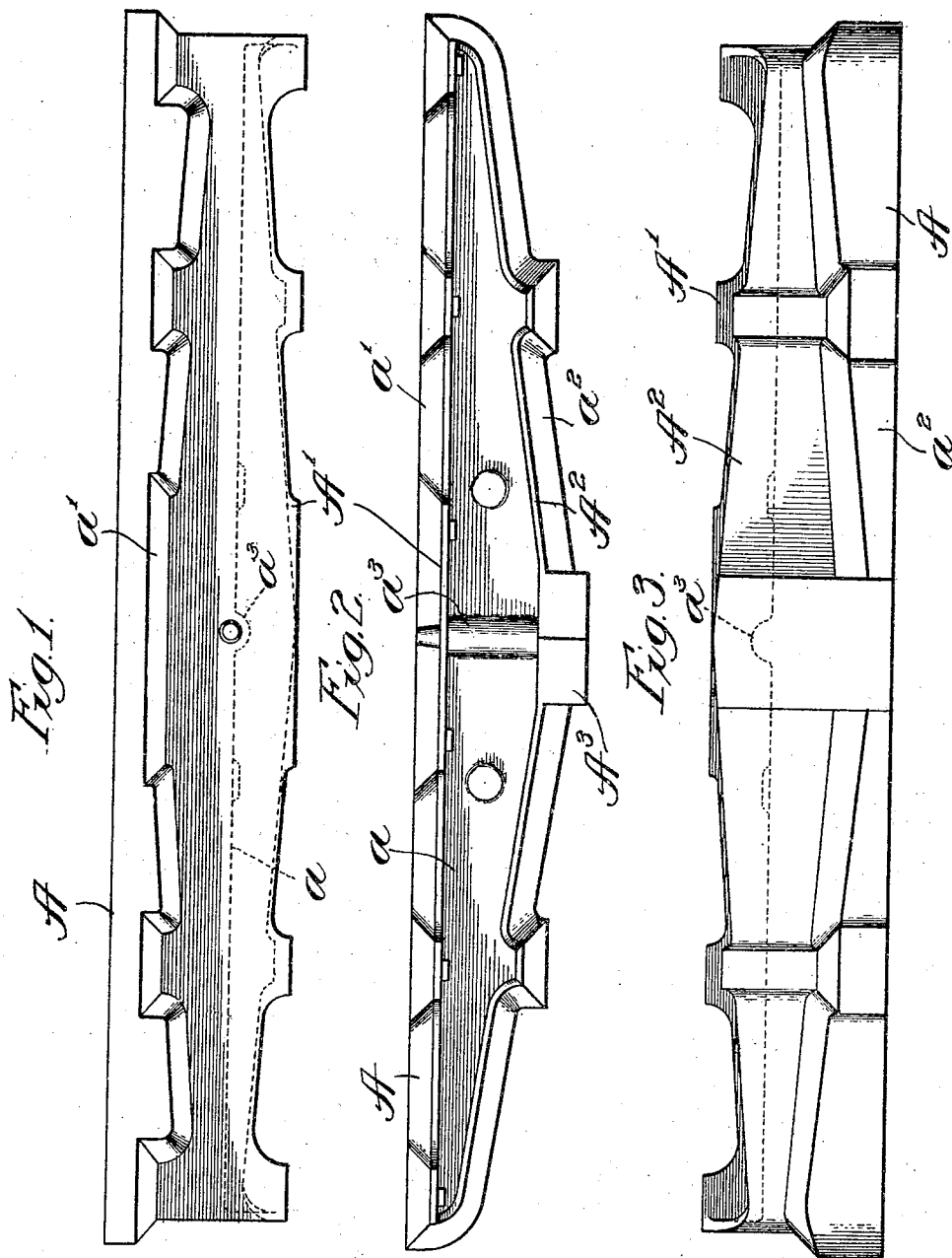


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APPLICATION FILED FEB. 11, 1909.

932,020.

