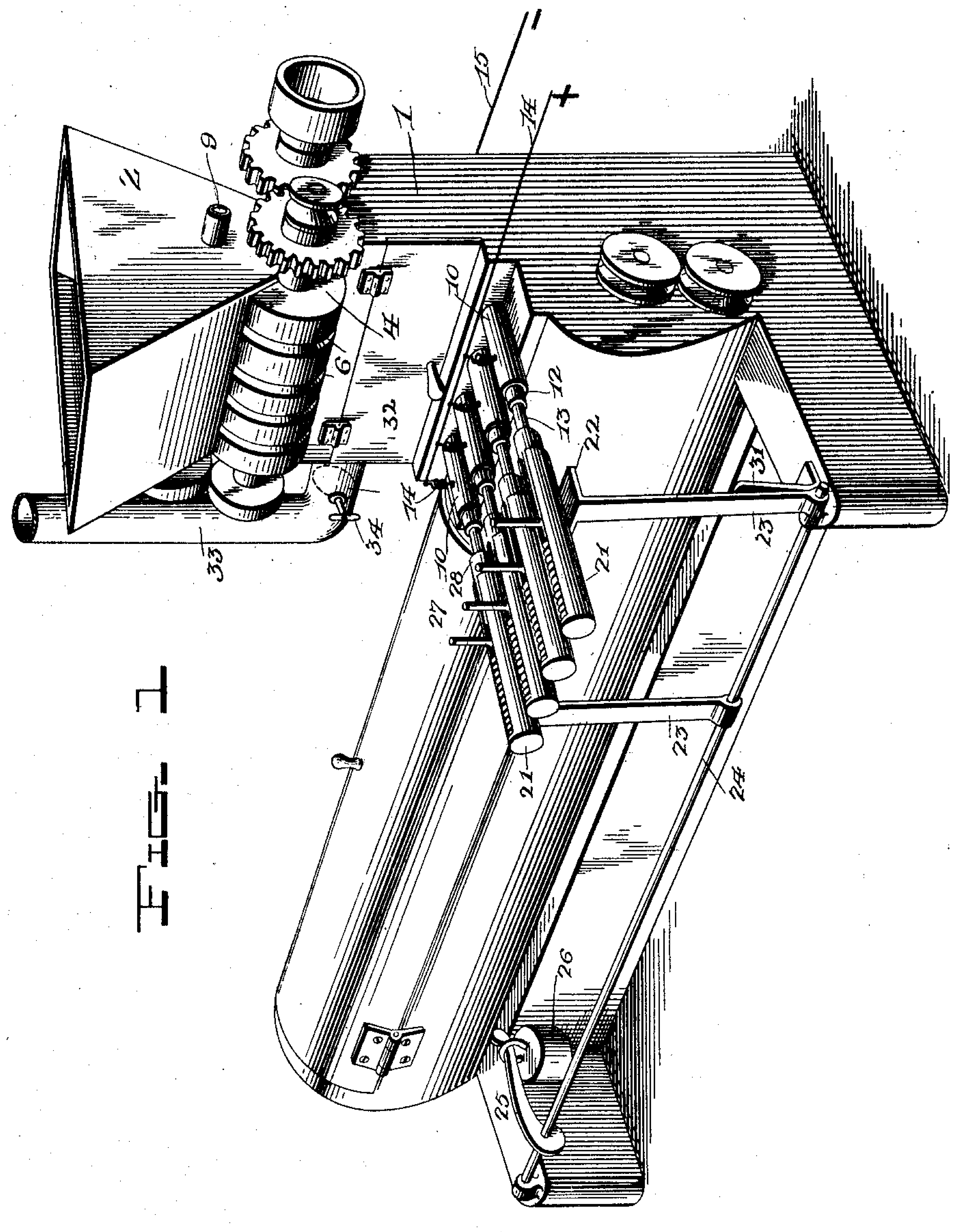

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