

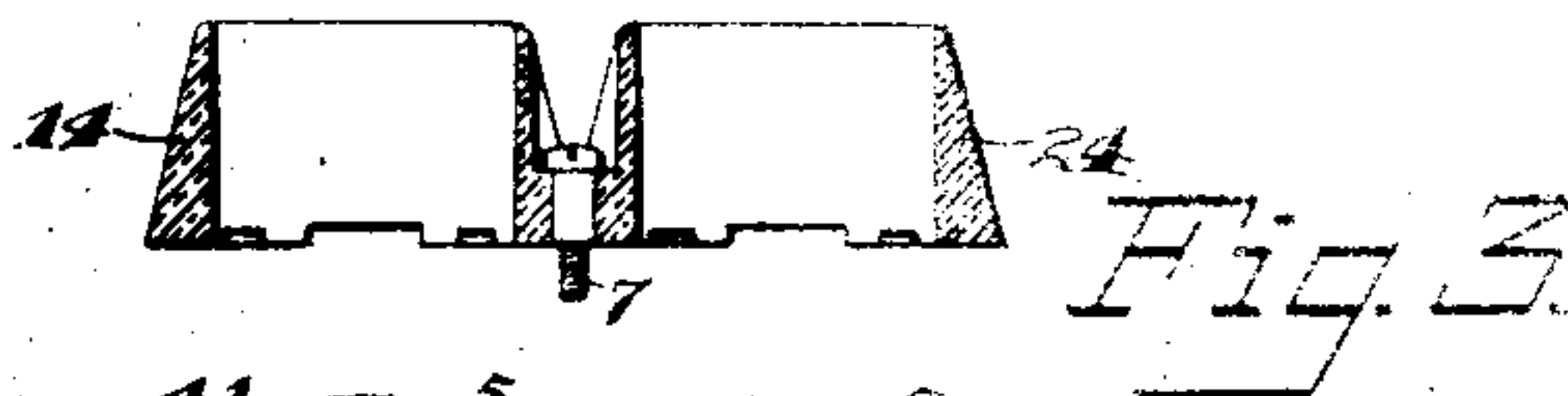
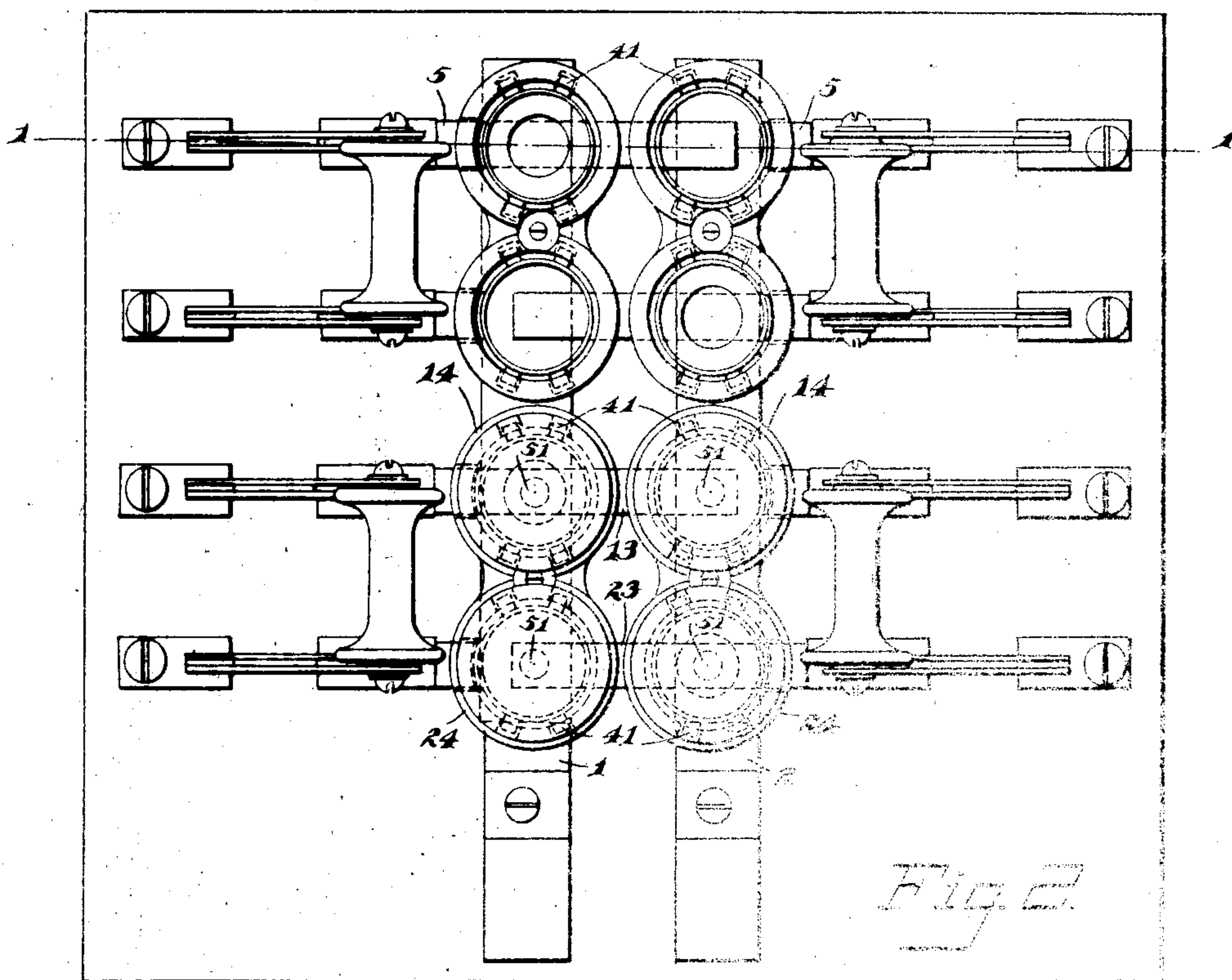
