

No. 881,519.

C. E. WILSON.

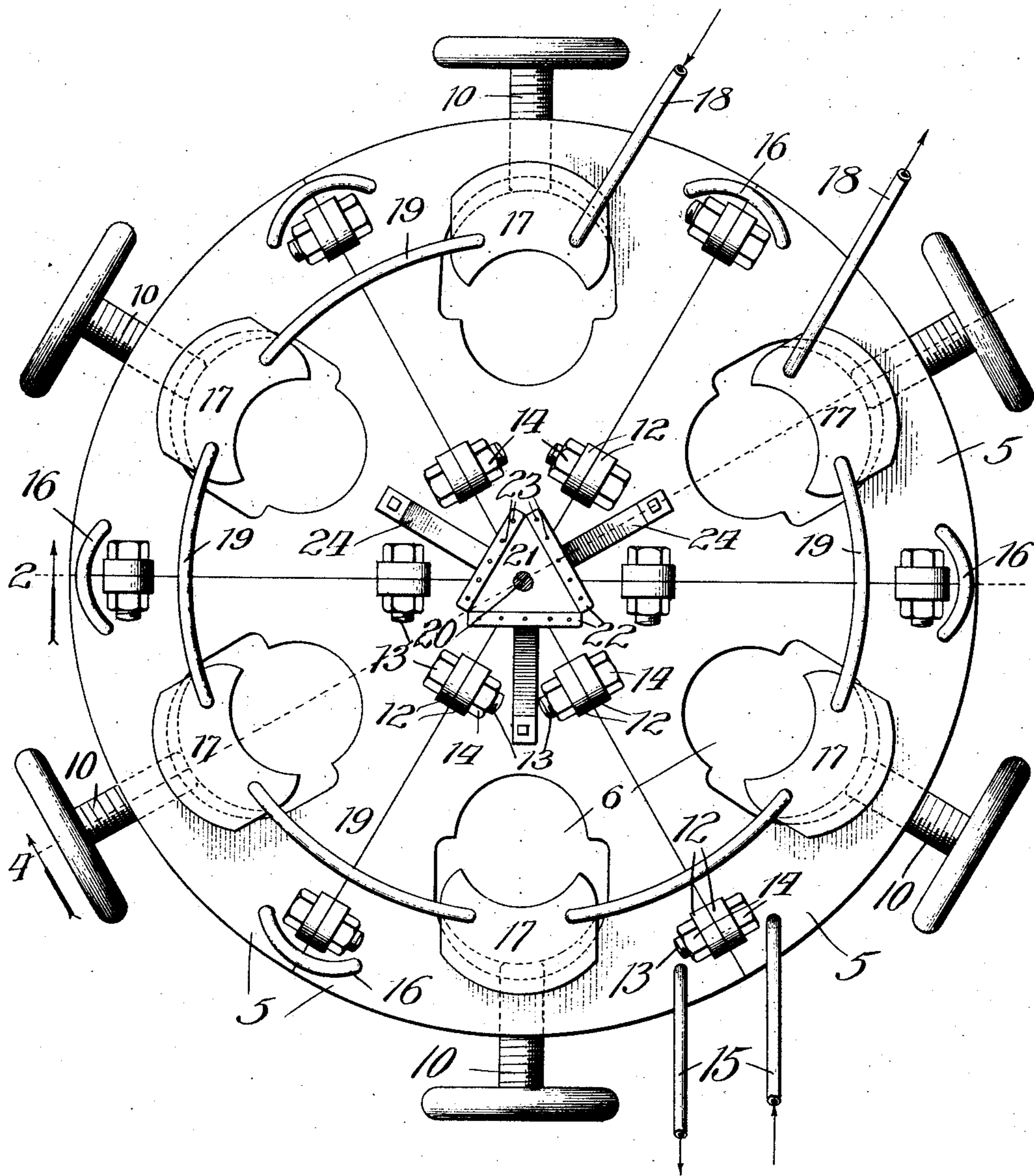
PATENTED MAR. 10, 1908.

ELECTRODE HOLDER FOR ELECTRIC SMELTING FURNACES.

APPLICATION FILED SEPT. 15, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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Chas. H. Buell.

