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**PATENT SPECIFICATION**



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**515,866**

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COMPLETE SPECIFICATION

**Method of and means for obtaining Photographic Images of Living and other Objects**

I, RUTH DROWN, a citizen of the United States of America, of 4706, Oakwood Avenue, Los Angeles, California, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a method of and means for obtaining photographic images of parts of the human body or of other objects. One object of my invention is to enable accurate photographs of healthy and diseased parts of living bodies somewhat similar to X-ray photography to be obtained in simple and easily applied manner. Another object is to provide a compact portable apparatus for obtaining photographic images according to the invention.

It is believed that the action obtained by my present method consists in actuating the flow of electrons by the uni-directional flow of current from the battery or other equivalent source and the radiant energy from the body being examined.

In pursuance of the foregoing and according to my present invention a method of obtaining photographic images of living and other objects and more particularly human beings consists in subjecting a highly sensitised photographic plate or film to an electromotive force so as to produce a field thereon and providing means susceptible to the influence of the invisible energy rays or electrons of the atoms of the object to be photographed to produce a change in voltage drop across an electrical circuit to correspondingly influence said field.

The apparatus for carrying out the invention can comprise a light sensitive cell, a uni-directional source of current connected at the negative side to the cathode of the light sensitive cell and at the positive side to the anode of the cell, a series of impedance rheostats constructed so as to have a condenser action and connected in parallel with the cell and the source of current, a rectifier, and a photographing device comprising the

opposed plates of a fixed condenser between which the film or plate is located, said rheostats being connected across one of the plates of the condenser and the cell plate, and the other plate of the condenser being connected to the filtered negative side of the said source.

In carrying an embodiment of my invention into practice it should be understood that the latent image is carried to the sensitised surface by means of a magnetic field having certain lines of force and the thickness or width of the field, i.e., transverse to the shortest distance between the negative and positive points can vary from one thirty second of an inch to one inch. This field when applied across a sensitised surface spreads or is trapped into the plane of such surface and by the action of a suitable developer the image of the field can be printed. Consequently, if the potential of the applied force is varied by using the electronic or light ray influence of the object to be photographed to affect the photo-electric cell included in the circuit of the apparatus, the lines of force will be correspondingly varied on the plate.

In practice the subject to be photographed is placed close to the photo-electric cell, and it is found that the radiant energy of the subject impinges on the cathode of the tube resulting in an increasingly higher resistance being placed across the cell. Such increase will cause an exceedingly minute change of the current in the anode circuit, in turn producing a change in the voltage drop across the circuit, such voltage drop or change in potential being led through the selecting or tuning section constituted by the said rheostats. That is to say a photo-electric cell is used to isolate a particular section to be photographed and in doing so it produces changes in the electromotive force in an electrical circuit, such changes of the electromotive force being utilised to excite the circuit producing a field across a highly sensitised emulsion surface, the resulting distortion or change of the lines of force across said surface producing an image which can be

developed chemically. Suitable apparatus for achieving this result is illustrated by the appended sheets of drawings, wherein:—

5 Fig. 1 is a diagrammatic view of a complete circuit.

10 Fig. 2 is a sectional side elevation view of a portable casing accommodating the cell; rheostat or tuning device, photographic plate holder and circuit wiring.

15 Fig. 3 is a detail sectional plan view showing one of the adjustable tuning devices, a number of which are suitably connected in the circuit as shown diagrammatically in Fig. 1, and assembled on a panel in the portable casing as shown in front and broken rear elevation in Figs. 4 and 5 respectively.