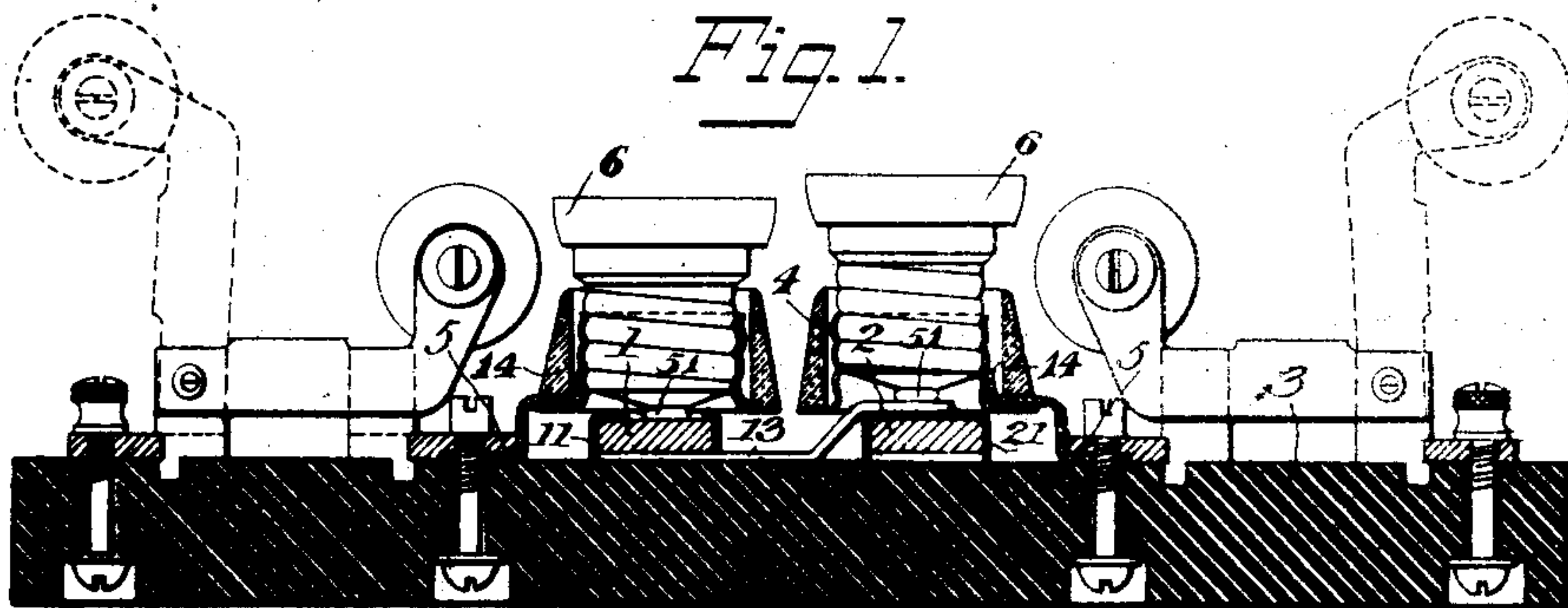
No. 871,348.

