

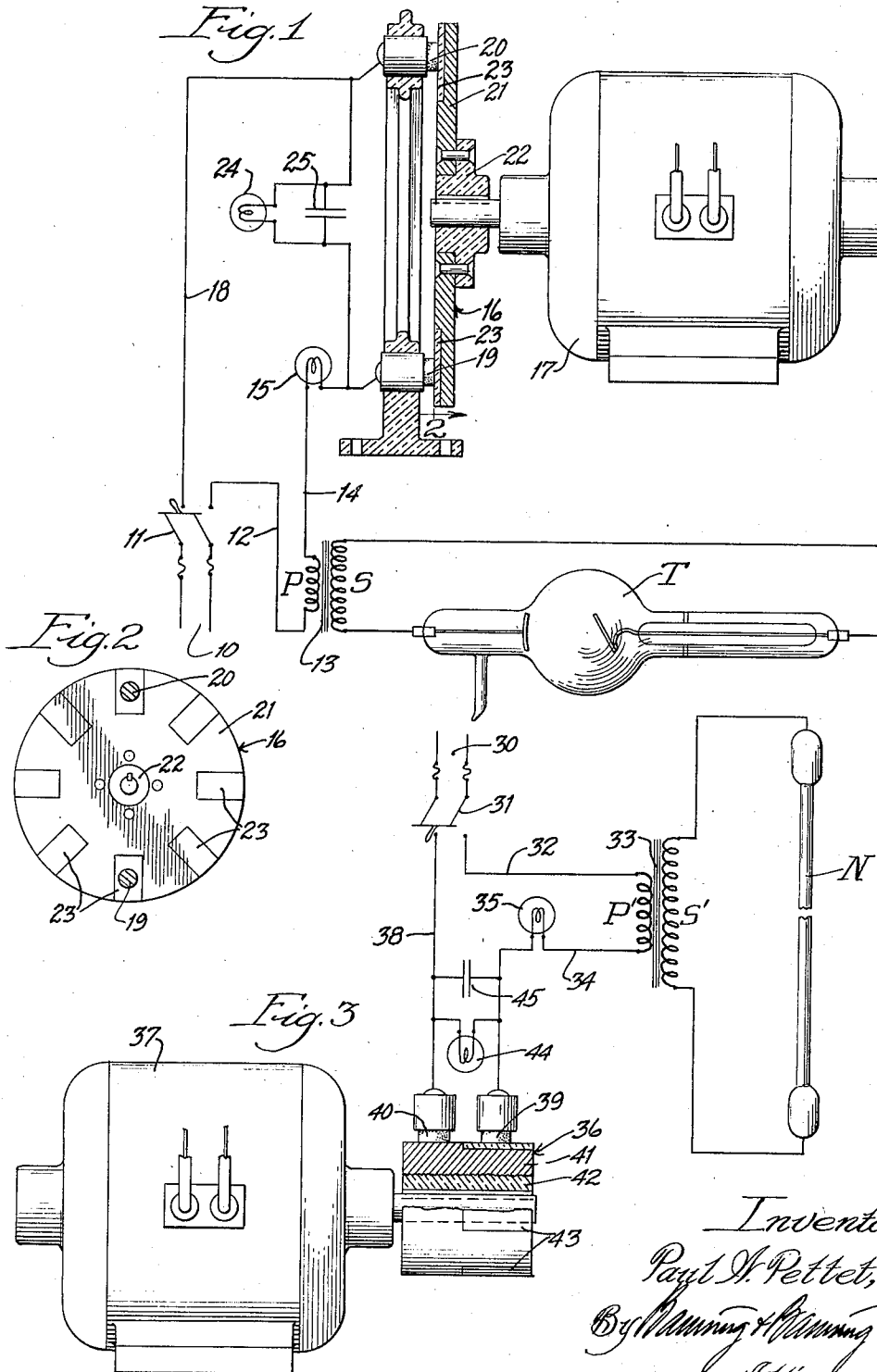
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ELECTRON DISCHARGE APPARATUS AND THE LIKE

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ELECTRON DISCHARGE APPARATUS AND
THE LIKE

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2 Claims. (Cl. 176-124)

An object of this invention is to provide a simplified apparatus for the operation of neon signs, X-ray tubes, and like apparatus which operate through electron discharge.

5 Another object is the provision of apparatus for readily transforming or converting direct current line voltage into an alternating current for the operation of such apparatus as neon tubes, X-ray apparatus, low-voltage signal ap-
10 paratus, low-voltage spot and arc welding, and the like.

