F. HACHMANN.

CASTING MOLD.

APPLICATION FILED APR. 2, 1917. RENEWED APR. 17, 1920.

1,356,712.

Patented Oct. 26, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

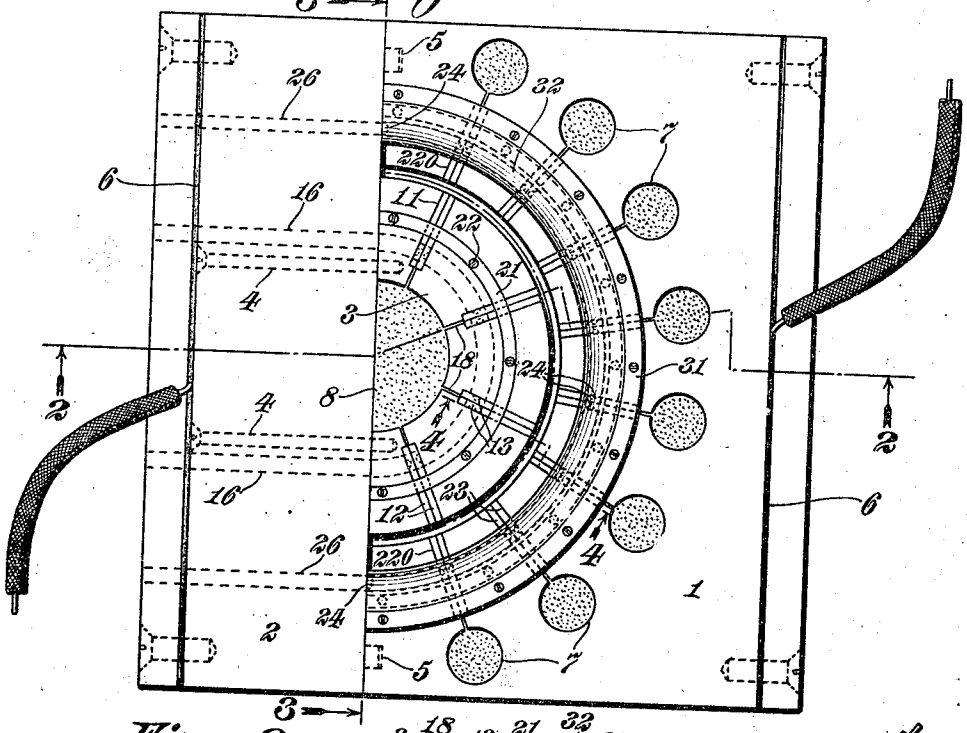
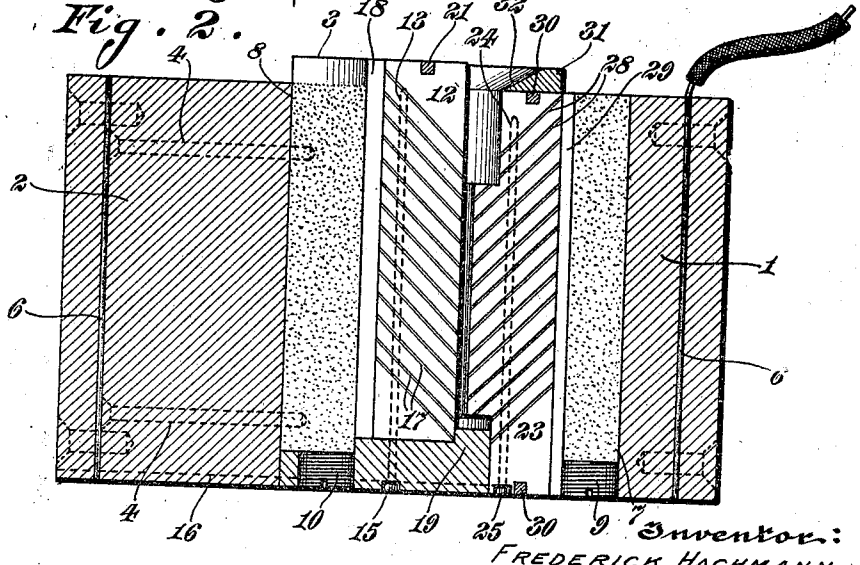


Fig. 2.