FIG. 2

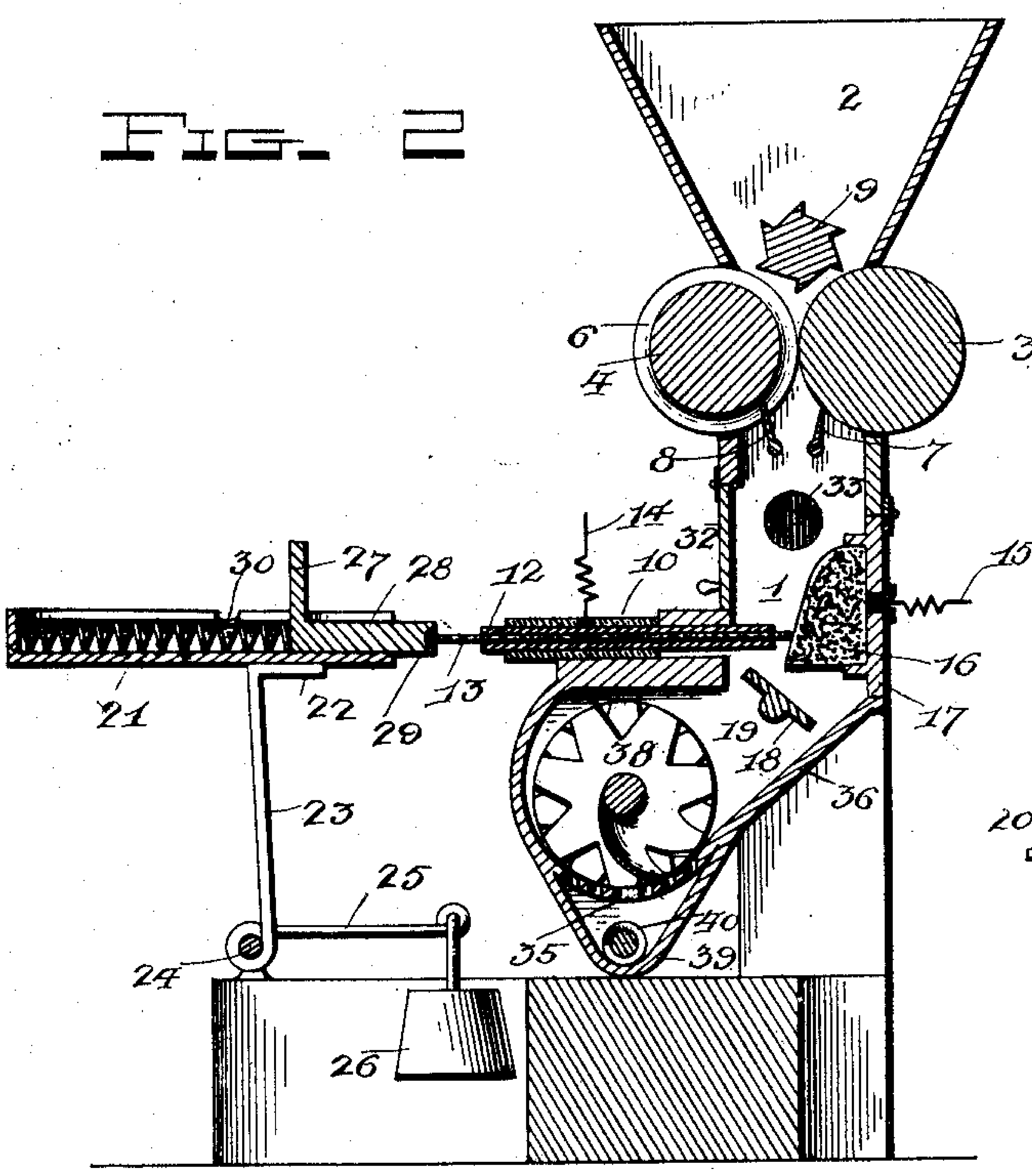


FIG. 4

