P. KAMINSKI.

CONTROLLING SYSTEM FOR SIMULTANEOUSLY FIRING A NUMBER OF GUNS FROM A CENTRAL STATION.

APPLICATION FILED MAR. 29, 1921.

1,438,833. Patented Dec. 12, 1922.

Fig. 1.

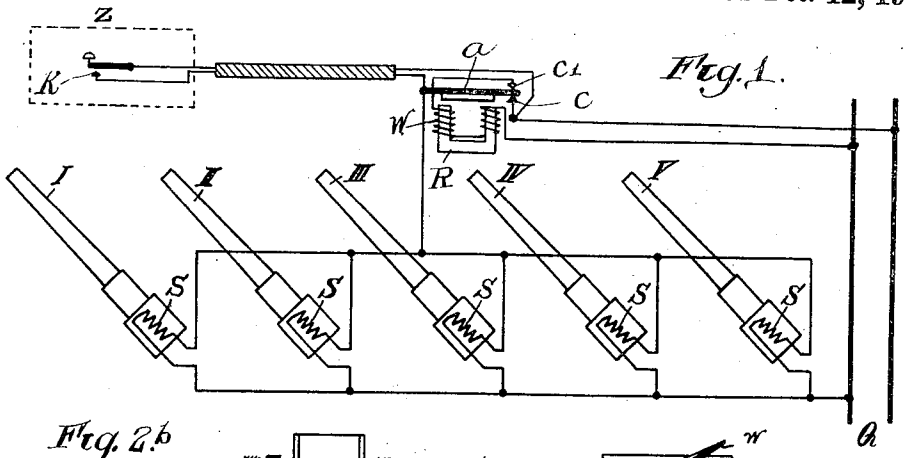


Fig. 2b

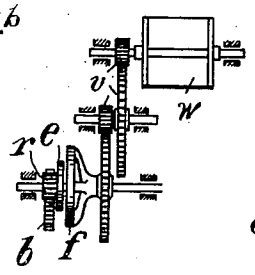


Fig. 2a

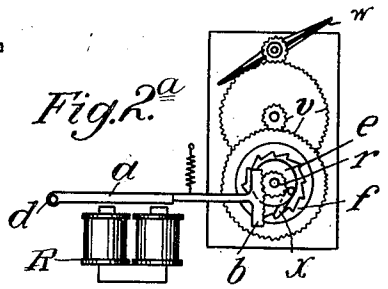
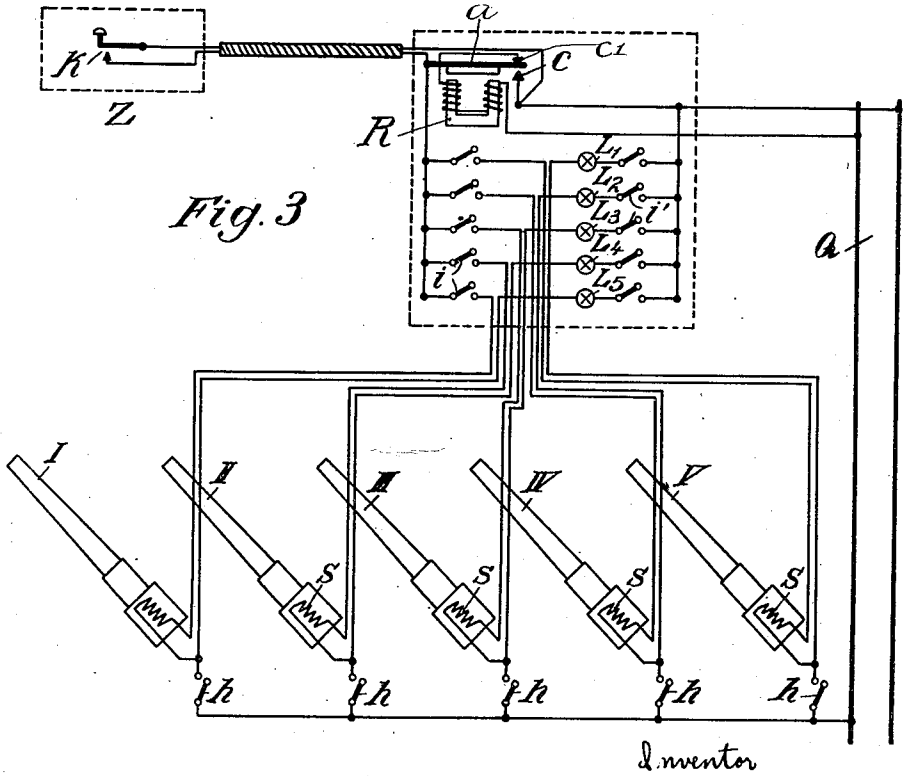


