

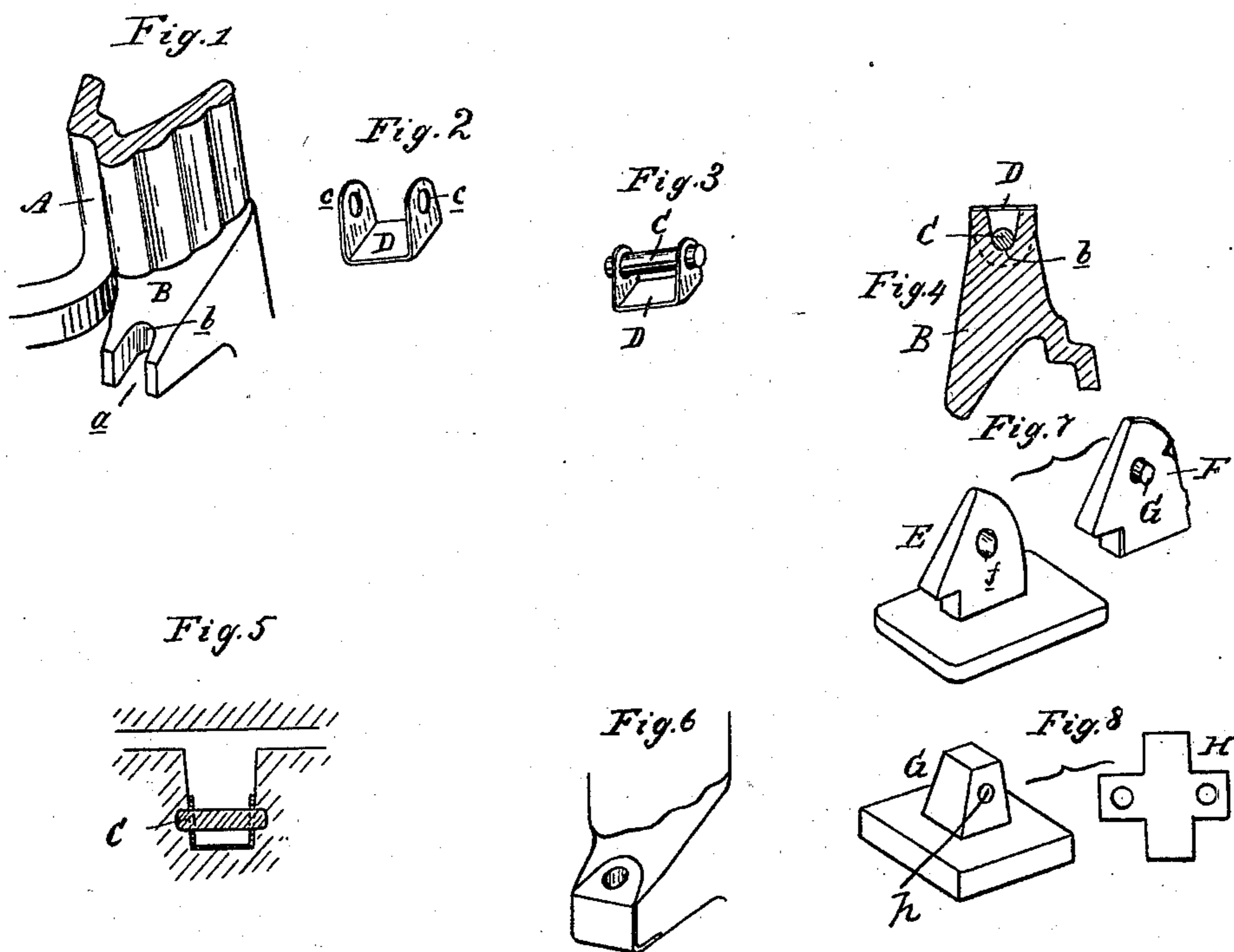
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W. J. KEEP & J. JAMIESON.

MEANS FOR FORMING HINGE PIN AND OTHER HOLES.

No. 366,113.

Patented July 5, 1887.



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UNITED STATES PATENT OFFICE.

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MEANS FOR FORMING HINGE-PIN AND OTHER HOLES.

SPECIFICATION forming part of Letters Patent No. 366,113, dated July 5, 1887.

