F. A. SWANSON.

PROCESS OF CONSTRUCTING PERMANENT MAGNETS.

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1,432,920. Patented Oct. 24, 1922.

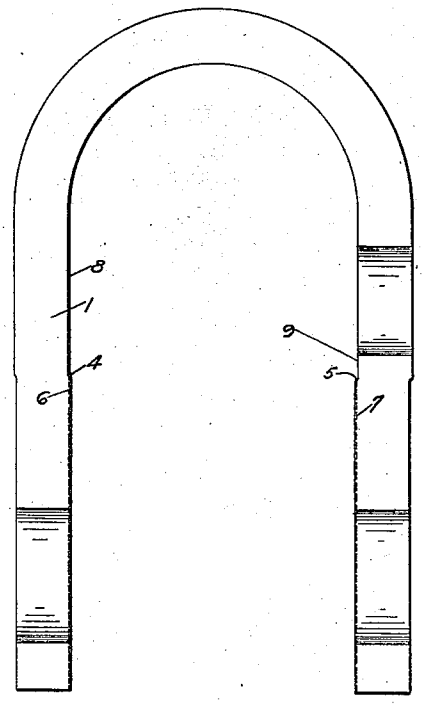


Fig. 1

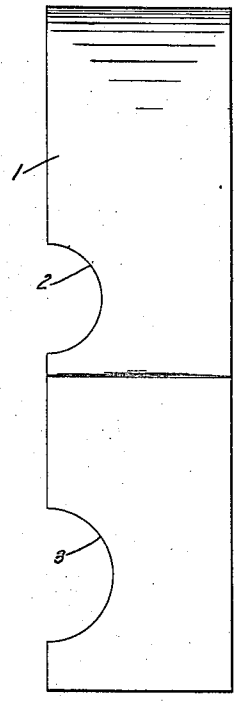
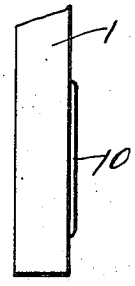


Fig. 2

Fig. 4.



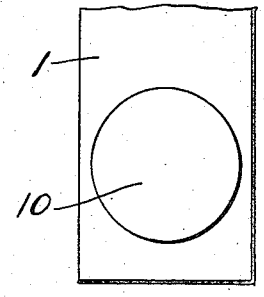


Fig. 3.

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UNITED STATES PATENT OFFICE.

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PROCESS OF CONSTRUCTING PERMANENT MAGNETS.

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To all whom it may concern:

Be it known that I, FRANK A. SWANSON, a citizen of the United States, residing at Newark, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Processes of Constructing Permanent Magnets, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

My invention relates to the process of manufacturing permanent magnets particularly of the type used on magneto generators used for ignition purposes. In generators of this character the magnets are usually of the horseshoe type and are constructed to fit very snugly over magnetic field poles or some member used for collecting the magnetic flux from the magnets and distributing it through the generating coil structure. This means that the distance between the limbs of the magnet must be smooth and accurate so that the said limbs will fit very closely the pole pieces or member as above described. In order to get close fitting magnets it has been customary to form the magnets so that the distance between the limbs is something less than the actual distance to be embraced by the limbs and then grind the interior surface of the said limbs until the proper distance between the limbs is secured. According to past methods it has been customary to grind a much farther distance up on the limbs of the magnet than that embraced by the pole pieces or other member in order to insure that the magnets would go into position. This method of grinding is apt to produce a taper effect, that is to say, the inner ground surfaces would not be parallel thereby making the ends of the limbs a looser fit on the pole pieces than some point farther up, when, as a matter of fact the magnet pole itself is near the end of the limbs where a good contact ought to be secured.

It is the object of my invention to provide a process for making magnets so that the bearing surfaces shall be true and parallel and in which the minimum amount of grinding need be done, with consequent less wear on the grinders with considerable saving in time.

My invention is exemplified in the drawings, in which Figure 1 is a view of the horseshoe magnet illustrating my improved process and Figure 2 is a side view of Figure 1. Figure 3 shows the lower end of one limb of the magnet having a modified construction, while Figure 4 is a side view of Figure 3.

In the drawings 1 illustrates a horseshoe magnet having portions cut out at 2 and 3 for a particular type of magnet. After the magnet has been formed to the U shape and while still hot, or it may be heated again to the desired temperature, it is placed in a proper tool or fixture and operated on by suitable mechanism so that the ends of the limbs are offset towards each other a suitable distance, as at 4 and 5 say from ten to fifteen thousandths of an inch. Preferably both limbs are offset simultaneously by one operation. After the magnets have been hardened they are then placed on a grinder usually of the disc type and part of the offset portions is ground off to a point as illustrated by the dotted lines 6 and 7, which indicate the required distance between the limbs of the magnet, but which are still nearer together than the surfaces 8 and 9 immediately above the ground off portions 6 and 7, in some cases the distances may be the same.

It is to be understood that instead of offsetting the entire end of the limbs of the magnet as shown in the drawing a boss of suitable area may be indented inwardly on each limb at a point substantially near the magnetic poles.

This particular construction is illustrated in Figs. 3 and 4 wherein the portion or boss 10 is indented inward.

In some cases the indentations or offset portions may be made accurately enough so that little or no grinding is necessary but in these cases it is desirable to take the scale, formed during the hardening operation, off by some suitable process, such as sand blasting.

It will be seen by this process that the disc grinders can be operated more advantageously, because the rim of the disc will not be cutting as in the old method, but all the work will be taken on the side of the grinder and the magnet can be moved back and forth very freely and the magnets can be ground to true and accurate parallel surfaces more expeditiously.

Having thus described my improved process, what I claim is:—

1. The process of constructing permanent

magnets, which consists in offsetting the end portion of the magnet and then subsequently grinding down a part of said offset portion to a true surface.

2. The process of constructing permanent horseshoe magnets which consists, in offsetting toward each other end portions of the two limbs of the magnet, then subsequently grinding off on the inner sides a part of said offset portions to parallel surfaces a fixed distance between each other.

3. The process of constructing permanent horseshoe magnets, which consists, in heating the magnets to a suitable temperature, then acting on the ends of the limbs of the magnets with a suitable tool to force the ends of the limbs a certain distance towards each other, then subsequently grinding off on the inner sides a part of the offset portions to true surfaces a fixed distance from each other.

4. The process of constructing permanent horseshoe magnets, which consists, in heating the magnets to a suitable temperature, then acting on the ends of both limbs of the magnet simultaneously with a suitable tool to force the ends of the limbs a certain distance toward each other, then subsequently grinding off on the inner sides a part of the offset portions to true surfaces a fixed distance from each other.

In testimony whereof, I affix my signature.

FRANK A. SWANSON.