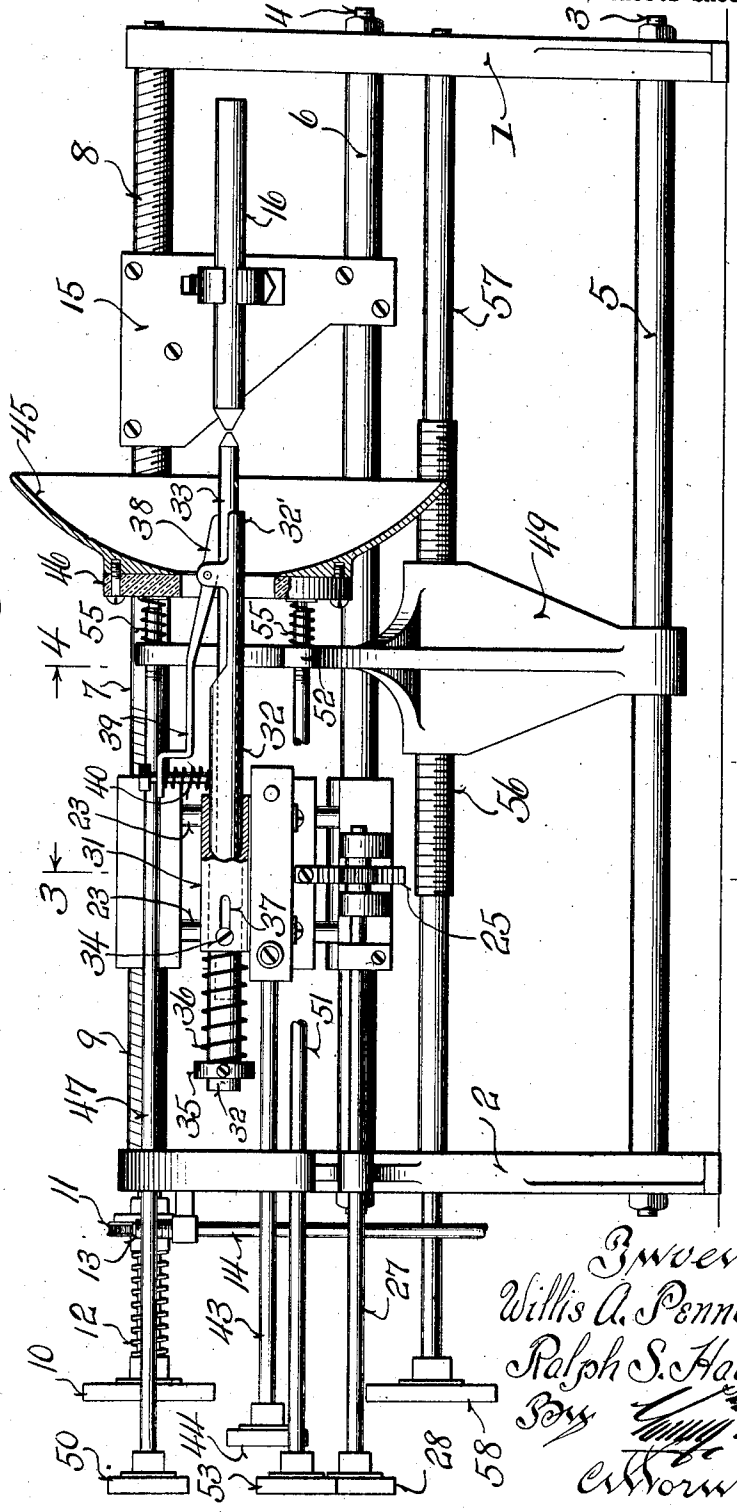
Jan. 25, 1927. 1,615,552

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LIGHT PROJECTING APPARATUS