Application filed April 28, 1886. Serial No. 200,426. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. KEEP, of Detroit, Wayne county, Michigan, and JAMES JAMIESON, of Hamilton, in the county of Wentworth and Province of Ontario, Canada, have invented new and useful Improvements in Means for Forming Hinge-Pin and other Holes; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to a new and improved means for forming the holes in hinge-knuckles and other places by the process of casting; and the object of our invention is to save the labor and expense of drilling holes—such as pin-holes in cast-metal hinge-knuckles, especially the knuckles cast upon stove-doors and stove-door frames, for hanging the parts together by means of a loose pin inserted into the pin-holes of two coacting knuckles, as is the usual manner to form such hinges on stoves.

In the manufacture of stoves it is very important to form the hinges very accurately, as stove-doors are required to make what is called “gas-tight joints;” and, moreover, all the like parts have to be interchangeable.

Previous to our invention it had been proposed to use a slotted chill and pin for the purpose of making such pin-holes; but this was objectionable, for the following reasons, among others: The chill left the knuckle or lug imperfect, as it chilled the iron to a considerable extent, and, moreover, with this plan the pin and chill each required a separate handling by the molder, and were liable to get out of place in ramming the sand. Chills are also very difficult to make smooth inside, so that they will come off easily, and are therefore difficult to get off from the hot castings, and are often lost and mixed with the sand. Moreover, owing to the shifting of the pin or chill in the sand, the holes were often slightly out of place, and as the metal became chilled it was impossible to file them, even if that were commercially practicable. This is very objectionable, as the least variation in the position of the hole renders the casting a total loss.

Attempts have been made to overcome these

difficulties by the use of a sheet-metal hood, and a thin tube, to be held in place by the hood. This, however, was found to be objectionable also, inasmuch as the incoming metal was apt to wash the light tube out of position, and, moreover, when the molten iron surrounded the tube it made the metal of the latter so soft that it would be pressed inward, and, irrespective of this, when the metal cooled the shrinkage would make the hole in the tube smaller, and the size and shape of the hole would thus vary. If the shrinkages were regular, this might have made no difference; but it was found impossible to depend on any amount of regularity in the shrinking, as, owing to the varying thickness of the metal of the tube, the shrinking varied considerably. This irregularity in the size of the hole is a very serious matter, because the pin must be driven in such a manner that it will not fall out, and yet if the hole is one four-thousandths of an inch too small the driving in of the pin will split the lug and render the casting useless. Another difficulty was that the tube required filling, which is an extra expense and trouble. To overcome these various difficulties, we found, after considerable experimenting with the above-mentioned plans and much loss resulting therefrom, that if we used a thin sheet hood having perforations sufficiently small to receive and tightly hold a metal pin that projected through the sides of the hood, the difficulties connected with the plans above referred to were overcome. As the pin was held fast by being tightly fitted into the hood, the two parts required but one handling by the molder, and, as the metal of the hood is very thin, it did not chill the metal as it ran in, but, on the contrary, the inner surface of the hood fused and united with the incoming metal. As the pin projected through the hood and was thus firmly held, it was not likely to get out of place by the ramming in of the sand, and, as the end of the pin was firmly held in place by the sand, it also held the hood in place, and thus both hood and pin were prevented from being washed out of place by the rush of the incoming metal.

It must be remembered that it is necessary

when a tube is used that it shall not extend beyond the outer surface of the hood, because it unites with the metal, and if it projected beyond the surface it would have to be filed off. The tube cannot therefore be made long enough to project into the sand to hold the hood in place. This holding of the hood in place is especially necessary when the hood and pin or tube are in the upper or cope side of the mold, as they are likely to fall by their own weight if not securely held by the pin projecting into the sand, as in our improvement.

In view of the state of the art, as above set forth, we consider our invention to consist of a thin metallic hood having perforations to securely hold a pin projecting through the sides of said hood, in contradistinction to a slotted chill and pin or to a thin metal hood and tube.

Referring now to the drawings, Figure 1 represents in perspective a section of stove-plate pattern with a hinge-knuckle arranged to carry out our invention. Fig. 2 is a perspective view of the hood. Fig. 3 is a perspective of the hood with the pin in place. Fig. 4 is a sectional elevation of the hinge-knuckle pattern in Fig. 1 as prepared for molding. Fig. 5 is a section of a mold prepared for casting the hinge-knuckle in accordance with our invention. Fig. 6 is a perspective view of a cast hinge-knuckle ready for use. Fig. 7 is a perspective view of the catch of a stove-door and a hood to be used in connection therewith. Fig. 8 is a similar view of a lug and a blank from which its hood is formed.