20 Referring to the drawings a source of direct or uni-directional current 1 is connected by its negative side to the cathode 2 of a photo-electric cell 3 via a filter 4 which can consist of coils of insulated wire or solenoids wound on both iron cores and air cores and in series. The source of potential may be a battery carried in the portable casing 5 so that the apparatus can be self-contained and available for use anywhere. The positive side of the source 1 is connected to the anode 6 of the cell 3. Connected across the anode and a rectifier 7 is one, or preferably as shown, a plurality of series coupled impedance rheostats 8 which are constructed to act as condensers, the rectifier 7 being in turn connected to the filtered negative side of the source 1 so that the rheostats are in parallel with the beforementioned circuit of the battery and cell. This rectifier may be a quartz-crystal type, a vacuum tube rectifier, a rectifier of the oxide type or a chemical rectifier. A pair of large surface area (in relation to their thickness) conducting plates 9 and 10 are located in narrowly spaced relationship, e.g., after the manner of a fixed condenser and are connected in parallel with the rectifier. This condenser device forms in effect a photographing device because between them is interposed a highly sensitised plate or film.

55 With the source of potential connected as shown there will always be a difference of potential between the cathode and anode of the cell, the anode being positive in relation to the cathode by reason of the applied direction of polarity of the source of potential.

60 In practice the object to be examined is placed close to the surface of the cathode so that the invisible light rays or radiations will impinge upon the cathode resulting in negative electrons being emitted from the cathode. This places a negative potential on the anode, and an

increased resistance is placed across the cell resulting in an exceedingly minute change of current in the anode circuit. Because of this change in current there will be a voltage drop across the circuit which is led through the selecting or tuning section constituted by the rheostats.

70 The changes in dielectric stress of the condenser-like arrangement of plates 9 and 10 caused by the changes of potential applied to the plates 9 and 10, produces corresponding changes in the field which is contained in the sensitised surface of the photographic plate or film. This field is in the nature of a magnetic field with appropriate lines of force depending upon the particular setting of the tuning device constituted by the impedance rheostats 8. As the tuned in electromotive force which produces the field is varied or regulated by the energy derived from the nervous system or organism of the living object being photographed, the field is varied correspondingly.

90 The tuning device can comprise any suitable number of rheostats connected in series as shown in Fig. 1 to afford a wide range of adjustment. Each rheostat comprises a plurality of conductor studs 14 arranged in an arcuate path about a centre conductor pivot pin 15 from which radiates a contact 16 engaging the studs singly. Each stud is lined with an insulating sleeve 17 about which is wound a wire 18 so that there is a capacity between the wire and the conductor stud 14. The windings 18 are in series for each rheostat, and the conductor pivot pin 15 of each rheostat is connected to the first winding of the next rheostat in succession as shown in Fig. 1. Such an arrangement affords a wide range of fine tuning, the impedance formed in the circuit being determined by the number of windings selected.

105 The rheostats can be mounted on a panel 19 fixed in the portable casing 5. A switch 20 for making and breaking the circuit of the battery can be provided on this panel, and the photo-electric cell 3 can be plugged into a socket 21 on the base of the casing between the panel 19 and a partition 22 separating a compartment 23 containing the condenser plates 9 and 10. Immediately above the space between these two plates is a narrow lid 24 adapted to light seal the compartment 23, and to be opened for insertion and removal of a mount containing the photographic plate or film.

125 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim

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is:—

1. Method of obtaining photographic records of portions of human bodies or other objects consisting in forming a magnetic field across a sensitised plate or film by means of an electrical circuit and producing changes in the electromotive force in the circuit by means of a light sensitive cell or photo-electric cell exposed to the influence of the radiant energy of the object to be photographed.
2. Method of obtaining photographic records of portions of human bodies and other objects consisting in creating a magnetic field by an electrical device and locating a highly sensitised photographic plate or film in the magnetic field and locating a light sensitive cell in juxtaposition to the object to be photographed, placing a potential on the anode of the cell by means of a uni-directional source of current of the said circuit to increase the resistance of the cell and thereby produce a change in voltage drop across the circuit to the said field producing means.
3. Apparatus for obtaining photographic records of portions of human bodies and other objects comprising means for applying a magnetic field across the sensitized surface of a photographic plate or film, a photo-electric or light sensitive cell adapted to produce changes in the electromotive force producing said field and susceptible to the influence of electrons given off by the radiant energy of the object to be examined, and tuning means connected in parallel with the cell and a source of current.
4. Apparatus for obtaining photographic records of portions of human bodies and other objects comprising a light sensitive cell, a uni-directional source of current connected at the negative side via a filter to the cathode of the light sensitive cell and at the positive side to the anode of the cell, a series of impedance rheostats connected in parallel with the cell and the source of current, a rectifier, and terminal members between which the film or plate is located, said rheostats being connected across one of the terminal members and the cell plate, and the other terminal member being connected to the filtered negative side of the said source.
5. Apparatus for obtaining photographic records of portions of human bodies and other objects according to claims 4 or 5, wherein the negative side of the source of current is connected to the cathode of the photo-electric or light sensitive cell via one or more solenoids or coils of insulated wire wound on air-cores and iron cores.
6. Apparatus for obtaining photographic records of portions of human bodies and other objects according to claim 4 or 5, wherein a portable casing accommodates the electrical elements and is partitioned to screen the plate or film receiving section from the cell and the tuning means or rheostats.
7. Apparatus for obtaining photographic records of portions of human bodies and other objects substantially as described with reference to the accompanying drawings.