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Fig. 1



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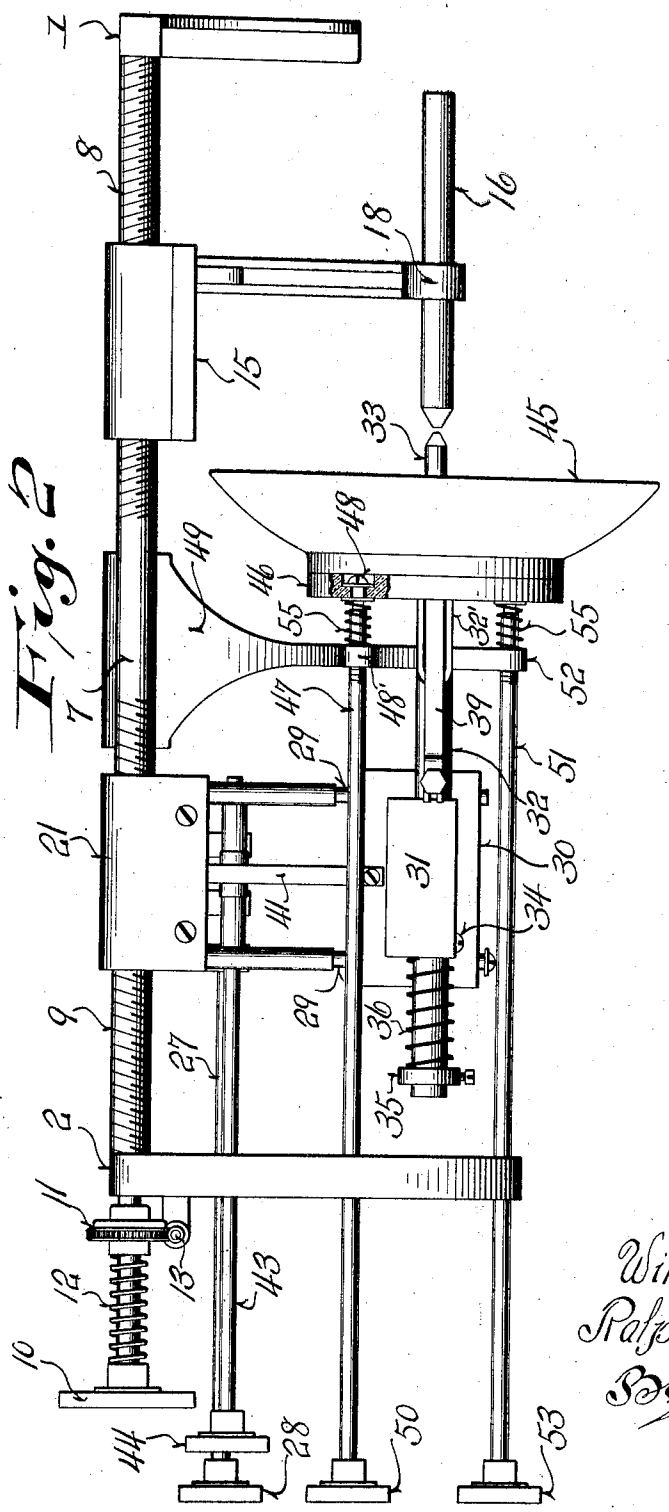


