(No Model.)

E. RILEY.

MOLDER'S SNAP FLASK.

No. 385,203. Patented June 26, 1888.

Fig. 1.

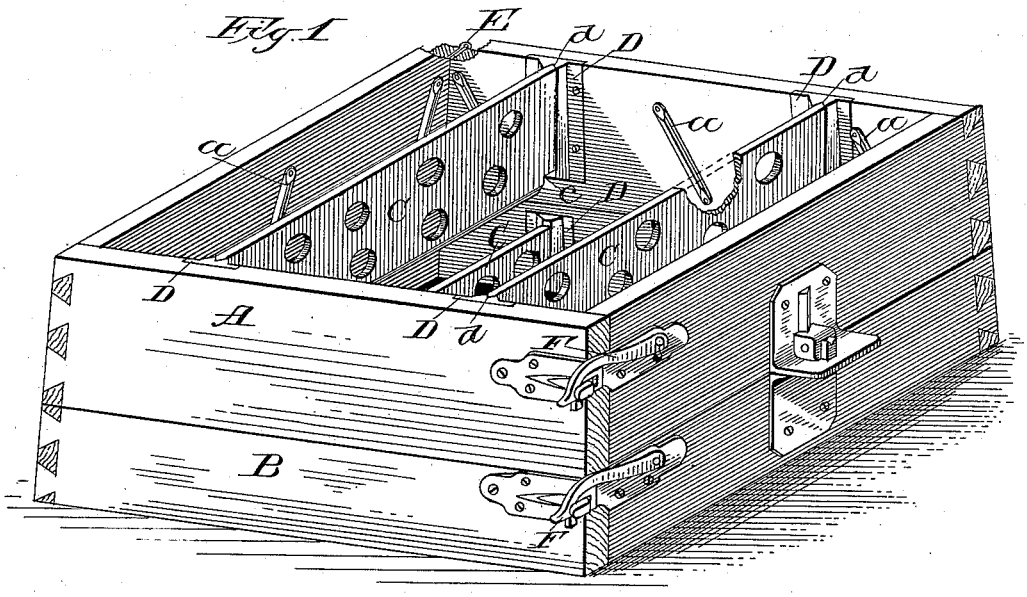


Fig. 2.

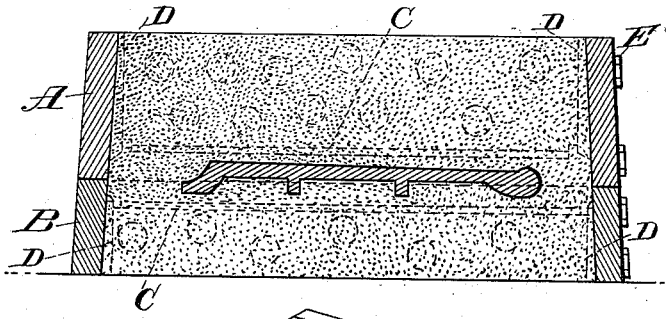


Fig. 4.

Fig. 5.

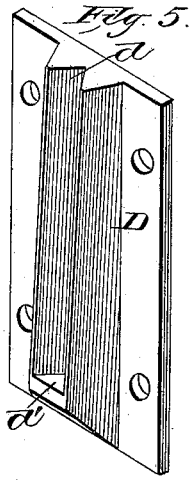
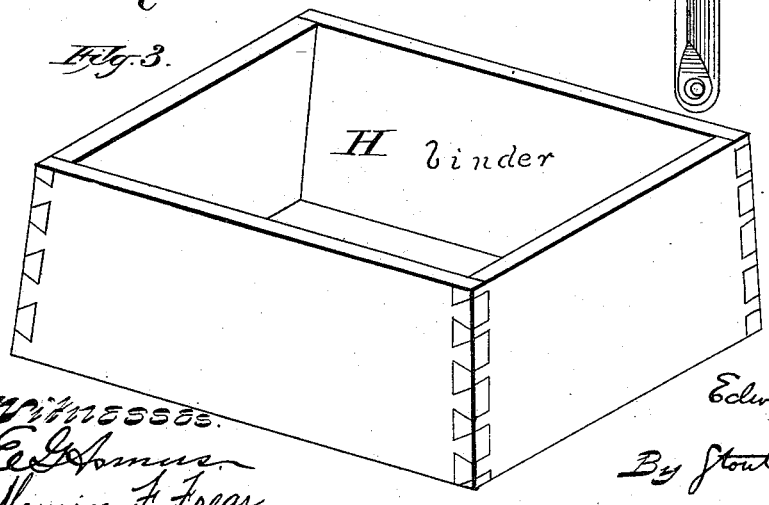


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD RILEY, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO THE MILWAUKEE HARVESTER COMPANY.