Patented Aug. 24, 1909.

3 SHEETS—SHEET 1.



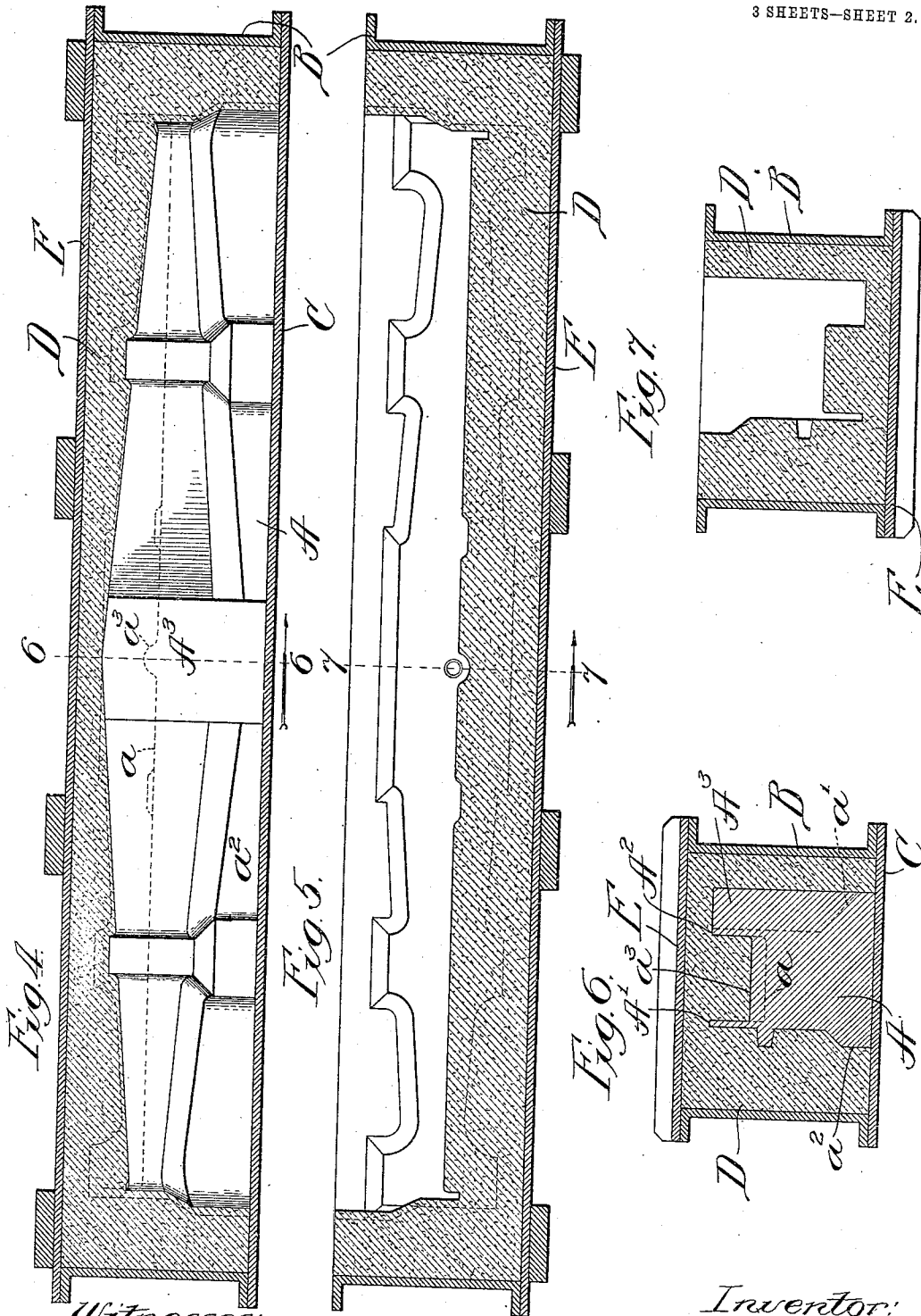
Witnesses:
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Chas. H. Buell

