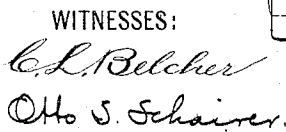


1,053,468.

5 SHEETS—SHEET 1.



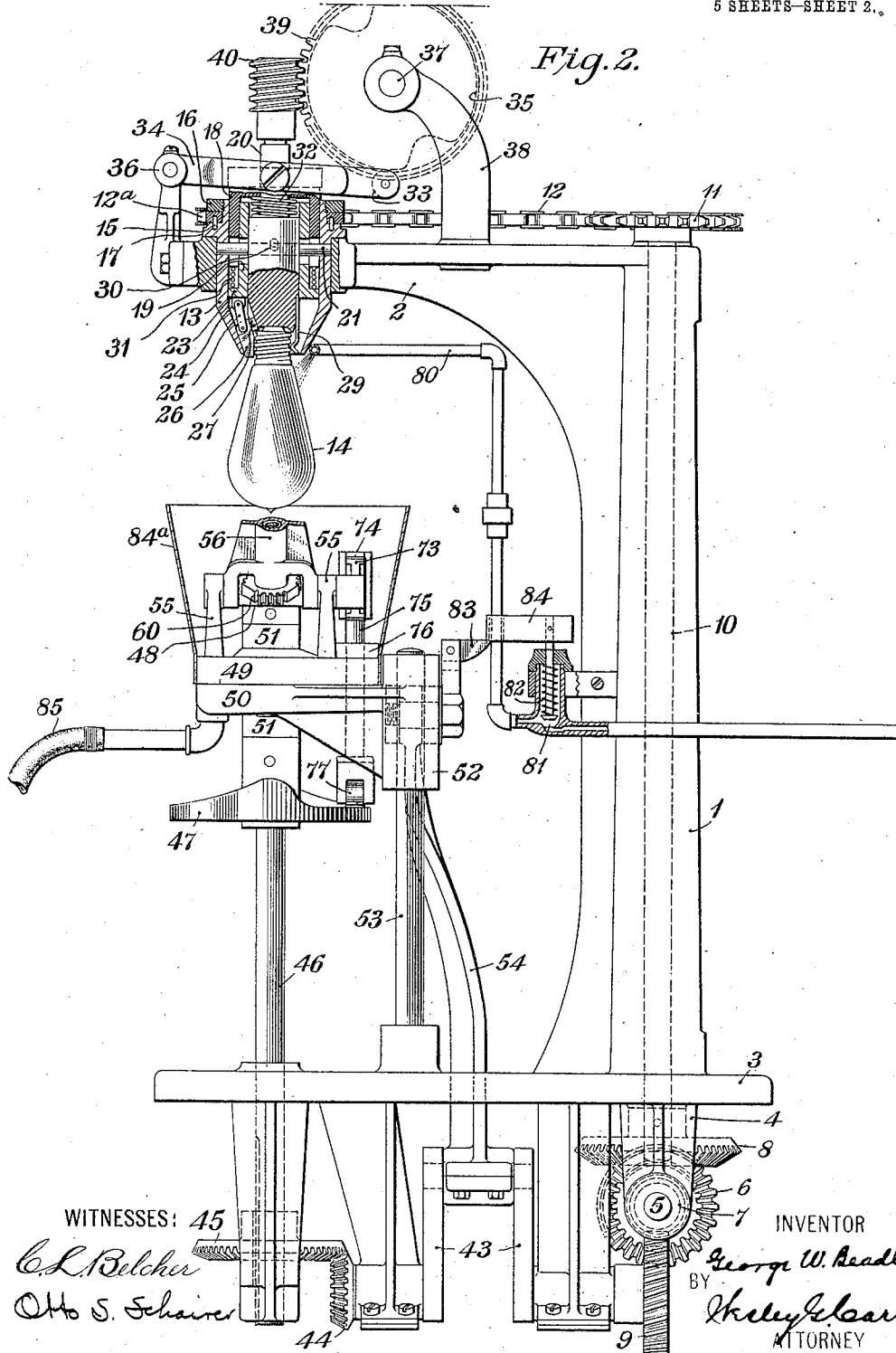
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 INCANDESCENT LAMP CLEANING MACHINE.
 APPLICATION FILED NOV. 3, 1909.