Fig. 3



Inventor
Paul Kaminski
by Knight Bros
Attorneys

Patented Dec. 12, 1922. 1,438,833

UNITED STATES PATENT OFFICE.

PAUL KAMINSKI, OF BERLIN-PANKOW, GERMANY, ASSIGNOR TO SIEMENS & HALSKE, AKTIENGESELLSCHAFT, OF SIEMENSSTADT, NEAR BERLIN, GERMANY, A GERMAN CORPORATION.

CONTROLLING SYSTEM FOR SIMULTANEOUSLY FIRING A NUMBER OF GUNS FROM A CENTRAL STATION.

Application filed March 29, 1921. Serial No. 456,752.

To all whom it may concern:

Be it known that I, PAUL KAMINSKI, a citizen of the German Empire, residing at Berlin-Pankow, Germany, have invented certain new and useful Improvements in Controlling Systems for Simultaneously Firing a Number of Guns from a Central Station (for which I have filed application in Germany on April 13th, 1916), of which the following is a specification.

My invention relates to a system of connection for simultaneously firing a plurality of guns by means of electricity, all the guns being fired by closing a contact disposed at a central station.

The firing of a gun requires a rather great amount of energy and a multiple thereof is consumed in firing a plurality of guns at a time so that it becomes necessary to use a heavy switch for switching the current on and off.

On the other hand, the contact device at the central station is required to be easily operable, for inst., after the manner of a mouth contact or a light hand contact. Provision should further be made for an immediate firing of the guns as soon as the contact is closed since even a short delay will unfavourably influence the accuracy of fire, the more so if the guns are mounted on board a ship rolling in the sea.

I attain the object in view by employing a relay acting instantaneously as soon as the contact at the central station is closed and which will on the other hand keep the firing circuits closed for some time, thus ensuring the firing of the guns even if the central contact is immediately opened again. This effect is preferably obtained by allowing the relay armature when attracted, to execute an unobstructed movement, whereas on returning to its normal position it is acted upon by a retarding device in a manner known per se. The relay may be connected with the source of current, which supplies the electrical energy for the firing. In the drawings affixed to this specification and forming part thereof two systems of connection embodying my invention are illustrated by way of example in a purely diagrammatic way.

In the drawings

Figs. 1 and 3 are diagrams disclosing each one modification, while

Fig. 2^a illustrates in side elevation in detail the relay according to Figs. 1 and 3; and the retarding device connected therewith.

Fig. 2^b shows aforesaid retarding device in end elevation.

Referring to Fig. 1, five guns I, II, III, IV, V are shown as being controlled from the central station Z as regards firing. The firing of the guns is effected by supplying current to a coil S provided at each gun.

The current may be supplied from any suitable source Q of direct or alternating current, preferably from the existing net work. In the system disclosed in Fig. 1 the coils S are permanently connected with the one pole of the source of current, whereas their connection with the other pole is effected by a relay R. The winding W of the said relay is connected at one end directly with the source of current Q and at the other, and by way of contact c, and armature a and by way of an easily movable contact k provided at the central station Z, with the other pole. When the contact k is closed the relay R is excited and attracts its armature a, thereby interrupting contact at c_1 and immediately closing the contact c whereby the circuits of the firing coils S connected in parallel are closed also, and whereby at the same time the circuit through relay R is interrupted.