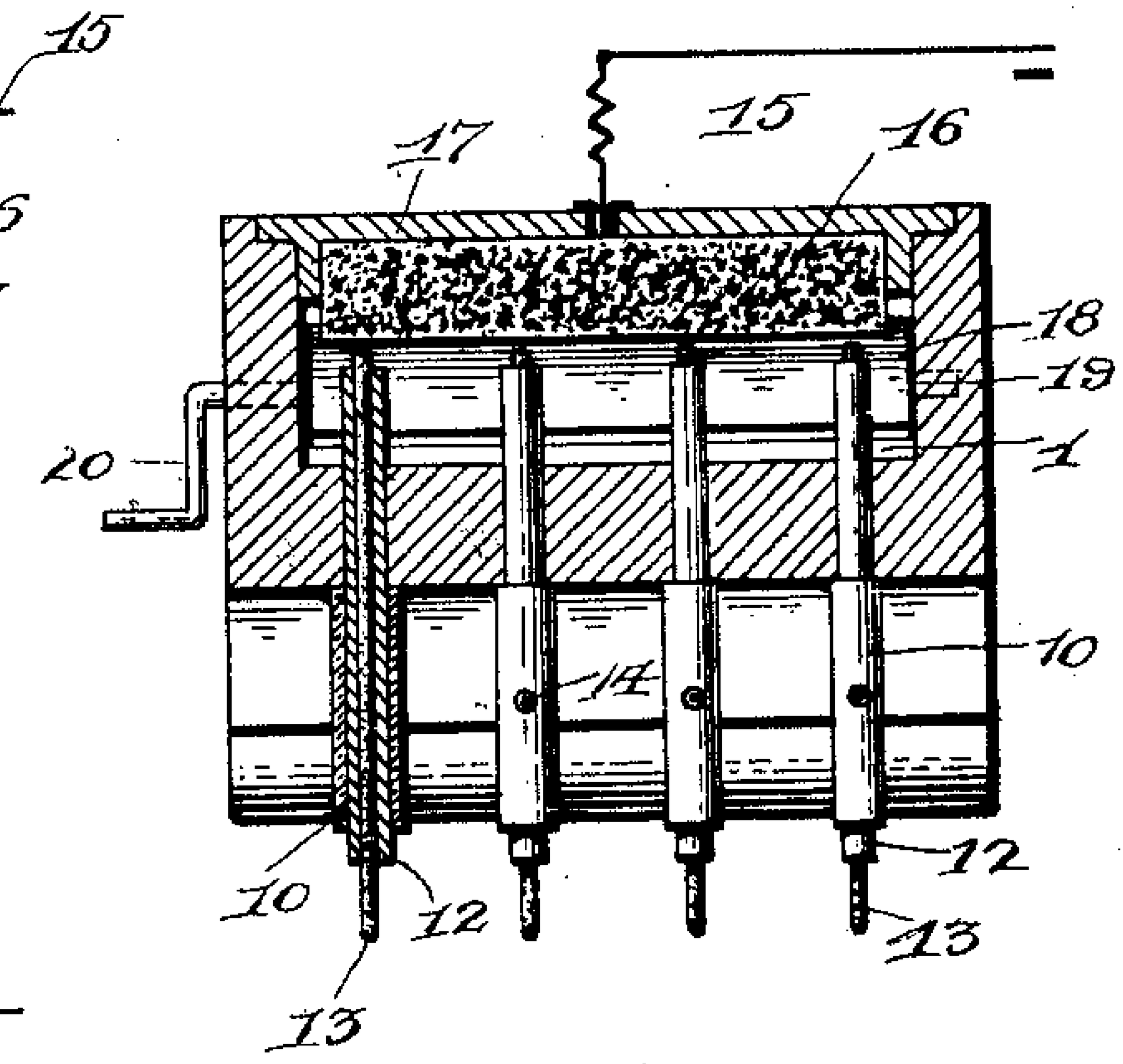
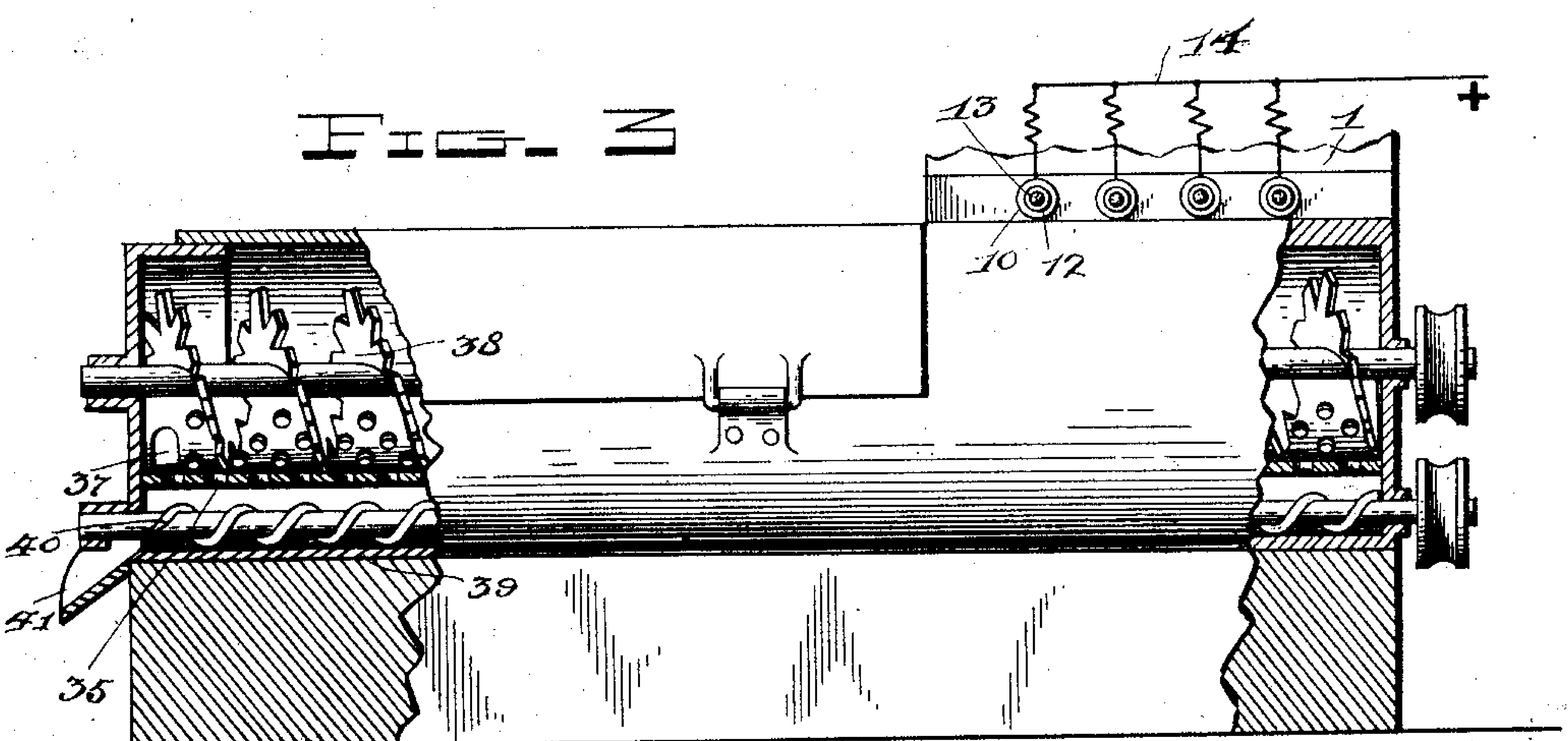


