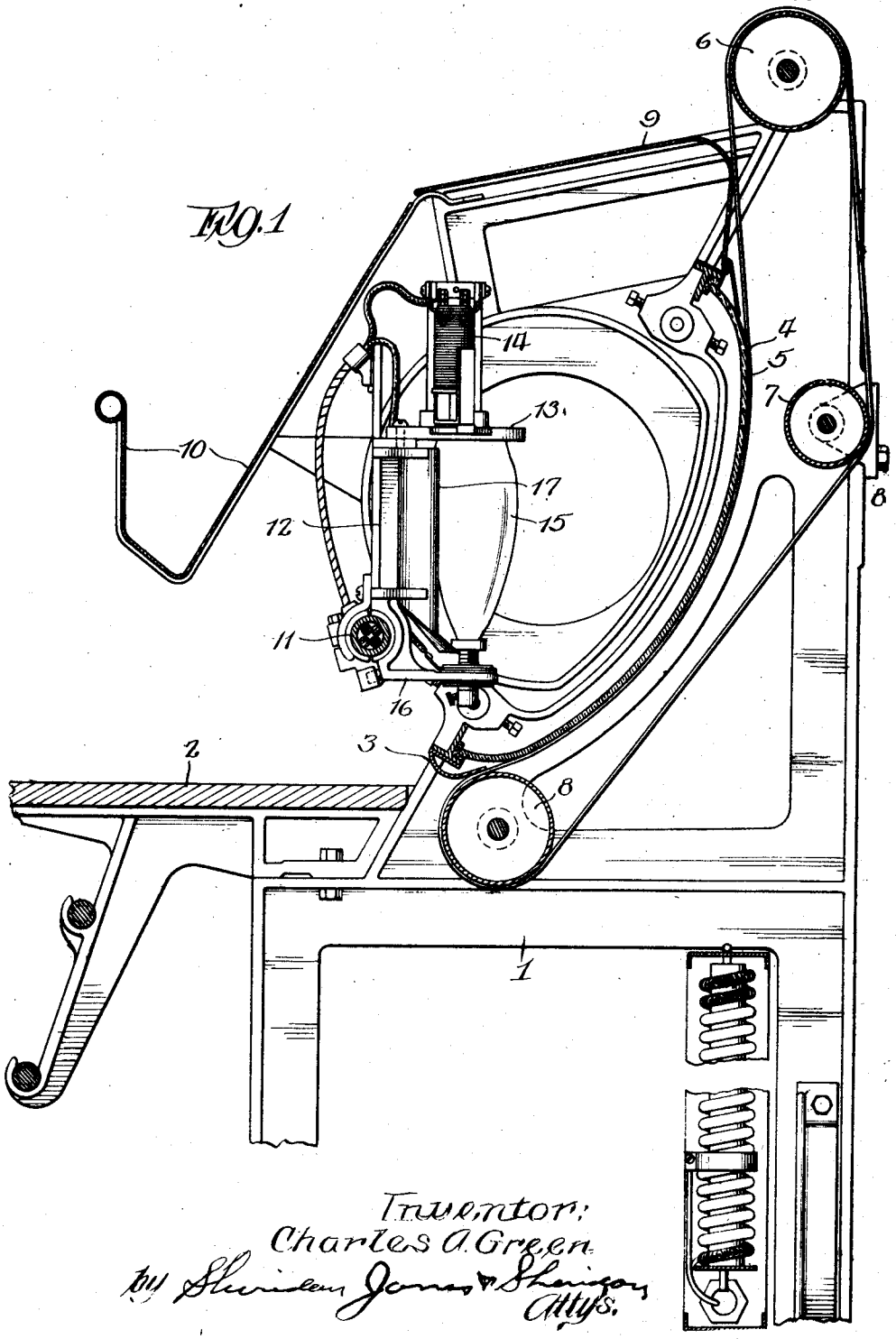
Aug. 10, 1926. 1,595,775

C. A. GREEN

ARC LAMP

Original Filed Oct. 11, 1922 2 Sheets-Sheet 1

FIG. 1



