No. 615,408. Patented Dec. 6, 1898.

M. S. OKUN.

ELECTRIC ARC LAMP.

(Application filed Oct. 21, 1895. Renewed May 28, 1898.)

(No Model.)

Fig. 1.

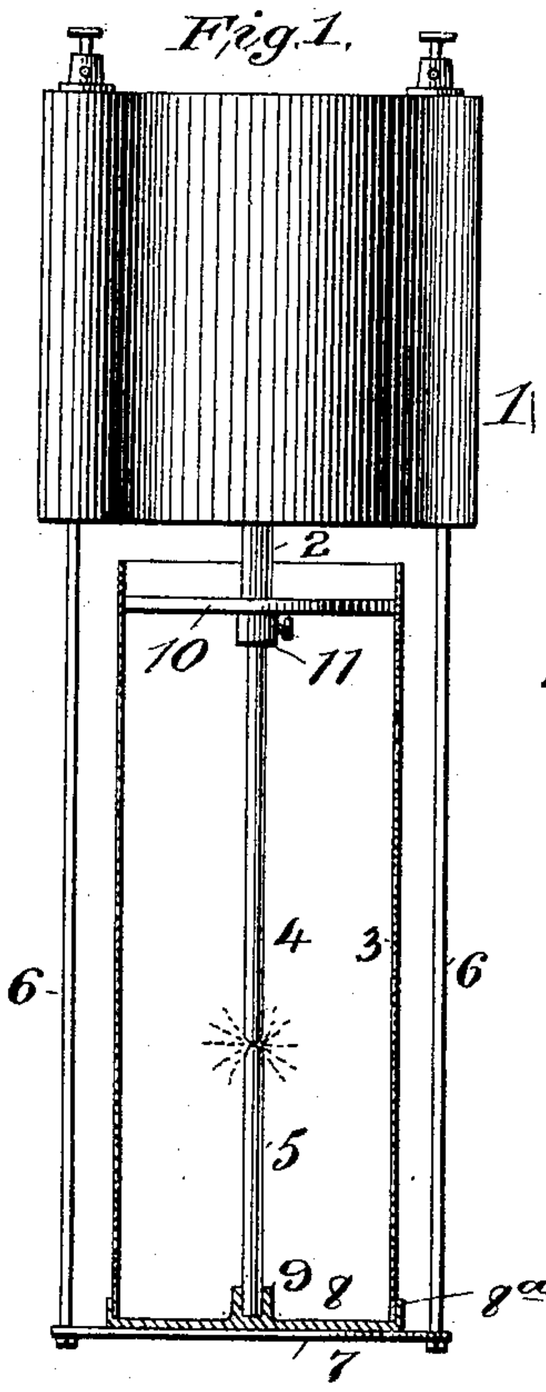


Fig. 2.