Inventor:
Thomas de la Hunty
By Sheridan, Wilkinson & Scott,
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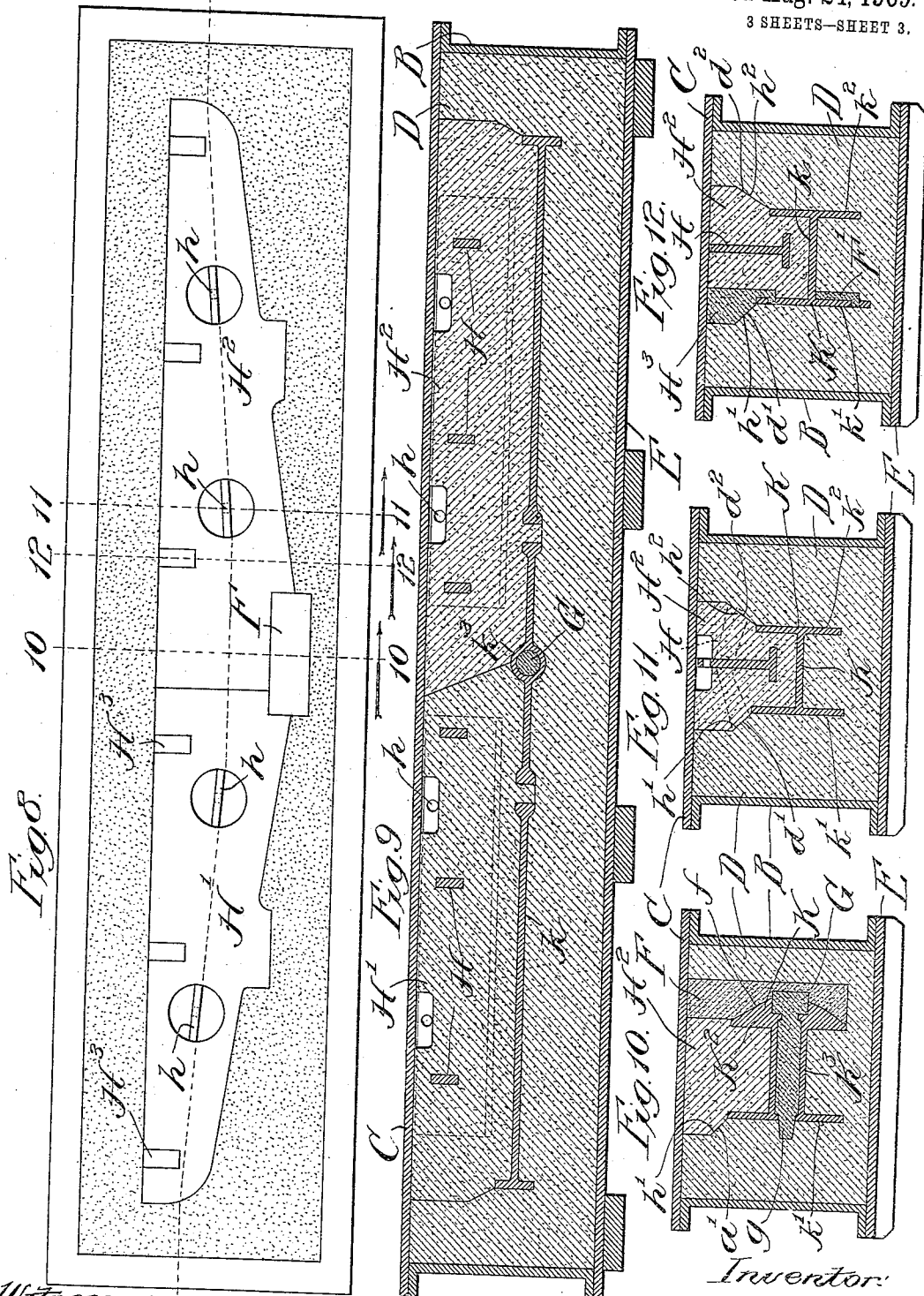
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UNITED STATES PATENT OFFICE.

