W. KURZE.

MOLDING BOX.

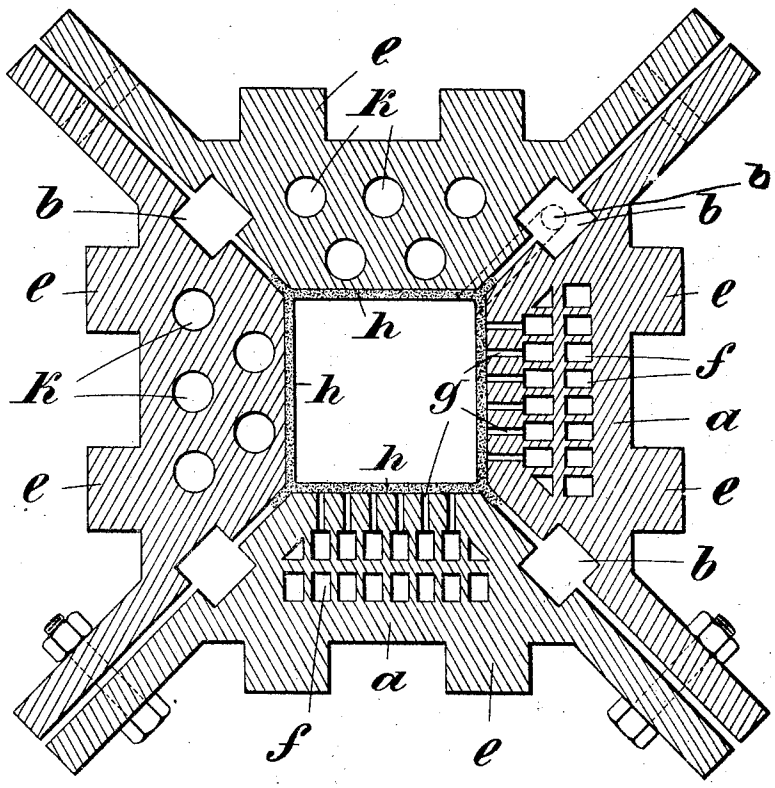
APPLICATION FILED APR. 4, 1911.

1,094,447.

Patented Apr. 28, 1914.

4 SHEETS—SHEET 1.

Fig. 1.