Fig. 2

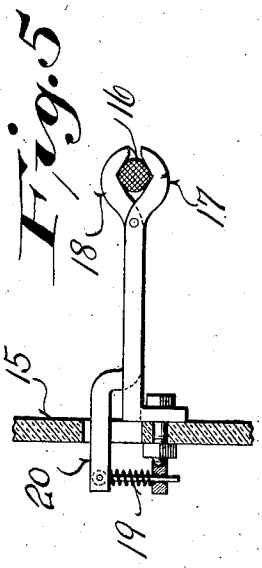


Fig. 5

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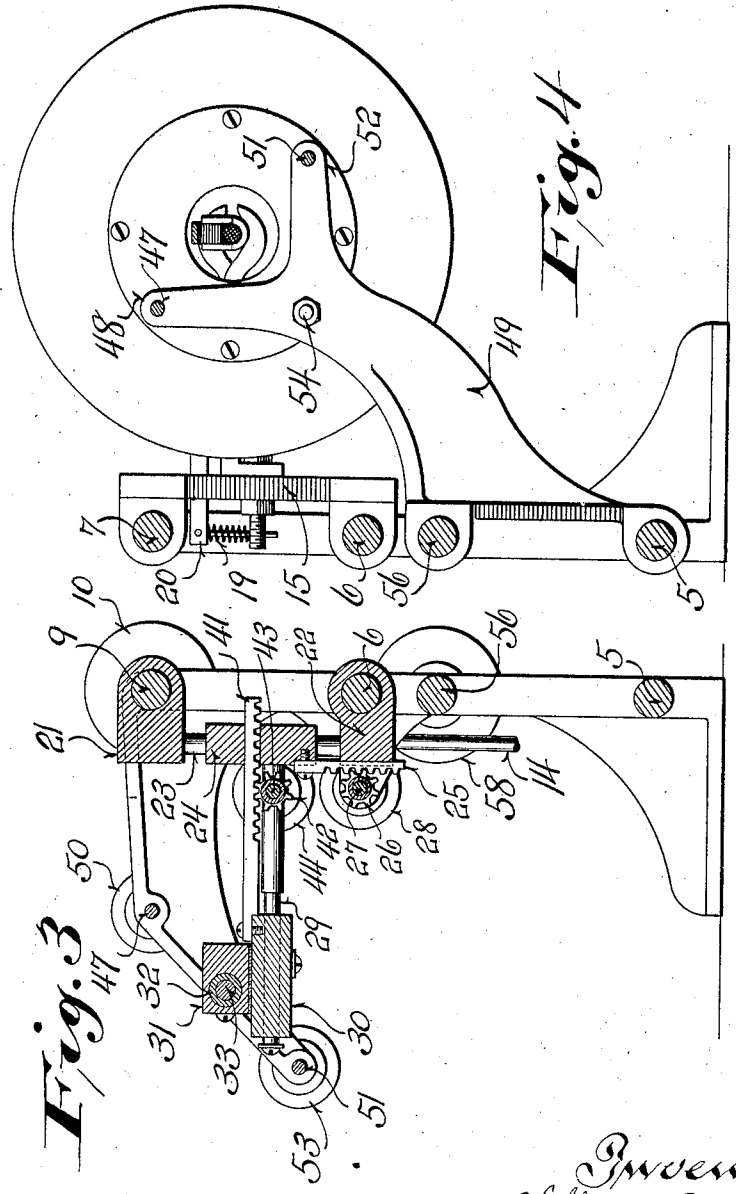


Fig. 3

Fig. 4

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UNITED STATES PATENT OFFICE.

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LIGHT-PROJECTING APPARATUS.

Application filed May 14, 1925. Serial No. 30,279.

This invention relates to a light projecting apparatus.

In devices of this nature for projecting the light from an electric arc and for adjusting the members of the mechanism, difficulty has been experienced due to the clogging of the mechanism by material discharged from the arc with the final result that the mechanism gummed up and gave a great deal of trouble. In addition to this, in mechanisms of this type it is the usual practice to start the arc by adjusting the mechanism which requires a subsequent resetting of the electrodes.

This invention is designed to overcome the above noted defects, and objects of the invention are to provide a light projecting apparatus in which an electric arc is employed, and in which the parts are so positioned that material discharged from the arc will fall clear of the mechanism and consequently such mechanism will not become clogged.

Further objects are to provide a light projecting apparatus in which the arc may be struck without altering the adjustment of the parts, and in which a very simple and quickly operated holder is employed for each of the electrodes.

Further objects are to provide an adjusting mechanism in which the exact relative position of the electrodes may be most easily controlled, in which the electrodes may be mechanically fed by motor or similar means, if desired, or may be manually fed, and in which means are provided for bodily adjusting the position of a reflector and also for adjusting its angular setting to the exact needs of the occasion.

An embodiment of the invention is shown in the accompanying drawings, in which:—

Figure 1 is an elevation of the apparatus with parts in section to more clearly show the construction.

Figure 2 is a plan view of the structure shown in Figure 1.

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a sectional view on the line 4—4 of Figure 1.

Figure 5 is a detail of one of the electrode holding means.

The projecting apparatus comprises a pair of end frames 1 and 2 which are rigidly joined by means of bolts 3 and 4 which clamp the end members in relative position and furnish slides or guiding rods 5 and 6, respectively, it being understood that these rods may have reduced threaded ends or may be spacers carried upon bolts.

