Mar. 6, 1923.

H. W. JENCKS ET AL

1,447,666

FOUNDRY FLASK

Filed Oct. 29, 1919

3 sheets-sheet 1

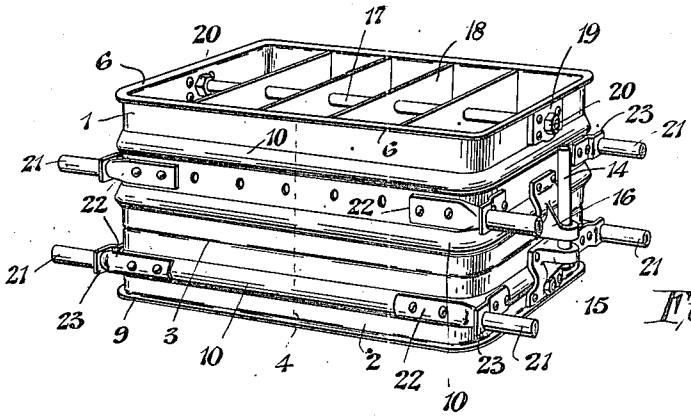


Fig. 1.

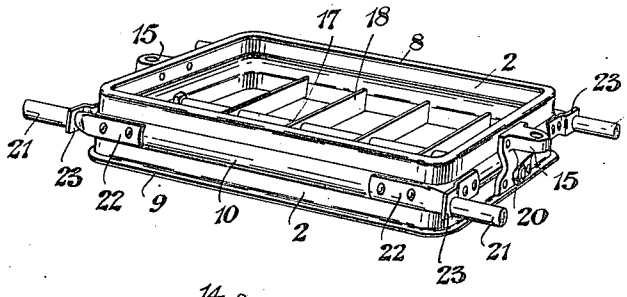


Fig. 2.

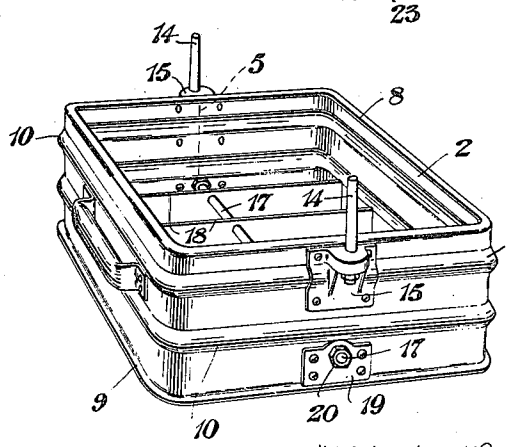


Fig. 3.

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3 sheets-sheet 2

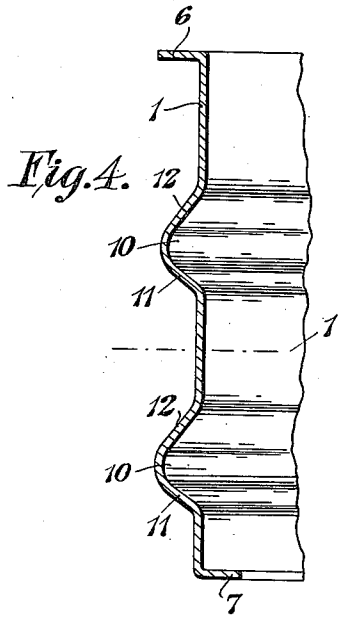


Fig. 4.

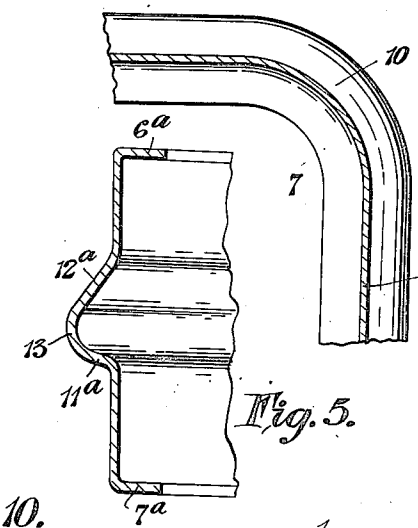


Fig. 6.