Dated this 1st day of July, 1938.

RAYNER & CO.,

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Agents for the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

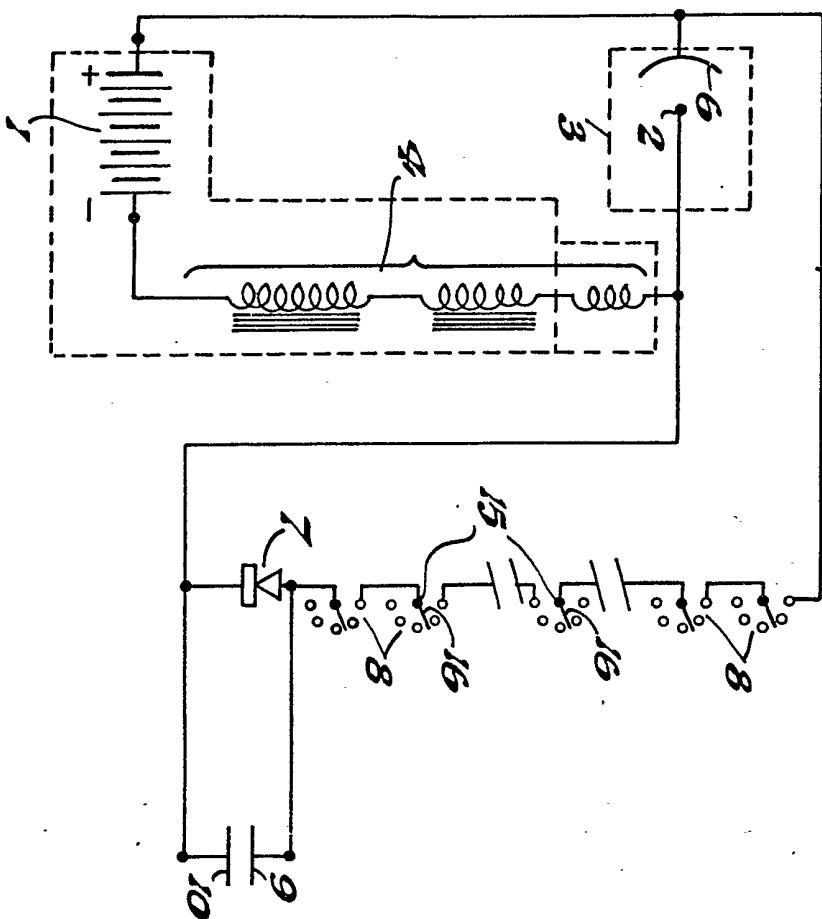


Fig. 2.