Inventor:

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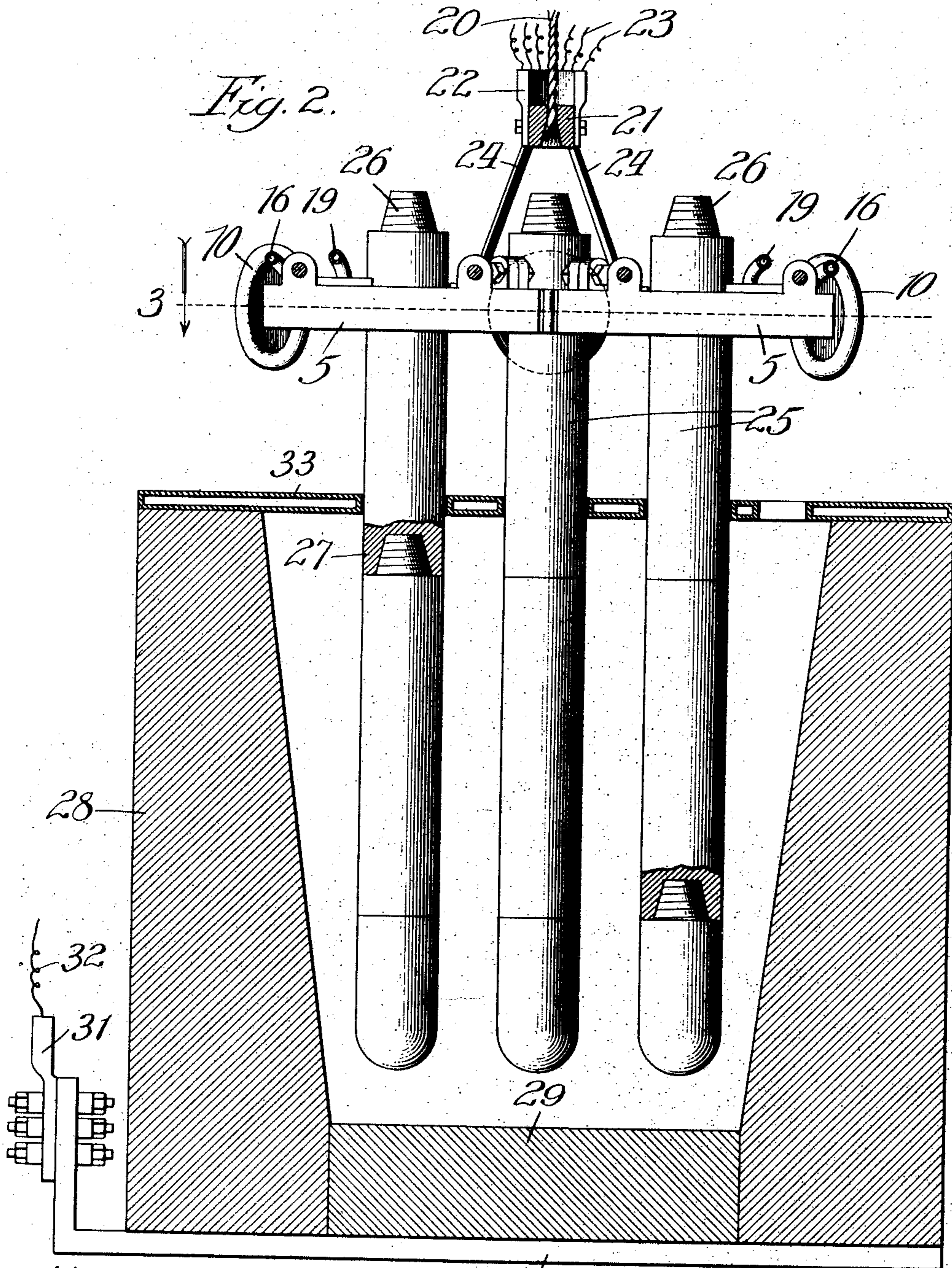
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