Fig. 5.

Fig. 10.

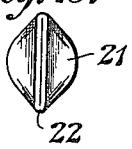


Fig. 7.

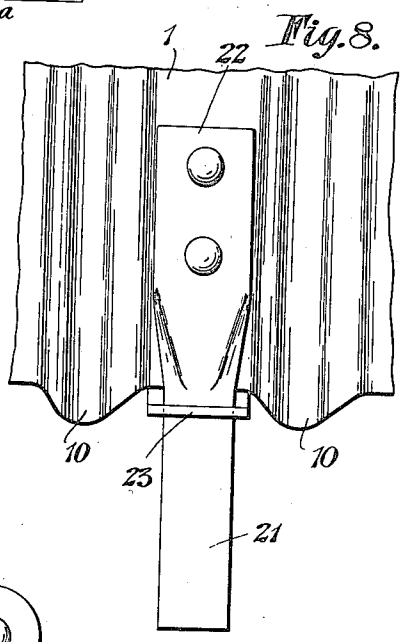


Fig. 8.

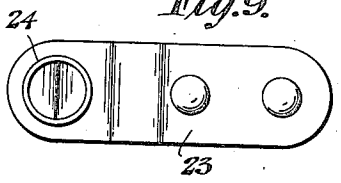


Fig. 9.

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3 sheets-sheet 3

Fig. 11.

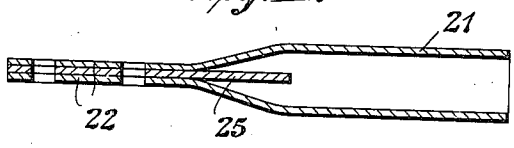


Fig. 12.

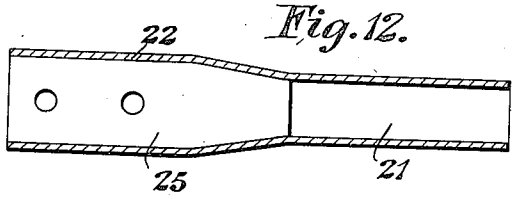


Fig. 13.

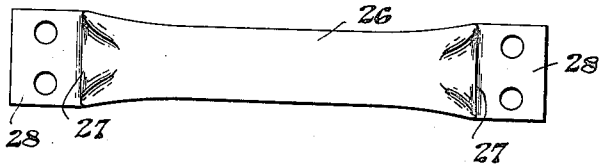


Fig. 15.

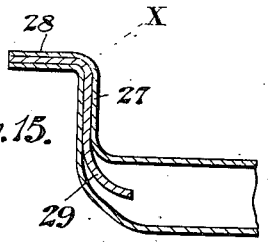
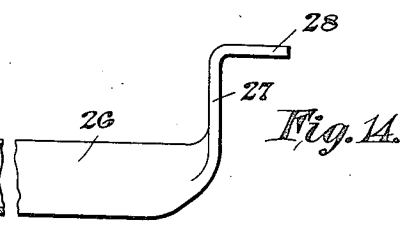


Fig. 14.



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Patented Mar. 6, 1923.

1,447,666

UNITED STATES PATENT OFFICE.

HOLLIS W. JENCKS, OF DETROIT, MICHIGAN, AND JOHN R. MONTGOMERY AND GEORGE F. SPARKS, OF YOUNGSTOWN, OHIO, ASSIGNORS TO TRUSCON STEEL COMPANY, OF YOUNGSTOWN, OHIO, A CORPORATION OF MICHIGAN.

FOUNDRY FLASK.

Application filed October 29, 1919. Serial No. 334,198.