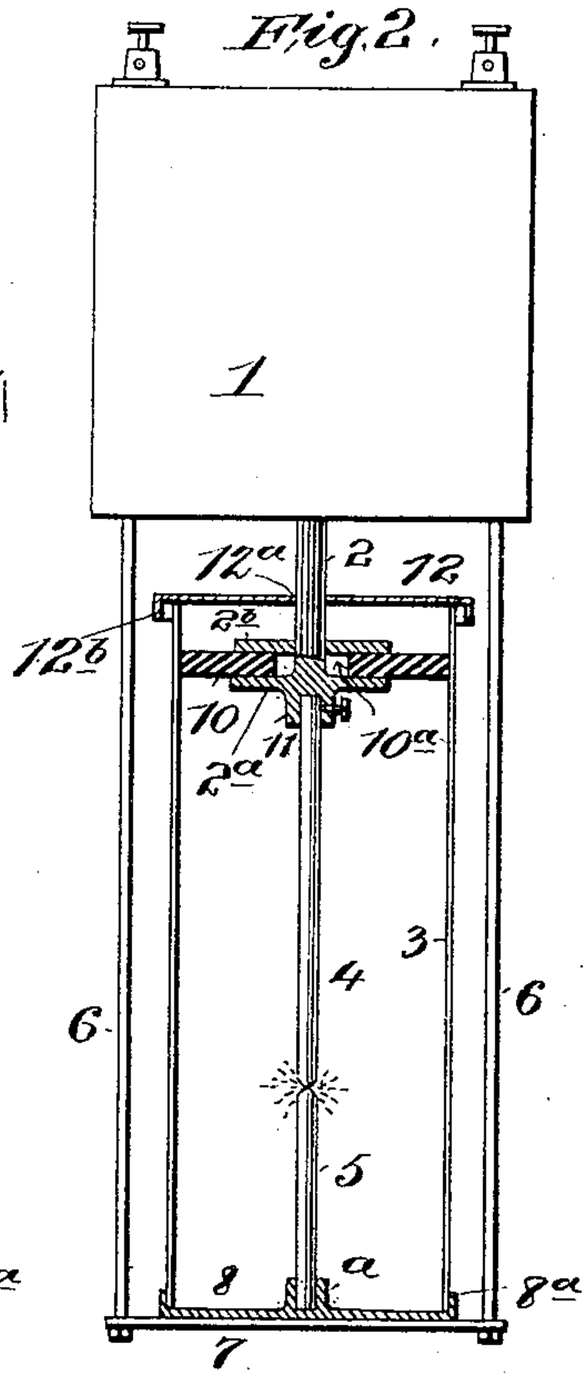


Fig. 3.

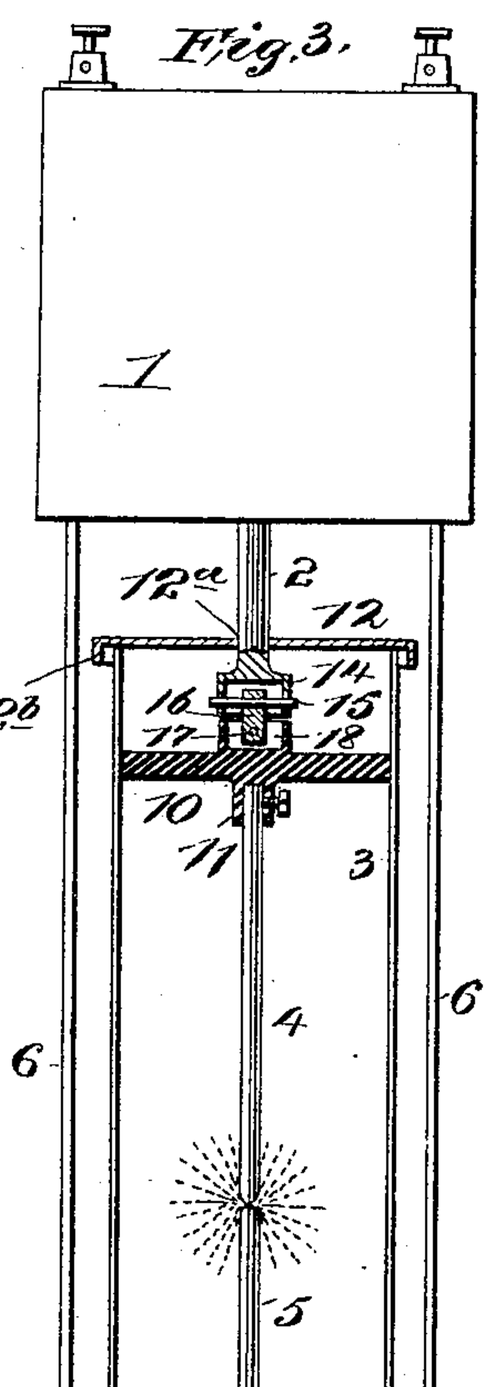


Fig. 3a.

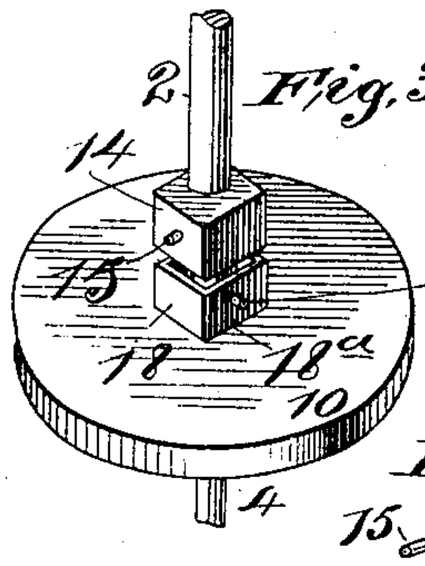


Fig. 3b.