An elongated screw 7 is revolubly carried in the end frames and is provided with reversely threaded portions 8 and 9. This screw is adapted to be rotated by means of the hand wheel 10 or by means of the worm wheel 11, such worm wheel being in frictional engagement with the shaft to permit the rotation of the hand wheel irrespective of the rotation of the worm wheel. For example, the worm wheel may bear against a collar, and may be forced into contact therewith by means of a spring 12. This worm wheel may be driven by a worm 13 carried by a motor driven shaft 14, if desired, such shaft being rotated at a relatively low constant speed to automatically move the electrodes towards each other.

The threaded portion 8 advances a carriage 15 which supports the electrode 16, such electrode being clamped between a stationary jaw 17 rigidly secured to the carriage, as shown in Figure 5, and a movable jaw 18 pivoted to the stationary jaw, and urged upwardly by means of a spring 19 located on the outer side of the carriage 15. The carriage is preferably formed of insulating material for its major portion, as indicated in the sectional view of Figure 5. Obviously, the electrode 16 may be quickly replaced by depressing the outer end of the lever 20 which is integral with the jaw 18 and a new electrode may be substituted. The lower end of the carriage 15 is guided upon the rod 6, as shown in Figures 1 and 3.

A second carriage composed of an upper threaded block 21 carried by the threaded portion 9 of the screw, and a lower block 22 slidably mounted upon the rod 6 and joined to the upper block by means of vertical rods 23 is provided and is adapted to be advanced by the threaded portion 9 of the screw. The vertical rods 23 are spaced apart, as shown most clearly in Figure 1, and a vertically movable block or carriage 24 is guided thereon (see Fig. 3). This block 24 is provided with a rack 25, as shown in Figure 3, which is engaged by a pinion 26 carried upon a rearwardly extending manually rotatable shaft 27, such shaft being provided with a hand wheel 28, as shown in Figures 1 and 2. The block or vertically adjustable

carriage 24 is provided with a pair of outwardly extending rods 29 (see Figures 1 and 2) upon which a laterally adjustable carriage or block 30 is slidably mounted. This block carries the electrode receiving member 31 which is preferably insulated therefrom. This electrode receiving member is in effect a block and slidably carries a metallic sleeve 32 which in turn carries the electrode 33. It is to be noted from Figure 1 that the block 31 is slotted and receives a pin 34 secured to the sleeve 32.

The sleeve 32 is provided with a collar 35 at its outer end and a helical spring 36 is provided to hold the sleeve normally retracted with the pin or screw 34 in the outer end of the elongated slot 37 in the block 31. It is to be noted that the forward portion of the sleeve 32 is cut away to provide a lower lip 32′ within which the electrode 33 rests. A clamping jaw 38 is pivotally mounted upon this portion of the sleeve and is provided with a rearwardly extending arm 39 which is urged upwardly by means of a spring, as indicated at 40 in Figure 1, thus permitting quick renewal of the electrode 33 by depressing the arm 39 against the action of the spring.

The means for controlling the lateral adjustment of the carriage 30 may comprise a rack 41, as shown in Figures 1 and 2. This rack meshes with a pinion 42 rigidly carried by a manually adjustable shaft 43. This shaft is provided with a hand wheel 44 at its rear end.

An annular reflector 45 surrounds the electrode 33 and is carried by a composition ring 46 preferably formed of asbestos or similar material as its main ingredient. However, this ring is supported at three points. As shown in Figure 2, the ring 46 is recessed and receives a reduced portion of a shaft 47 such reduced portion being provided with a screw 48 which retains a washer in contact with the bottom of the recess in the ring 46.

It is to be noted that the shaft 47 is screw threaded through an outwardly and upwardly extending arm 48 of a carriage 49. Further, this shaft is provided with a rear hand wheel 50 for its manipulation. A shaft 51 is screw threaded through a laterally projecting arm 52 integral with the carriage 49, as shown in Figures 2 and 3, and is joined to the ring 46 in the manner described for the shaft 47, and is provided with a rear adjusting hand wheel 53. A short fixed shaft 54 (see Figure 4) is rigidly attached to the carriage 49 and is connected to the ring 46 in the same manner as the shaft 47.