To all whom it may concern:

Be it known that HOLLIS W. JENCKS, JOHN R. MONTGOMERY, and GEORGE F. SPARKS, all citizens of the United States of America, and respectively residing at Detroit, Wayne County, Michigan; Youngstown, Mahoning County, Ohio, and Youngstown, Mahoning Co., Ohio, have invented certain new and useful Improvements in Foundry Flasks, of which the following is a specification.

This invention relates to foundry flasks and the object of the invention is to provide an improved form of flasks which may be readily and economically produced and shall have exceptional strength, especially at the corners of the flask when the same is of angular shape.

Another object of the invention is to provide a flask of such form that the filling and ramming of the sand into place is materially facilitated as well as the removal of the sand from the flask at the completion of the molding operation.

With these objects in view, the invention comprises the various features of construction and arrangement which will be more fully described hereinafter and will be clearly brought out in the claims appended hereto.

In the accompanying drawings, which illustrate different forms of flasks and flask members constructed in accordance with the present invention.

Figure 1 is a perspective view of a complete flask embodying features of the present invention;

Figure 2 is a similar perspective view of the drag member of the flask with the cope member removed therefrom;

Figure 3 is a perspective view of the drag member of a somewhat modified form of flask;

Figure 4 is a vertical section of the flask wall showing the improved arrangement of flanges and the form of the strengthening ribs;

Figure 5 is a vertical section of the flask wall showing a slightly modified form of rib in conjunction with a modified arrangement of the flanges;

Figure 6 is a detail horizontal section of the corner of a flask member showing one of the strengthening ribs and the lower flange;

Figure 7 is an enlarged sectional plan view illustrating one form of handle for the flask;

Figure 8 is a side elevational view of the form of handle shown in Figure 7;

Figure 9 is an end elevational view of the handle;

Figure 10 is a detail end view of the handle member illustrated in Figure 7, this view being taken in the opposite direction from that in which Figure 9 is taken;

Figures 11 and 12 are sectional views, taken at right angles to each other, of a modified form of handle member;

Figure 13 is a view of a further form of handle member;

Figure 14 is a partial plan view of the handle member shown in Figure 13; and

Figure 15 is a sectional plan view of a handle member similar to that illustrated in Figures 13 and 14 but having a reinforcing element.

As will be seen from Figure 1, the complete flask comprises as usual a cope member 1 and a drag member 2 arranged one above the other, the line of engagement of the two members being indicated at 3 in Figure 1 and the drag member being illustrated by itself in Figure 2. Each of these members is made from pressed steel which is preferably rust resisting and is of substantial thickness to insure long life. The flask members may be made of rectangular shape, as illustrated in Figure 1, or they may be made square, as indicated in Figure 3, or they may be of circular or other shapes dependent upon the nature of the article to be molded.

The flask members are preferably of an integral nature, being in some cases made in one continuous piece of metal in the manner of a pipe. In some cases, however, it may be preferred to make each flask member

from a length or strip of metal bent to the desired form and having the two ends thereof abutting and welded together to make them integral. Instead of making the flask member of a single piece of metal, it might be made in two parts arranged with the corresponding ends in abutting relation and welded together to preserve the integral nature of the flask. Instead of welding the abutting ends of the parts forming the flask member, these ends might be connected by plates overlapping the abutting ends and suitably riveted or otherwise secured thereto. The line of the weld may be at the side of the flask member, as indicated by the dotted line 4 in Figure 1, or it might be at the end of the flask, as indicated by the dotted line 5 in Figure 3. The making of the flask integral either by forming it in a continuous piece or by welding the abutting ends of one or more pieces together is of importance in that there are no parts which can become loose or disjointed by reason of knocks imparted to the flask member while ramming the sand in place or in loosening the sand.