THOMAS DE LA HUNTY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO SCULLIN-GALLAGHER IRON AND STEEL COMPANY, A CORPORATION OF MISSOURI.

MOLD FOR MAKING I-BEAM CASTINGS.

932,020.

Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed February 11, 1909. Serial No. 477,344.

To all whom it may concern:

Be it known that I, THOMAS DE LA HUNTY, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Molds for Making I-Beam Castings, of which the following is a specification.

My invention relates in general to the art of casting metal, and more particularly to making castings of I-shaped cross section.

Heretofore in making castings having I-shaped cross-sections, such for instance as body bolsters and truck bolsters for railway cars, it has been necessary to employ a two-part pattern and flask divided along the plane of the web of the casting. This has been necessary owing to the oppositely projecting flanges at each side of the web, rendering it impossible to remove the entire pattern from the surrounding mold formed in a single flask. The process heretofore practiced in making such castings has been as follows: The pattern is formed in two halves divided along the plane of the web. Each half is placed upon a follower board and surrounded by one of the sections of a two-part flask. Gagers and bars are then placed within the flask, after which the sand is tamped around the patterns in the flask sections. The flask sections are then inverted and the respective sections of the pattern removed. Whatever cores are necessary are then placed in position in the two sections of the mold and retained in the desired positions by nails. The cope, or top section of the mold, is then again inverted and placed in position upon the drag, or bottom section. The two sections of the flask are then clamped together and it is ready to be removed to the position where the molten metal may be poured. This process, it will be observed, requires separate handling of the two sections of the flask after the sand has been tamped therein, in order to invert the flask sections, after which it is necessary to again handle the cope section in order to place it upon the drag. These operations require the use of cranes and hence considerable time and labor are required in the process of preparing the mold to receive the molten metal. Moreover, the necessity of separately preparing the cope and drag requires double the amount of foundry floor space that would be required if the mold could be made in a single flask. Other ob-

jections which might be mentioned in the practice of the present process of making I-shaped castings are, that care is required in placing the cope upon the drag so as to bring them into proper registry. The placing of the cope upon the drag also crushes the meeting faces of the two sections of the mold, and when cores are used they are apt to be tilted and displaced when the cope is placed upon the drag. As the cope is retained in position upon the drag merely by pins and engaged recesses, the moving of the mold to the position to receive the molten metal often results in a shifting of the two sections of the mold. The result of these difficulties is to produce imperfect castings. The shifting of the drag and cope weakens the resulting casting and results in a fin or rib on the casting at the meeting plane of the cope and drag. This fin must be chipped and ground off in order to produce a smooth surface. Such a fin is particularly objectionable on cast body or truck bolsters, as it extends along the center bearing, which should be as smooth as possible.

The primary object of my invention is to provide process for making a mold for casting web or I-beams, by the practice of which the objections above mentioned will be obviated, and by the use of the resulting mold more perfect web or I-section castings may be made and at less expense.

A still further object of my invention is to provide a process of making molds for castings by the practice of which an efficient mold may be economically made.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which—

Figure 1 is an elevational view of one side of the pattern; Fig. 2, a plan view of the pattern; Fig. 3, an elevational view of the opposite side of the pattern; Fig. 4, a central, longitudinal section through the flask and tamped sand, the pattern being shown in side elevation; Fig. 5, a central longitudinal section of the flask and mold thereon inverted; Fig. 6, a cross-sectional view on lines 6—6, Fig. 4; Fig. 7, a cross-sectional view on lines 7—7, Fig. 5; Fig. 8, a plan view of the flask showing the mold therein with the cover sections in position; Fig. 9, a longitudinal sectional view on line 9, Fig. 8; and Figs. 10, 11 and 12, cross-sectional views on lines 10—10, 11—11 and 12—12, Fig. 8.