PATENTED NOV. 19, 1907.

H. KRANTZ.
PANEL BOARD.

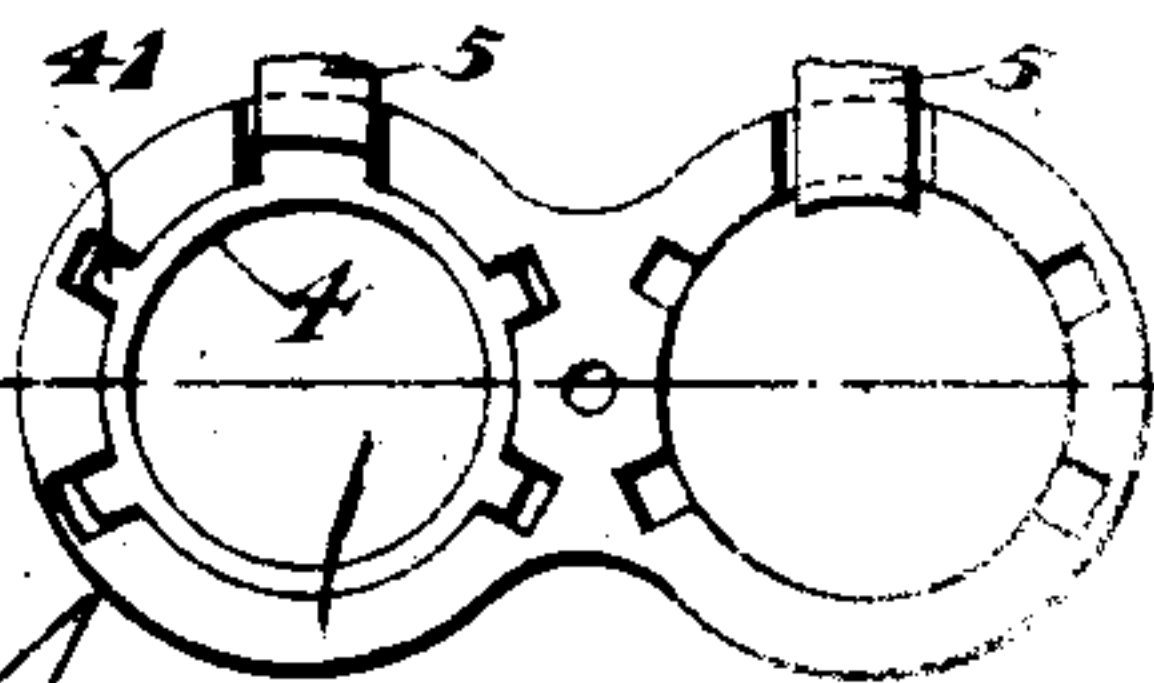
APPLICATION FILED JULY 6, 1905.

2 SHEETS—SHEET 1.



WITNESSES:
William M. Hilbert
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Fig. 4.