The cope member of the flask is preferably provided around its upper edge with an outwardly turned flange 6 and is provided around its lower edge with an inwardly turned flange or sand strip 7. Similarly, the drag member of the flask is preferably provided around its upper edge with an inturned flange or sand strip 8 and around its lower edge with an outturned flange 9. The arrangement of these flanges constitutes an important feature of the present invention as the inturned flange serves to hold the sand in the flask member while the out-turned flange, which is at the upper edge of the flask member while the same is being filled with the sand, renders it more easy to work or tamp the sand into the flask member and makes it possible to completely fill the mold to a smooth top surface. The reverse arrangement of the flanges also tends to materially stiffen the flask member. The invention however is not limited in all aspects thereof to the use of this particular arrangement of flanges, as hereinafter referred to in connection with Figure 5.

Each flask member is also provided with one or more projecting ribs 10 which serve to stiffen and strengthen the flask member, these ribs being integral with the flask member, as clearly illustrated in Figures 4 and 5. Where the flask member is of angular form, these ribs extend to the full depth thereof, entirely around the corners of the flask, without buckling or cutting away the metal of the flask member and this arrangement provides a flask corner of exceptional strength. While the invention in all aspects thereof is not limited to the particular form of the strengthening ribs, particular attention is directed to the preferred forms of these ribs as illustrated in Figures 4 and 5. The profile of the ribs is not symmetrical but the lower side 11 thereof is inclined at a greater angle to the plane of the flask wall than is the upper side 12 of the rib. This arrangement of the rib sides is of material assistance in filling the sand into the flask member and also in holding the sand in place as the lower sharply inclined side 11 acts as a support for the sand when tamped into the flask and serves to hold the sand intact when the flask member is moved from one place to another. The upper side 12, on the other hand, due to the smaller angle of inclination thereof, acts in the opposite manner and while facilitating the tamping of the sand against the lower side of the rib, permits ready removal of the sand as it presents a smooth surface, along which the sand readily slides, rather than a shoulder or projection which would prevent this easy sliding movement. This particular form of strengthening rib, therefore, facilitates the filling of the sand into and the removal thereof from the flask member and, in combination with the out-turned upper flange, provides a flask wall construction which enables the sand filling and removing operations to be effected much more easily and efficiently than with flask members of other constructions.

In the modified form of strengthening rib shown in Figure 5, the lower wall 11^a of the rib for the greater part thereof constitutes a continuation of the curved portion 13 connecting the sides 11^a and 12^a of the rib, but this arrangement also provides a lower rib side which is of greater inclination relatively to the flask wall than is the upper side 12^a of the rib, the advantages of the form of rib shown in Figure 4 being retained and possibly amplified. In Figure 5, the improved form of reinforcing rib is shown in combination with upper and lower flanges 6^a and 7^a both of which are inturned, and similarly the non-symmetrical form of rib is capable of use with upper and lower flanges both of which are out-turned. In other words the use of the improved form of reinforcing rib is not restricted to any particular arrangment of the flanges.

It will be understood that the cope member is filled in its normal position, that is, as this member appears in Figure 4, whereas the drag member is filled in an inverted position, that is, with the inturned normally uppermost flange 8 resting upon a board, or other smooth surface, and the normally lowermost out-turned flange 9 uppermost. The member illustrated in section in Figure 4 may be considered to show the drag member in the inverted filling position thereof, the reinforcing ribs at such time permitting the sand to be readily filled into the drag member as previously pointed out in regard

to the cope member. It will be noted that, considering Figure 4 to illustrate the inverted drag member, the reinforcing ribs when the drag member is in its normal position will be reversely arranged with respect to the ribs on the cope member and the advantages pointed out as to these ribs serving to hold the sand in place do not apply to the drag member. It is to be noted, however, that when the drag member is turned into its normal position it rests upon a board, or other smooth surface, so that the sand cannot fall out of the same.

The cope and drag members of the flask are positioned and held in exact superposed relation by means of pins 14 at the opposite ends of the drag member, which pins are carried by pin holders 15 riveted or otherwise secured to the end walls of the drag member. The cope member of the flask has apertured members 16 secured to the end walls thereof, the apertures in which members are arranged to fit over the pins 14. In Figure 2 the pins 14 are shown removed from the pin holders 15 and it is, of course, to be understood that the pins might, if desired, be carried by the members 16 and fit apertures in the members 15.