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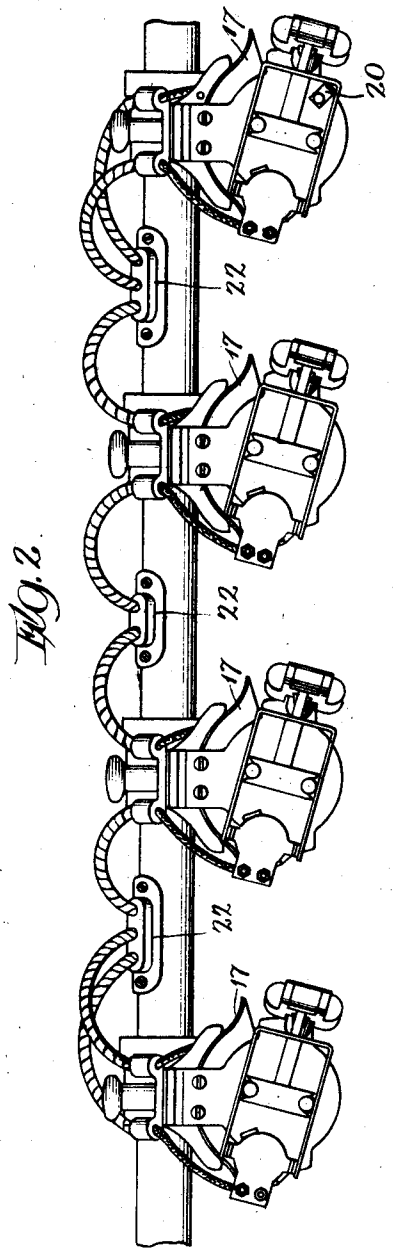


Fig. 2.

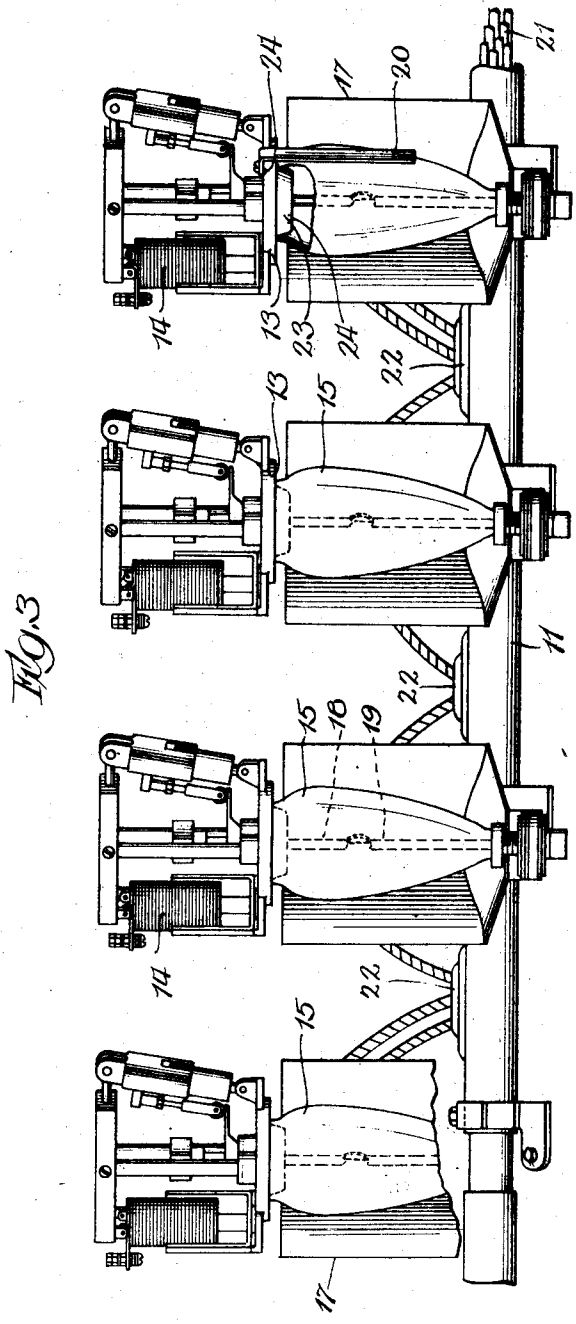


Fig. 3.

