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H. E. KRANZ

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CONTROLLING SYSTEM

Filed June 30, 1926

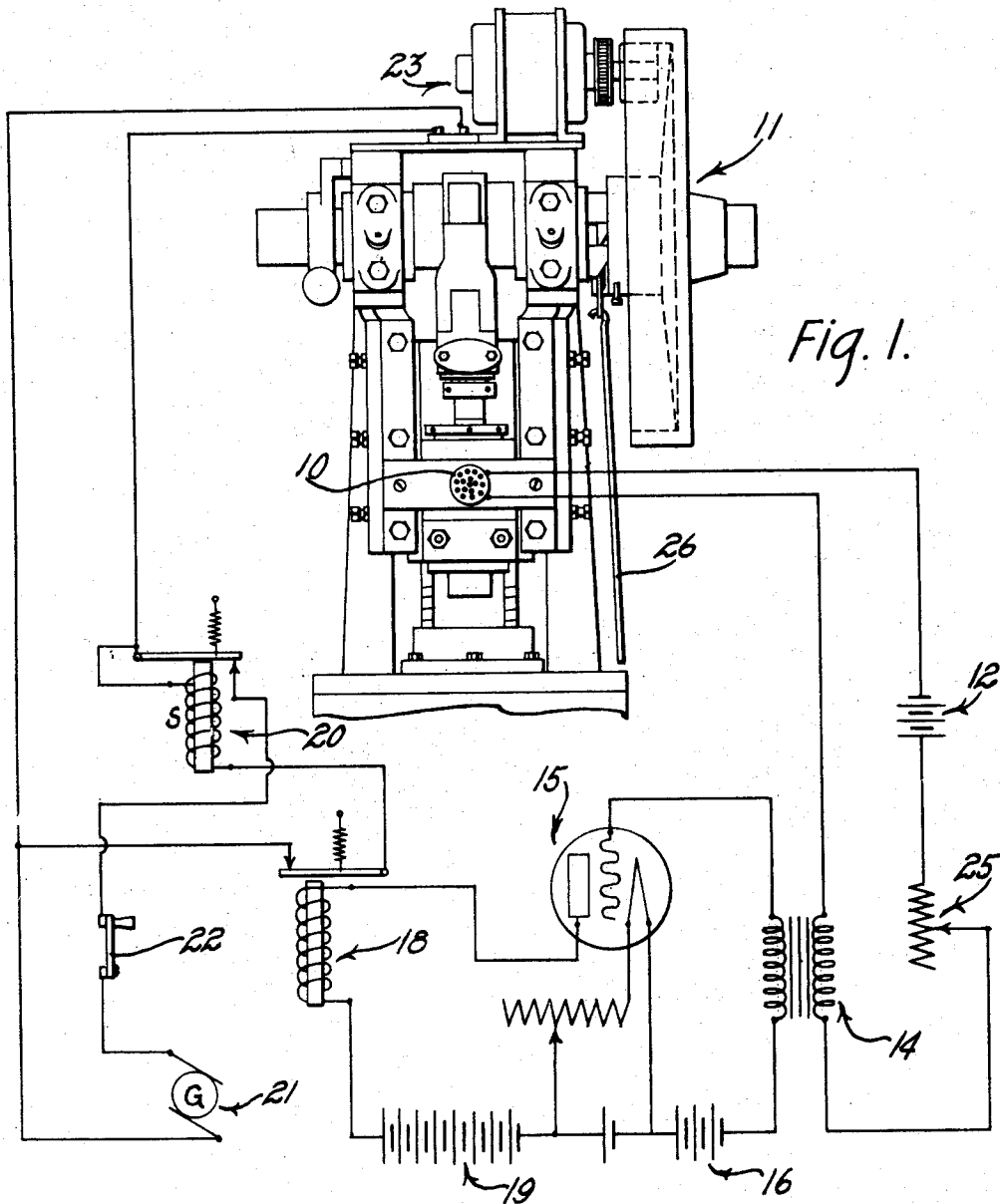


Fig. 1.

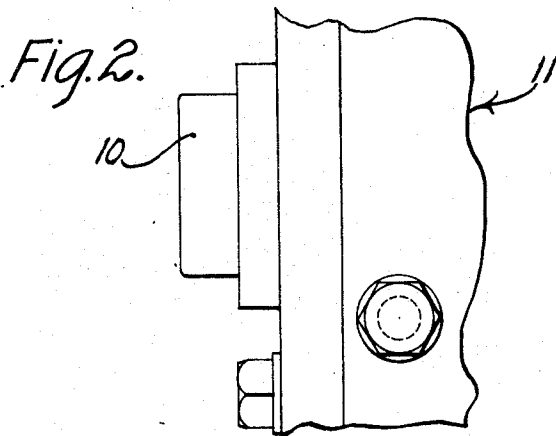


Fig. 2.

Inventor
Hermann E. Kranz
by *H. H. Hutton* Att'y.

UNITED STATES PATENT OFFICE

HERMANN ERNEST KRANZ, OF MAYWOOD, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

CONTROLLING SYSTEM

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This invention relates to controlling systems, and more particularly to controlling systems for power driven mechanisms.