It is to be noted that each of the three shafts 47, 51 and 54 are provided with helical springs 55 which are positioned between the ring 46 and the arms of the carriage 49, thus urging the ring outwardly although permitting rocking motion thereof with reference to the shafts as the fitting between the shafts and the ring is relatively loose. Thus it will be seen that the ring is supported at three points as is apparent from an examination of Figures 1 and 4 and by suitably adjusting the hand wheels 50 and 53 the exact tilt or angular setting of the reflector 45 may be most easily secured. The carriage 49 is provided with an aperture therethrough which is internally threaded and cooperates with the threaded portion 56 of a shaft 57, such shaft being provided with a rear manipulating hand wheel 58. The lower end of the carriage 49 is guided by the rod 5, as may be seen from Figures 1 and 4.

In operating the apparatus, it is merely necessary to press the sleeve 32 (see Figure 1) inwardly against the action of the spring 36 to strike the arc without requiring any alteration in the setting of the electrodes. Obviously, when the pressure is reduced the electrode 33 is moved rearwardly until the pin 34 contacts with the rear end of the slot 37. Thereafter, the electrodes may be fed toward each other by rotating the hand wheel 10 or by driving the shaft 14 in any suitable manner, rotation of the shaft 7 causing simultaneous motion of the two electrodes. The exact vertical or horizontal position of the electrode 33 with reference to the electrode 16 may be most readily secured by adjusting the hand wheels 28 and 44.

It is intended in the operation of this machine that a crater be formed upon the electrode 16 and that the major portion of the light be projected rearwardly against the reflector 45. This reflector 45 may be advanced or retracted by rotating the hand wheel 58 until the exact position is secured. Thereafter, the exact angular setting of the reflector 45 may be secured by rotating the hand wheels 50 and 53. If the angular setting of the reflector has been secured it is not necessary to alter it although the reflector may be advanced or retracted by rotation of the hand wheel 58.

It is preferable to use a small electrode for the rear electrode 33 and a larger one for the forward electrode 16.

It will be seen that a light projecting apparatus has been provided which will prevent clogging of the mechanism by falling portions of the material at the arc, which may be most easily adjusted to strike the arc without altering the setting of the apparatus, and which is provided with easily controlled adjustments for controlling the horizontal or vertical relative position of the electrodes and also their spacing apart.

It will be seen further that easily controlled means are provided for advancing or retracting the reflector and for securing the exact angular setting thereof desired.

It is to be noted further that the appa-

ratus is relatively simple although adapted for the accurate adjustments of its parts, as described above.

Obviously, each of the hand wheels may be made of insulating material if desired.

Although the invention has been described in considerable detail, it is to be understood that the invention may be variously embodied and is, therefore, to be limited only as claimed.

We claim:

1. A light projecting apparatus comprising a pair of horizontal electrodes, an annular reflector surrounding one of said electrodes, and mechanism for adjusting the relative position of said electrodes and of said reflector with reference to said electrodes, said mechanism being located wholly to the side of said electrodes, whereby material falling from said arc will fall clear of said mechanism.

2. A light projecting apparatus comprising a pair of horizontal electrodes for forming an arc, an annular reflector surrounding one of the electrodes, remote controlled means for tilting the reflector into any desired angular position, a carriage supporting said reflector, and means for advancing and retracting said reflector, each of said means projecting from the rear of the apparatus.

3. A light projecting apparatus comprising a pair of horizontal electrodes for forming an arc, an annular reflector surrounding one of the electrodes, means for tilting the reflector into any desired angular position, a carriage supporting said reflector, means for advancing and retracting said reflector, said tilting means engaging said reflector at spaced points, and a member carried by said carriage and engaging said reflector at a point spaced from said first mentioned points.

4. A light projecting apparatus comprising a pair of horizontal electrodes, a reflector, a carriage for advancing and retracting said reflector, a pin fixed to said carriage and supporting said reflector, and a pair of elongated shafts adjustable from the rear of the machine for movably supporting the reflector at points spaced from said pin, said carriage and said shafts being located to the side of said electrodes.

5. A light projecting apparatus comprising a pair of horizontal electrodes, a reflector, a carriage for advancing and retracting said reflector, a pin fixed to said carriage and supporting said reflector, and a pair of elongated shafts adjustable from the rear of the machine for movably supporting the reflector at points spaced from said pin, said carriage and said shafts being located to the side of said electrodes.

In testimony that we claim the foregoing we have hereunto set our hands at Milwaukee, in the county of Milwaukee and State of Wisconsin.

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