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COIL FOR ELECTROMAGNETS.

APPLICATION FILED JUNE 4, 1906.

973,838.

Patented Oct. 25, 1910.

Fig. 1.

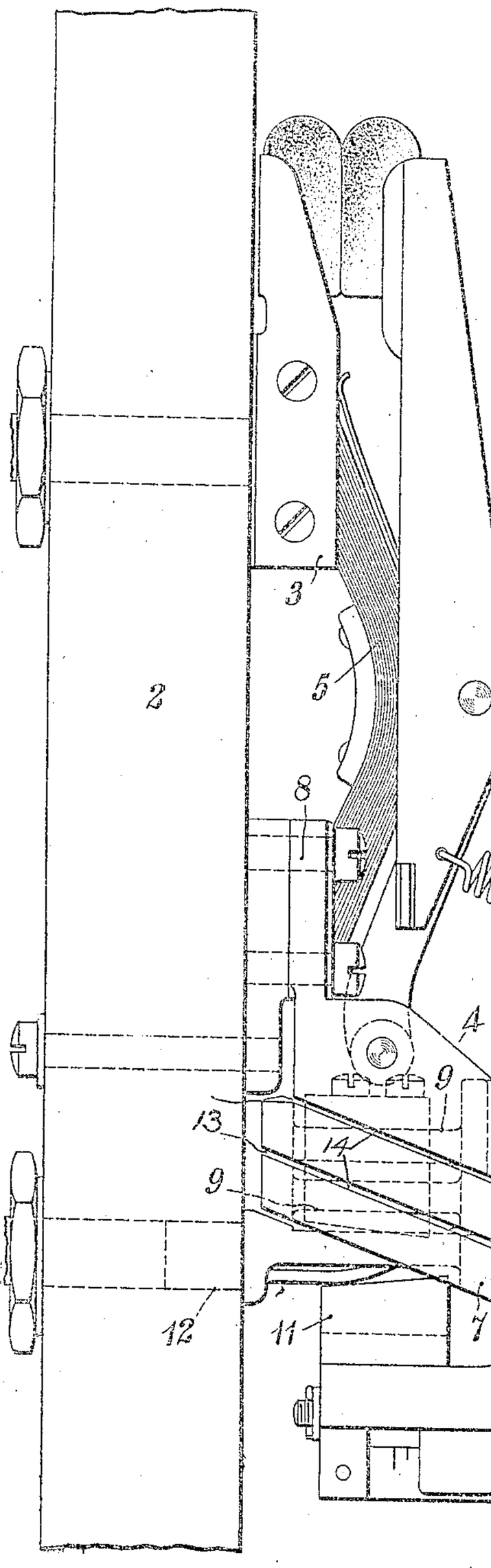


Fig. 2.

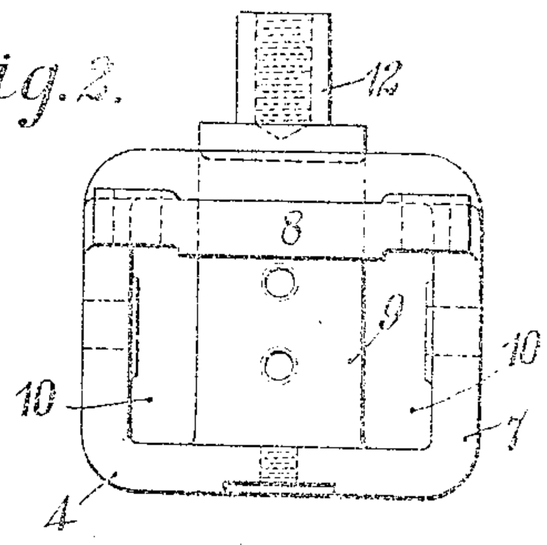
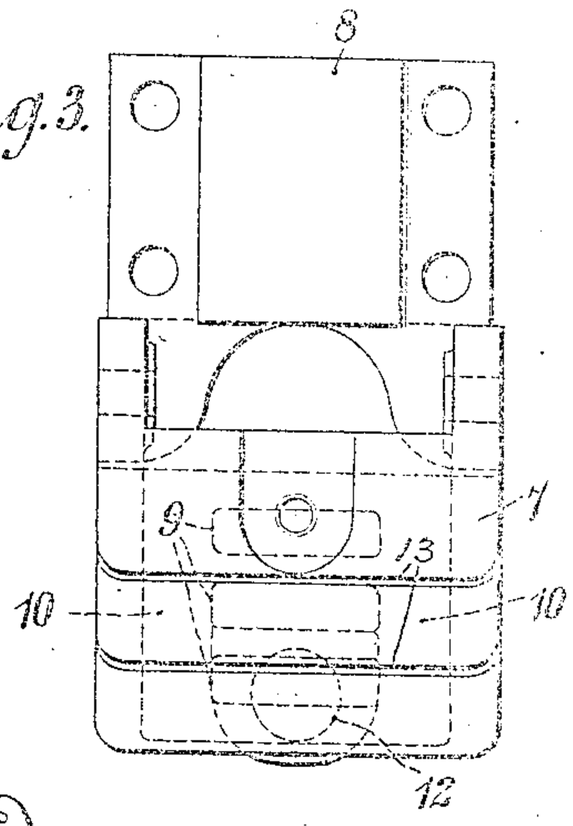


Fig. 3.



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COIL FOR ELECTROMAGNETS.

