

CONTENTS

Modelmaking	1
Sprue Systems	21
Investing	31
Burnout and Melting	41
Throwing the Casting	53
Direct Methods	67
Sand Casting	77
Casting Pewter	89
Flexible Molds	101
Foundry Casting	113
Special Cases	133
Glossary	141
Reference	146

SLING CASTING

In this centrifugal system, the operator becomes the "machine" – the person supplies the power.

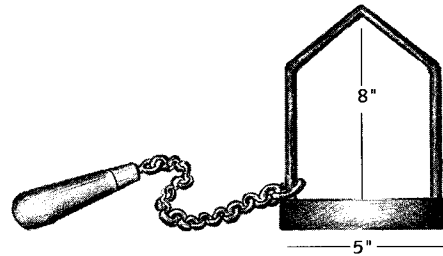
Make a sling as shown, keeping in mind that it doesn't have to be anything fancy. The sizes indicated on the sketch are appropriate for flasks up to about 3" x 3". This technique is not recommended for flasks much larger than that.

Spruing must be handled differently because the sprue former, the dome-shaped opening in the top of the flask, will serve as the crucible. In order to keep the molten metal from dribbling into the mold cavity as it melts, the sprues must be small enough that the surface tension of the metal prevents it from entering the sprue openings through the force of gravity. This is achieved by using sprues that are no larger than 14 gauge B&S. Sprues of rectangular section, cut from similar gauge sheet wax, can also be used.

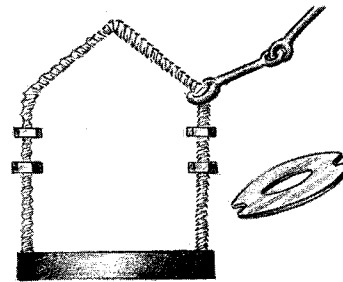
Note that because these sprues are small, more than one will probably be needed. It might also be necessary to include on-sprue reservoirs, (see Chapter 2 for more information).

Burnout is achieved as in a conventional investment casting. When the flask is ready, set the sling caster onto a heat proof surface such as fire brick and check the area all around and overhead to be sure the swinging action will not be impeded.

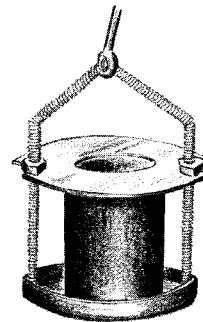
Set the flask into the center of the sling's pad. If using the deluxe model shown here, clamp the hold-down lid into place by screwing the bolts down the threaded rods.



Basic sling caster



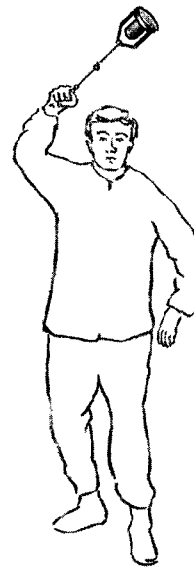
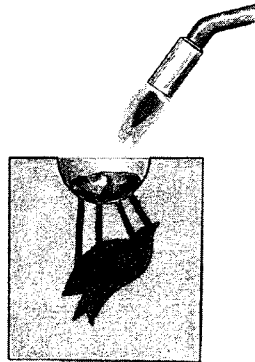
Deluxe model with hold-down plate



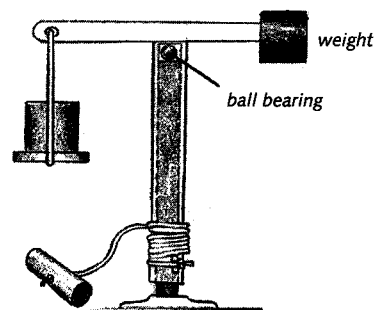
SLING CASTING (continued)

Set the metal into the neck of the flask and melt it with a torch, adding flux a couple times. When the metal is completely molten, stand close to the sling, raise it high enough to straighten out the cable or rods, and slowly sway it back and forth a few times to get the feel of it. Keep the torch on the metal while this is going on.

Just before throwing the casting, check to be sure that the line of the swing is free of obstructions (and bystanders). Remove the torch and at the same time snap the sling overhead in a broad circle. Speed is not as important as a constant pressure, in this case not only to force the metal into the mold, but also to keep the hot flask from dropping on your head. After about a minute of swinging, gradually slow down the swing and allow the sling to come back to vertical position. When the button has lost its red color the flask can be quenched. The process has a certain drama, but when done with a common sense and a cool head it can be safe and practical.



A simple sling machine can be made of a couple pieces of pipe that telescope together. Weld the cross bar to the outer tube and configure some way to attach a counterweight. Wrap a piece of rope around the column and pull it when the metal is molten. This will cause the pipe to spin and force the metal into the mold as the flask is pulled into a horizontal position. It probably goes without saying that the machine must be securely fastened to a solid base.



PROCESS FOR A POURED CASTING

1. Prepare two mold pieces with perfectly flat sides by rubbing each piece on sandpaper.

2. Carve the impression of the casting into one block. Casting an object with pattern on both sides is possible but registration (lining up the two parts) is difficult. You can solve this by making one side a random pattern.

3. Scratch radial vent lines.

4. Carve a sprue channel from the heaviest part of the casting to the outside edge of the mold and enlarge this to a funnel at the top. This sprue should be no longer than an inch.

5. Tie the two mold pieces together with wire.

6. Prop the mold in a pan and warm it slightly with a torch flame. Melt the metal in a pouring crucible, adding flux once or twice. When it is completely fluid, pour the metal into the mold with a smooth movement.