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Patented Aug. 10, 1926. 1,595,775

UNITED STATES PATENT OFFICE.

CHARLES A. GREEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO C. F. PEASE COMPANY, A CORPORATION OF ILLINOIS.

ARC LAMP.

Application filed October 11, 1922, Serial No. 593,672. Renewed June 14, 1926.

This invention relates to improvements in arc lamps arranged in groups for uniform lighting in connection with blue print machines, photo-engraving, and other arts.

Heretofore continuous blue printing has been carried out by feeding the tracings and blue print paper onto an endless belt which passes a series of arc lamps arranged in a row. Due to the blowing aside of the arcs, caused by the magnetic fields established by the lamps, the intensity of the light varies, resulting in a lack of uniformity, and in some cases causing streaks.

The object of the present invention is to overcome this difficulty by providing certain improvements in the detailed construction of the individual arc lamps and their relation to each other, resulting in uniform distribution of the light over an extended area.

Certain other improvements are claimed in my divisional application 38,069, filed June 18, 1925.

The improvement is explained in connection with a continuous blue print machine, although the invention is not limited to this embodiment thereof.

In the drawings—

Figure 1 is an elevation, partly in section, of a part of a blue print machine;

Fig. 2 is a top plan view of the row of arc lamps used therein; and

Fig. 3 is an elevation of said arc lamps.

The blue print machine comprises a suitable frame 1 having a table 2 over which the operator slides the blue print paper on which the tracings are superimposed. The tracings and the blue print paper travel rearwardly under a guide 3 and upwardly along an endless belt 4, which slides over a curved glass support 5, and is supported and moved by a series of rollers 6, 7, and 8, the roller 6 constituting the driving roller.

The printing is done as the prints travel slowly past the curved sheet of glass, the tracings and blue prints issuing at the top of the machine and being fed forwardly on to a sheet metal supporting plate 9, over which they slide into a sheet metal receptacle 10.

The arc lamps are supported on a transverse pipe or conduit 11, carried by the frame of the machine, each lamp having a supporting frame 12 of non-magnetic material, preferably aluminum. The lower end of this frame surrounds the conduit 11, providing a hinged support which permits the lamp to be swung forwardly for inspection or trimming. The aluminum frame carries a supporting plate 13 of magnetic material, such as cast-iron, on which the various parts of the arc lamp are mounted. The mechanism for feeding the carbon downwardly is mounted on this support and includes a solenoid 14 and suitable clutch mechanism forming no part of the present invention.

A glass globe 15 is mounted on an extension 16 constituting part of the arc lamp aluminum frame. A reflector 17 is arranged in front of the globe to distribute the light evenly to the rear over the blue print paper.

In the arc lamps used heretofore, the arc which formed between the upper and lower electrodes or carbons had a tendency to blow to one side, as an iron frame was employed as a support for the structure. It was, therefore, necessary to mount the solenoid or magnet in each lamp fairly high above the points of the carbons, resulting in a long lamp. In the present construction the frame is made of aluminum, which has a number of very desirable properties, including its non-magnetic property, and said frame is mounted below the solenoid the latter being mounted not far above the arc and the lamp being correspondingly shorter. In this construction, and with the arrangement of the arc lamps in a row, as shown in Figs. 2 and 3, the bowing of the arc to one side has been greatly minimized.

Referring to Fig. 3, the arc which forms between the carbons 18 and 19 in each case has a tendency to blow to the right, this tendency being offset, however, by the magnetic field established by the solenoid of the adjacent lamp. The right hand lamp having no lamp to the right of it to compensate in the manner described, I provide a strip of magnetic material 20, preferably a piece of mild steel, which is secured to the right hand lamp of the group, as shown in Figs. 2 and 3. Said strip brings the magnetic field in such proximity to the arc as to counteract its tendency to blow to the right. As a result of this arrangement the arc is comparatively steady and centrally located with reference to the carbons.