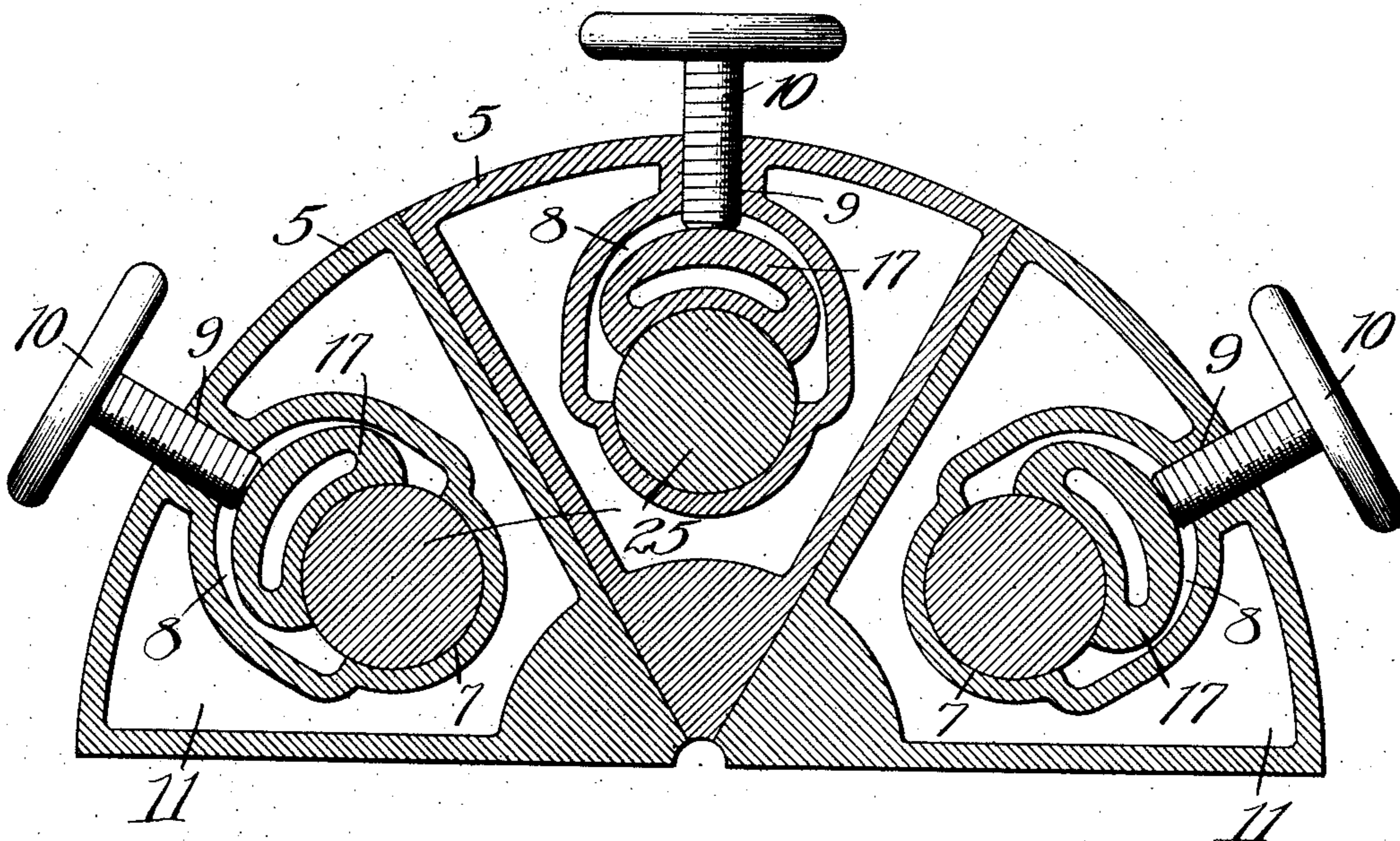
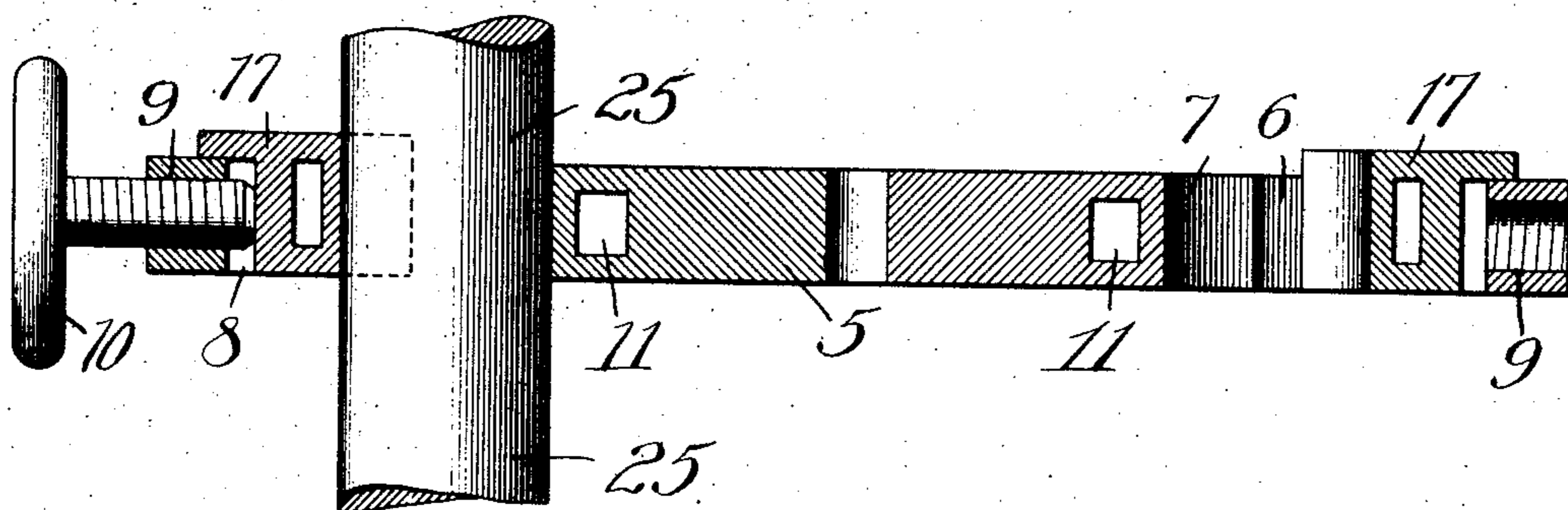