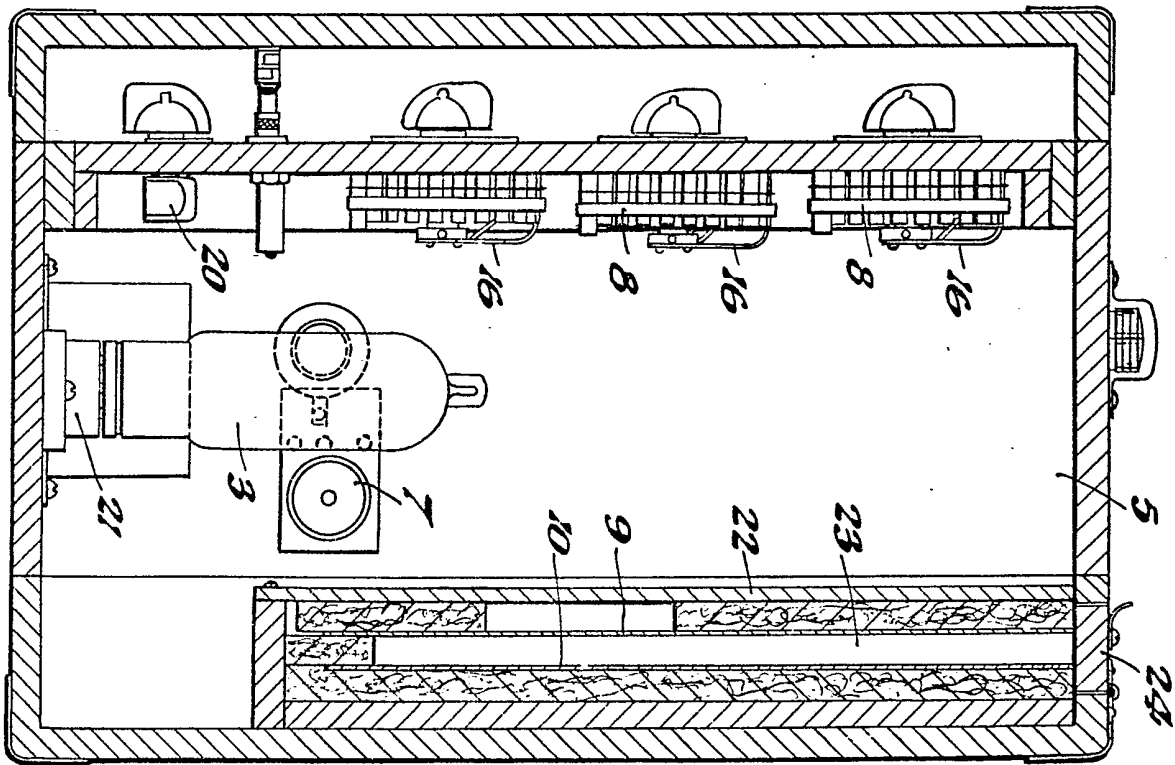
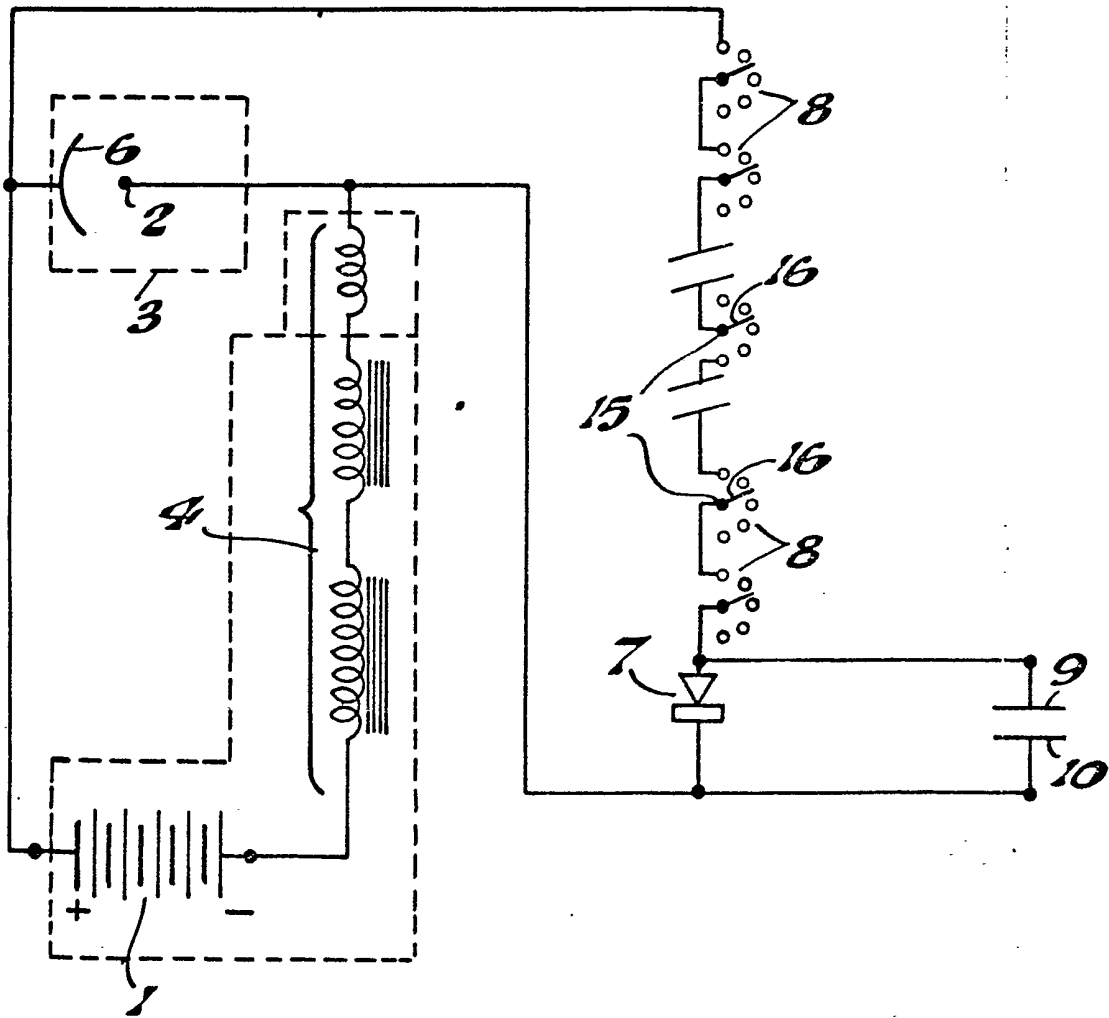