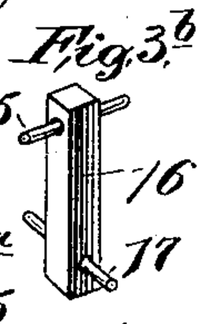


Fig. 3c.

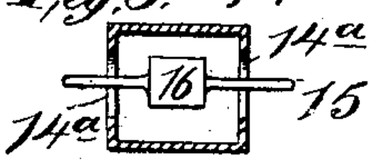


Fig. 4.

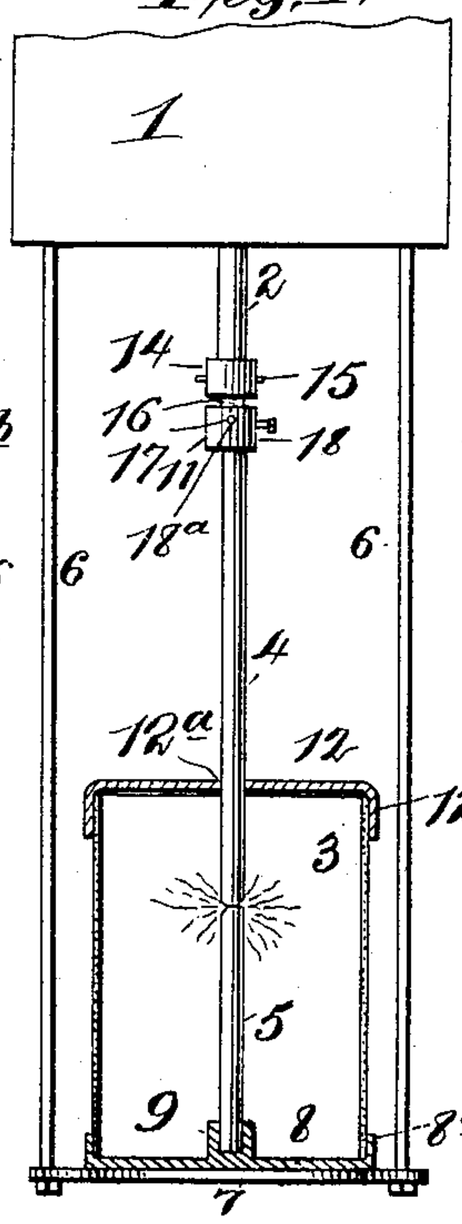


Fig. 5.

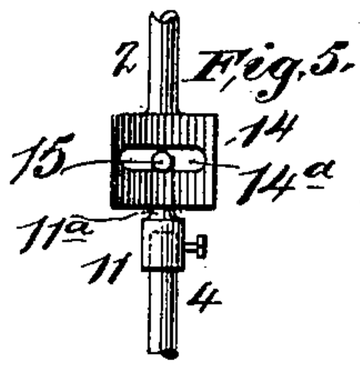


Fig. 6.

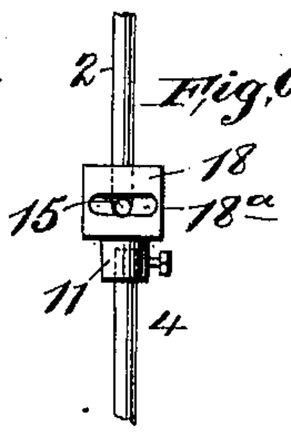
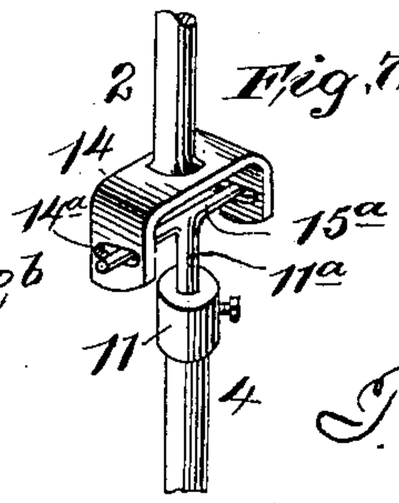


Fig. 7.



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UNITED STATES PATENT OFFICE.

MOSES S. OKUN, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 615,408, dated December 6, 1898.