FIG. 3



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UNITED STATES PATENT OFFICE.

JAMES J. FAULKNER, OF MEMPHIS, TENNESSEE.

ELECTRIC FURNACE.

SPECIFICATION forming part of Letters Patent No. 628,782, dated July 11, 1899.

Application filed November 12, 1898. Serial No. 696,292. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. FAULKNER, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Electric Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electric furnaces, and more particularly to that class employed in the manufacture of calcium carbid; and the object attained is the economical production of the carbid, due to the automatic handling of the material necessary to the process.

To this end the invention consists in the construction, combination, and arrangement of the several elements of the furnace, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings the same reference characters indicate the same parts of the invention.

Figure 1 is a perspective view of my improved electric furnace for the economical production of calcium carbid. Fig. 2 is a vertical transverse section through the hopper and furnace-chamber. Fig. 3 is a longitudinal section through the conveyer. Fig. 4 is a horizontal section of the furnace.

In the drawings, 1 denotes the furnace-chamber, of fire-brick or other suitable refractory material, above which is mounted the hopper 2, in which are journaled the feed-rollers 3 and 4, the roller 3 being a plain cylindrical one, while the roller 4 is similar and is provided with a parallel series of circumferential grooves 6 6, and below each roller is a hinged spring-actuated scraper-blade, the blade 7 having a plane edge, while the contiguous edge of the blade 8 is serrated to conform to the plane and groove face of the roller 4.

9 denotes a ratchet-tooth-shaped roller mounted above the feed-rollers 3 and 4, and its office is to facilitate the compression of the loose material between the feed-rollers.

10 10 denote a horizontal series of parallel non-conducting sleeves fixed in the wall of the furnace, and in each sleeve is mounted a conductor-tube 12 to receive the copper-coated carbon electrode 13, the series of conductor-tubes being electrically connected to the positive (+) conductor 14.

15 denotes the negative (—) conductor in electric communication with the carbon electrode 16, which is removably secured in the hinged door 17 in the path of the series of electrodes 13.

18 denotes the hearth, and it consists of a plate fixed on a rock-shaft 19, one end of which terminates in an operating-handle 20, by means of which the proper inclination may be given to the hearth.