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES E. WILSON, OF FERRIS, WEST VIRGINIA.

ELECTRODE-HOLDER FOR ELECTRIC SMELTING-FURNACES.

No. 881,519.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed September 15, 1906. Serial No. 334,751.

To all whom it may concern:

Be it known that I, CHARLES E. WILSON, a citizen of the United States, residing at Ferris, in the county of Fayette and State of West Virginia, have invented a new and useful Improvement in Electrode-Holders for Electric Smelting-Furnaces, of which the following is a specification.

My object is more especially to provide an electrode holder for use in electric furnaces, where large units of electric power are required, and of an improved construction adapting it for holding a plurality of carbon pencils and for distributing the current uniformly thereto.

It is also my object to provide a holder which will permit a pencil, or pencil section, to be placed in position and adjusted without the necessity of removing the holder or of cutting off the current to the pencils in the holder.

In the drawing,—Figure 1 is a broken top-plan view of my improved holder, adapted for sustaining and distributing current to six carbon pencils; Fig. 2, a reduced section taken on line 2 in Fig. 1 and showing the holder with pencils fastened therein, in combination with an electric-furnace crucible; Fig. 3, an enlarged plan-section of one-half the holder, the section being taken on line 3, in Fig. 2; and Fig. 4, a broken section taken on line 4, in Fig. 1.

The holder shown is formed of six similarly constructed segments, 5, formed with smooth meeting faces and which when placed together constituted a complete circular head. Extending through each segment is an opening, 6, presenting the semi-circular surface, 7, and space, 8. Entering through the side of the head to the space, 8, is a threaded opening, 9, fitted with a set-screw, 10. Surrounding the wall of each opening, 6, is a chamber, 11, cored in the segment. Each segment carries at opposite meeting edges, upwardly projecting attaching lugs, 12, located as shown, having bolt receiving perforations which register when the sections are placed together. Bolts, 13, are passed through the said registering openings, and nuts, 14, upon the bolts, serve with the bolts to clamp the sections securely together. In the top of each section close to opposite sides of its chamber, 11, are pipe receiving openings. Extending to two of said openings, in adjacent sections, are water inlet and outlet pipes, 15, while connecting the adjacent openings of the sections,

are short water-conducting pipes, 16. The water entering at one pipe, 15, will pass through all the chambers, 11, in series and escape at the other pipe, 15. In each space, 8, is a hollow segmental follower or pencil-clamping block, 17, engaged by the set-screw, 10. Water inlet and outlet pipes, 18, communicate with two adjacent followers, 17, and all the chambers of the followers are connected in series by pipes, 19, whereby water entering through one pipe, 18, will pass through all the followers and escape at the other pipe, 18. The head is suspended from a cable, 20, which is secured at its lower end to a preferably triangular, and preferably copper, block, 21, provided along each edge with attaching plates, 22, for conducting wires, 23, leading from the source of electric-current supply. Secured to and extending downward from the sides of the block, 21, are suspending conductor-bars, 24, securely fastened to three of the segments, 5, at points equidistant apart.