The same reference characters are used to designate the same parts in the several figures of the drawing.

Reference character A indicates the pattern, which consists of flanges A' and A², corresponding to the flanges at one side of the web of the proposed casting.

a indicates a surface corresponding to the surface of the web adjacent to the flanges A' A². The outer surfaces of the flanges A' A² are continued the distances corresponding to, and are of a contour to conform to, the outer surrounding surfaces of the casting. Surrounding the pattern are laterally projecting shoulders a' and a² located along the surfaces A' A² at the edges of the flanges which project from the opposite side of the web of the casting. The shoulders a' a² conform in outline to the edges of the flanges on the casting, and are beveled so as to produce correspondingly beveled shoulders in the mold.

A³ indicates the portion of the pattern which is to form in the mold a recess to receive a center bearing core, while a³ indicates the portion of the pattern for forming in the mold a cylindrical recess within which is located the king pin core.

B indicates a flask of a suitable size to surround the pattern and leave sufficient room to receive the sand.

C designates a follower board upon which the pattern and flask are placed.

D indicates the sand packed around the pattern within the flask to form the mold.

After the mold has been formed, as shown in Fig. 4, the flask with the pattern and mold therein is inverted to the position shown in Fig. 5, in which it rests upon the baseboard E. The pattern is then removed, leaving the mold with the contour as shown in Figs. 5 and 7. A cover section is then made for the mold, which, for convenience, may be made in two parts, as indicated by reference characters H' H². The two parts of the cover section are made in core boxes, within which are first placed suitable arbors H around which the sand is packed, such arbors serving to support the sand when the core boxes are removed, and also affording means for lifting the parts of the cover section.

h h indicate portions of the arbors H around which the sand is removed to afford ready engagement with the lifting apparatus.

The cover section of the mold is made to conform to one surface of the web of the casting and to the inner surfaces of the adjacent flanges. The cover section is also provided with outwardly inclined shoulders h' h², which rest upon correspondingly inclined shoulders d' d² formed in the mold by the shoulders a' a² of the pattern. The engagement of the shoulders h' h² with d' d²

supports the cover section in proper position within the mold and forms close joints between the cover and the mold.

Before the cover section is placed in position upon the mold, a center bearing core F is placed in the recess formed in the mold by the part A³ of the pattern. A king pin core G is then located, as shown in Fig. 10, with one end g supported in the sand of the mold, and its head supported in a recess in the center bearing core F.

In order that the casting may have holes through the flanges thereof for fastening devices, stop-off cores, such as shown at F' in Fig. 12, are placed in the proper positions in the mold before the cover section is placed thereon. The holes in the upper flanges of the casting are formed by stop-off cores H³ located in the cover section of the mold.

When the cover section of the mold is placed in position, a complete mold results, having surfaces to form a casting of the desired contour. When the molten metal is poured into the complete mold, a casting K is formed, having a web k and parallel flanges k' k² extending in opposite directions from each side of the web. The center bearing core forms a smooth center bearing K² on the casting, while the position of the king pin core G forms a tubular portion k³ at the center of the web.

After the metal has sufficiently cooled, the casting is removed from the flask and the flask may be again used for forming a new mold.

From the foregoing description it will be observed that by my invention it is possible to cast I-section beams and other structures, and by this term I mean structures having a web and oppositely projecting flanges at each side thereof, in a mold formed in a single flask, thereby avoiding the objections incident to molds formed of two sections united along the plane of the web of the desired structure.

