No. 854,764. PATENTED MAY 28, 1907.

G. SEMENZA.

THREE PHASE CURRENT ARC LAMP.

APPLICATION FILED OCT. 25, 1902.

Fig. 5.

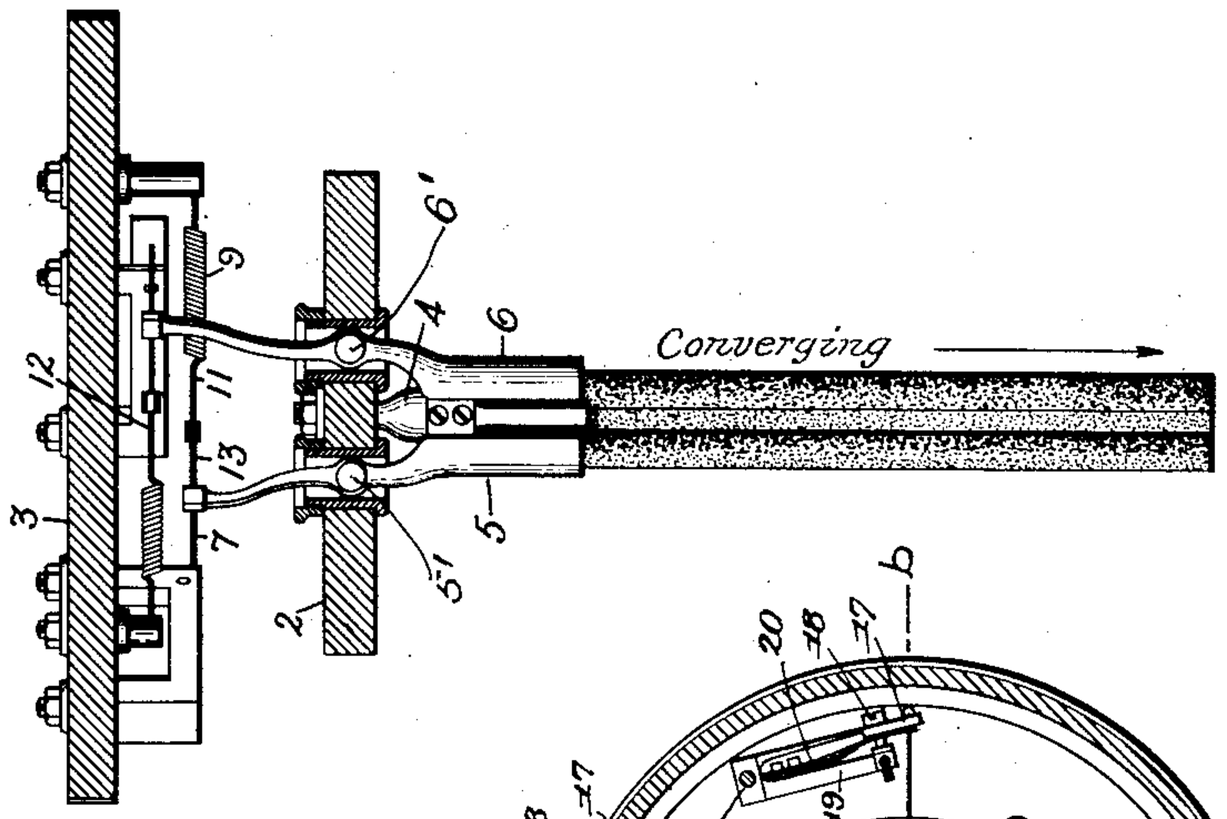

Fig. 2.

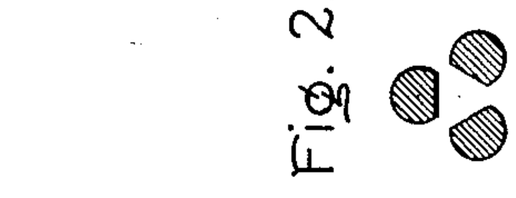

Fig. 4.

Fig. 3.