1,053,468.

Patented Feb. 18, 1913.

5 SHEETS—SHEET 2.



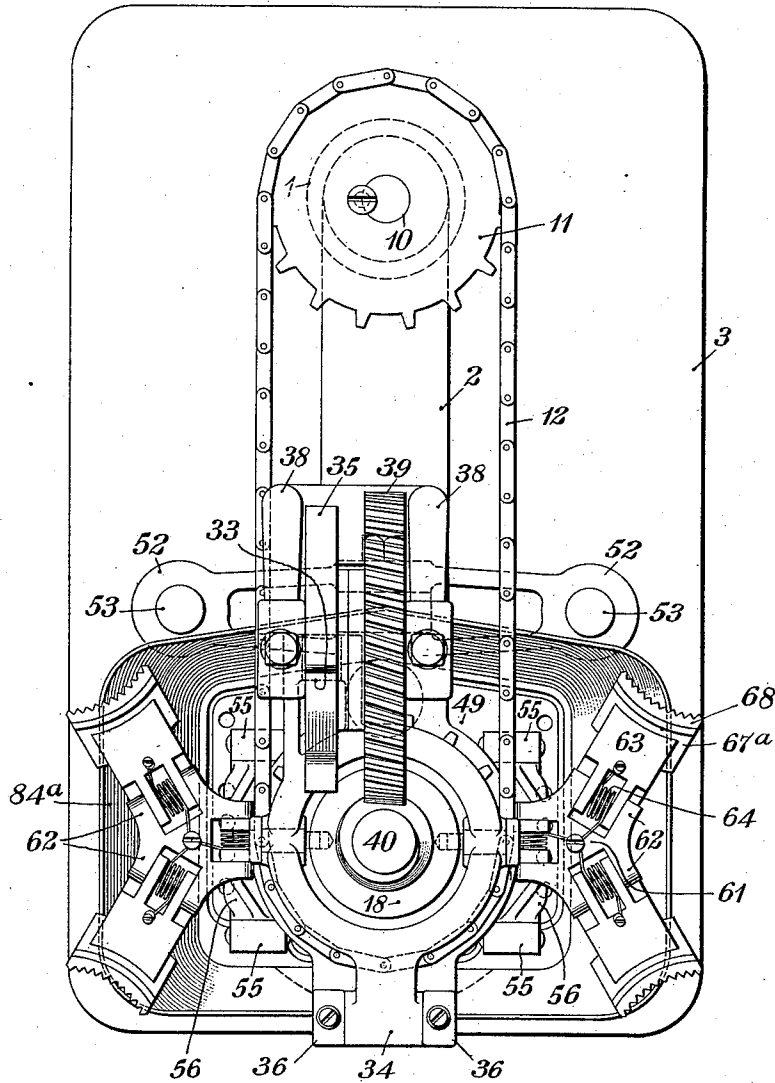
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5 SHEETS—SHEET 3.

Fig. 3.



WITNESSES:

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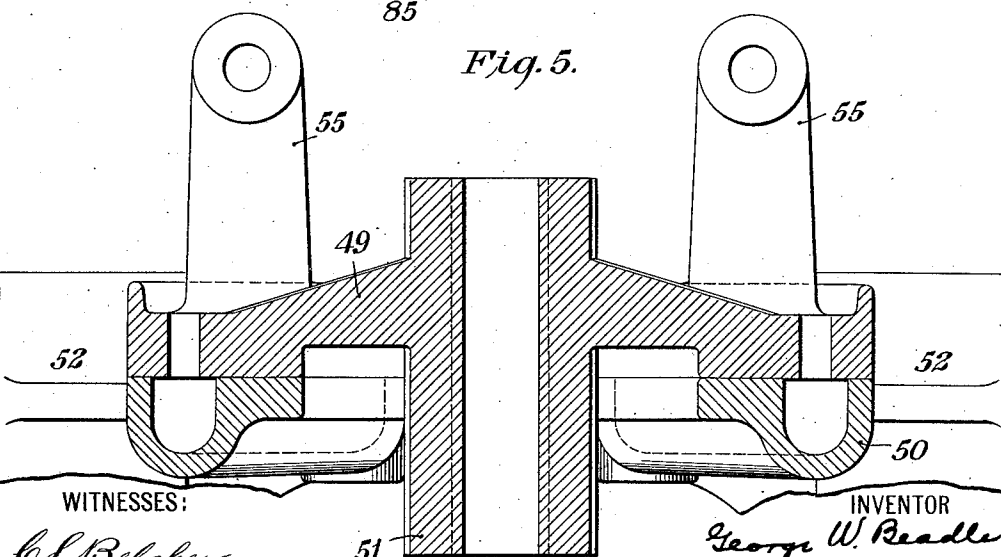
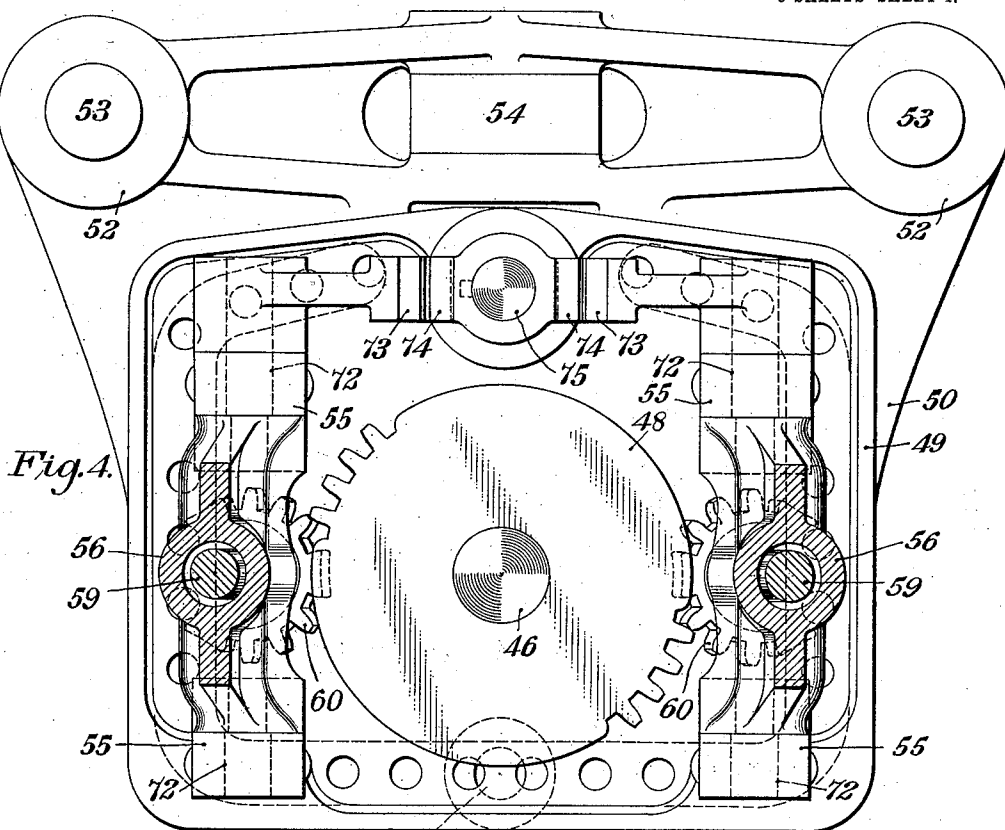
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5 SHEETS—SHEET 4.