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Ray J. Ernst

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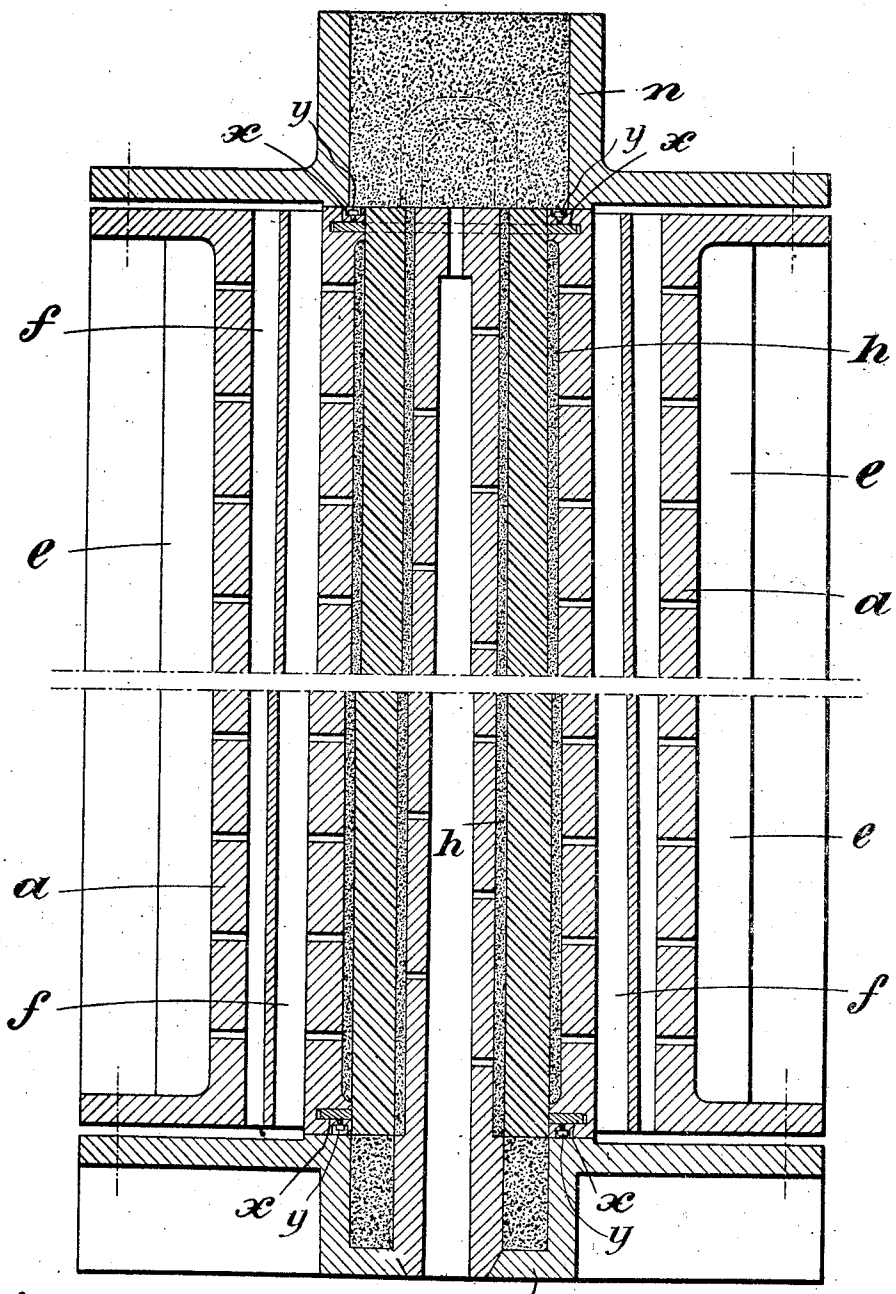
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4 SHEETS—SHEET 2.

Fig. 2.



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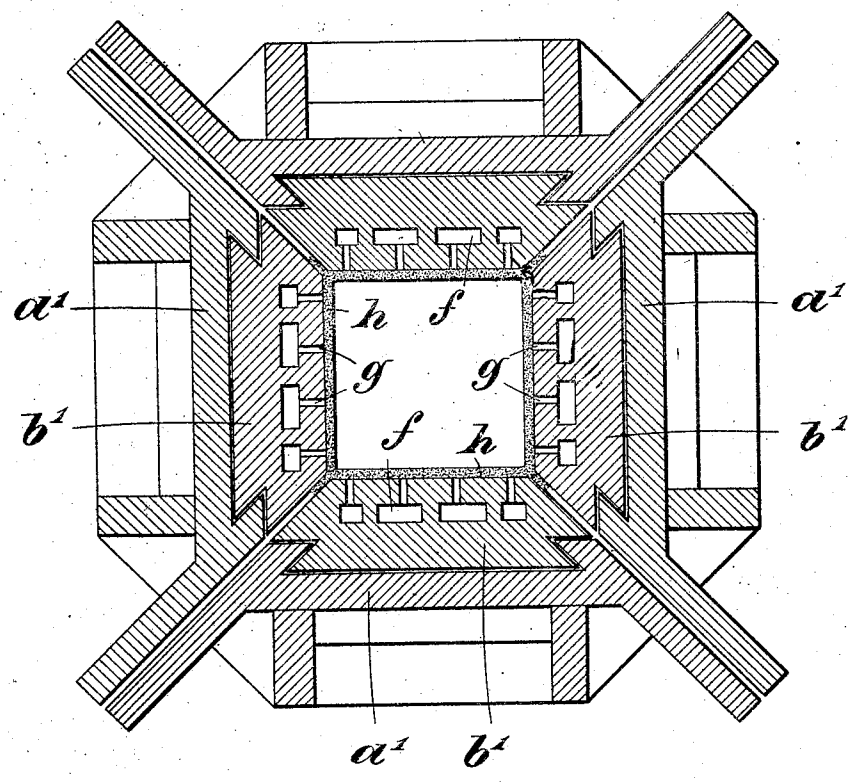
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4 SHEETS—SHEET 3.