To fasten a carbon pencil, 25, in place, it is passed downward through an opening, 6, between the surface, 7, and follower, 17, and clamped by tightening the set-screw, 10, against the follower. This gives a large surface contact between the holder and the opposite sides of each pencil. The pencils I employ are of the sectional type and each section may be formed, as indicated, with a threaded projection, or joint-member, 26, at one end and a threaded socket or joint-member, 27, in the other end.

In Fig. 2 I show a crucible, 28, having a carbon electrode, 29, in its base resting upon a current-conducting base-plate, 30. On the base-plate is connecting means, 31, for the electric circuit wires, 32. Fitting over the crucible is a water-jacketed cover, 33, having openings through it for the passage of the pencils and for feeding material to the crucible.

In practice as the pencils wear away at their lower ends and become shortened, say to the length of nearly one section, new sections may be screwed upon the projecting ends, 26, above the holder. By loosening the set-screws, 10, the followers will be slightly withdrawn from the surfaces of the pencils, permitting the latter to be lowered as desired, after which they may be fastened in adjusted position by tightening the set-screws.

My improved head makes it possible to

mount a large number of pencil electrodes in a compact cluster, and to distribute large units of electric energy through the pencils, thus, in the present construction, if the carbon pencils are capable of conducting 2,000 electric H. P. each, 12000 electric H. P. may be supplied from a single head, governed by a single controlling means. New pencil sections may be inserted as desired, without in any way disturbing the operation of the furnace and without danger to the attendant. If it is desired to operate the furnace continuously in the smelting of ores, tap-holes may be provided in the sides of the crucible for drawing off the metal and slag as they accumulate. By constructing the pencils in sections and feeding them as desired, there is practically no unnecessary waste of the pencils and all the material thereof may be utilized.

What I claim as new and desire to secure by Letters Patent is—

1. In an electric-furnace pencil-electrode holder, the combination of clamping means for releasably engaging a pencil and provided with an opening therefor, and a pencil formed of longitudinal sections joined together with the upper section provided with a joint-member and releasably held by said clamping means in said opening to adapt it for coupling to said joint-member another section equipped with a joint-member to engage therewith, for the purpose set forth.

2. An electric - furnace current - distributing holder for a plurality of pencil electrodes, comprising, in combination, a head having pencil receiving openings through it, electric current conducting means connected with the head, and a pencil-support, comprising current-conducting pencil engaging and releasing clamping means on the head at each of said openings.

3. An electric - furnace current - distributing holder for a plurality of pencil electrodes, comprising, in combination, a water

jacketed head having pencil receiving openings through it, electric current conducting means connected with the head, and a pencil-support, comprising water-jacketed pencil engaging and releasing clamping means on the head at each of said openings.

4. In an electric furnace, the combination of a current distributing holder for a plurality of pencil electrodes, comprising, a head having pencil receiving openings through it, electric-current conducting means connected with the head, and pencil engaging and releasing clamping means on the head at said openings, and pencils formed of longitudinal sections fastened together at their ends passing through said openings and adjustably fastened therein by said clamping means.

5. An electric furnace current - distributing holder for a plurality of pencil electrodes, comprising, in combination, a pencil-supporting head connected with the electric-current supply and having an opening through it for each pencil, each opening being formed with a segmental wall against which the pencil fits at one side, an adjustable clamping block in each opening against which the pencil fits at its opposite side, and set-screws in the sides of the head engaging said blocks, whereby each pencil may be positioned independently of the others.

6. An electric - furnace current - distributing holder for a plurality of pencil electrodes, comprising, in combination, a pencil-supporting head formed of a plurality of interfitting segments secured together, electric-current conducting means connected with the head, the segments having openings through them for the passage of the pencils, and pencil engaging and releasing clamping means on the sections at each of said openings.

CHARLES E. WILSON.

In the presence of—

H. M. GIBBES,
T. R. RAGLAND.