Inventor:
FREDERICK HACHMANN,
By John N. Bruninga.
His Attorney.

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2 SHEETS—SHEET 2.

Fig. 3.

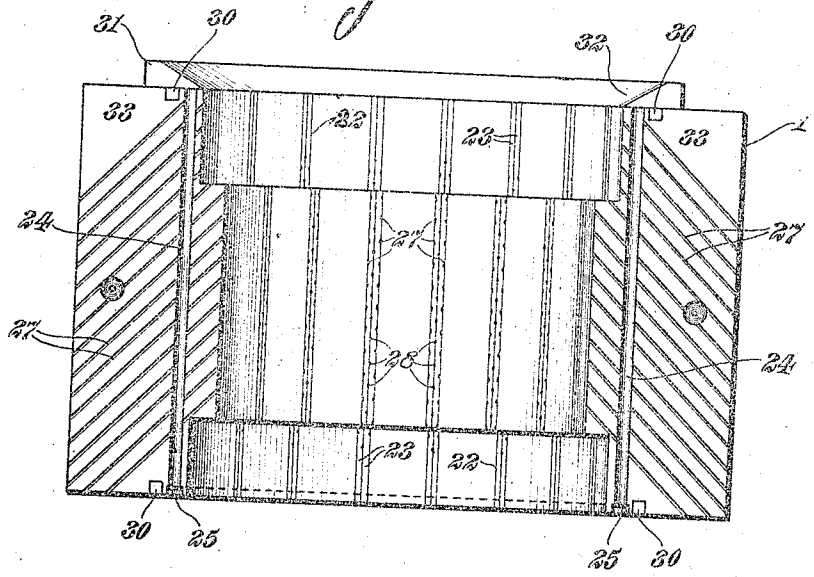


Fig. 4.

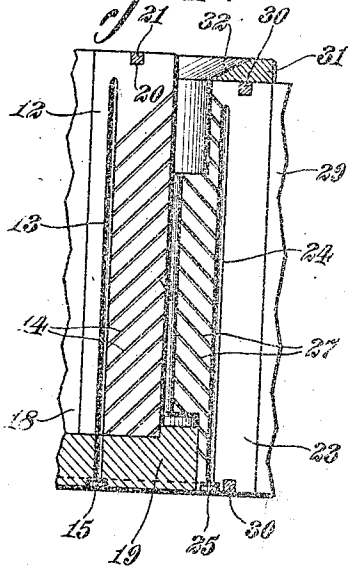


Fig. 5

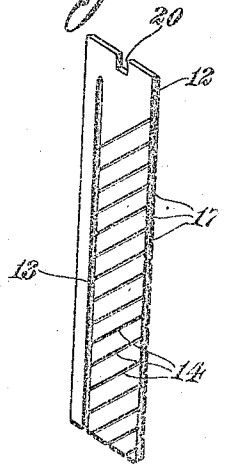
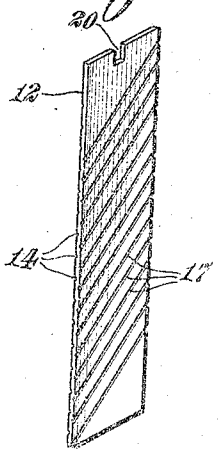


Fig. 6



Inventor:
FREDERICK HACHMANN,
By John N. Bruninga.
His Attorney.

UNITED STATES PATENT OFFICE.

FREDERICK HACHMANN, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-FOURTH TO JOHN A. DOWDALL AND ONE-FOURTH TO BERNARD GREENSFELDER, BOTH OF ST. LOUIS, MISSOURI, AND ONE-HALF TO NATIONAL METAL DIE MOLD COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

CASTING-MOLD.

1,356,712. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed April 2, 1917, Serial No. 159,237. Renewed April 17, 1920. Serial No. 374,751.