Application filed October 21, 1895. Renewed May 28, 1898. Serial No. 682,075. (No model.)

To all whom it may concern:

Be it known that I, MOSES S. OKUN, a citizen of the United States, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Arc-Lamps, of which the following is a specification.

My invention relates to improved means for retarding the consumption of the carbons in arc-lamps; and the invention consists in a globe closed air-tight below the arc, in combination with a carbon-feeding mechanism and a disk or plate operated by said mechanism and fitting snugly within said globe against its inner walls, so that said disk can rise and fall within said globe, said disk or plate thereby acting to retard the entrance of air into said globe to reach the arc, while at the same time permitting the carbon to feed properly to regulate the arc.

The invention also consists in means to permit the carbon-operating rod of carbon-operating mechanisms to have necessary lateral movement relatively to said disk or plate to prevent binding of said disk or plate upon the walls of the globe.

The invention also consists in the combination of a carbon-feeding rod and a carbon-holder with means to permit the carbon-rod to have independent lateral movement relatively to the carbon-holder to permit free feeding of the carbon in a snugly-fitting feed-opening in or on the globe.

The invention further consists in the novel details of improvement and the combinations of parts, that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a side elevation of an arc-lamp, showing the simplest form of my invention, the globe being in section. Fig. 2 is a similar view showing means in section for permitting the carbon-feeding rod to have lateral movement relatively to the disk that travels within the globe. Fig. 3 is also a similar view showing means for permitting the carbon-rod to have lateral movement relatively to the carbon-holder. Figs. 3^a and 3^b are details of said means. Fig. 3^c is a detail showing a modification. Fig. 4 is a view similar to Fig. 1, showing the improvements of Fig. 3 as applied to a globe having a snugly-fitting feed-opening for the upper carbon; and Figs. 5, 6, and 7 are detail views showing various forms of devices for permitting the carbon-operating rod to have lateral movement relatively to the carbon-holder.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, the number 1 indicates a casing or box which may contain suitable carbon-operating mechanism, and 2 is a carbon operating or feeding rod actuated thereby in well-known manner.

3 is a globe within which the arc is formed by the carbons 4 5, which globe may be supported by or connected with the casing 1 in any suitable manner. I have shown rods 6 depending from the casing 1 and carrying a bar or plate 7, which supports a plate or disk 8, having an upturned flange 8^a, which plate or disk 8 receives the globe 3 and closes its lower end; but it is evident that the globe 3 can be otherwise supported and its lower end can be closed by any other suitable means.

9 is a carbon-holder for the negative carbon.

All of the above parts may be of well-known or desired construction. The globe 3, however, is by preference tubular and is preferably of comparatively small area or transverse diameter.

10 is a disk or plate arranged to fit snugly within the globe 3 and adapted to travel up and down therein, the disk or plate 10 serving to retard the entrance of air into the globe to prevent its access to the meeting ends of the carbon in all positions of the disk or plate 10. The disk or plate 10 is carried by the carbon-operating rod 2 or other carbon-operating device of a carbon-operating mechanism, and said disk or plate partakes of the up-and-down movements of the carbon. The disk or plate 10 may be connected with the rod 2 by any suitable means, and the carbon-holder 11 lies beneath said disk or plate and may be carried directly by the rod 2, as in Fig. 2, or by the disk or plate 10, as in Fig. 3.

When the carbons 4 5 are first placed in position at their proper lengths, the disk or plate 10 will be within the globe 3 near its upper end, and as the carbons consume and the rod 2 descends the disk or plate 10 will

follow down with said rod, but at all times acting to retard the access of air to the arc. As the carbons burn, carbon dioxid (CO_2) and later on carbon monoxid (CO) form within the globe and retard the consumption of the carbons, the disk or plate 10 serving to prevent the escape of said gas, as well as retarding the entrance of air into the globe near the carbons, whereby the life of the carbons is prolonged. A snug fit should be made between the inner wall of the globe and the periphery of the disk or plate 10, while still allowing said disk or plate to have free up-and-down movements within the globe as the carbon 4 is operated. The disk or plate 10 acts as an internal movable cover for the globe.

It is evident that the globe 3, instead of being tubular, could be rectangular or of other cross-section, the disk or plate 10 being correspondingly shaped to slide within the globe. Furthermore, the disk or plate 10 is substantially an enlargement on the carbon-rod 2, arranged to prevent access of air to the arc.