A represents a portion of a stove-plate pattern provided with the hinge-knuckle pattern B, to be used in casting a knuckle with a round pin-hole. To this end the pattern is cut away so as to form a recess, *a*, which has tapering sides and a rounding bottom, *b*, as shown. Into this recess is placed before molding a round pin, C, of sufficient length to project with one or both ends from the sides of the recess, as shown in Fig. 5. The pin C has to fit accurately the rounding bottom of the recess. It is of suitable material to present a smooth surface and resist, without melting or disintegration, the heat of the molten metal, wrought-iron or steel having been found suitable for our purpose in making stove-castings.

D is a support or hood, made of sheet metal, with the ends bent and perforated to form the holes *c*, in which the pin may be supported, as shown in Fig. 3. This support is placed over the recess in the knuckle, so as to hold the pin C, as shown in Fig. 4. In this position it forms a hood over the recess *a*, inclosing it tightly upon all sides, so that when the pattern is now molded in the sand in the usual manner not a particle of sand can find its way into said recess.

When the pattern is withdrawn from the drag, the pin C will be left perfectly undisturbed and firmly supported in its proper position by the hood, which latter rests on the

mold, as shown in Fig. 5. The mold being properly completed for casting and the molten metal poured into it in the usual manner, it will flow around the cylindrical pin and form a perfect cylindrical pin-hole in the exact position required, and after the casting is removed from the mold the pin can readily be driven out of the pin-hole.

The essential requirements of the hood D are to support the pin C and hold it securely in its position in the mold, and to prevent the sand in molding from filling into the cavity around the pin; but among the different forms that may be devised to fill these requirements we prefer to use a hood of the kind shown in the drawings, which provides the finished knuckle with a smooth surface, as shown in Fig. 6, so that when the hinge is perfected the two knuckles of the hinge bear against each other on these surfaces.

The iron pin or chill is made to protrude somewhat from each side of the hood, so that it shall be firmly held by the sand of the mold. Otherwise the weight of the chill and hood will be so great that when they are placed so as to hang in the cope or top of the mold they will fall out.

Our device is simple and cheap, and in practice by using holes in the hood and placing the pin therein the hood and the pin engaged with each other may be prepared ready for use.

Our invention is not alone applicable to the casting of pin-holes in hinge-knuckles, but it will be found of great practical use for casting holes in stove catches, lugs, &c., where such holes may be used for other purposes; and Figs. 7 and 8 are intended to illustrate such general use.

In Fig. 7, E is a catch of a stove-door, which it is desirable to cast with a hole, *f*. This may be easily done by constructing a hood of tin—such as the hood F, shown alongside of the aforementioned figure, which is of corresponding shape and size with the catch, and supports the pin G. This hood, being used in connection with the pattern, of suitable form, in the manner above described, so as to permit of molding the catch and withdrawing the pattern, leaving the hood in position in the mold, will after casting form an integral part of the catch and the pin can be readily driven out.

In Fig. 8, G represents a lug, which it is desired to cast with a hole, *h*. For this purpose a suitable hood may be readily formed by striking up the metal plate H of the form shown alongside. This plate can be easily bent into the required shape to form a hood and support the pin for casting the hole.

The general application of our invention and the manner to proceed in other instances will now readily appear, and the desirability of having the hoods with the pin secured therein supplied by the trade for such parts of the standard form and size as hinge-knuckles, stove-catches, &c., will be conceded.

We are aware of the Patents Nos. 102,983 and 317,498, and make no claim to anything shown therein, as we consider our invention essentially different from the subject-matter of said patents.

What we claim as our invention is—

1. The herein-described device for casting lugs with pin-holes, the same consisting of the combination of a pin and a thin metallic hood provided with holes for securely supporting said pin, and through which the ends of the pin project, substantially as described.

2. The herein-described device for casting lugs with pin-holes, the same consisting of the combination of a chill-pin and a thin metallic hood, the chill-pin being removably but tightly

secured in the hood and having projecting ends, substantially as described.

3. The combination, with a pattern, B, having guiding-recess *a*, of a removable solid cylindrical core, C, and a core-carrier, D, having oppositely-located circular openings *c*, which are adapted to hold the core C snugly in said carrier and through which the ends of said core project, substantially as and for the purpose specified.

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Witnesses:

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