MOLDER'S SNAP-FLASK.

SPECIFICATION forming part of Letters Patent No. 385,203, dated June 26, 1888.

Application filed April 17, 1886. Serial No. 199,173. (No model.)

To all whom it may concern:

Be it known that I, EDWARD RILEY, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Molders' Snap-Flasks; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to molding; and it consists in certain novel features, to be hereinafter described, with reference to the accompanying drawings, and subsequently claimed.

Heretofore small molds could be made in a snap-flask, owing to the fact that after the flask was removed there would be enough packed sand surrounding the cavity left by the pattern to resist what pressure came from the molten metal poured therein; but for a large casting it is rarely, if ever, possible that enough sand can be left outside the pattern-cavity to stand the pressure when the metal is poured in, and it is also very difficult to pack the sand tight enough in a large snap-flask that the cope can be lifted off the pattern without danger of collapse, and even were this much possible there can be no certainty that the sand is tight enough for a successful cast.

A snap-flask being of well-known convenience about a foundry, various attempts have been made to utilize such a device in which to make the molds for large castings, and attempts have also been made to successfully construct the ordinary mold-box so that it might in a measure serve the same purpose as a snap-flask, this purpose being to use one flask for an indefinite number of molds.

For a large casting the mold made in a snap-flask must be braced against internal strain during the operation of pouring the metal, and to meet this necessity I am aware that a series of rectangular bands of metal fitting within the closed flask and forming a hoop or band around the mold to retain the sand in place when said mold is removed have been employed.

As an improvement on the means above described, single intersecting-bars or a grated support have been employed in the cope of a non-tapered snap-flask, the bars and hoop or band of the grating being somewhat broadest at the bottom, so as to better support the sand. I am also aware that a mold-box of ordinary construction, except that the inner sides thereof tapered outwardly from the top of the cope to the bottom of the nowel or drag, so as to present a uniformly-increasing transverse sectional area from the top to the bottom of the flask, has been employed in connection with two metallic sand-bands adapted to fit freely in said flask at the meeting faces of the cope and nowel, these bands remaining on the mold after the flask was lifted off, a bottom plate and cap-plate being clamped upon said mold to aid the sand-bands in holding the same against the pressure of the molten metal.

I am also aware that detachable wooden cross-bars and metal sockets have been employed in the cope of an ordinary box-flask, so as to permit ready removal of said cross-bars when burned and the substitution therefor of new ones, while at the same time said metal sockets serve as barriers to prevent ignited cross-bars from setting fire to the cope, and also to obviate the necessity of nails or screws for securing said cross-bars in place.

The object of my invention is to improve the ordinary snap-flask, whereby a mold for a large casting may be readily made therein with less sand and without including any supporting grating, band, or jacket.

In the drawings, Figure 1 represents a snap-flask constructed according to my invention; Fig. 2, a vertical transverse section of the same, inclosing the sand and pattern necessary to the formation of a mold; Fig. 3, a perspective view of the binder that forms part of my invention; Fig. 4, a detail view of a sand-cleat, and Fig. 5 a similar view of socket employed on the flask.

Referring by letter to the drawings, A represents the cope, and B the drag, of a snap-flask, each of said parts being hinged at E and the sections locked at the opposite corners by latches F. Unlike the ordinary snap-flask, the cope A and drag B are made tapering, or, in other words, there is a gradual decrease in the area of the flask from the bottom of said

drag to the top of the cope, so that a mold made in the flask would form the frustum of a pyramid.

