

S. E. JOHANNESSEN.
 TRANSFORMER.
 APPLICATION FILED JAN. 26, 1911.

Patented Dec. 5, 1911.

1,010,500.

Fig. 1.

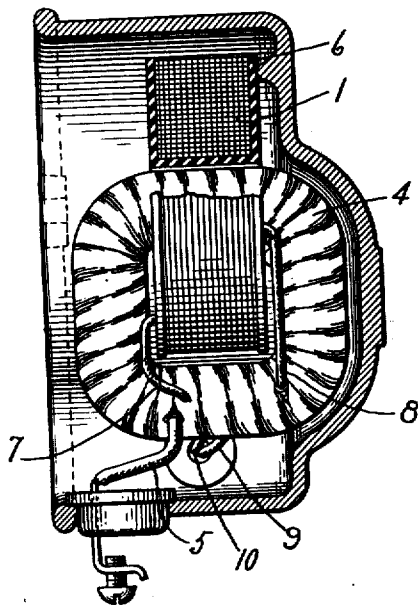


Fig. 2.

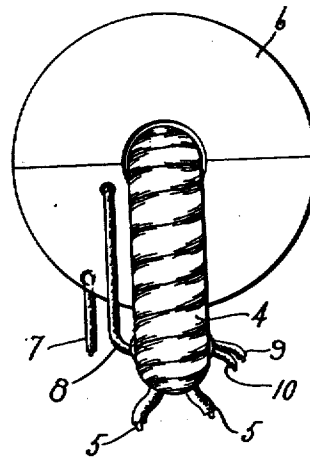
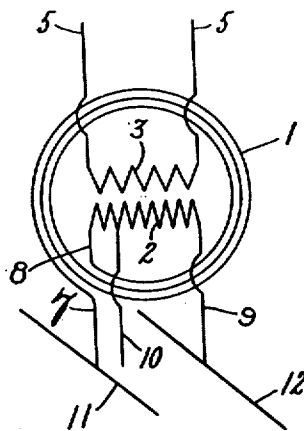


Fig. 3.



Witnesses:
 Earl G. Klock.
 J. Ellis Elen

Inventor:
 Svend E. Johannesen,
 by *Alfred H. Davis*
 His Attorney

UNITED STATES PATENT OFFICE.

SVEND E. JOHANNESSEN, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TRANSFORMER.

1,010,500.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed January 26, 1911. Serial No. 604,706.

To all whom it may concern:

Be it known that I, SVEND E. JOHANNESSEN, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Transformers, of which the following is a specification.

My invention relates to transformers.

It is often desirable to connect a resistance with either the primary or secondary winding.

The primary object of my invention is to so construct a transformer that a part of the transformer itself, the core, may be used as a resistance. I have embodied this idea in a construction herein later described, my object in this device being to provide a "bell-ringing" transformer, the transformer to be used especially in connection with the ordinary lighting or power circuit to supply a current at a voltage suitable for use with door bells or other devices requiring a small amount of energy and wherein the current should be kept within safe limits at all frequencies, even if the secondary be short circuited.

A further object is to so construct this device that it may be used with a direct current supply, in which case a part acts merely as a resistance to lower the voltage to a proper value for door bell use.

In the accompanying drawings, which form a part of this specification and wherein similar reference characters refer to the same parts in all the figures, Figure 1 is a side view partly in section, showing a bell ringing transformer in its case; Fig. 2 shows the transformer removed from its case, and shows the connection of the core in series with one of the windings; Fig. 3 is a diagrammatic view of the connection of the core in series with one of the windings, and also shows a tap from that winding.

According to my invention, the core 1 of the transformer is constructed to present a continuous electric path and on this core the primary and secondary windings are placed in any desired manner. One end of this core path is then connected with the primary winding 2 or the secondary winding 3, as desired. Obviously, it is not necessary that the entire length of iron in the core be used, but the element 1 of the draw-

ing may be regarded as a part only of the whole core of the transformer.

In the construction shown, I have used insulated iron wire for the core, but this is not necessary; any form of core may be used so long as that part which is to be used as the resistance presents a continuous path for the electric current, and is insulated from itself and from adjacent conducting bodies. Thus the laminations commonly used in constructing cores may be used by properly insulating them and connecting them together to form an electrical path.

In the particular construction illustrated, the primary winding 2 has a greater number of turns than the secondary 3 and the two are wound, one on the other, in the coil 4. The terminals 5 of the secondary are shown brought out to suitable binding posts. The cross section of the coil 4 is made as nearly circular as possible, and on which is placed a fiber spool 6, on which is wound a coil of insulated iron wire forming the core 1. One terminal 7 of the iron wire and one terminal 9 of the primary are carried out of the case; the other terminals of the iron and the primary are connected at 8.

When the device is to be used on an alternating current circuit the terminals 7 and 9 are connected to the supply line 11, 12 and the bell or other device to be supplied with energy with its switch is connected to the terminals 5, 5. The resistance of the iron core is sufficient to keep the current at a safe value even though the secondary be short circuited. It may be, however, that the light or power circuit with which the device is to be used carries direct current. To suit such a condition a tap 10 is taken from the primary at a point such that the resistance of the primary between the terminal 9 and the tap 10 is sufficient to lower the voltage to the desired value. In this case the bell and switch are connected in series with this portion of the primary winding across the line 11, 12. It is not absolutely necessary that the tap 10 be so located that a part of the primary winding is used as the D. C. resistance but it is necessary merely that the proper resistance be included between the tap and one of the other terminals.

Thus I have devised a transformer where-

in a part of the transformer itself may be used to replace the resistance which is commonly, entirely separate. Further, that I have applied my invention in this instance, to a bell-ringing transformer and so constructed the transformer that if it is desired by changing the connections a part of the windings may be used as a plain resistance to lower the voltage to the desired value.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention; together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means.

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

1. In a transformer, a winding and a core connected in circuit with the winding to act as a resistance.

2. In a transformer, a winding and a core of insulated wire connected in circuit with the winding to act as a resistance.

3. In a bell ringing transformer, a primary winding, a secondary winding, and a core of insulated wire connected in series with the primary winding.

4. In a bell ringing transformer, a primary winding, a secondary winding, a core of insulated wire in series with the primary and a tap in one of the windings.

5. A device of the character described for use with both direct current and alternating current to reduce the power to desired values comprising a transformer provided with a core of insulated wire, a primary winding in series with the core, a secondary winding and a tap located in one of the windings.

In witness whereof, I have hereunto set my hand this 19 day of Jan., 1911.

SVEND E. JOHANNESEN.

Witnesses:

ROBERT J. CONNOR,
CORLISS E. SEE.