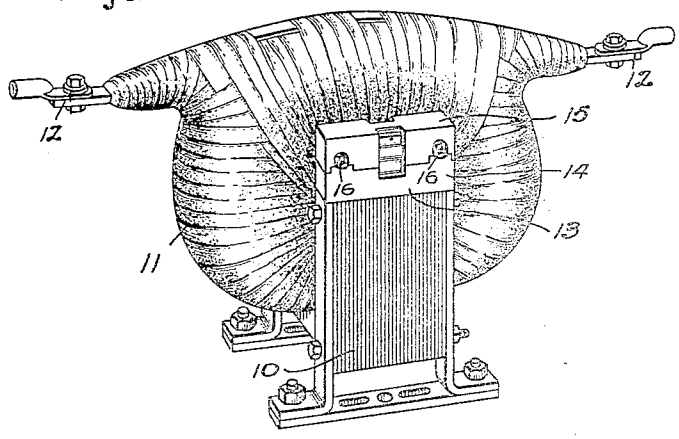
April 24, 1928. 1,667,617

E. J. ZELT

TERMINAL BLOCK FOR CURRENT TRANSFORMERS

Filed Aug. 29, 1927

Fig. 1.



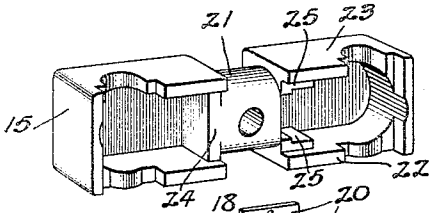


Fig. 2.

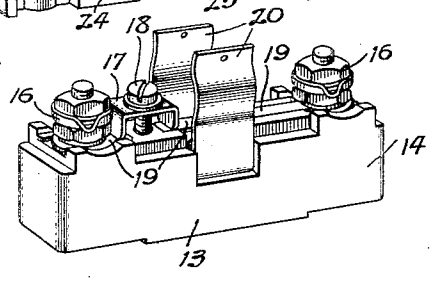
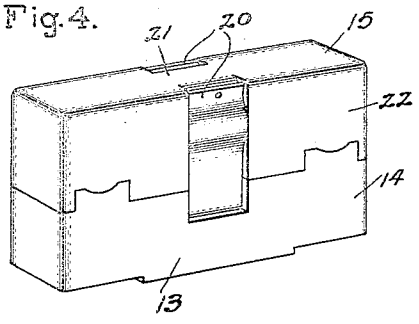


Fig. 4.



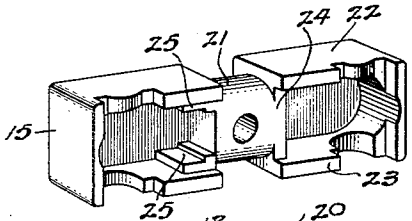


Fig. 3.

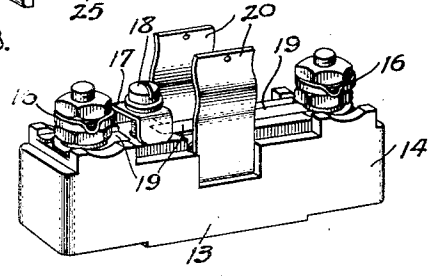
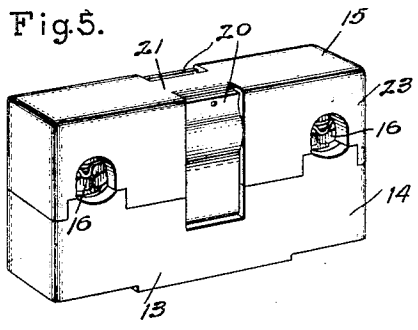


Fig. 5.



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Patented Apr. 24, 1928. 1,667,617

UNITED STATES PATENT OFFICE.

ELMER J. ZELT, OF FORT WAYNE, INDIANA, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TERMINAL BLOCK FOR CURRENT TRANSFORMERS.

Application filed August 29, 1927. Serial No. 216,030.

My invention relates to terminal blocks for current transformers and is particularly applicable in connection with the secondary terminals of a transformer of this type. It is desirable to keep the secondary terminals of a current transformer short circuited whenever they are not connected to some secondary load circuit because if the transformer is excited with the secondary winding open the secondary voltage may reach excessive values and cause injury to the transformer. The reactance of the primary winding is also much higher with the secondary winding open and this reactance may be objectionable in the primary circuit. The short circuit should be removed, however, when a load circuit is connected to the secondary terminals. The general object of the invention is to provide an improved terminal block arranged with a short circuiting device and a cover which cooperate in such manner that the position of the cover is determined by the position of the short circuiting device so that errors in the use of the short circuiting device cannot easily be made. A further object of the invention is to provide a constant current transformer terminal block with a short circuiting device and a cover so arranged that the cover cannot be placed in position with the secondary load circuit connected to the transformer unless the short circuiting device is open so that the load circuit will be supplied properly with current from the transformer.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing in which Fig. 1 shows a current transformer provided with a secondary terminal block constructed in accordance with the invention, Fig. 2 is a perspective front view of the terminal block with the cover removed and with the terminals short circuited; Fig. 3 is a view similar to that shown in Fig. 2 but with the short circuiting device open, Fig. 4 is a perspective rear view of the terminal block with the cover in place, and Fig. 5 is a perspective front view of the terminal block with the cover in place.

Like reference characters indicate similar parts in the different figures of the drawing.

The current transformer shown in Fig. 1 of the drawing includes a magnetic core 10 provided with insulated windings 11, the terminals 12 of the primary winding being arranged for series connection in a primary circuit and the terminals of the secondary winding being supported in a terminal block 13. This terminal block 13 is mounted on the core 10 with its rear face in an inaccessible position close to a portion of the insulated windings 11.