Suitable means may be provided for allowing free movement of the disk or plate 10 in the globe. For this purpose the carbon-rod 2 is arranged to have lateral movement relatively to the disk or plate 10 should this be found desirable or necessary. In Fig. 2 I have shown simple and efficient means for this purpose. As shown, the disk or plate 10 has an aperture 10^a, which is larger than the rod 2, so that the latter can move laterally therein, and the rod 2 carries a flange 2^a, upon which the disk or plate 10 rests. The flange 2^a is wider than the aperture 10^a, and thus serves to close it in all positions of the parts. In order to insure the proper descent of the disk or plate 10 when thus loosely connected with the rod 2, I provide a flange or washer 2^b, which is by preference rigidly carried by the rod 2 and rests upon the disk or plate 10. By this means when the rod 2 descends the flange or washer 2^b causes the disk or plate 10 to descend correspondingly and at the same time the flange 2^b prevents the disk or plate 10 from tilting on the flange 2^a. Furthermore, the flange 2^b assists in preventing or retarding air from passing through the aperture 10^a in disk or plate 10 into the globe 3. With the arrangement above described friction between disk or plate 10 and the inner wall of the globe 3 is reduced or prevented, owing to the ability of the rod 2 to move laterally relatively to said disk or plate.

To further reduce the chance of air entering the globe, I may place a cover 12 on the top of the globe 3, which cover is provided with a snugly-fitting feed-opening 12^a for the passage of the carbon-rod 2. An outer depending flange 12^b may be placed on the cover 12 to keep the cover upon the globe. The cover 12, however, is adapted to have lateral movement on the globe to reduce friction of the rod 2 in the aperture 12^a. If preferred, the cover may be arranged as shown in Fig. 9 of my Patent No. 522,680, dated July 10, 1894, wherein a supplemental disk or washer rests on the main cover and has lateral movement, as explained in said patent. My improvements are also designed to permit the carbon-operating rod 2 to have lateral movement relatively to the carbon-holder 11, and these improvements may be used with the disk or plate 10, as in Fig. 3, or without said disk, as in Fig. 4.

In Figs. 3, 3^a, and 3^b the rod 2 carries at its lower end a box-like or tubular extension 14, provided with apertures 14^a in opposite walls, in which apertures a pin or pins 15 fit loosely, so as so slide longitudinally therein. The pin 15 is carried by a bar or block 16, which fits into the extension 14, and near its opposite or lower end the bar or block 16 carries another pin 17, which extends at right angles to the pin 15. (See Fig. 3^b.) The bar or block 16 extends into a tubular or box-like extension 18, which is connected with the carbon-holder 11 or made integral therewith (see Fig. 4) or connected with the disk or plate 10, as shown. This tubular or box-like element or extension 18 has apertures 18^a, which lie at right angles to the apertures 14^a in the extension 14, and the pin 17 fits loosely in said apertures 18^a, so as to slide longitudinally therein. The carbon 4 may be guided in the aperture 12^a in cover 12 on the globe, as in Fig. 4, or the rod 2 may pass through said aperture 12^a, as in Fig. 3. In either case the carbon-rod 2 can have free lateral movement relatively to the carbon-holder 11 owing to the capacity of the pins 15 or 17 to slide in the respective apertures in which they fit, whereby friction between the carbon and its guide or the guide for the rod 2 is reduced.

In Fig. 3^c the apertures 14^a are elongated horizontally or made in the form of slots, which allow the pins 15 or 17 (or both) to have lateral movement as well as longitudinal movement to increase the number of directions in which the rod 2 can move relatively to the carbon-holder 11.

In Fig. 5 the intermediate loose bar 16 is dispensed with and the pin 15 is carried by an extension 11^a on the carbon-holder 11, the pin 15 entering horizontal slots 14^a in the extension 14 on the rod 2, whereby the rod 2 can have lateral movement in various directions relatively to the carbon-holder.

In Fig. 6 the positions of the parts are reversed—that is to say, the pin 15 is carried by the rod 2 and the extension 18, (or 14,) carried by the holder 11, is provided with the horizontal slots to receive the pin 15.