Varied forms of manually operable mechanical devices have been used for controlling the operation of machinery. Thus for example various types of mechanical contrivances have in some instances been employed to control the operation of hazardous machinery and render it less dangerous to the operators. In types of machinery, such as presses, machines having feed rolls and the like where material must be manually inserted or fed into the machine, the operator is confronted with the hazards incident to such work, namely, the danger of sustaining injuries to the hands. Other types of machines, such as high speed coiling or winding machines, present the potential dangerous possibility of engaging the clothes of the worker. In the event that an operator sustains an injury while working in the presence of the above mentioned hazards, the position of the operator may be such that it would be impossible for him to cause the actuation of a manually operable safety device in order to stop the machinery.

Objects of this invention are to provide an improved, simple, efficient and dependable control system for an operating mechanism.

In accordance with these and other objects the invention contemplates the provision of a combination of electrical circuits. One embodiment of the invention resides in the use of an electron discharge device or vacuum tube having an input and an output circuit. The propelling mechanism or machine for which the device is to be employed is provided with a suitable microphone attached or adjacent to the machine. The circuit containing the microphone is electrically connected with the input circuit of the electron discharge device, the output circuit of which includes means for affecting the electrical operating circuit for the machine. Certain air vibrations, such as sound vibrations, are received and amplified by the microphone circuit and thereby control the circuit of the driving means.

These and other objects will be apparent

from the following description taken in connection with the accompanying drawings, wherein

Fig. 1 is a circuit diagram of a controlling device or system disclosing one embodiment of the invention, said device being shown in association with a machine press, and

Fig. 2 is a fragmentary side view disclosing the position of the microphone upon the machine.

Referring now to the drawings it will be observed that this improved controlling system includes a suitable vibration responsive means such as a microphone 10 conveniently secured in position on the front portion of a press 11. This microphone 10 is contained in a circuit having a source of electrical current such as a battery 12 and including the primary winding of an input transformer 14. The secondary winding of the input transformer 14 is contained in the grid circuit of an electron discharge device such as a vacuum tube 15 and is provided with a battery 16. The plate circuit of the vacuum tube 15 includes the winding of a relay 18 and a battery 19, the armature and contact of the relay 18 being electrically connected in series with a circuit containing the winding of a second relay 20. This latter circuit is connected in parallel with a power circuit and the armature and contact of the relay 20 are electrically connected in series with the power circuit. The power circuit has a source of power supply 21, a suitable switch 22 and an electric motor 23 for driving the press 11 connected in series.

Vibrations such as sound waves produced by the voice of an operator will be received by the microphone 10 and a variation in the current will take place in the microphone circuit. This microphone circuit may readily be traced from one side of the battery 12, through the microphone to the primary winding of the input transformer 14, an adjustable resistance 25 and then to the opposite side of the battery 12. Impulses from this circuit are induced in the secondary winding of the transformer 14 which is connected in series with the grid of the vacuum tube 15. The normal current flow in the plate circuit

of the tube 15 is not sufficient to actuate the relay 18, but when the above mentioned impulses are impressed upon the grid circuit a larger current will be caused to flow in the plate circuit and this will cause the actuation of the relay 18. It will be observed that under normal operating conditions the contacts of the relay 18 will be closed and the relay 20 will thus be connected across or in parallel with the power circuit.

By closing the switch 22 the relay 20 will be energized and the armature will close the contact thereof to connect the motor 23 in series with the power circuit to operate the fly wheel of the press 11. This circuit may be traced from one side of the source of power supply 21 through the switch 22, the contact and armature of the relay 20, the motor 23 and then back to the opposite side of the power supply 21. If, during the operation of the motor, an accident should occur or if for some other reason the operator should not be in a position to manually actuate the shifter rod 26 for the purpose of stopping the press, the voice of the operator will be sufficient to create the above mentioned increase in the plate current. The plate current thus increased will cause the operation of the relay 18 to open the bridge circuit containing the winding of the relay 20. The relay 20 thereupon de-energizes to open the power circuit containing the motor 23. By this simple system the machine may be stopped quickly without any manual operations.

It is to be understood that the circuits disclosed in this system may also be adjusted to render the system responsive to various degrees of vibration. While the invention has been illustrated in connection with a particular type of machine, it will be understood that the invention is not limited to the precise form shown and described, as other modifications and adaptations thereof may be made without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a controlling system, an electrical circuit including a propelling mechanism, another circuit including an electron discharge device, and means responsive to a current flow in the circuit of the electron device for affecting the circuit including the propelling mechanism.

2. In a controlling system, an electrically operable propelling mechanism, an electrical circuit including an electron discharge device, and means responsive to a current flow in the circuit of an electron device for rendering the propelling mechanism functionally inoperative.

3. In a controlling system, an electron discharge device including input and output circuits, a microphone electrically connected with the input circuit, an electrical circuit

including a propelling mechanism, and means responsive to a current flow in the output circuit for affecting the circuit containing the propelling mechanism.

4. In a safety control system for a propelling mechanism, an electron discharge device including input and output circuits, a vibration responsive means electrically connected with the input circuit, a power circuit including a propelling mechanism, a relay bridged across the power circuit having a contact included serially in the power circuit, and a relay in the output circuit having a contact in series with the winding of the first mentioned relay.

5. In a controlling system, a mechanism, an electrical circuit, means connected therein responsive to vibrations for affecting the current in the circuit, means for amplifying the change in current, and means actuated by the last mentioned means for operating the mechanism.

6. In a controlling system, an electron-discharge device including input and output circuits, a vibration responsive means connected with the input circuit of the electron discharge device, an operated element, and means responsive to a current flow in the output circuit of the electron discharge device for operating the element.

In witness whereof, I hereunto subscribe my name this 16th day of June A. D., 1926.

HERMANN ERNEST KRANZ.