The end and side walls of the flask members may be rigidly braced or tied together by means of tie rods 17 and division plates or partitions 18 respectively extending between and secured to said end and side walls. The plates 18 may be secured to the side walls of the flask by welding or otherwise and the tie rod 17 passes through these plates and, if desired, may be welded or secured thereto to brace or strengthen the same at the central parts thereof. The tie rod 17 may at its ends pass through plates 19 riveted or otherwise secured to the end walls of the flask member and be provided with interior and exterior nuts 20 threaded thereon to rigidly secure the tie rod to the flask walls. It may in some cases be preferred to weld the ends of the tie rod to the end walls of the flask both interiorly and exteriorly thereof so as to make these tie rods integral with the flask to prevent any relative movement between the flask walls. The flask member must be absolutely rigid as even slight relative movement between the walls thereof might throw the flask out of plumb so that the pins 14 would not register and fit exactly into the apertures in member 16. This is entirely prevented by making the tie rods integral with the flask walls in the manner stated.

Where the flask member is formed from a piece of metal having its ends abutting along the line 5, Figure 3, or along similar lines at both ends of the flask member, these abutting ends might be connected together by means of the members 15, 16 and 19.

In accordance with other features of the invention the flask members are provided with handles of improved form, which are shown in perspective in Figures 1 and 2 and in detail in Figures 7 to 10. The handle comprises a member 21 which is made from a tubular piece of metal having one end thereof flattened, as indicated at 22, Figures 8 and 10, the flattened end being riveted or otherwise secured to the flask wall. The flattening of the portion 22 permits the handle to be readily secured to the flask member and it provides for a material increase in the strength of the handle at the point of greatest stress thereon by having the two walls of the tube pressed together vertically so that each wall is reinforced by the other. This form of handle is inexpensive and will carry very heavy loads by reason of the peculiar formation and distribution of the metal as just pointed out. It is preferred to provide a plate 23 which is riveted to the wall of the flask which is at right angles to that to which the member 21 is secured, and is provided at its outer end with an aperture 24 through which the handle member 21 extends. With this arrangement the weight is equally distributed between the two walls at the corner of the flask and between all of the walls of the flask where the handles are provided at all corners thereof.

In the case where very heavy loads are to be carried by the handles, it is preferable to reinforce the same by inserting a reinforcing or strengthening element 25 between the walls of the flattened portion of the handle, which element is permanently held in place and extends into the tubular portion of the handle at the point where said portion merges into the flattened portion, thus reinforcing the handle approximately at the point of greatest strain.

A modified form of handle member is illustrated in perspective in Figure 3 and in detail in Figures 13 and 14. This handle member likewise comprises a tubular piece of metal 26 but it is provided with flattened portions 27 at both ends thereof and these flattened portions are bent at right angles to the tubular portion of the handle and then the extremities 28 are bent outwardly at right angles. These extremities are provided with apertures whereby the handle may be riveted or otherwise secured to the flask wall. In this construction also the handle is materially strengthened by the flattening of the tube at the point where the greatest strain occurs and, if desired, a strengthening or reinforcing element 29 may be inserted between the walls of the flattened portion, as illustrated in Figure 15, this reinforcing element extending into the tubular portion where the same merges into the flattened portion and strengthen-

ing the handle at this point, and also strengthening the handle at the bend of the flattened portion, as indicated at X, where the greatest strain occurs.

It will be understood from the above description that flask members are provided which are of a construction which facilitates the filling and removal of the sand into and from the flask and which gives exceptional strength and rigidity to the flask. As above stated, while it may be preferred to provide the strengthening or reinforcing ribs 10, these ribs are not in all cases essential as it may be desirable with some constructions to provide an interior smooth wall for the flask member instead of having the deep groove which appears when the ribs are employed. In other cases the ribs may be provided either in the forms illustrated or in other forms and means provided for offsetting the grooves so as to secure a substantially smooth surface.