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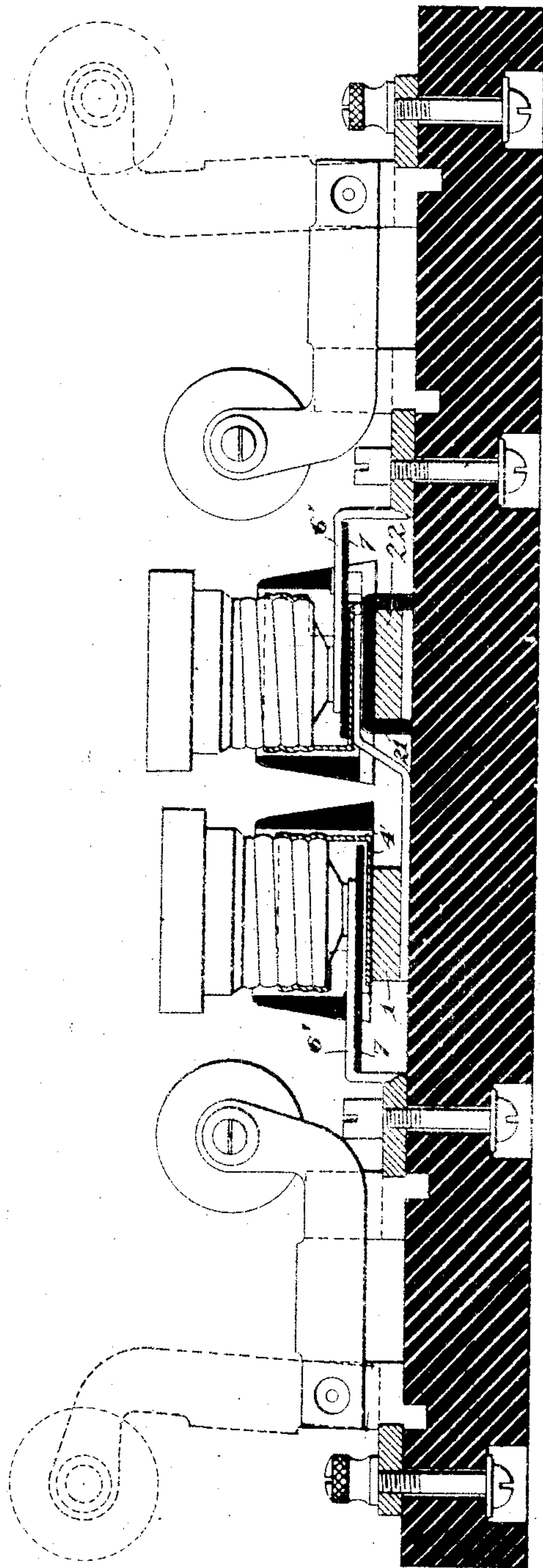


Fig. 5.

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UNITED STATES PATENT OFFICE.

HUBERT KRANTZ, OF BROOKLYN, NEW YORK.

PANEL-BOARD.

No. 871,348.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed July 6, 1905. Serial No. 268,310.

To all whom it may concern:

Be it known that I, HUBERT KRANTZ, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Panel-Boards, of which the following is a specification.

This invention broadly relates to electrical switch board mechanisms, such as panel boards or the like, but it refers more particularly to improvements in the construction of such switch boards as are adapted to provide for the use of safety fuse devices of diverse forms.

The herein described invention has for its object to so simplify the elements and condense the combinations and arrangements thereof in electrical switch boards that the size and cost of the latter will be materially reduced, and to so reduce the number of joints and connections, at the same time improving the features of insulation, that the structure of the switch board will be further perfected, both electrically and mechanically.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

That my invention, and the manner in which the above stated ends may be attained, will be more clearly expressed and made comprehensible to others, I have appended, as a part of this invention, drawings of two forms of construction embodying such invention, although in the light of this disclosure its principles may readily be carried out by various other modified structures by those skilled in the art.

In such drawings, like letters of reference denote corresponding parts throughout all the views, of which:

Figure 1 is a vertical section taken along line 1--1 of Fig. 2, illustrating the compact arrangement accruing to an embodiment of this invention in which safety fuse devices are provided with fuse-plugs which afford a terminal in direct contact with the underlying conductors. Fig. 2 is a plan view showing the general assemblage of the bus-bars and the superposed safety fuse devices comprising porcelain sockets, the brass shells therein and other parts. Fig. 3 is a longitudinal vertical section of a part of the safety

fuse device constituting a receptacle adapted to accommodate two fuse-plugs. Fig. 4 is a bottom view of Fig. 3 showing one mode of retaining in the receptacle a screw-threaded shell constituting a terminal of the safety fuse device. Fig. 5 is a vertical section taken similarly to Fig. 1, but showing a modified embodiment of my invention in which the safety fuse device is of a peculiar construction, whereby certain of the conductors are clamped between terminals of said device.