Fig. 3.



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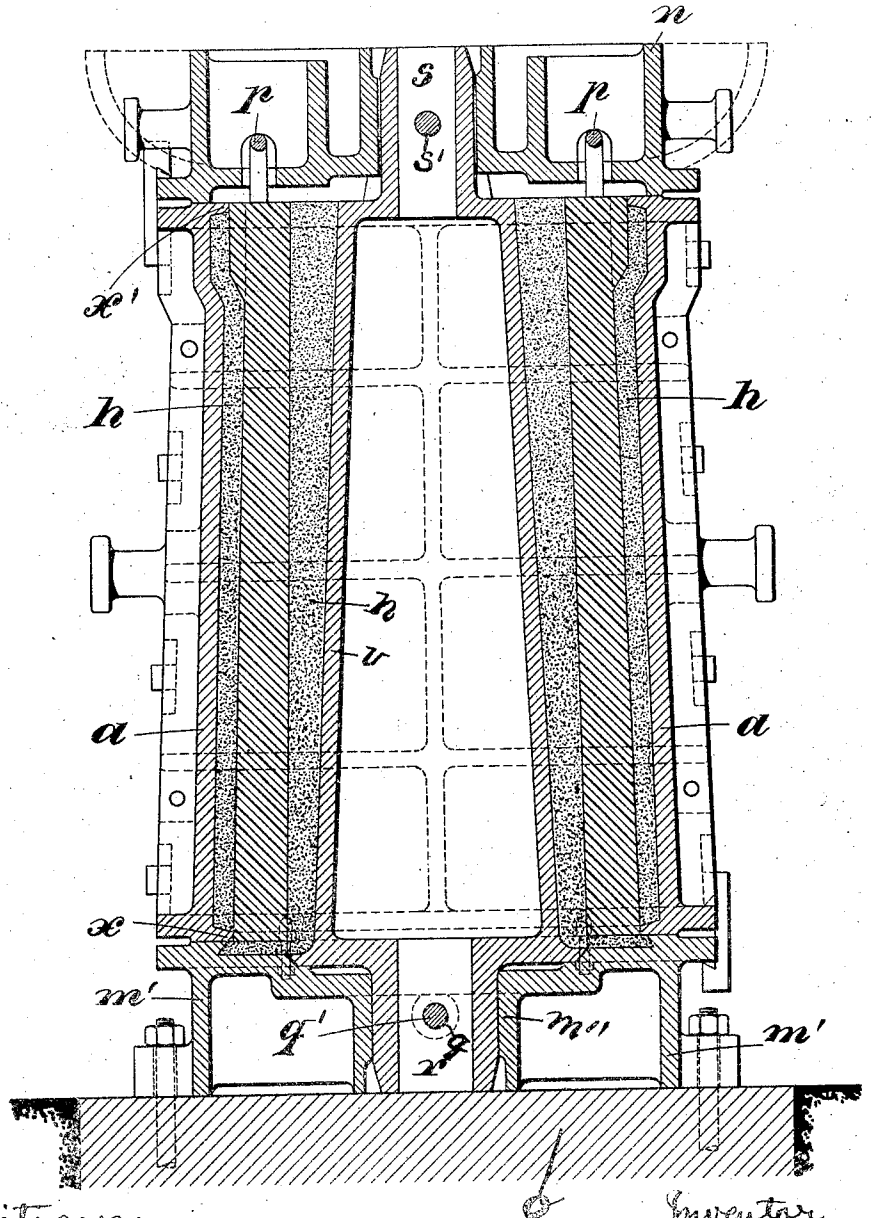
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1,094,447.

Patented Apr. 28, 1914.

4 SHEETS--SHEET 4.

Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

WILHELM KURZE, OF WILHELMSHÜTTE, NEUSTADT-ON-THE-RÜBENBERGE, GERMANY.

MOLDING-BOX.

1,094,447. Specification of Letters Patent. **Patented Apr. 28, 1914.**

Application filed April 4, 1911. Serial No. 618,913.