It is to be understood that the invention is not restricted to the exact constructional arrangements and details disclosed as such may be modified within the scope of the appended claims.

What I claim and desire to secure by Letters Patent is:

1. A flask member, comprising a flask wall provided with one or more projecting reinforcing ribs having one side thereof inclined relatively to the flask wall to a greater extent than the other side thereof.

2. A flask member, comprising a flask wall having one or more integral projecting ribs of substantially V-shape in cross section, one arm of the V being inclined relatively to the flask wall at a greater angle than the other arm.

3. A flask member, comprising a flask wall having one or more integral projecting reinforcing ribs, one side of each rib being formed to support the sand in the flask member and the other side of the rib being formed to present a smooth inclined surface permitting easy removal of the sand.

4. A flask member as claimed in claim 1, wherein the flask wall is provided with flanges extending around the upper and lower edges thereof.

5. A flask member as claimed in claim 1, wherein the flask wall is provided with an outwardly turned flange extending around one edge thereof and with an inwardly turned flange extending around the other edge thereof.

6. A flask member as claimed in claim 1, wherein the reinforcing ribs extend completely around the corners of the flask.

7. A flask member, comprising a sheet metal flask wall having flanges extending around the upper and lower edges thereof and having one or more integral outwardly projecting reinforcing corrugations extending therearound in parallelism with said flanges but spaced therefrom, each corrugation being of substantially triangular cross section having its base in vertical alignment with the flask wall and having its apex vertically displaced relatively to the center of its base, for the purpose specified.

8. A flask member, comprising a flask wall having one or more integral outwardly projecting reinforcing ribs, the internal surfaces of said ribs being relatively inclined and having different inclinations with respect to the flask wall.

9. A flask member, comprising a flask wall having one or more integral projecting reinforcing ribs of a uniform thickness the same as that of the flask wall, each rib consisting of a curved portion connected with the flask wall by relatively inclined portions of different angularity with respect to the flask wall.

10. A flask member, comprising a flask wall of pressed steel, and an initially separate tie rod extending between opposite points of said wall and welded to said wall at its opposite ends.

11. A flask member, comprising a flask wall of pressed steel having one or more integral reinforcing ribs, and an initially separate tie rod extending between opposite points of said wall and integrally united to said wall at its opposite ends.

12. The combination with a flask member of a handle, comprising a tubular member having a portion thereof flattened to bring the walls thereof into contact, and means securing the flattened portion of said handle to the flask wall.

13. The combination as claimed in claim 12, wherein a reinforcing element is inserted between the walls of the flattened portions of the handle member, said element extending into the tubular portion of said member adjacent the point where the tubular portion merges into the flattened portion.

14. The combination with a flask member of a handle, comprising two members arranged at an angle to each other and connected to the flask walls at the corner thereof, one of said members having a portion extending above and in contact with the other member whereby the weight is transmitted to both walls of the flask.

15. The combination as claimed in claim 14, wherein one of said members is apertured and the other members passes through said aperture and projects therebeyond.

16. The combination as claimed in claim 15 wherein one of said members comprises a flat plate and the other member comprises a tubular member having a portion thereof flattened and secured to the flask wall, said plate at its outer end overlying and contacting with the tubular portion of the other member.

17. The combination with a flask member

of a handle, comprising two angularly disposed members connected to the flask walls at the corner thereof, said members co-acting to distribute the weight evenly to the flask walls.

18. The combination with a flask member of a handle secured to one wall of the flask at the corner thereof, and a bracing member secured to another wall of the flask extending at an angle to said handle and connected thereto.

In testimony whereof we affix our signatures.

HOLLIS W. JENCKS.
JOHN R. MONTGOMERY.
GEORGE F. SPARKS.