In order to keep the firing current flowing long enough when the central contact k is opened again immediately after having been closed, the return motion of the armature a is influenced by a retarding device of suitable construction. In the instance illustrated in Figs. 2^a, 2^b the retarding device consists of a gearing influenced by a vane w. A toothed quadrant b fixed on the spindle d of the armature a meshes with a pinion r carrying a ratchet mechanism e, x. The pawl x co-operates with a loosely mounted ratchet wheel f in suchwise that the vane w is actuated by means of a gearing v as the armature a is returning into its original position. The return motion of the armature a is thus considerably retarded

and the contact c is not opened until the firing of the guns is ensured.

The system illustrated in Fig. 3 essentially corresponds to the one disclosed in Fig. 1, the only difference being that the firing of the guns is made dependent upon their actual readiness for firing. To this end there is provided at the central station Z a device indicating the condition of each single gun as to its readiness for firing, signal-lamps L_1, L_2, L_3, L_4, L_5 being for inst. provided one for each gun, which light up as soon as a switch h provided at each gun is closed in making it ready for firing. These switches h are inserted in the portion of the line connection to the firing coils S which is independent from the relay-contact c. As long as this switch is open, not only the corresponding lamp L does not light up but the gun associated therewith will also be prevented from being fired even though the central contact k be closed.

The firing devices of the individual guns may further be disconnected at will at the central station by means of double switches i, i_1.

I claim:

1. In an electrical system for simultaneously firing a plurality of guns from a central station, means for firing the guns, a current supply connection between said firing means and said current supply and a firing contact at said station adapted to control said connection, and a relay controlled by said firing contact and having an armature and contact and suitable circuit connection for interrupting its energizing circuit when the armature is attracted, said armature also having suitable circuit connection for closing, when in attracted position, the firing circuit in parallel to said firing contact, and mechanically controlled retarding means connected to said armature for maintaining the latter in attracted position to keep the firing circuit closed for a predetermined time.

2. In an electrical system for simultaneously firing a plurality of guns from a central station, means for firing the guns, a current supply connection between said firing means and said current supply and a firing contact at said station adapted to control said connection, and a relay controlled by said firing contact and having an armature and contacts and suitable circuit connection for interrupting its energizing circuit when the armature is attracted, said armature also having suitable circuit connection for closing, when in attracted position, the firing circuit in parallel to said firing contact, and mechanically controlled retarding means connected to said armature for maintaining the latter in attracted position to keep the firing circuits closed for a predetermined time, and a "ready" indicating circuit for each gun at said station connected to its firing circuit and a manually operated switch in the firing circuit for controlling said indicating circuit, and adapted to set the firing circuit for its gun to be closed by said firing contact.

3. In an electrical system for simultaneously firing a plurality of guns from a central station, means for firing the guns, a current supply connection between said firing means and said current supply and a firing contact at said station adapted to control said connection, and a relay controlled by said firing contact and having an armature and contacts and suitable circuit connection for interrupting its energizing circuit when the armature is attracted, said armature also having suitable circuit connection for closing, when in attracted position, the firing circuit in parallel to said firing contact, and mechanically controlled retarding means connected to said armature for maintaining the latter in attracted position to keep the firing circuits closed for a predetermined time, and a "ready" indicating circuit for each gun at said station connected to its firing circuit and a manually operated switch in the firing circuit for controlling said indicating circuit, and adapted to set the firing circuit for its gun to be closed by said firing contact, and an individual switching device for each gun for disconnecting its firing circuit from the control of said firing contact.

In testimony whereof I affix my signature.

PAUL KAMINSKI.