973,838.

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To all whom it may concern:

Be it known that I, CHRISTIAN AALBORG, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Coils for Electromagnets, of which the following is a specification.

My invention relates to magnetizing coils for electro-magnets and has special reference to such coils as are adapted for use with automatic circuit interrupters.

The object of my invention is to provide a simple and durable coil of the class above indicated which shall be adapted for use with a two-part or U-shaped core member, and the construction of which shall involve a minimum expenditure of labor and material.

Circuit-breakers or similar devices intended for automatically interrupting electric circuits traversed by relatively large current values, have usually been provided with magnet coils which were relatively expensive and difficult to construct and which comprised a number of convolutions formed of large sized rods of conducting material bent into the desired shape.

According to my present invention, I provide a multi-path coil which may be readily constructed and which is adapted for use with a U-shaped magnetizable core.

Figure 1 of the accompanying drawing is a side elevation of a circuit interrupter embodying the magnet coil of my invention, the coil being further disclosed in detail in Figs. 2 and 3.

Referring to the drawings, a circuit interrupter 1 is mounted upon an insulating slab 2 and comprises a stationary contact member 3, an overload release magnet 4, a movable bridging contact member 5 and an operating handle 6. The tripping magnet 4 comprises a coil 7 having a contact projection 8 which is adapted to be engaged by the movable bridging contact member 5 when the circuit interrupter is closed. I deem it unnecessary to further describe the arrangement of parts or the action of the circuit interrupter since they are well known, and the coil may be used with any suitable form of interrupter or for other purposes.

The coil 7 is shown as substantially rectangular in cross-section and as provided with a series of cross webs 9 which connect opposite sides and leave two similar recesses 10 into which the two legs of a U-shaped magnetizable core 11 are drawn when sufficient current traverses the coil. In the center of one side and above the point of connection with the cross webs 9, is located the projection 8 which extends in a line parallel to the axes of the coil. When the circuit interrupter is closed, current is supplied from the stationary contact member 3, through the bridging contact member 5 to the projection 8 and the circuit is continued from this point, as hereinbefore explained, through the coil 7 to a terminal projection 12. This projection is a continuation of the cross web 9, which is farthest removed from the projection 8.

In order to cause the current flowing into the circuit to encircle and energize the magnetizable core members, the casting may be transformed into a series of convolutions by making lateral saw-cuts 13 between the webs 9 and diagonal saw-cuts 14 across the ends which connect the ends of the lateral saw-cut above a given web on one side, with the ends of a similar cut on the opposite side below the same web.

In coils which are adapted for use with very large circuit-breakers, it may be of advantage to core the slots or form them in casting the coil instead of machining or saw-cutting them.

When the completed coil is in use, the electric current enters the projection 8 divides, passes through the upper portion on either side, returns through the upper web in a common path, again divides and passes through the side section of the coil, and so on until it finally passes through the terminal projection 12 from the lowest web.

A coil of this kind is well adapted for use with relatively large values of electric current, since there is no danger of the adjacent convolutions becoming overheated and displaced or moved into engagement with each other.

It is, of course, not essential that the slotted tubular shell, which constitutes the major portion of the coil, should have the cross-sectional form shown in the drawing, and, as regards this and other structural features, it is to be understood that the descriptive terms employed in the foregoing

specification and in the appended claims are not to be construed as imposing limitations which are not demanded by the prior art.

I claim as my invention:

1. A magnet coil comprising a tubular shell and a plurality of webs extending through the shell from side to side, said shell having side slots between the ends of adjacent webs and diagonal slots joining the ends of each side slot with the ends of the next slot in the series at the opposite side of the shell.

2. A multi-path magnet coil comprising a tubular shell of approximately rectangular cross-section and a plurality of webs extending through the shell from side to side, said shell having side slots between the ends of adjacent webs and diagonal slots between the ends of each side slot and a longitudinally offset slot at the opposite side of the shell to form paths of connection between one end of each web and the opposite end of the next adjacent web.

3. A magnet coil comprising a tubular member having substantially parallel cross webs through the center, lateral slots across the sides connected by the web and diagonal slots across the ends adjacent to the connected sides.

4. A magnet coil comprising a tubular member having substantially parallel cross webs through the center, lateral slots across the sides connected by the webs and diagonal slots at both ends which form two paths of connection between one end of each web and the opposite end of the next adjacent web.

5. A magnet coil comprising a tubular shell and a plurality of substantially parallel cross webs extending through the shell from side to side, said shell having side slots between the ends of adjacent webs, diagonal slots in the sides adjacent to those connected by the webs and projections by which the coil is supported and electrically connected in circuit.

6. A multi-path magnet coil comprising a tubular shell and parallel cross-webs connecting its opposite sides, said shell having side slots between the ends of adjacent webs, diagonal slots joining the ends of the side slots to form paths of connection between one end of each web and the opposite end of the next adjacent web, an integral contact projection at one end, and an integral terminal projection at the opposite end.

7. A magnet coil of substantially rectangular contour having a plurality of internal cross pieces, slots between the ends of adjacent cross pieces and diagonal slots that connect the ends of the first-named slots at one side with the ends of corresponding slots in different planes at the other side.

In testimony whereof, I have hereunto subscribed my name this 24th day of May, 1906.

CHRISTIAN AALBORG.

Witnesses:
WM. BRADSHAW,
BIRNEY HINES.