To all whom it may concern:

Be it known that I, FREDERICK HACHMANN, a citizen of the United States, and residing at St. Louis, Missouri, have invented the new and useful Improvement in Casting-Molds, of which the following is a specification.

This invention relates to casting molds, and more particularly to molds for casting metals.

In application Serial No. 159,236, filed April 2, 1917, executed of even date herewith, there is described a casting mold, provided with venting passages to insure withdrawal of the gases from the mold cavity, and provided with lubricant conducting passages adapted to supply to and maintain on the walls of the mold cavity, a lubricant, so as to prevent adhesion of the metal to the mold. In the particular embodiment described in said application, these passages are formed in the body of the mold; it is, therefore, necessary to subdivide the mold into a series of blocks in order that the small passages may be cut into the faces of the blocks. Such a construction is, however, expensive, difficult to make, and difficult to keep in repair.

Some of the objects of this invention, therefore, are to develop a casting mold of the above type, in which the venting and lubricating passages are formed in such a manner as to cheapen the construction of the mold, and so as to permit accurate and reliable operation.

Further objects will appear from the detail description taken in connection with the accompanying drawing, in which,

Figure 1 is a plan of a mold embodying this invention;

Fig. 2 is a section on the line 2—2, Fig. 1;

Fig. 3 is an elevation of one of the mold sections, taken on the line 3—3, Fig. 1;

Fig. 4 is a section on the line 4—4, Fig. 1; and,

Figs. 5 and 6 are details of one of the venting elements or plates.

In accordance with this invention, the venting and lubricating passages are formed in separate elements or plates, which are set into the mold body. These plates are arranged in pairs with the venting passages formed in the outside faces, and with the lubricating passages formed in the inside faces of these plates or elements. In order to secure these plates in position, there is provided for each set of plates, a locking bar set into the mold body and the ends of the plates, so as to securely retain these plates in coöperative relation. The lubricant-receiving pockets formed in the mold body are open ended, and closed at their lower ends by plugs, so as to permit the lubricant and its vehicle to be readily removed therefrom.

Referring now to the accompanying drawings, 1 and 2 designate mold sections, which are formed to provide a mold cavity of the shape of the casting to be produced, this casting being, in this case, one-half of a bearing. In the construction of the section 2, the semi-circular part 3 is attached thereto by suitable screws 4. The mold sections are held in coöperative relation by dowels 5, and each section is provided with an electrical heating element 6, as in the application referred to.

Formed in the mold section 1, and spaced around the mold cavity, so as to follow the contour thereof, is a series of pockets 7, adapted to receive the lubricant, such as oil, and the lubricant-carrying vehicle, which, as in the application referred to, is a granular porous carbon free from graphite. Formed in the mold section 2 is a central pocket 8 for also receiving the lubricant and its vehicle. The pockets are open at their lower ends, and are closed by plugs 9 and 10 respectively, so as to permit the bottoms to be opened in order to facilitate removal of the lubricant and its vehicle, this being accomplished by blowing the carbon out with an air-blast.

Formed in the mold section 2 is a series of slots 11, adapted to receive plates 12, shown in Figs. 5 and 6. Each of these plates has formed in the outside surface thereof, a vertical channel 13, and a series of downwardly directed capillary grooves 14, leading from the mold cavity to the channel 13. The channels 13 in the different plates discharge into a semi-circular channel 15, which

connects at its ends with channel 16, running to the outside of the mold section 2, so as to be in free communication with the outside air. The inside or engaging faces of the plates 12, have formed therein, upwardly extending grooves 17, the grooves in a pair of plates forming capillary lubricant-conducting channels extending downwardly from the pocket 8 to the mold cavity. Formed in the part 3 of the mold section 2 is a series of slits 18, leading from the junction of the plates 12 to the pocket 8, so as to form continuations of the channel 17. There is thus formed a series of downwardly directed lubricant-conducting channels between the pocket and the mold cavity, as clearly shown in Fig. 2. In order to retain the plates 12 in place in the mold section 2, the lower part of this section is undercut, as shown at 19, Fig. 2, to form a shoulder which is adapted to retain the lower ends of these plates in position. The upper ends of the plates are notched, as shown at 20, Figs. 5 and 6, and the part 3 of the mold section 2, has a groove cut therein, adapted to receive a semi-circular bar 21, which is set into that part and into the notches 20, formed in the ends of the plates 12, and this bar is retained in position by screws 22. The plates are thus firmly held in coöperative relation in the mold sections.