These and other objects, as will hereinafter appear, are accomplished by this invention which is fully described in the following spec-
15 ification and shown in the accompanying drawing, in which—

Figure 1 is a diagram of the connections showing one embodiment of the invention;

20 Fig. 2 is a slightly reduced front elevation of a portion of the apparatus of Fig. 1 as viewed on the line 2 thereof; and

Fig. 3 is a view similar to Fig. 1 showing another embodiment of the invention.

25 The embodiment illustrated in Fig. 1 comprises a source 10 of direct current electricity having a switch 11, one side of which is connected through a lead 12 with a primary P of the step-up transformer 13, the opposite end of the pri-
30 mary being connected through a lead 14 with a ballast lamp or resistor 15. This lamp or resistor in turn is connected through a rotary interrupter 16 which is driven by means of a motor 17 from the interrupter, returning to the
35 switch 11 through a lead 18. Thus the leads 14 and 18 are connected to brushes 19 and 20 respectively, the brushes being suitably insulated and bearing against the face of a plate 21 which is mounted on the shaft of the motor 17.

Referring now to Fig 2, this plate 21 is made
40 of metal and is mounted upon an insulator 22 so as to be completely insulated from the motor 17. This plate has a series of spaced oppositely disposed openings in its face in which are in-
45 serted blocks of insulation 23, the face of the whole being turned and polished so as to present a smooth surface to the brushes. In shunt with the rotary interrupter 16 is a lamp 24 and a condenser 25 which tend to absorb the spark from the brushes. The ballast lamp or resistor
50 15 serves to limit the amount of current flowing through the interrupter. The ends of the secondary S of the step-up transformer 13 are connected to the two ends of the X-ray tube T in a well known manner.

55 From the foregoing it will be seen that with

the motor 17 in operation on closing the switch 11 current will pass through the interrupter at such times as the brushes 19, 20 bear upon the metal of the face of the plate 21. As this plate continues to rotate, however, the insulators 23
5 then pass under these brushes and current is accordingly interrupted, this current again being resumed when the plate turns enough to bring it again in contact with the brushes. Thus an alternating current is produced in the circuit
10 through the primary coil P. At each make and break of the primary current a secondary current of high voltage is induced in the secondary coil S which is applied to the terminals of the X-ray tube T.

15 In Fig. 3 is shown a modified form of the device having a direct current line 30 controlled by a switch 31. One pole of this switch is connected to a lead 32 with the primary P' of the step-up transformer 33, the other side of the
20 primary being connected through a lead 34 and ballast lamp or resistor 35 with a rotary make and break device 36, which is driven by a motor 37, the return lead 38 from this device being connected to the other side of the switch 31.

25 Brushes 39, 40 are connected to the leads 34, 38 respectively; and these brushes bear upon the cylindrical surface of the rotary interrupter 41, the body of which is of metal and is insulated from the motor shaft by means of a hub
30 or core 42 of insulating material. The brush 40 bears constantly upon the metal surface of the interrupter, but in the opposite end of this cylindrical surface are inserted a series of insulating blocks 43. Thus as the interrupter rotates the
35 brush 39 bears alternately upon the metal face of the interrupter causing current to pass there-through, and then upon one of the insulating blocks 43 which causes the current to be inter-
40 rupted.

Thus it will be seen that a pulsating or alternating current always of the same polarity is passed through the primary P' of the step-up transformer 33, thereby inducing in the sec-
45 ondary S' of this transformer a much higher potential which is thus applied through suitable connections to the two ends of the neon tube N. The ballast lamp or resistor 35 and the lamp 44 and condenser 45 perform the same functions as the corresponding parts 15, 24 and 25 of Fig. 1.

50 It will be understood that a suitable step-down transformer may be used at 13, and that the secondary thereof will supply low-voltage current to any suitable apparatus designed to operate on alternating current, such as signal
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apparatus, spot and arc welding apparatus, and the like.

From the foregoing it will be seen that a very simple and efficient form of electron discharge apparatus is provided, and one which will operate successfully on a D. C. source of current supplied.

While I have shown and described but a few embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. In electron discharge apparatus, a step-up transformer, a source of direct current supply,

an interrupter and the primary of said transformer in series circuit with said source, a condenser and a lamp connected in parallel shunt to said interrupter, and a consumption circuit connected to the secondary of the transformer.

2. In electron discharge apparatus, a step-up transformer, a source of direct current supply, an interrupter and the primary of said transformer in series circuit with said source, a condenser and a lamp connected in parallel shunt to said interrupter, a ballast lamp in series with the primary to limit the current flow there-through, and an electron discharge tube, the secondary of the transformer being connected to the two ends of the tube.

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