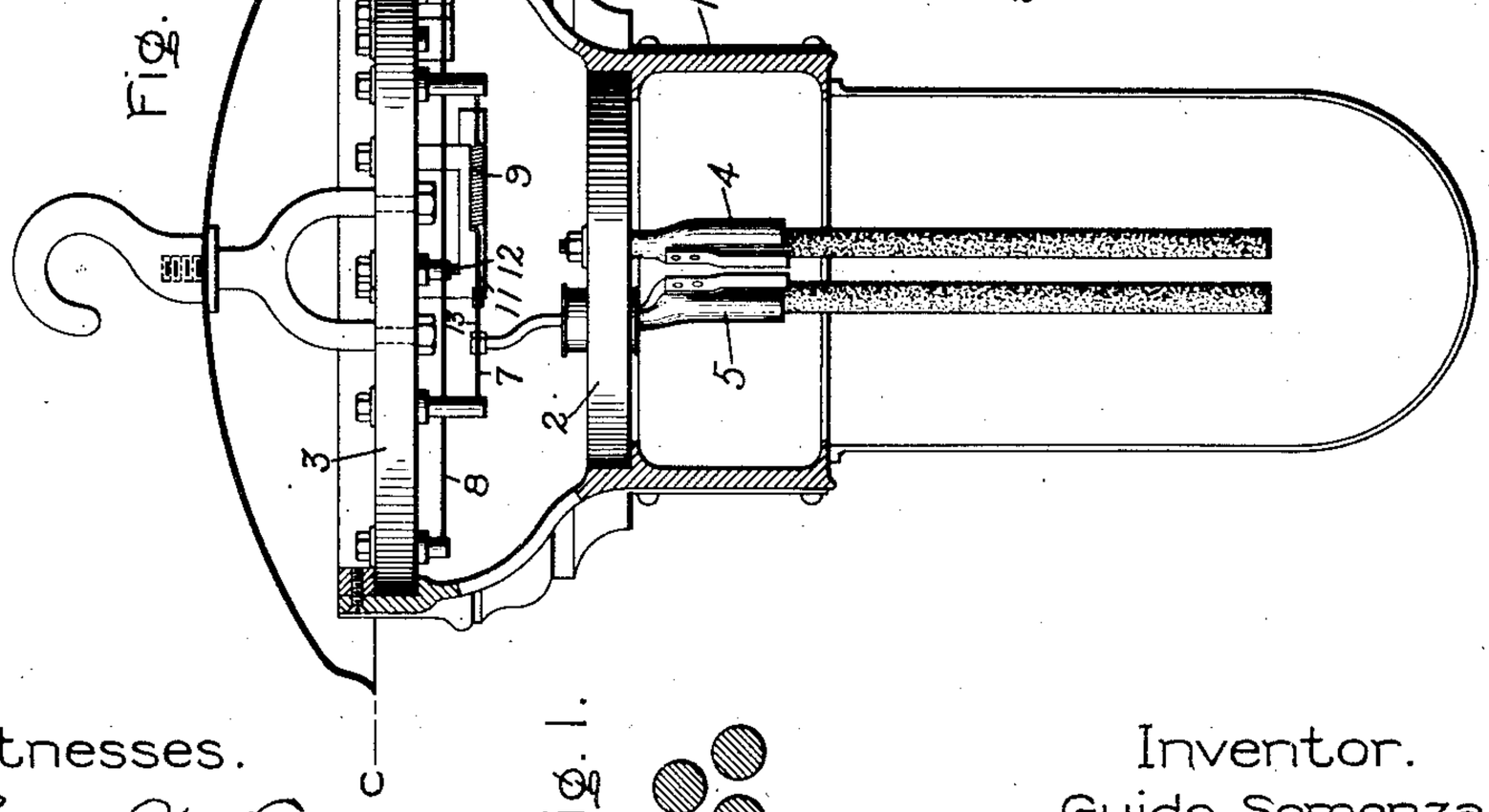

Fig. 1.

Witnesses.

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UNITED STATES PATENT OFFICE.

GUIDO SEMENZA, OF MILAN, ITALY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

THREE-PHASE-CURRENT ARC-LAMP.

No. 854,764. Specification of Letters Patent. Patented May 28, 1907.

Application filed October 25, 1902. Serial No. 128,760.

To all whom it may concern:

Be it known that I, GUIDO SEMENZA, electrical engineer, a subject of the King of Italy, residing at Milan, 4 Via Paleocapa, have invented certain new and useful Improvements in Three-Phase-Current Arc-Lamps, of which the following is a specification.