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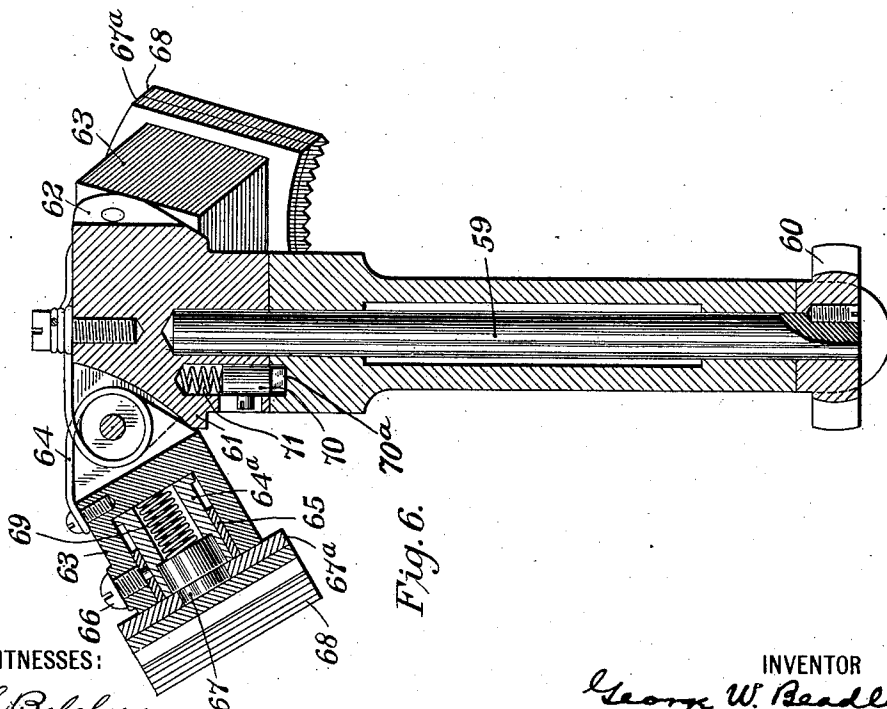
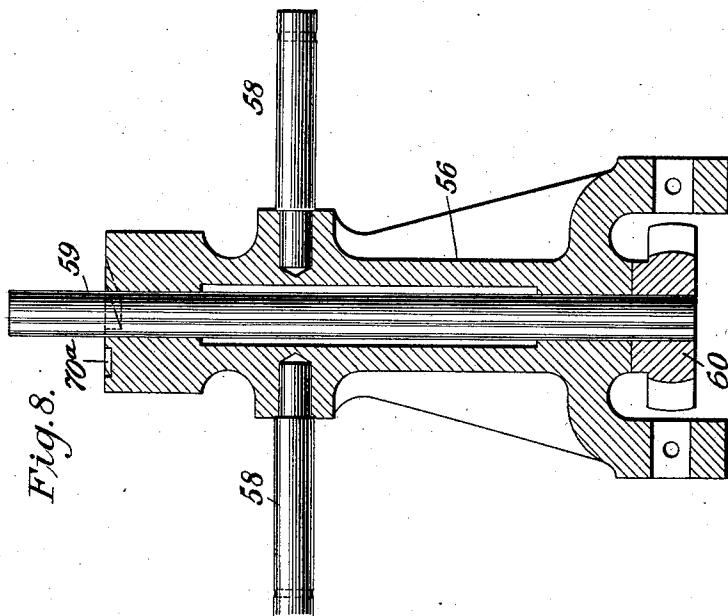
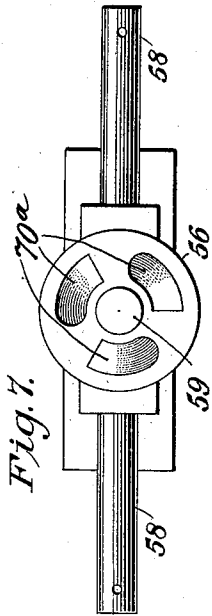
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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INCANDESCENT-LAMP-CLEANING MACHINE.