To all whom it may concern:

Be it known that I, WILHELM KURZE, a resident of Wilhelmshütte, Neustadt-on-the-Rübenberge, a subject of the King of Prussia, and whose post-office address is Wilhelmshütte, Neustadt-on-the-Rübenberge, near Hanover, Kingdom of Prussia, German Empire, have invented new and useful Improvements in or Relating to Molding-Boxes, of which the following is a specification.

This invention relates to a metal-molding box to be used more particularly in the manufacture of soft castings. The molds hitherto used for the same purpose, having the molding sand firmly rammed around the model employed increase the cost of the casting to be produced owing to the necessity of a model and in consequence of the work involved in producing the casting. In order to replace the model which up to the present could not be dispensed with use is made according to the present invention of a metal-molding box, the interior or cavity of which does not precisely correspond with the casting to be produced but is slightly larger than the latter. In the interior of the metal-molding box small ribs or ledges are provided which determine the precise shape and size of the casting to be produced and between which a lining or coating substance is placed. This substance is smoothed preferably with the aid of a plane by sliding it across the ledges. These ledges which by preference are arranged at the upper and lower end of the molding box may if desired be movable so as to enable castings of different sizes to be produced in one and the same molding box. Arranged in the walls of the metal-molding box which preferably consists of several parts are appropriate passages, adapted to receive and to discharge the gases from the lining or coating substance through transverse passages. In order to still further facilitate the handling and assembling of the individual parts of the box its individual parts may also be composed of two or several preferably plate-shaped sections. By this arrangement the release of a casting after the casting operation is considerably simplified since only the inner plate-shaped sections of the individual box portions need be removed. In a construction of this kind the cooling passages are arranged in the inner sections and receive and discharge the gases through transverse passages.

In the drawings three constructional forms of the invention are illustrated.

Figure 1 is a transverse section of one form of the metal-molding box. Fig. 2 a longitudinal section of the same with the core shown inserted. Fig. 3 represents the second constructional form in which each box part is composed of two plate-shaped sections, and Fig. 4 shows a further modification of a complete molding flask with the core in inserted position.

In the construction illustrated in Figs. 1 and 2 the molding box consists of four mantle portions a and its cavity does not precisely correspond to the casting to be produced, but is slightly larger than the latter. The individual parts of the molding box may be of any desired form. Arranged in their interior by preference at the upper and lower end are small projecting ledges or ribs x (Fig. 2) determining the precise shape of the casting to be produced. Between these ribs an appropriate coating or lining substance h is applied. This lining has a thickness of about 15 to 20 mm., and is smoothed by means of a plane operated over the ribs x. The ribs x may be movable in the interior of the molding box by any suitable means known in the art, for instance as shown in Fig. 2, where the ribs are held in slots in adjusted position by means of set screws "y". By thus moving the ribs at right angles to the central axis of the molding box the thickness of the lining substance employed between the ribs and consequently the size of the casting to be produced may be varied. The adjustment and displacement of the ribs in the metal molding box may be effected in any appropriate manner. Arranged in the individual parts of the molding box and extending in axial direction are passages f adapted to receive and to discharge the gases from the lining substance h through transverse passages g thereby serving for cooling the individual parts of the mantle a. Of course the shape and size of the passages f may be varied at will. By preference the lining substance arranged between the ribs x consists of sand and linseed oil, but it may be constituted by other material such as clay, loam or the like. The individual parts of the molding box may be assem-

bled and held in position in any appropriate manner and in order to counteract their mutual displacement or deformation, reinforcing ribs *e* or the like may be arranged on their outer faces.

In the constructional form shown in Fig. 3, the metal-molding box consists likewise of four parts of which each is composed of two plate-shaped sections a^1 b^1. The contacting surfaces of these sections are substantially parallel with the inner molding walls. The connection of the two plate-shaped sections a^1 b^1 may be effected in any desired manner. In the example shown the section a^1 is provided with a dovetailed groove adapted to engage with a correspondingly shaped projection on the section b^1.