In Fig. 7 the extension 14, instead of being tubular or box-like, as before described, is composed of two depending arms, oppositely disposed and provided with the horizontal slots 14^a to receive the pin 15, which is carried by the holder 11; but of course said slotted arms could be carried by the holder 11 and project upwardly to receive the pin 15, carried by the rod 2.

In all of the devices above described the rod 2 has independent movement in at least two directions (or in directions at right angles to each other) relatively to the carbon to reduce friction when the rod 2 or the carbon passes through a guide or cover.

It will be understood that the carbon-operating rod and the carbon-holder have pivotal movement relatively to each other as well as lateral movement, as before explained.

Having now described my invention, what I claim is—

1. In an arc-lamp, a globe closed below the arc, and a disk or plate fitting snugly within said globe so as to travel up and down therein with the upper carbon to retard the access of air to the arc.

2. In an arc-lamp, a globe closed tightly below the arc, a carbon-operating rod, and a disk or plate carried thereby and fitting snugly within the globe so as to travel up and down therein while retarding the access of air to the arc.

3. In an arc-lamp, a globe closed tightly below the arc, a carbon-operating rod, a disk or plate carried thereby and fitting snugly within the globe so as to travel up and down therein while retarding the access of air to the arc, and means for permitting said rod to have independent lateral movement relatively to said disk or plate.

4. In an arc-lamp, a globe closed below the arc, a carbon-operating rod and a disk or plate carried thereby and fitting snugly within the globe to travel up and down therein, said disk or plate having an aperture larger than said rod through which the latter passes, and a flange or support carried by said rod to sustain said disk or plate while retarding the passage of air therethrough.

5. In an arc-lamp, a globe closed below the arc, a carbon-operating rod and a disk or plate carried thereby and fitting snugly within the globe to travel up and down therein, said disk or plate having an aperture larger than said rod through which the latter passes, a flange or support carried by said rod to sustain said disk or plate while retarding the passage of air therethrough, and a flange or washer over said aperture in said disk or plate to prevent the passage of air through the aperture in said disk or plate.

6. In an arc-lamp, a globe closed below the arc, a carbon-operating rod and a disk or plate carried thereby and fitting snugly within the globe to travel up and down therein, said disk or plate having an aperture larger than said rod through which the latter passes, a flange or support carried by said rod to sustain said disk or plate while retarding the passage of air therethrough, and a flange or washer rigidly carried by said rod over said aperture in said disk or plate to control the downward movement of said disk or plate.

7. In an arc-lamp, a carbon-rod, a carbon-holder, a guide for a carbon and means for permitting said rod to have lateral movement independently of said holder during the operation of the lamp.

8. In an arc-lamp, a carbon-operating rod, a carbon-holder, means for connecting said rod with said holder so that one part can have lateral movement in directions substantially at right angles to the other during the operation of the lamp, and means for guiding a carbon when carried by said holder.

9. In an arc-lamp, a carbon-rod, a carbon-holder, means for connecting said rod and holder so that one part can have lateral movement relatively to the other in two directions at substantially right angles to each other, said rod and holder also having pivotal movement relatively to each other, and means for guiding a carbon when carried by said holder.

10. In an arc-lamp, a carbon-rod, a carbon-holder, and a pin or projection carried by one part and connected with the other part so that one of said parts or the pin or projection can move relatively to the other to permit one or both of said parts to have independent lateral movement, and a guide for a carbon when the latter is carried by said holder.

11. In an arc-lamp, a carbon-rod and a carbon-holder one of said parts having an extension provided with opposed apertures, the other part carrying a pin or projection located in said apertures to permit one of said parts to move laterally relatively to the other part, and means for guiding a carbon when the latter is carried by said holder.

12. In an arc-lamp, a carbon-rod and a carbon-holder one of said parts having opposed horizontal slots, the other part carrying a pin or projection which enters said slots so that one part can have lateral movement relatively to the other part in various directions.

13. In an arc-lamp, a carbon-operating rod carrying an extension provided with oppositely-disposed openings, a carbon-holder also carrying an extension provided with oppositely-disposed openings, a bar or block between said extensions and having pins or projections that enter the respective openings in said extensions to permit one part to move laterally relatively to the other, and means for guiding a carbon when the latter is carried by said carbon-holder.

MOSES S. OKUN.

Witnesses:
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