By using a single flask only one-half of the foundry floor space is required that is necessary when two-part flasks are employed, as each part of the two-part flask requires as much floor space to have the mold made therein as is required by the single flask. The tilting of cores, and the crushing and shifting of the cope and drag, are avoided when a single flask is used. As the cope is dispensed with, the use of bars, gagers and core nails is eliminated, as they are necessary in the cope to preserve the mold and the cores intact when the cope is inverted and placed upon the drag. The use of a single flask also avoids the labor incident to matching and fitting the patterns and flasks. In my improvement, after the pattern is drawn, the mold is open, thereby facilitating inspection by the foreman. The use of a single flask decreases the labor inci-

dent to the present process, as there is no cope to be lifted into position upon the drag, and further facilitates the work of shaking out the casting, as there is only one flask to be handled and not two as has been the case heretofore. As the casting is molded in one flask, the parting line is eliminated, thereby giving a truer contour and smoother surface to the casting, so as to obviate the chipping and finishing which must be done when the castings are made by the present method.

I claim:—

1. In the art of casting metal, the process of making a mold, which consists in placing a flask around a pattern conforming to the casting except at its base, around which is provided a shoulder, tamping sand around the pattern within the flask, removing the pattern from the flask, forming a mold cover conforming to the remaining surfaces of the casting and having a laterally projecting shoulder corresponding to the shoulder on the pattern, and placing the mold cover upon the mold with the shoulders thereon in engagement, the relative locations of the shoulders on the mold and cover being such as to support the cover in position to form a complete mold having an inner contour conforming to the casting.

2. In the art of casting metal, the process of making a mold, which consists in placing a flask around a pattern conforming to the casting except at its base, around which is provided a beveled shoulder, tamping sand around the pattern within the flask, removing the pattern from the flask, forming a mold cover conforming to the remaining surfaces of the casting and having a beveled laterally projecting shoulder corresponding to the beveled shoulder on the pattern, and placing the mold cover upon the mold with the beveled shoulders thereon in engagement, the relative locations of the beveled shoulders on the mold and cover being such as to form a complete mold having a continuous inner contour conforming to the casting.

3. The process of making a mold for casting web structures, which consists in placing a single flask around a pattern conforming in contour to the surfaces at one side of the web and the outer surrounding surfaces of the structure, tamping sand around the pattern within the flask, removing the pattern from the flask, forming a mold cover conforming to the surfaces at the other side of the web of the structure, and placing such cover upon the mold in position to form a complete mold to receive the molten metal.

4. The process of making a mold for cast-

ing web structures, which consists in placing a single flask around a pattern conforming in contour to the surfaces at one side of the web and the outer surrounding surfaces of the structure, said pattern also having a beveled shoulder around the base thereof, tamping sand within the flask around the pattern, removing the pattern from the flask, forming a mold cover conforming to the surfaces at the other side of the web of the structure and having a beveled shoulder corresponding to that on the pattern, placing such mold cover upon the mold with the beveled shoulders thereon in engagement to form a complete mold having a continuous inner contour conforming to the casting.

5. The process of making a mold for casting web structures, which consists in placing upon a follower board a pattern conforming to one surface of the web, the inner faces of the adjacent flanges, and the surrounding outer surfaces of the structure, placing a single flask upon the follower board around the pattern, tamping sand in the flask around the pattern, removing the pattern from the flask, forming a mold cover conforming to the other surface of the web and inner surface of the adjacent flanges of the structure, and placing the mold cover so formed upon the mold in position to form a complete mold having an inner contour conforming to the surfaces of the structure.

6. The process of making a mold for casting web structures, which consists in placing upon a follower board a pattern conforming to one surface of the web, the inner faces of the adjacent flanges, and the outer surrounding surfaces of the structure, said pattern also having a beveled shoulder around the base thereof, placing a single flask upon the follower board around the pattern, tamping sand in the flask around the pattern, removing the pattern from the flask, forming a mold cover conforming to the other surface of the web and inner surfaces of the adjacent flanges of the structure and also having beveled shoulders conforming to those on the pattern, and placing the mold cover so formed upon the mold with its beveled shoulders resting upon the beveled shoulders of the mold, thereby forming a complete mold having an inner contour conforming to the structure.

In testimony whereof, I have subscribed my name.

THOMAS DE LA HUNTY.

Witnesses:

HARRY SCULLIN,

THOMAS M. GALLAGHER.