Referring now to such drawings, through the assistance of the hereinafter-specified reference letters, it will be noted that the construction thereby shown exemplifies an embodiment of the invention in its application to a simple two-pole system, comprising the usual two bus-bars of diverse polarity here designated as 1 and 2, though, as will be very readily comprehended, it may equally be applied to three-wire or other systems. Such bus-bars are suitably mounted, preferably flat-wise, upon an appropriate base 3 so as to extend parallelly thereacross. Either or both of said bus-bars may be more or less incased within or otherwise insulated by sheaths 11 and 21 of non-conducting material, such sheaths preferably having the general form of a channel bar, as shown, so as to cover the sides and tops of the bus-bars. Surmounting the bus-bars are suitable safety fuse devices, such for example as those shown in the accompanying drawings. These safety fuse devices comprise a receptacle having a suitable terminal and a removable plug adapted to be inserted in said receptacle, and also provided with a terminal, so that each safety fuse device will have two terminals, one for the entering of the current and the other for the egress of the current. As one very important and valuable feature of my invention resides in the provision of a direct contact with the underlying bus-bar of a terminal of each of the surmounting safety fuse devices, the insulating sheaths will be so formed or cut away at intervals as to leave exposed in suitable places enough of the bus-bar surface to make the desired contacts. Thus, in the embodiment shown by Figs. 1, 2 and 5 the sheaths are broken away or orificed in the top in all places wherever it is intended to have the current pass from the underlying bus-bar directly up through one of the terminals of the surmounting safety fuse devices, the lat-

ter being so constructed and arranged in the form shown by Figs. 1 and 2, that a direct contact is made with the terminal, which in this case is one and the same as the end of the fuse-plug, which, together with its receptacle, make up the safety fuse device. A reverse arrangement is shown by Fig. 5; that is to say, while a direct contact is likewise made with a terminal of the safety fuse device, such terminal constitutes the lining of the receptacle, and the end of the contained fuse-plug constitutes the other terminal. The sheaths may also be cut away in the sides so that the cross-bars extending from above an adjacent bus-bar may pass therethrough into direct contact with the sheathed bus-bar.

In order that the appropriate terminals of the safety fuse devices may be brought into electrical communication with the distant bus-bars, the latter are provided with extensions or arms constituting the cross-bars, which terminate within the receptacles forming a part of the safety fuse devices, wherein they may be directly united to and contacted with the said terminals to establish the various circuits of the switch board without the use of excess material or an undue number of contacts in its construction. Such extensions are exemplified in the drawings by the cross-bars 23 and 13, each extending from a direct underlying contact with its bus-bar and terminating above the insulated surface of the bus-bar of opposite polarity, at which point a direct contact will be had with the appropriate terminal of the safety fuse device, the terminal being the fuse-plug end or the shell, as the preference may be.

Figs. 1 to 4 illustrate a structure wherein suitable means is provided for retaining a terminal of the safety fuse device in direct contact with one of the underlying conductors, as set forth by the foregoing. Such structure may comprise fuse-plug sockets mounted directly over the exposed portions of a bus-bar and also directly over exposed ends of extensions from another bus-bar. While such receptacles may be designed to accommodate one or more fuse-plugs, I prefer the dual construction shown as 14 and 24 on the appended drawing, as the same is well adapted for being made at a very small cost and is capable of being very readily assembled in making up the entire switch board construction, inasmuch as but a single attaching screw will suffice to affix the socket in place, the shell being also retained at the same time in cases where such is used. Such receptacles are preferably so devised that the fuse plug inserted therein may make direct contact with the underlying conductor by protruding its end or tip through a bottom opening, as shown. These receptacles are very simple in form, being, broadly