1,053,468.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed November 3, 1909. Serial No. 526,063.

To all whom it may concern:

Be it known that I, GEORGE W. BEADLE, a citizen of the United States, and a resident of East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Incandescent-Lamp-Cleaning Machines, of which the following is a specification.

My invention relates to machines utilized in the manufacture of incandescent lamps, and it has for its object to provide a machine whereby the bulbs of completed incandescent lamps may be automatically and quickly cleaned.

Figure 1 of the accompanying drawings is a view, in front elevation, of a machine constructed in accordance with the present invention. Fig. 2 is a view, in side elevation, of the machine, some of the parts being shown in section and others being broken away, for the sake of clearness of illustration. Fig. 3 is a plan view of the machine. Fig. 4 is an enlarged plan and sectional view, on the line IV—IV of Fig. 1. Fig. 5 is an enlarged sectional view of certain of the parts of the machine. Fig. 6 is an enlarged sectional and side view of some of the cleaning devices and the supporting arm therefor. Fig. 7 is an end view of one of the arms that supports the cleaning devices, and Fig. 8 is another sectional view, at right angles to that of Fig. 6, of one of the arms for supporting the cleaning devices.

The operating parts of the machine are carried by a stationary frame 1 having horizontal shelves or brackets 2 and 3 and pendant bearing brackets 4 for the main driving shaft 5, upon which are mounted a bevel gear 6 and a worm gear 7, the former of which meshes with another bevel gear 8 and the latter with a worm wheel 9. The bevel gear 8 is mounted upon the lower end of a vertical shaft 10 for which bearings are provided in the vertical portion of the frame 1 and upon the upper end of which is mounted a sprocket wheel 11. A chain 12 operatively connects the sprocket wheel 11 with another and similar sprocket wheel 12^a, that is mounted upon the upper end of the shell 13 of a chuck adapted to receive and hold a lamp 14 during cleaning thereof, the sprocket wheel 12^a being secured to the shell 13 by means of pins 15 and a nut 16.

The lower end of the shell 13 is tapered,

and, at its upper end, it is provided with a shoulder 17 that is seated upon the upper face of the shelf 2, by means of which it is supported and in which it is rotatably mounted. Fitting closely together and arranged concentrically within the shell 13, are two cylindrical shells or members 18 and 19 and the enlarged lower end of a shaft 20, the shell 13 and the shaft 20 being rigidly connected by means of a pin 21 that projects through slots in the members 18 and 19. The member 19 is provided at its lower end with an outwardly turned flange 23 and with lugs 24 to which the upper ends of links 25 are pivotally connected, the lower ends of the links being pivotally connected to blocks or clutch members 26 that are adapted to engage and to grip the base of the lamp 14. The members 26 are provided on their inner edges near their tops with plate-like projections 27 that are adapted to operate in and to be guided by inclined slots in the lower end of the enlarged portion of the shaft 20. As the cylindrical member 19 is moved up or down, the blocks or clutch members 26 will, by reason of the inclination of the slots 28 and of the tapering of the lower end of the shell 13, move away from and toward the axis of the shaft 20 and will thereby be caused to release and firmly grip the base of the lamp and prevent its slipping relative to the chuck during the cleaning operation.

In order to retain the lamp temporarily in the chuck and until the clutch members 26 are caused to grip its base, spring clamping members 29 are secured to and extend beyond the lower enlarged end of the shaft 20. The member 19 is moved up and down by means of a slot-and-pin connection 30 between it and the member 18, interposed between the lower end of which and the upper annular face of the flange 23 is a helical compression spring 31, the slot-and-pin connection 30 permitting a slight amount of relative movement between the members 18 and 19, and the spring 31 resiliently opposing such movement. Another helical compression spring 32, that is interposed between the upper end of the member 18 and the shoulder provided by the enlargement of the lower end of the shaft 20, tends to maintain the members 18 and 19 in their uppermost positions which they are permitted to occupy only when a roller 33, that is