If a three-phase current voltaic arc is produced by employing three cylindrical and parallel carbons, the arc thus formed at their lower extremity does not remain stationary but changes in its position continually by rising and falling in the space comprised between the carbons themselves. For this reason a system of three-cylindrical and parallel carbons cannot produce a good industrial arc-lamp without resorting to other arrangements and in order to obtain it, various devices have been made use of to fix the arc in its position. Among these may be mentioned, Thomson (American Patent No. 571463) that surrounds the arc with six coils through which passes a current, and Rice (American Patent No. 611891) that employs a fourth electrode facing the other three. According to my invention these devices can be dispensed with by modifying the shape of the carbons and their reciprocal disposition as shown in the accompanying drawings, in which—

Figure 1 is a section of the carbons of a three-phase lamp as heretofore in use; Fig. 2 is a section of said carbons having the shape and relative arrangement they may receive, according to my invention; Fig. 3 is a side elevation of a lamp embodying the present invention, the casing being shown in cross-section; Fig. 4 is a horizontal section taken on line *c*—*d*, Fig. 3; and Fig. 5 is a vertical section taken on line *a*—*b*, Fig. 4.

In fact, while cylindrical carbons (Fig. 1) or carbons presenting edges or surfaces with slight curvatures on their facing sides, facilitate the displacement of the arc, the employment of the carbons presenting flat surfaces on their facing sides (Fig. 2), causes the arc to remain easily at the base of the carbons. The cause of this fact is not yet quite clear; one may advance the hypothesis that it may depend upon the different concentration of the heat in the various points of the surface of the carbon as, in the case of Fig. 1, the arc is formed along a narrow zone (theoretically along a line) while in the case of Fig. 2 the formation of the arc takes place on a sufficiently large surface. Moreover, in order to maintain the arc in its place, it is necessary that the carbons should not be absolutely parallel, but slightly converging from the top downward, in such a way that toward the lower end, they should be nearer than at the top end; the dimensions and the distance of the carbons must be chosen and based on the number of watts to be consumed in the lamp. By the said arrangements, an arc is obtained which satisfactorily remains at the base of the carbons and allows the construction of an industrial three-phase current arc-lamp capable of working even on low frequencies (25—15 cycles).

Figs. 3 and 4 evidently show but one of the various forms which the lamp can assume.

The skeleton of the lamp consists of a metallic tubular body 1 fitted with two slate disks 2 and 3, the latter disk carrying the lighting mechanism. The carbon-holder 4 is stationary, while the other two carbon holders, 5 and 6, can oscillate on pivots 5′ and 6′ secured to disk 2. On the lower face of disk 3 two German silver wires 7 and 8 are arranged and stretched between suitable screw terminals. These wires carry the current to the carbons, wire 7 to carbon 5 and wire 8 to carbon 6. At points 11 and 12 midway between the terminals spiral springs 9 and 10 are attached, one to each wire, and at the same point, but opposite to the spring, is attached a rigid wire 13, 14, which binds the system with the end of the corresponding carbon-holder. The springs and the wires are first sufficiently stretched to cause the carbons to come in contact with each other, while no current is passing through wires 7 and 8. As soon as current flows through the lamp the temperature of the wires 7 and 8 is increased and these wires expand, permitting the springs 9 and 10 to contract slightly so as to displace the points 11 and 12 laterally. This displacement causes the points of the carbons to move apart from each other and to produce the arc, bringing the carbons in their working position.

The wires 7 and 8 may be mounted in any suitable manner so as to permit of adjustment. Thus, one end of each of the wires may be attached to a stud 15 secured to the plate 3, the other end being carried upon an

adjustable mounting 16. This mounting may take any desired form, as, for example, it may consist of a spring arm 17 to which the end of the wire is attached, and a screw device 18 which passes through the member 17 into a stationary part 19. Thus, when the screw is loosened, the entire tension of the spring-arm is exerted upon the wire; while upon tightening the screw, the tension is diminished, and finally overcome, so that the wire is left loose. If desired, a spring 20 may be secured to a fixed part and engage the member 17 so as to augment the ultimate tension which may be placed upon the wire. The current may be introduced through either the studs 15 or the mountings 16; and these parts, being secured upon the slate member 3, require no special insulation.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an electric arc lamp, the combination of a plurality of electrodes, converging toward each other, each electrode being mainly cylindrical but having a flat side of less width than the maximum diameter of the electrode.

2. In an electric arc lamp, the combination of three electrodes each supported at one end and symmetrically arranged so that the arc is formed at adjacent opposite ends of the electrodes, each electrode being nearly round in cross section but having a flat side presented toward the arc.

3. A multiphase alternating current arc lamp having a plurality of electrodes arranged side by side so as to permit an arc to be formed at adjacent ends, said electrodes presenting flat sides toward the arc to assist in maintaining the arc at the ends of the electrodes.

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

GUIDO SEMENZA.

Witnesses:

MICHELE DE DRAGO,

VIRGINIO CARNEVALY.