Secured to the inner sides of the cope B are a series of cleats, *a*, that are preferably beveled, or of such other contour that they will readily leave the sand when the flask is removed from the mold formed therein. The cleats *a* support the sand in the cope while the latter is being manipulated, to permit the withdrawal of the pattern, and, consequently, said cleats are more or less inclined, the inclination of those shown being to such an angle that practice has determined to be best adapted for the purpose named. To further aid in supporting the sand in both cope and drag of large snap-flasks, I provide sand-plates C, the ends and bottom edges of which are preferably beveled or wedge-shaped, said ends fitting corresponding way, *d*, in castings D, that are let into the inner faces of said cope and drag. The ways *d* in the castings D are made wedge-shaped in order that they may readily come away from the sand-plates C when the flask is opened, this being necessary in order to prevent breaking down of the sand; and while I have described the ways and the adjacent edges of the sand-plates as being correspondingly beveled or wedge-shaped, it is obvious that they may be half-round or of such other contour that when said flask is opened there will be no binding between the latter and said sand-plates.

The lower outer corners of the sand-plates C are preferably cut away, as shown at *c*, to fit and rest upon stops *d'*, that form part of the castings D, and said sand-plates are preferably made from strips of perforated metal, in order that they may be thin, light, and of sufficient strength, while at the same time the perforations therein aid to support the sand, and also afford a saving of material in the manufacture of said plates.

By the employment of the plates C in my snap-flask the sand is readily supported against its tendency to fall in toward the center of the parts composing said flask or to fall out when removing the cope to withdraw the pattern, and consequently less ramming is necessary when making the mold, thereby rendering the latter less liable to blow when metal is poured therein.

The part H (shown by Fig. 3) is what I term a "binder," and forms an adjunct to my snap-flask in order to insure successful casting in molds made in said flask, this binder being slipped onto a mold before the metal is poured in, its office being to prevent bursting of said mold under internal pressure produced by the gases and molten metal. The binder being tapered, it will compress the mold tightly around the sides; but this compression will not extend so far in toward the center of said mold as to render the latter liable to blow.

The mold is made in the flask in the usual manner, and, when completed, the surrounding flask is unlatched and taken away, the cleats *a* slipping readily out of the sand and the casting D coming easily off the adjacent ends of the plates C to leave the latter in said sand.

An indefinite number of molds may be made in the same flask and left on the floor of the foundry. When all is ready for the pouring of the molten metal, the binder H is slipped onto a mold and the metal is poured in the latter. The pouring being completed, the binder is removed from the first mold and placed on another to support the latter while being filled with molten metal, this operation being repeated indefinitely.

By having the flask and binder tapering I not only provide for a ready compression of the sand that forms the mold, but I am also enabled to make said mold with less sand, this in itself being an advantage in the use of snap-flasks.

So far as I am aware all snap-flasks have hitherto been made straight up and down, and it has not been practical to employ such a flask for making molds for large castings. There being certain special advantages in snap-flasks, it is desirable that the same be of such construction as that they may be employed for the molds of any sized casting, and to accomplish this object is the general purpose of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. As an improved article of manufacture, a snap-flask having the sides thereof tapered inwardly, whereby there is a gradual decrease in the area of said flask from the bottom of the drag to the top of the cope, substantially as set forth.

2. A snap-flask having the inner sides of its cope provided with cleats that are more or less inclined and of such contour that they will readily leave the sand when said flask is opened for removal from a mold, substantially as set forth.

3. A snap-flask having two opposite inner sides of its cope and drag provided with ways, in combination with sand-plates having their ends shaped to fit said ways, the latter and said ends of the sand-plates being of such contour as to readily separate when the flask is opened for removal from a mold, substantially as set forth.

4. A snap-flask having the inner sides of its cope provided with beveled cleats that are more or less inclined and wedge-shaped ways secured to two opposite sides of the cope and drag, in combination with sand-plates having their ends of a contour corresponding to that of the ways and adapted to loosely fit the latter, substantially as set forth.

5. A snap-flask, in combination with cast-

ings let into two opposite sides of the cope and drag and provided with ways having stops at their lower ends, and sand-plates having their ends shaped to loosely fit said ways, the latter and said ends of the sand-plates being of such contour as to readily separate from each other when the flask is opened, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

EDWARD RILEY.

Witnesses:
H. G. UNDERWOOD.
MAURICE F. FREAR.