April 5, 1932. W. M. BROWN 1,852,502

MEANS FOR CORING KEY WAYS

Filed June 20, 1931

Fig. 1.

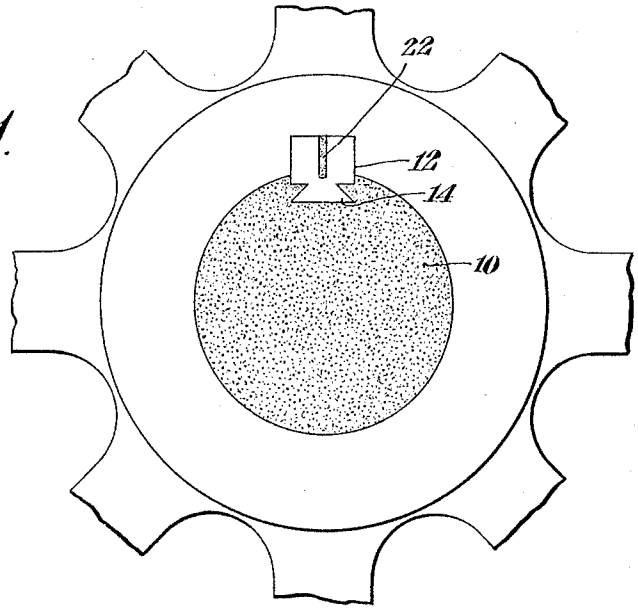


Fig. 2.

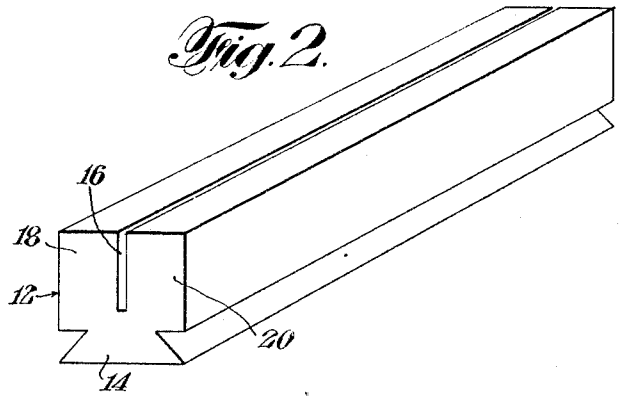


Fig. 4.

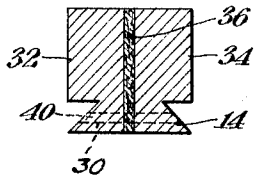
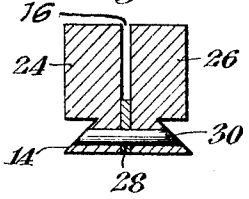


Fig. 3.



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UNITED STATES PATENT OFFICE

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MEANS FOR CORING KEY-WAYS

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This invention relates to improvements in method and means for coring keyways in metal articles such as cast gears, wheels, pulleys or the like. While not limited thereto, the invention is particularly useful in forming keyways in manganese steel castings.

Heretofore the practice has been to form keyways in manganese steel castings by the use of a well known form of sand core with a projecting key part. The old method and means are objectionable because of the difficulty of maintaining sharp square corners on sand cores. With repeated use, the corners of the cores crumble. This results in the production of keyways having irregular or somewhat rounded corners. Before castings, with such imperfect keyways can be used, it was usually necessary to subject the casting to a grinding operation or to a machining operation. In the case of manganese steel castings, it has been customary heretofore to grind the keyway so as to sharply define the corners. But, this is difficult because the corners of the grinding wheel will not stand up in practice. The present invention overcomes these difficulties and provides a method and means whereby castings can be secured with clean sharp corner keyways.

The invention will be fully apparent from the following specification when read in connection with the accompanying drawings and will be defined with particularity in the appended claims.

In the drawings:—

Fig. 1 is a plan view illustrating a casting with a keyway formed therein in accordance with the present invention;

Fig. 2 is a perspective view of a metallic key insert adapted to be secured to a sand core;

Fig. 3 is a cross sectional view illustrating a modified form of key insert;

Fig. 4 is a similar view illustrating a further modification.

In forming keyways in manganese steel or other castings, I provide a sand core 10 to which is secured a metallic key insert 12, the latter having a dove-tail shank portion 14 which is embedded and interlocked with the sand core. Extending longitudinally of the key insert 12, there is a slot or void 16. This slot is adapted to permit the complementary parts 18 and 20 of the insert to approach one another when the metal is cast around the same. In short, by grooving the key insert longitudinally, the same is weakened so that the key can contract.

Prior to pouring the metal to form the casting, the sand core 10 with its insert 12 is positioned in the usual form of mold and suitably held therein. The void or slot 16 is provided with a suitable filling 22 of blacking, sand or other core material adapted to prevent the cast metal from flowing into the slot. After the core with its contractible insert has been positioned within the mold, the molten metal will be poured and thus solidify around the core and the key insert, thus forming a casting of the desired shape with an opening therein shaped to correspond to the shape of the core and the key insert. As the molten metal cools, it shrinks as is well known in the art. This shrinkage of the cooling metal will contract the slotted key insert slightly compressing or crushing the film 22. After the casting has sufficiently solidified, the contracted key insert can be readily driven from the casting. This operation is facilitated because of the slotted or contractible structure of the key insert. If found necessary before driving out the insert, the filling can be removed although generally this will be unnecessary because the material is of a somewhat compressible nature.

The key insert illustrated in Figs. 1 and 2 is formed of a single piece of metal with longitudinal slot or void 16 extending lengthwise thereof. However, in some cases, the key insert may be of two parts, for example, as shown in Fig. 3 wherein the complementary parts 24 and 26 are spaced from one another by a longitudinally extending separator 28, the parts being secured by transversely extending pins 30.

In the modification of Fig. 4, the complementary parts 32 and 34 are separated from one another by a compressible body of asbestos or other material 36 capable of resist-

ing hot metal, the parts being held in assembled relationship by transversely extending pins or rivets, indicated at 40.

While I have described the invention with particular reference to the formation of castings of manganese steel for which it is particularly suited, it is not to be construed that I am limited thereto since various modifications and substitutions of equivalents may be made by those skilled in the art without departing from the invention as defined in the appended claims.

What I claim is:—

1. A device of the character described comprising a core and a key insert having a dovetailed portion secured to a core, said key insert having a longitudinally extending void and a filling of crushable material therein.

2. A device of the character described comprising a core having a metal key insert secured thereto, which is longitudinally weakened to render the insert transversely contractible said key insert having a shank portion embedded and interlocked in said sand core.

3. A device of the character described comprising a sand core having a metal key insert secured thereto, which is provided with a longitudinally extending void adapted to render the insert transversely contractible, said key insert having a dove-tail shank embedded in said sand core.

4. A device of the character described comprising a key insert adapted to be secured to a core, said insert comprising two complementary parts secured to one another with a separator between them.

In witness whereof, I have hereunto signed my name.

WILLIAM MILTON BROWN.