21 21 denote a parallel series of horizontal feed-tubes fixed on the bar 22, supported on the upper ends of the arms 23 23, arising from the rock-shaft 24, which in turn is provided with a lateral arm 25, carrying a weight 26. Each one of the feed-tubes 21 is longitudinally slotted on its upper side to form a guide for the lateral arm 27 of the spring-actuated plunger 28, the concave end 29 of which forms a socket for the contiguous end of the alined electrode 13, the plungers being held in contact with their respective electrodes by the weight 26, while each plunger is individually and independently adjustable by means of its spring action to compensate for the unequal consumption of its own particular electrode. Each of the feed-tubes 21 is provided with a lateral notch 30 to lock the plungers while the carbon electrodes are being renewed.

31 denotes a fixed bracket, which acts as a limit-stop to the forward movement of the tubes 21, and 32 denotes a hinged door by means of which access may be had to the furnace.

33 designates a chimney-flue communicating with the furnace and provided with a valve 34.

35 denotes a perforated conveyer-chute communicating at one end with the inclined bottom 36 of the furnace and provided at its outer end with a discharge-spout 37. 38 denotes a spiral conveyer mounted in said chute and serving to convey the products from the furnace along the perforated chute to the discharge-spout. Immediately beneath and parallel with the perforated conveyer-chute is a second imperforate chute 39, which is also

provided with a spiral conveyer-shaft 40 and a discharge-spout 41.

The operation of the machine is as follows: The prepared lime and carbon are first thoroughly mixed in a comminuted state and placed in the hopper, where, under the combined action of the fluted roller 9, the grooved rollers 3, and plain roller 4, the mass is compressed into a series of cylindrical rods or pencils coinciding with the electrodes 13, where they are subjected to the fusing action of the current. The fused portion is converted into calcic carbid, while the unfused portion is unchanged, and in this condition both portions fall on the inclined hearth, thence into the perforated chute, the lumps being conveyed along the chute by the conveyer-shaft 38 and discharged at the spout 37, while the pulverized portion passes through said perforated chute and falls into the lower imperforate chute, whence it is discharged at the spout 41.

Of course it will be understood that when the furnace is in active operation the electrodes are maintained at arcing distance by the material which is being treated.

It will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric furnace, the combination with the furnace-chamber of two opposing electrodes, and means for automatically adjusting one of said electrodes, said means comprising a fixed insulated support for the movable electrode, a sleeve, a spring-actuated plunger mounted in said sleeve and longitudinally alined with said movable electrode, substantially as and for the purpose set forth.

2. In an electric furnace, the combination with the furnace-chamber of a normally stationary electrode, a series of movable electrodes, and means for independently and automatically adjusting said movable electrodes, said means comprising a series of fixed insulated supports for said movable electrodes, a series of connected sleeves adapted to move simultaneously to and from said fixed sleeves, and an independent spring-actuated plunger mounted in each of said movable sleeves and alined with each of said movable electrodes, substantially as and for the purpose set forth.

3. In an electric furnace, the combination with the furnace-chamber, a tilting hearth mounted in said chamber, of a stationary electrode fixed above the furnace-hearth, a series of horizontal electrodes also mounted above said hearth and adapted to travel to and from said stationary electrode, and a series of independent spring-actuated plungers contiguously alined with said horizontal electrodes, substantially as and for the purpose set forth.

4. In an electric furnace, the combination with the furnace-chamber, of a normally-fixed electrode, a fixed non-conductor sleeve, a conductor-tube mounted within said sleeve, a movable electrode mounted therein and adapted to travel to and from said fixed electrode, and a spring-actuated plunger alined with said movable electrode, as and for the purpose set forth.

5. In an electric furnace, the combination with the furnace-chamber, of a normally-fixed electrode, a movable electrode adapted to travel to and from said fixed electrode, and a spring-actuated plunger coacting with the free end of said movable electrode, as and for the purpose set forth.

6. In an electric furnace, the combination with the furnace-chamber, of a normally-fixed electrode, a movable electrode, a gravity-actuated rocking bar, a feed-tube carried by said bar, and a plunger mounted in said feed-tube and alined with said movable electrode, as and for the purpose set forth.

7. In an electric furnace, the combination with the furnace-chamber, of a normally-fixed electrode, a movable electrode, a gravity-actuated rocking bar, a feed-tube carried by said bar and a spring-actuated plunger mounted in said feed-tube and alined with said movable electrode, as and for the purpose set forth.

8. In an electric furnace, the combination with a furnace-chamber, of a fixed and a movable electrode, and a tilting hearth mounted beneath said electrodes, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES J. FAULKNER.

Witnesses:
FRED SCHOTTENBERG,
J. M. STEINBRECHER.