In the prior constructions, previously re-

ferred to, the arc in blowing out to one side would consume one side of the carbon, the upper end of the arc terminating at a point considerably above the lowest point of the carbon, the lower end being unsymmetrical in shape. This projecting lower point caused a shadow to be thrown which interfered with uniform printing.

With the present arrangement the upper carbons are symmetrical in shape at their lower extremities and the arc travels slowly around said lower ends consuming them evenly and furnishing a light which is free from shadows.

As shown in Figs. 2 and 3, the supply wires 21 enter the conduit 11 with branch connections issuing from the outlet boxes 22. Figs. 2 and 3 also show a slightly diagonal arrangement of each lamp with reference to the axis of the supporting conduit. This arrangement results in some improvement in the magnetic field.

In the absence of the improvements described bowing of the arcs occurs and disturbs the uniformity of the lighting effect.

At the upper end of each globe, and within the same, is a casing 23 having suitable holes 24 in it to permit the escape of heated gases. By virtue of the smaller construction of the frame and associated parts, previously referred to, I am enabled to use a smaller globe, which, in turn, results in drawing in the outside air more advantageously, the air being drawn in at the top of the globe and expelled intermittently through the same openings, as the successive installments of air heat up and expel themselves. Under these conditions less oxygen is drawn in at a time, and there is less irregularity in the heating. This permits the use of said smaller globes without danger of cracking them.

The construction described also permits the use of higher voltages with increase of current and correspondingly longer and heavier arcs. The longer arcs emit a greater proportion of rays effective for blue printing and photography generally than the shorter arcs, and increase the printing speed. With my improved construction I am enabled to increase the current used twenty-five per cent with an increase in printing speed of about one hundred per cent, with improved results from the standpoint of uniformity in the prints.

The improvements described herein are applicable both to alternating current and direct current lamps, although the improvement over the prior practice is more pronounced in the case of lamps used on alternating current circuits. Heretofore it has been necessary to design arc lamps specially for alternating current or direct current use as applied to photographic work, whereas with my improved construction the same lamp may be used in either work, making it a universal arc lamp.

I claim:—

1. Apparatus of the class described comprising a series of arc lamps each having an intermediate supporting structure, an electromagnet on one side of said structure, and electrodes, between which the arc is formed, on the other side of said structure, said lamps being so arranged that the magnetic field of one is opposed by the next lamp in the region of the arc of the first lamp to minimize bowing of said arc, and means associated with the end lamp of said series to compensate for the absence of an additional lamp beyond the same.

2. In combination, a row of arc lamps each having a non-magnetic support for the lower carbon thereof, a solenoid above said carbons arranged on one side of the axis of said carbons, and a magnetic member arranged adiacent the carbons of the last lamp of the row on the opposite side of the axis thereof from its solenoid.

3. An arc lamp comprising a non-magnetic support for the lower carbon, a solenoid mounted in elevated position, a magnetic supporting structure below said solenoid and above the region of the arc, and a magnetic member depending from said structure to the region of said arc.

4. An arc lamp comprising a magnetic supporting plate, a solenoid mounted thereon above the same, a non-magnetic frame depending from said plate to support the lower electrode, and a strip of magnetic material depending from said supporting plate.

5. A series of arc lamps each having electrodes in alinement, a solenoid mounted on one side of the axis of each lamp, each lamp being mounted with its solenoid slightly out of the line connecting the axes of the respective carbons, a non-magnetic support for each lower carbon, and a reflector associated with each lamp, whereby the magnetic field of each influences the next one to prevent the establishment of a bowed arc in a fixed plane, thereby providing a uniformly distributed source of light.

In testimony whereof, I have subscribed my name.

CHARLES A. GREEN.