Fig. 1.

[This Drawing is a reproduction of the Original on a reduced scale.]



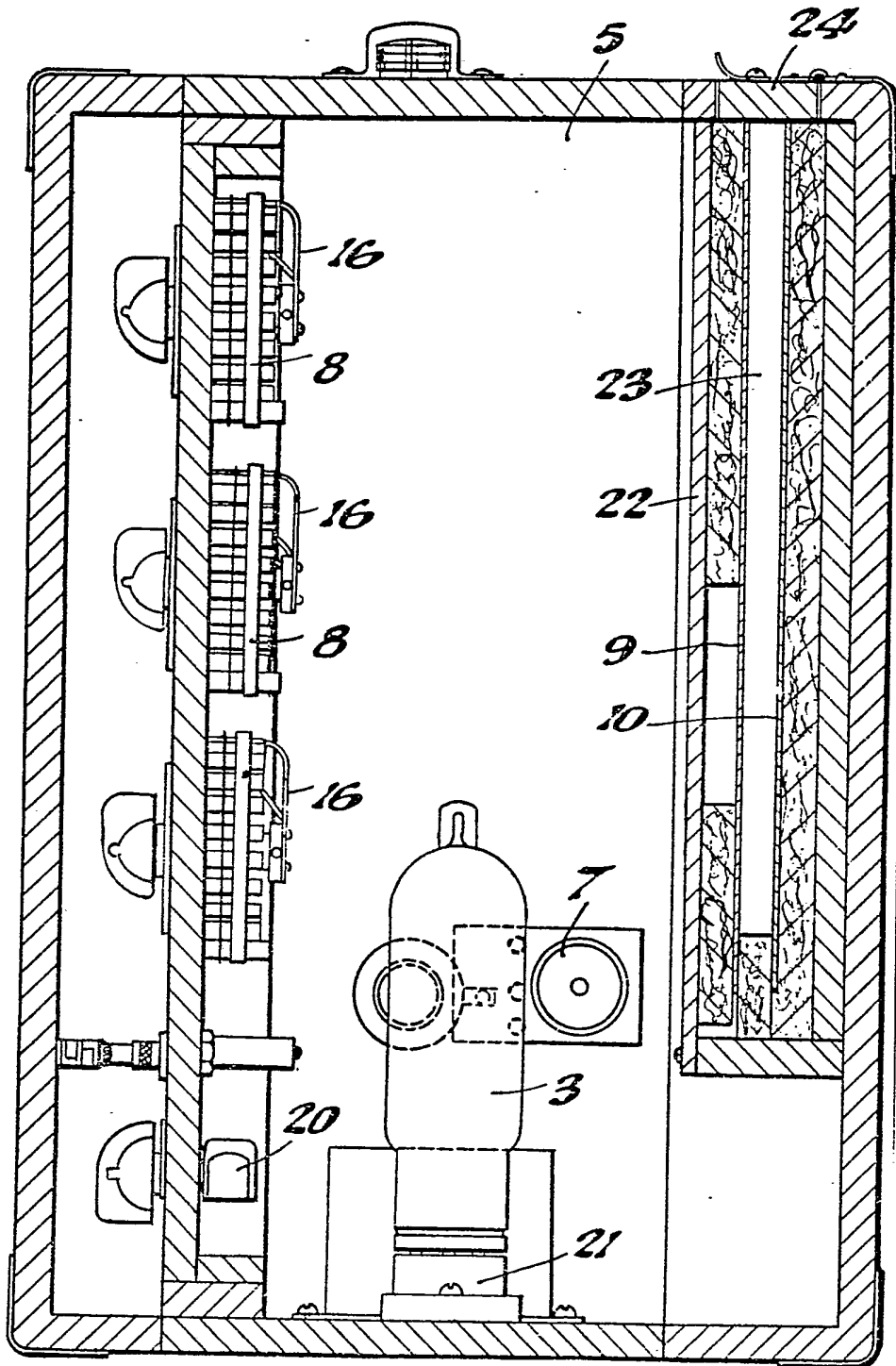


Fig. 2.

[This Drawing is a reproduction of the Original on a reduced scale.]