The cooling passages *f* adapted to receive and to discharge the gases are arranged in the inner sections b^1. In this case of course the shape and size of the cooling and transverse passages may also be varied at will. For the purpose of releasing a finished casting or of smoothing or replenishing the coating substance it is thus only necessary to withdraw the inner sections b^1 from the outer sections a^1 and then to re-assemble these sections. The core used in the metal-molding box as shown in Fig. 2 is coated in the usual manner with a layer of a lining substance and is supported and guided in the lower box portion *m* by means of an appropriate projection. The upper box portion *n* is rammed with molding sand in the usual manner and provided with intakes molded in the sand as known in the art. These intake openings which are omitted in Fig. 2 as obvious expedients, may if desired lead to the vertical channels *b* (Fig. 1) and within these channels the metal may be conducted to passage *b'*, leading to the interior of the mold.

The construction of the modification shown in Fig. 4 is substantially the same as that illustrated in Figs. 1 to 3. In this case, however, the lower box portion *m'* is secured by means of screws or the like to a suitable base or foundation *o*. The central box portion has a slightly larger diameter than the casting to be produced, and as in the modification described with reference to Figs. 1 to 3 the shell or mantle *a* is provided with ribs *x'* between which the lining *h* is applied to the mantle and smoothed by means of suitable tools. A metal core *v* provided likewise with suitable coating or lining *h* is shown inserted in the mold. The mantle portion *a* may consist of several sections if desired, which are suitably connected with each other in any manner known in the art in case longer articles are cast. The lower end of core *v* is provided with an extension *r* of small diameter, which is seated in the central portion *m''* of the base *m'*. Extension *r* is provided with a transverse boring *q* which registers with a corresponding boring in portion *m''* and through both borings a pin *q'* is passed whereby the core is held rigidly attached to the base *m'*. In similar manner a projection *s* is provided at the upper end of the core, which rests in the top portion *n'* of the mold, with which it is rigidly connected by transverse pin *s'*. The two extensions *r* and *s* prevent the core from lateral and upward displacement during the casting. Preferably a number of shackles or staples *p* are fastened to the top *n* so that they protrude with their free ends into the mold. When the metal fills the mold the staples *p* thereby weld to the metal and form convenient eyes by which the casting may be lifted from the mold.

With the aid of the metal molding box according to this invention all possible castings may be produced such as for instance rolling ingots, pipes or the like.

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

1. In a metal molding box the combination of a plurality of box parts, each being composed of several sections and adjustable ribs on the inner sections of the box parts, for determining the precise shape of the casting.

2. In a metal molding box the combination of a plurality of box parts, each being composed of two plate-shaped sections, the contacting faces of which are substantially parallel with the inner walls of the molding box and adjustable ribs on the inner sections of the box parts, for determining the precise shape of the casting.

3. In a metal molding box the combination of a plurality of box parts, each being composed of two plate-shaped sections, the contacting faces of which are substantially parallel with the inner walls of the molding box formed by one of said sections, cooling passages and transverse passages in the inner sections of the box parts for receiving and discharging the gases and ribs on the inner sections, substantially as described.

4. In a metal molding box the combination of a plurality of box parts, each being composed of several sections, transverse passages extending through the inner and outer sections of the box parts for receiving and discharging the gases and ribs on the said inner sections, substantially as described.

5. In a metal molding box the combination of a plurality of box parts, ribs on each of said parts, longitudinal passages and transverse passages in said parts, an upper box portion and a lower box portion and a metal core with projections adapted to engage with corresponding openings in the said upper and lower box portions, substantially as described.

6. In a metal molding box the combina-

tion of a plurality of box parts, each being composed of several sections, cooling passages and transverse passages in the inner sections of the box parts for receiving and discharging the gases, ribs on the said inner sections, an upper box portion and a lower box portion and a metal core with projections adapted to engage with corresponding openings in the said upper and lower box portions, substantially as described.

7. In a metal molding box the combination of a plurality of box parts, each of which being composed of two plate-shaped sections, the contacting faces of which are substantially parallel with the inner walls of the molding box formed by one of said sections, cooling passages and transverse passages in the inner sections of the box parts for receiving and discharging the gases and ribs on the said inner sections, an upper box portion and a lower box portion and a metal core with projections adapted to engage with corresponding openings in the said upper and lower box portions, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILHELM KURZE.

Witnesses:
ERNEST C. OBERHOLTZER,
M. L. THOMPSON.