carried at the free end of a lever 34, occupies one of the notches in a cam 35. The lever 34 surrounds and is pivotally connected to the upper end of the member 18 and is fulcrumed, at one end, to a bracket 36 that is secured to the end of the shelf 2. The cam 35 is mounted upon a shaft 37 for which bearings are provided in the ends of upwardly extending brackets 38 upon the shelf 2, and it is actuated by means of a worm wheel 39 that is also mounted upon the shaft 37 and meshes with a worm gear 40 upon the upper end of the shaft 20. Since the sprocket wheel 12^a is rigidly connected to the shell 13 of the chuck, and the shell 13 is, in turn, rigidly connected to the shaft 20, it will be understood that the chain 12 not only serves to rotate the lamp 14, but also actuates the governing and operating means for the clutch members 26. The ratio of the gears 39 and 40 and the shape of the cam 35 are such that the lamp to be cleaned will make a large number of revolutions between such opening and closing of the chuck, which occurs twice for each revolution of the gear 39 and of the cam 35.

The worm wheel 9 drives a crank 43 and a bevel gear 44 with which meshes another bevel gear 45 that is mounted and keyed upon the lower longitudinally slotted end of the shaft 46 so as to be capable of movement longitudinally thereof while rotating simultaneously therewith. Rigidly secured upon the shaft 46 near its upper end is a cam 47, the cam surface of which is annular, and, upon the end of the shaft, is secured a gear 48 having diametrically opposite portions of its edge toothed and the intermediate portions blank. Surrounding the shaft 46, between the cam 47 and gear 48, is a table or carriage comprising upper and lower members 49 and 50, the former of which is provided with a bearing 51 for the shaft, and the latter of which is provided with apertured lugs or brackets 52 by means of which the table is supported. Projecting vertically from the shelf 3 are rods or shafts 53 that pass through the apertures in the lugs or brackets 52 and serve as guides that permit of upward and downward movements of the table. The table is moved upwardly and downwardly by means of a link or connecting rod 54 that is pivotally connected at one end to the crank 43 and at the upper end to the member 50. Pivotally mounted in two sets of trunnions 55 upon the table member 49, are two arms 56, the upper ends of which are normally drawn toward each other by helical tension springs 57, that are secured at their ends to laterally projecting pins 58 carried by said arms. Extending upwardly through the arms 56 are shafts 59, to the lower ends of which are secured gears 60 having three toothed portions and intermediate blank portions,

the toothed portions of the gears being adapted to mesh with the tooth portions of the gear 48.

Secured upon the upper end of each shaft 59 is a block 61 having three sets of apertured lugs 62 to which cartridge-shaped members 63 are pivotally secured, springs 64 being employed for the purpose of normally maintaining the members 63 in substantially the positions shown in the drawings. Each of the members 63 contains a cylindrical shell 64^a, having an outwardly flanged inner end, and a short tubular member 65 that is secured therein by means of a screw 66 and is provided for the purpose of retaining the member 64^a in the member 63 while permitting of a slight degree of longitudinal movement thereof. Fitted in the outer end of the member 63, is a short stud 67 carrying at its outer end a curved plate 67^a to the face of which is attached a corrugated rubber or other suitable cleaning or wiping device 68 that is adapted to engage the lamp to be cleaned. In order that the member 68 may yieldingly engage the lamp, a helical compression spring 69 is placed within the member 64^a and is interposed between the closed end of the member 63 and the inner end of the stud 67. As the gear 48 is revolved, the toothed portions thereof intermittently engage the toothed portions of the gear 60 and effect rotation thereof, which in turn causes rotation of the block 61 and brings the cleaning devices carried thereby successively and periodically into engagement with the lamp 14.