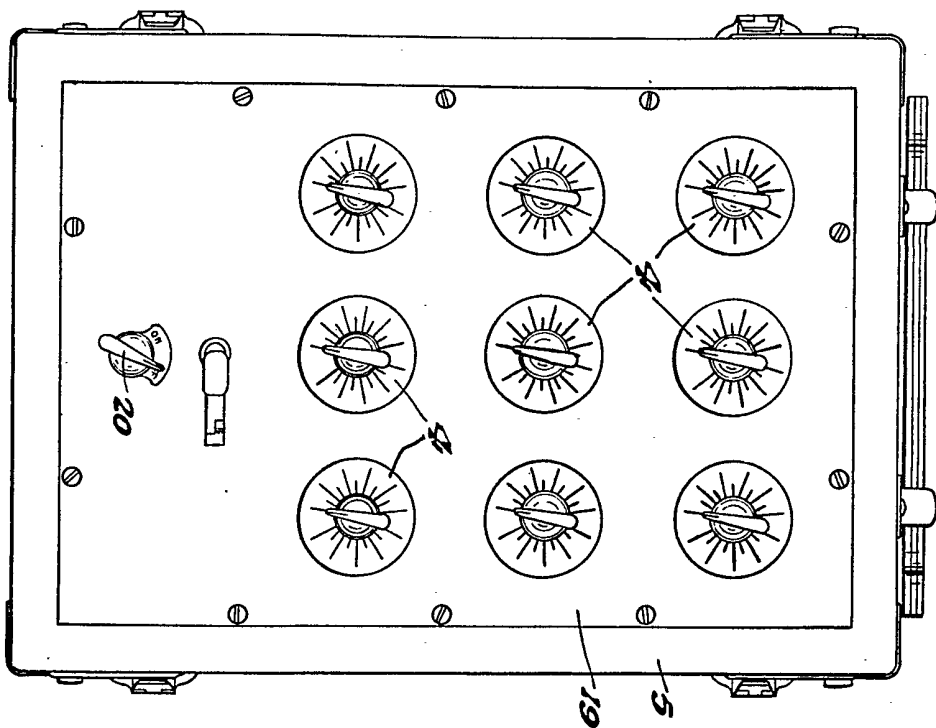


Fig. 4.

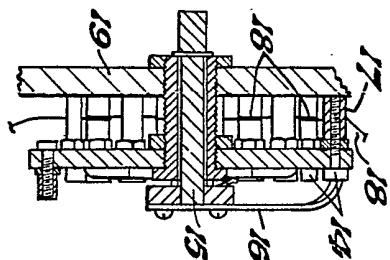


Fig. 3.