speaking, of a ring-like shape, and afford a most convenient means for retaining the fuse-plug in firm direct contact with the exposed underlying bus-bar or bus-bar extension, as the case may be. Generally it will be found to be preferable to use a threaded metallic shell, as it not only tends to protect the more fragile socket shell from injury but also adds to the appearance and general electrical advantages of the structure. The shell, which I have here shown and designated as 4, may have radially extending lugs 41 which fit within corresponding pockets in the base of the porcelain socket, so that to assemble such parts over the bus-bars it is merely necessary to place the porcelain socket over the brass shell and secure the former in place, thereby simultaneously affixing the latter and forming a rigid structure throughout by a simple operation. Branch line terminals pass into the receptacles of the safety fuse devices, and make direct contact with the brass shell constituting a terminal thereof. The fuse-plugs 6, which constitute another terminal, are affixable within the socket by means of the usual screw threads, so as to be capable of being adjustably pressed with any desired force and through the central contact points 51, into direct contact with the underlying conductor, which in one case will take place through the perforation in the insulating sheath and directly with the exposed part of the bus-bar, as shown to the left of Fig. 1, and in the other, directly with the cross-bar termination within the socket.

Fig. 5 illustrates my invention as embodied in a manner, somewhat reverse to the form just described, wherein the fuse plugs centrally contact directly against the underlying bus-bars or bus-bar extensions, since in the embodiment of Fig. 5 it is the opposite terminal of the safety fuse device, *i. e.*, the brass shell of the receptacle, that contacts with the bus-bars or extensions therefrom. The fuse-plugs, which constitute the other terminal of the safety fuse devices, contact directly with the branch line terminals. This modification possesses certain advantages over the first-mentioned form, as it affords a somewhat better way of making positive and direct contacts between the brass shell, the fuse-plug tip and the branch line terminals, besides having other mechanical and electrical conveniences and excellencies. In this arrangement it will be noted that both terminals of the safety fuse device make the desired and sought for direct contacts with the appropriate conductors, which are the bus-bars on the one hand and the branch line terminals on the other. The shell, which in this construction constitutes one of the terminals of the safety fuse device, is provided with a bottom portion 4' which makes direct contact with the conductor upon which it rests, such portion being inter-

gral with the threaded cylindrical portion. A piece of insulating material 7, placed above such contact portion, separates it from the branch line terminal 6', which passes through an orifice in the side of the receptacle and rests upon such intermediate insulating material 7. The brass shell will preferably also be shaped or cut away to an extent sufficient to insure against any possibility of short circuiting with such branch line terminal 6', which makes its connection with such shell through the superposed fuse-plug, which is supported by such shell and is adapted to be screwed therein to bring its tip (the other terminal of the safety fuse device) into direct contact with the branch line terminal 6'. The connection with the underlying bar is secured through the shell, which is another terminal of the safety fuse device, the bottom portion being maintained against the bar either by the pressure resulting from the attachment of the safety fuse device to the underlying bus-bar, or by affixing such shell directly to the bus-bar by the use of solder, screws, rivets or otherwise, as the preference may dictate.

The operation of the structural embodiment shown by Fig. 5 should be wholly obvious in view of the foregoing disclosure, but it may be conducive to clearness to briefly point out certain of its characteristic features. Each safety fuse device, comprising in the shown embodiment a plug and socket, will be securely positioned so as to directly overlie a bus-bar. By screwing down the plug its tip, which constitutes one terminal of the safety fuse device, will directly abut the branch line terminal. The latter transmits this pressure through an insulating layer to the intumed shell bottom, which constitutes the other terminal of the safety fuse device. The latter terminal in turn abuts directly against an underlying conductor which will be a bus-bar or an extension supported by a bus-bar. Thus it will be seen that by merely screwing down the plug all the contacting surfaces are pressed together with the same force, thereby positively insuring against loose contacts. The branch line terminals are thus clamped between the terminals of the safety fuse device, and in fact all the contacting surfaces will be clamped together in this arrangement. The advantages of the construction will appear to every electrician.

It will thus be seen that I have devised a means well adapted to realize the various objects of my invention.