In order to accentuate the positions of the cleaning devices, and to prevent backward or accidental movements thereof, the upper annular end faces of the arms 56 are provided with recesses 70^a having inclined bottom faces with which a pin 70 is forced into engagement by means of a spring 71. The lower ends of the arms 56 are rigidly secured to short shafts 72 for which bearings are provided in the trunnions 55 and on the outer ends of which are rigidly secured inwardly extending segmental gears 73 that engage a double faced rack 74 upon opposite sides, said rack being mounted upon the upper end of a rod or shaft 75, for which a bearing 76 is provided in the member 49, and at the lower end of which is mounted a roller 77 that engages the cam 47. As the cam 47 is rotated, the rod 75 and the rack 74 are reciprocated vertically, and the arms 56 are moved inwardly and outwardly about their pivotal supports, the cam 47 being so shaped and disposed with reference to the roller 77 that the arms will be moved outwardly, so as to raise the cleaning devices from the lamp, only when the table is in its lowermost position. The cam 47 and the gear 48 being rigidly secured to the shaft 46 upon opposite sides of the table compris-

ing members 49 and 50, are reciprocated vertically simultaneously with the said table.

In the use of the machine, a lamp may be inserted in the chuck when the roller 33 occupies one of the notches in the cam 35 and the lever 34 occupies its uppermost position, the chuck being open at its lower end under such conditions to receive the same. At this time, the table comprising members 49 and 50 and the parts carried thereby occupy their lowermost positions, and the arms 56 and the wiping devices 68 are held in their outermost positions, thus providing room for the lamp and the hand of the operator. After the lamp is inserted, it is firmly gripped by the blocks 26 and is thus caused to revolve with the chuck. It is engaged during its revolutions by the wiping devices 68 which reciprocate longitudinally thereof and are successively and periodically brought into engagement therewith, it being understood that the said wiping devices preferably differ somewhat in character. Water is directed upon the lamp, during the latter portion of the upward movement of the table, by means of a pipe 80, the supply of water to which is governed by a valve 81 that is normally maintained closed by a spring 82 and is opened by means of a projection or dog 83 carried by the table, which projection or dog is adapted to engage an arm 84 that is secured to the upper end of the valve stem. Secured to the edges of the table and extending upwardly therefrom is a receptacle 84^a for the water, and leading from the bottom of the table is a pipe 85, by means of which the water is carried away.

I claim as my invention:

1. A cleaning machine comprising a rotatable chuck adapted to hold the article to be cleaned, a plurality of wiping devices, means for causing the said devices to periodically and successively engage the said article, means for reciprocating the wiping devices longitudinally of the said article, and means for periodically moving the wiping devices toward and away from the axis of the chuck.

2. In a cleaning machine, the combination

with a chuck, adapted to hold the article to be cleaned, means for revolving the same, and means for periodically actuating the chuck to grip or release the said article, of a plurality of wiping devices, means for causing the same to periodically and successively engage the article to be cleaned, means for reciprocating the wiping devices longitudinally of the said article, and means for moving the wiping devices toward and away from the axis of the chuck.

3. In a cleaning machine, the combination with a chuck, means for revolving the chuck, and means for periodically actuating the chuck to grip or release the article to be cleaned, of wiping devices adapted to engage the article to be cleaned, supporting arms for the wiping devices, a movable carriage to which the said arms are pivotally secured, means for periodically raising and lowering the carriage, means for causing the wiping devices to periodically and successively engage the said article, and means for periodically moving the wiping devices toward and away from each other.

4. A cleaning machine comprising a rotatable chuck adapted to hold the article to be cleaned, a carriage with means for reciprocating the same, a plurality of wiping devices pivotally mounted upon the carriage, and means for causing the wiping devices to periodically and successively engage the said article.

5. A cleaning machine comprising a rotatable chuck adapted to hold the article to be cleaned, a carriage with means for reciprocating the same, a plurality of wiping devices pivotally mounted upon the carriage, means for reciprocating the wiping devices toward and away from the said article, and means for causing the wiping devices to periodically and successively engage the said article.

In testimony whereof, I have hereunto subscribed my name this thirteenth day of October, 1909.

GEORGE W. BEADLE.

Witnesses:

GEORGE P. SCHOLL,
R. C. KARCHNER.