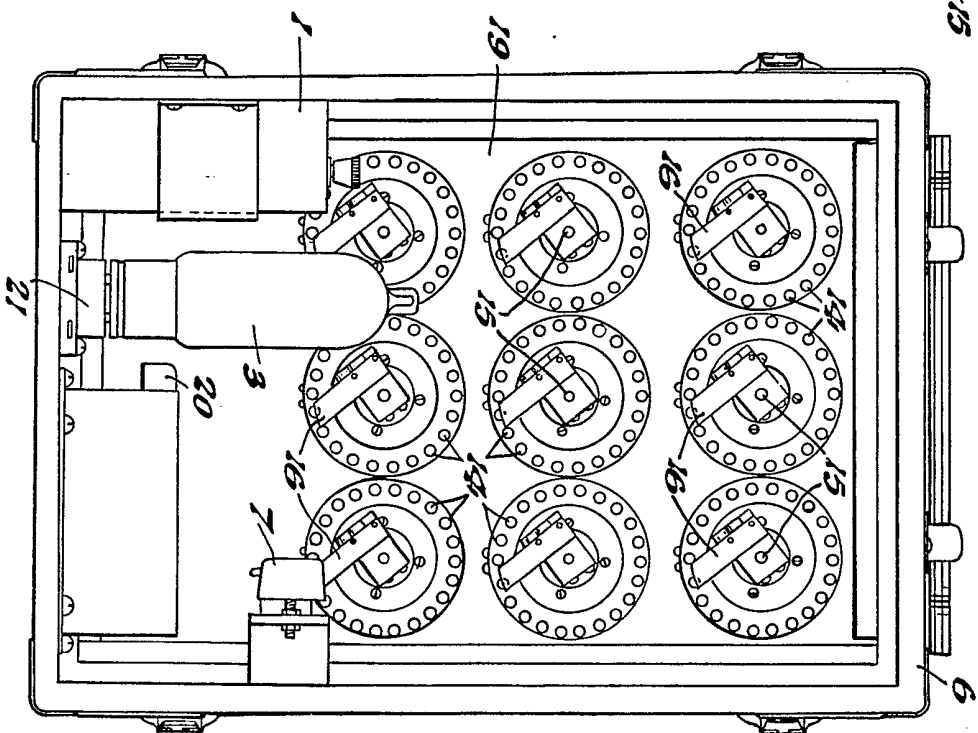
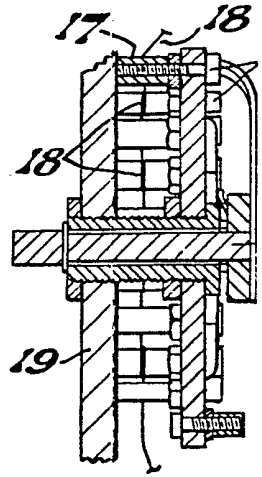
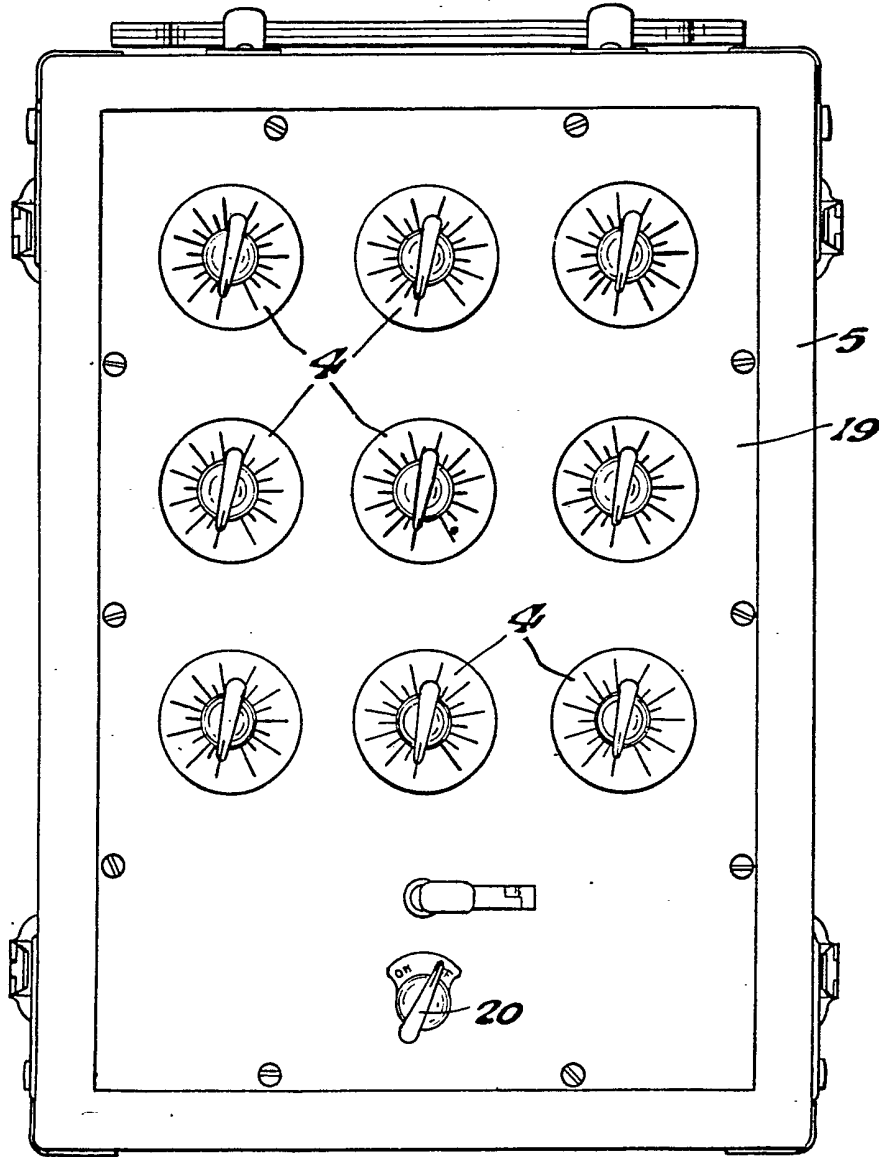


Fig. 5.

*Fig. 3.*



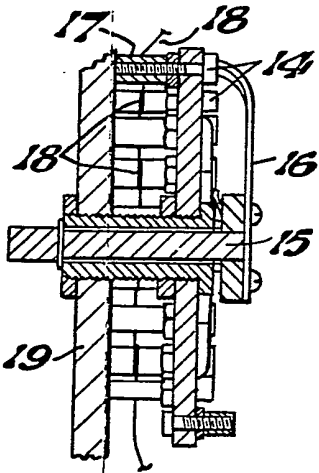
*Fig. 4.*



*[This Drawing is a reproduction of the Original on a reduced scale.]*



*Fig. 3.*



*Fig. 5.*