A panel board constructed as disclosed has but few contacts and interposed conductors. The circuits are all short and direct and many heretofore used parts have been dispensed with. Not only have these improvements been accomplished, but a very compact and highly mechanical struc-

ture has been attained with a concomitant saving of material and space.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a panel board, the combination of fuse plug receptacles, with underlying bus-bars in direct contact with a terminal of each of a number of said receptacles.

2. In a panel board, the combination of fuse plugs and receptacles, with an underlying bus-bar in direct contact with a terminal of each of certain of said receptacles, and a branch line piece leading into and directly contacting with the fuse plug contained in said receptacles.

3. In a panel board, the combination of bus-bars with a fuse plug receptacle comprising a metal shell, said receptacle surrounding one of said bus-bars, a fuse-plug within said shell and providing a terminal spaced away from said shell, a branch line piece in contact with said fuse-plug terminal, and an extension from another bus-bar terminating below the shell of said receptacle and in direct contact therewith.

4. In a panel board, a pair of bus-bars, cross-bars in part underlying one of said bus-bars in direct contact therewith and extending over the other bus-bar and insulated therefrom, and fuse-plug receptacles in direct contact with said cross-bars.

5. In a panel board, the combination with bus-bars of diverse polarity, of cross-bars extending from contact therewith and terminating above the opposite bus-bar and insulated therefrom, safety fuse devices mounted directly over said cross-bar terminations and having terminals exposed and making direct contact therewith, safety fuse devices also mounted upon said bus-bars and having terminals exposed and making direct contact with the underlying bus-bars, and branch line pieces extending into said devices and making direct contact with their other terminals.

6. An electrical switch board comprising, in combination, a plurality of bus-bars, a fuse-plug receptacle resting upon one of said

bus-bars and having a terminal in direct contact with the upper exposed surface thereof, an extension from said bus-bar terminating above another bus-bar but insulated therefrom, and another fuse-plug receptacle mounted over said termination and the underlying bus-bar and having a terminal making direct contact with the upper exposed surface of said termination.

7. In a panel board, the combination with bus-bars and branch line terminals, of a safety fuse-plug and receptacle therefor, the latter comprising a contacting piece extending along its bottom, a piece of insulating material thereabove, and a superposed external circuit lead terminating beneath the fuse plug, whereby the latter may be brought into direct contact therewith.

8. In a device of the class described, a lead, a fuse-plug receptacle surmounting said lead, and providing a terminal contacting said lead, a fuse plug having a terminal opposite the aforesaid terminal a piece of insulating material interposed between said opposite terminals, a conductor intermediate said terminals whereby one of said terminals may be brought into firm contact with said intermediate conductor passing out of said receptacle and the other terminal brought into direct contact with the lead lying beneath said receptacle.

9. A panel board comprising, in combination, a bus-bar, an overlying safety fuse device having a terminal in direct contact with said bus-bar and having another terminal movable toward the former terminal, a conductor between said terminals and in direct contact with the movable terminal, and insulation interposed between said conductor and the first-mentioned terminal.

10. A panel board comprising, in combination, a safety fuse device having two terminals

movable together and adapted to serve as a clamp, a conductor clamped between said terminals and contacting directly with one only of said terminals, and another conductor in direct contact with the other of said terminals.

11. A panel board comprising, in combination, a safety fuse device providing two relatively movable terminals adapted to form a clamp, a conductor clamped between said terminals and directly contacting with one but insulated from the other terminal, and an underlying bus-bar in direct contact with said other terminal.

12. A panel board comprising, in combination, a bus-bar, an overlying conductor insulated therefrom, a superposed safety fuse device providing two terminals adapted to serve as a clamp, one of said terminals being in direct contact with said conductor, and an interposed conductor clamped between said terminals and in direct contact with one only of said terminals.

13. A panel board comprising, in combination, a main line conductor, a surmounting safety fuse device having a terminal in direct contact with said main line conductor and having a vertically adjustable terminal movable toward said other terminal, and a branch line conductor terminating between said terminals in direct contact with said movable terminal but insulated from said other terminal, whereby all of said parts may be clamped together by adjusting said movable terminal.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUBERT KRANTZ

Witnesses:

S. L. WHITLOCK,
J. A. NEWTON.