The terminal block 13 includes a base portion 14 and a cover 15 both of suitable insulating material. Two secondary terminals 16 are mounted on the base 14 and the secondary winding is connected to these two terminals 16 at their lower ends which may be reached for this purpose through suitable openings in the rear face of the base 14.

A conductive link 17 is secured to the base 14 by a screw 18 about which the link may be rotated. When the link 17 is in a position lengthwise of the base 14, as shown in Fig. 2, its ends make contact with conductive extensions 19 from the two terminals 16 so that these terminals and thus the secondary winding of the transformer, are short circuited. When the link 17 is in a position transverse to the base 14 as shown in Fig. 3, it is out of contact with the extensions 19 so that it does not short circuit the secondary winding. The link 17 may be secured in desired position by tightening the screw 18.

The base 14 carries a pair of spring clips 20 between which a reduced section 21 of the cover 15 may be forced to secure the cover detachably on the base in position to enclose the terminals 16 and the short circuiting link 17. The cover 15 and base 14 are formed so that the cover may be reversed end for end and placed on the base to enclose the terminals 16 and the short circuiting link 17 with either of the longitudinal side walls 22 and 23 of the cover in front. The particular one of these positions which the cover may occupy or whether it may be placed on the base at all, however is determined by the position of the short circuiting link 17 and the presence or absence of load circuit conductors connected to the terminals 16.

When the short circuiting link 17 is in a

position lengthwise of the base 14 as shown in Fig. 2, so that the terminals 16 are short circuited, the cover 15 cannot be placed in position on the base with its side wall 23 in front because of the cover has a portion 24 which will come against the inner end of the link so that the link, when in this position, will hold the cover away from the base. The link 17 while in this position will not, however, interfere with the cover if the side wall 22 of the cover is in front because there will then be sufficient free space for the link between the side walls. When the link 17 is positioned transversely to the base 14, as shown in Fig. 3, so that it does not short circuit the terminals 16, the cover 15 cannot be placed in position on the base with its side wall 22 in front because the cover has portions 25 which will come against the ends of the link so that the link, when in this position, will hold the cover away from the base. The link 17 while in this transverse position will not, however, interfere with the cover if the side wall 23 of the cover is in front because the link will not be wide enough to reach the portion 24 of the cover nor long enough to reach either of the side walls 22 and 23 of the cover. When the side wall 22 of the cover is in front, as shown in Fig. 4, there is a close fit between this side wall and the base in front of the terminals 16 so that if secondary load conductors are connected to the terminals 16 the cover cannot be placed on the base in this position, the conductors holding the cover away from the base. When the side wall 23 is in front, however, as shown in Figs. 1 and 5, it does not fit the base closely but space is left between this side wall and the base in front of the terminals 16 for secondary load conductors connected to the terminals so that the conductors will not interfere with the cover in this position.

It is generally not safe to connect the primary winding of a current transformer into the primary circuit with the secondary winding open because the secondary voltage may become excessive and injure the insulation. It is therefore customary to keep the secondary winding short circuited until a load circuit has been connected to the secondary terminals. One advantage of the construction which has been described is that the position of the cover 15 is a sure indication of the position of the short circuiting link 17 and therefore of whether or not the secondary winding is short circuited. If the cover is in such position that load conductors cannot be connected to the secondary terminals, then it is certain that the secondary winding is short circuited and the transformer may be safely connected into its primary circuit without removing the cover or further inspecting the transformer to see that it is ready for the primary connection.

Another advantage of the construction is that it is practically impossible to forget to remove the short circuit between the secondary terminals after a load circuit has been connected to them. As has been described, when secondary load conductors are connected to the terminals 16, the cover cannot be placed on the base in any position while the terminals are short circuited. Therefore, after the load circuit has been connected, it is necessary to move the link 17 to open circuit position before the cover can be replaced. The secondary load conductors can be connected, of course, only through the front of the terminal block because the rear face of the block is close to the windings 11 and therefore inaccessible. This practically certain reminder to remove the short circuit from the secondary terminals when the load circuit has been connected is of great advantage because in may cases a current transformer is connected to operate a device such as a protective relay which operates only when the primary current reaches some excessive and dangerous value. Failure of such a device to operate in the secondary circuit is, therefore, no indication that the transformer and secondary load connections have been properly made.

While the principles of the invention have been explained in connection with a particular form of terminal block, it will be apparent that various changes may be made without departing from the scope of the invention as defined in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. A current transformer terminal block comprising a base, secondary terminals and a device for short circuiting said terminals mounted on said base, and a cover formed to fit said base in either of two positions, said short circuiting device being arranged when in short circuiting position to prevent application of said cover to the base in one of its said two positions.

2. A current transformer terminal block comprising a base, secondary terminals and a device for short circuiting said terminals mounted on said base, and a cover formed to fit said base in either of two positions, said cover being formed to conceal said terminals in one of its positions and to expose the terminals in the other of its positions, and said short circuiting device being arranged when in short circuiting position to prevent application of said cover to the base in the position exposing the terminals.

3. A current transformer terminal block comprising a base, secondary terminals and a device for short circuiting said terminals mounted on said base, and a cover formed to fit said base in either of two positions, said short circuiting device being arranged

when in short circuiting position to prevent application of said cover to the base in one of its said two positions, and said cover being formed to be held away from the other of its said positions by conductors connected to said terminals, whereby said short circuiting device must be in open circuit position to permit said cover to be applied to the base while conductors are connected to said terminals.

In witness whereof, I have hereunto set my hand this 24th day of August, 1927.

ELMER J. ZELT.