Set into slots 220 in the mold section 1 are plates 23, which are similar in construction to plates 12. The outside faces of these plates 23 have formed therein, vertical channels 24, leading into a circular channel 25, connected by channels 26 with the outside air, and these outside faces have also formed therein, downwardly extending capillary venting passages 27, connecting the mold cavity with these vertical venting channels 24. The inside engaging faces of the plates 23, have also formed therein, alining capillary lubricant-conducting passages 28, which connect the mold cavity with slots 29, leading to the pockets 7, so as to connect the mold cavity with these pockets. In this case, both the upper and lower faces of the mold section 1 are channeled or cut, and both ends of the plates 23 are notched to receive rings 30, which are secured in position by screws 31, so as to securely lock the plates 23 in coöperative relation in the mold section. In order to provide for a gate, the top of the mold has attached thereto, a plate 31, which is beveled, as shown at 32, so as to permit ready entrance of the metal. The faces 33 of section 1 are also provided with capillary venting passages 27 and channels 24, the latter discharging into the channels 25.

In the construction of these mold sections, the mold section bodies are finished approximately to form, and slotted to receive the plates 12 and 23. These plates are then grooved and set in position in their slots, and locked in position by their retaining bars. The whole is then finished, so as to form smooth inside mold cavity faces. The plates are then again removed and carefully cleaned, so as to remove burs, and so as to insure that the capillary passages 14, 17, 27 and 28, will be open and unobstructed; the plates are then replaced.

The operation and utility of the mold in casting will, of course, be obvious from the application referred to. The pockets containing the lubricant retaining vehicle are filled with the lubricant, such as a high flash point mineral oil, and this lubricant is also preliminarily applied to the inside faces of the mold, in any suitable manner. It will, of course, be understood that the mold sections are heated by passing current through the electrical heating element, so as to raise the temperature of the mold to a point suitable for casting. As the metal is poured into the mold, the air and other gases escape through the venting passages, so as to produce a clean casting. To lubricant is, of course, maintained on the faces of the mold cavity, so as to replace the lubricant volatilized during the casting operation. Adherence of the casting to the mold is, therefore, prevented.

With this construction, the cost of producing the mold is very much reduced, as the plates 12 and 23 can be readily formed by machines to accurate form. The mold, moreover, is of rugged and solid construction, and will last practically indefinitely. The utmost accuracy can be obtained with this construction. The construction of the carbon pockets, permitting ready removal of the spent carbon, is advantageous, since such carbon must be removed at intervals.

It is obvious that various changes may be made in the details of construction without departing from the spirit of this invention. It is, therefore, to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention, what is claimed is:

1. A casting mold, comprising, a mold body having a cavity adapted to form a casting, an element constructed and arranged in said body to form venting means, adapted to insure escape of the gases from said cavity during the casting operation, and a series of lubricant passages in said element adapted to conduct a lubricant to the walls of said cavity.

2. A casting mold, comprising, a mold body having a cavity adapted to form a casting, a series of elements constructed and arranged in said body to form venting means adapted to insure escape of the gases from said cavity during the casting operation, and a series of passages in said ele-

ments adapted to apply lubricant to the walls of said cavity.

3. A casting mold, comprising, a mold body having a cavity adapted to form a casting, a series of elements constructed and arranged in said body to form venting means, adapted to insure escape of the gases from said cavity during the casting operation, passages in said elements adapted to apply a lubricant to the walls of said cavity, and means for locking said elements in position.

4. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and an element constructed and arranged in said body to form lubricant-conducting passages leading to said cavity, adapted to apply a lubricant to the walls of said cavity.

5. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and a plate arranged in said body and grooved to provide passages connected with said cavity, certain of said passages being adapted to insure escape of the gases from said cavity during the casting operation, and certain of said passages being adapted to apply lubricant to the walls of said cavity, substantially as and for the purpose set forth.

6. A casting mold comprising, a mold body having a cavity adapted to form a casting, and a plate arranged in said body and grooved on its opposite faces to provide passages connected with said cavity substantially as and for the purpose set forth.

7. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and a plate arranged in said body and having on one face downwardly extending grooves and having on the other face upwardly extending grooves, arranged to provide passages connected with said cavity, substantially as and for the purpose set forth.

8. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and a plate arranged in said body and having an outlet channel and having grooves connecting said cavity with said channel, constructed and arranged to form venting passages and adapted to insure withdrawal of the gases from said cavity during the casting operation.

9. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and a pair of plates arranged side by side in said body and having series of grooves therein to form passages connected with said cavity, substantially as and for the purpose set forth.

10. A casting mold, comprising, a mold body having a cavity adapted to form a casting, a pair of plates arranged side by side in said body and having series of grooves therein to form passages connected with said cavity, and means for locking said plates in position.

11. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and a pair of plates, grooved on their engaging faces, and arranged in said body to form passages connected with said cavity.

12. A casting mold, comprising, a mold body having a cavity adapted to form a casting, and a pair of plates arranged in said body, said plates being grooved on their engaging faces and grooved on their outside faces to form passages connecting with said cavity.

13. A casting mold, comprising, a mold body having a cavity adapted to form a casting, said body having a pocket adapted to receive a lubricant, and an element constructed and arranged in said body to form passages connecting said cavity with said pocket.

14. A casting mold, comprising, a mold body having a cavity adapted to form a casting, said body having a pocket adapted to receive a lubricant, and a plate arranged in said body, said plate being grooved to form passages connecting said cavity with said pocket.

15. A casting mold, comprising, a mold body having a cavity adapted to form a casting, said body having a pocket adapted to receive a lubricant, and a pair of plates arranged in said body, said plates being grooved on their engaging faces to form passages connecting said cavity with said pocket.

16. A casting mold, comprising, a mold body having a cavity adapted to form a casting, said body having an air channel and having a pocket adapted to receive a lubricant, and a plate arranged in said body, said plate being grooved on one face to provide venting passages connecting said cavity with said channel, and said plate being grooved on the other face to form passages connecting said cavity with said pocket.

17. A casting mold, comprising, a mold body having a cavity adapted to form a casting, said body having an air channel and having a pocket adapted to receive a lubricant, and a pair of plates arranged in said body, said plates being grooved on their engaging faces to form venting passages connecting said cavity with said channel, and said plates being grooved on their outside faces to form passages connecting said cavity with said pocket.

18. A casting mold, comprising, a mold body having a cavity adapted to form a casting, a series of plates constructed and arranged in said body to form passages connected with said cavity, and a bar adapted to retain said plates in coöperative relation.

19. A casting mold, comprising, a mold

body having a cavity adapted to form a casting, a series of plates constructed and arranged in said body to form passages connected with said cavity, and a bar set into said body and into the ends of said plates, adapted to retain said plates in coöperative relation.

20. A casting mold, comprising, a mold body having a cavity adapted to form a casting, said body having an open ended pocket adapted to receive a lubricant, a plug for said pocket, and passages connecting said cavity with said pocket.

21. A casting mold, comprising a mold body having a cavity adapted to form a casting, a lubricant receptacle in the mold body, and passages from said receptacle through the mold wall and opening into the mold cavity for conducting the lubricant to the wall of the mold cavity.

22. A casting mold, comprising a mold body having a cavity adapted to form a casting, a plurality of passages through the mold wall for conducting lubricant to the wall of the mold cavity, and a receptacle arranged to discharge lubricant into said passages.

In testimony whereof I affix my signature this 31st day of March, 1917.

FREDERICK HACHMANN.