

(No Model.)

J. V. SMITH.  
CORE BARREL.

No. 489,188.

Patented Jan. 3, 1893.

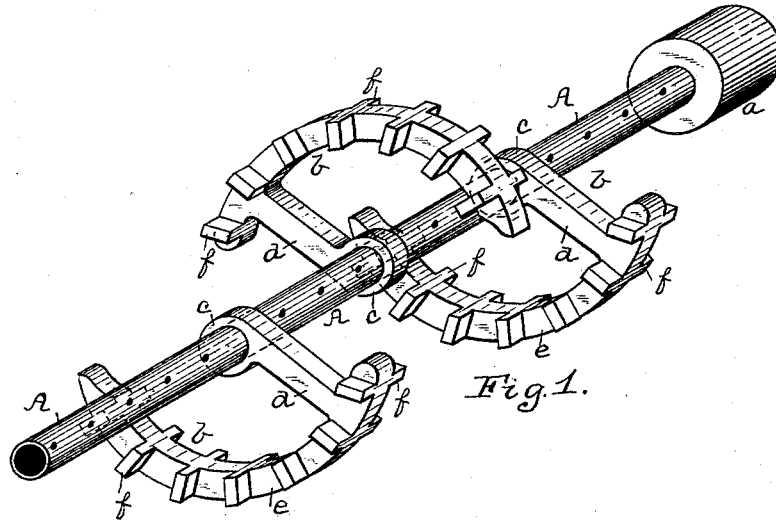


Fig. 1.

Fig. 2.

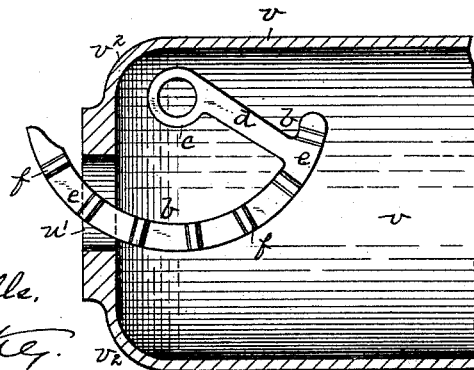
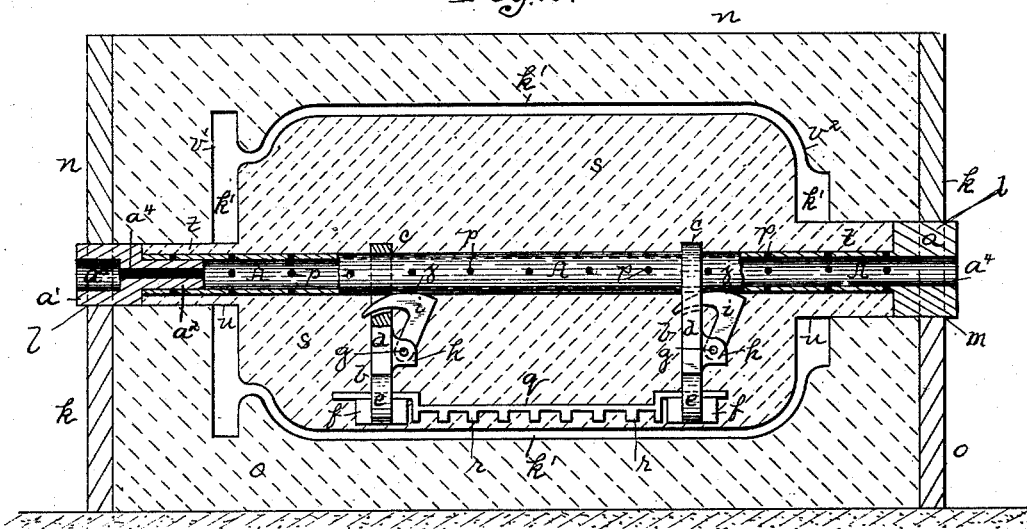


Fig. 3.

Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN VALENTINE SMITH, OF RESERVE, ASSIGNOR OF ONE-HALF TO JOHN C. PORTER, JR., OF ALLEGHENY, PENNSYLVANIA.

## CORE-BARREL.

SPECIFICATION forming part of Letters Patent No. 489,188, dated January 3, 1893.

Application filed January 7, 1892. Serial No. 417,264. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN VALENTINE SMITH, a resident of Reserve township, in the county of Allegheny and State of Pennsylvania, have  
5 invented a new and useful Improvement in Core-Barrels; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to core barrels, its object being to provide a core barrel for use in connection with the making of green sand  
10 cores for large hollow cylindrical castings, such as air chambers, reservoirs, &c., in which are formed end openings that are materially less in diameter than the body of the casting.

Another object of my invention is to provide a core-barrel which can be easily vented and one in which the parts composing the same can be easily taken apart and readily  
20 taken out from the interior of the casting as soon as it is formed.

To these ends my invention comprises, generally stated, a hollow bar with openings therein for venting the same, and placing  
25 around the same one or more supports or braces, said supports or braces being semi-circular in form and having wedges thereon for engaging with said hollow bar to hold the same in position.

It also consists in certain improvements in these parts which will be more fully herein-  
30 after set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same  
35 more fully referring to the accompanying drawings in which

Figure 1 is a perspective view of my improved core-barrel; Fig. 2 is a sectional view of a mold ready for casting, showing some of  
40 the parts in full lines, and Fig. 3 is a detail view of one end of the cylindrical casting showing therein one of the supports or braces ready to be taken out.

Like letters indicate like parts in each of  
45 the figures of the drawings.

I have shown my improved core-barrel in connection with the casting of air chambers or reservoirs, though it may be used with the making of any other kind of cylindrical cast-  
50 ings requiring large cores and whose ends are contracted in order to form openings which

are smaller than the main body of the casting. Around the hollow bar A I place the supports or braces *b*, there being generally  
two of these supports or braces employed in 55 the castings above described, one at or near each end thereof, although any number can be used, three being shown in Fig. 1. The supports or braces *b* have the bearings *c* which fit loosely around the hollow bar A so that  
60 they can be adjusted to place, while extending out from the bearings *c* are the arms *d* for supporting the semi-circular bars *e* at their outer ends, said semi-circular bars *e* being  
65 preferably with the lugs or projections *f* on each side thereof in order to take into the sand composing the core and give stronger and better support thereto. Hinged at *g* in  
bearings *h* on said arms *d* are the wedges *i* which engage with the hollow bar A at *j* and  
70 so lock the supports or braces *b* thereto.

At one end of the hollow bar A is the fixed head *a*, while at the opposite end of said hollow bar A is the removable head *a'* which has  
75 the projection *a<sup>2</sup>* fitting into the interior of said hollow bar. The removable head *a'* has also the openings *a<sup>3</sup>* for the insertion of a bar to assist in carrying it, or moving it around while in the mold. These heads *a* *a'* enable the  
80 flask *k* containing the mold *k'* to fit around the same through the medium of the openings *l* in the cope *n* and the openings *m* in the drag *o*, as is shown in Fig. 2.

In order to vent the hollow bar A, a number of small holes or perforations *p* are bored  
85 or formed therein, so permitting the gases to enter the interior of the hollow bar and escape through the opening *a<sup>4</sup>* during the casting operation. In case it is desired to vent the hollow bar A at both ends, another hole  
90 *a<sup>5</sup>* can be made in the removable head *a'* extending through the projection *a<sup>2</sup>* into the hollow portion *a<sup>3</sup>* thence to the open air. In order to further assist in bracing and supporting  
95 the core-barrel, a horizontal brace *q* may be connected with the supports or braces *b* by resting on top of the semi-circular bars *e*, said horizontal brace having the projections *r* extending down from the bottom thereof into  
100 the sand composing the core.

For the purpose of forming the core, the core-barrel is then placed in the core-box, the

sands composing the core is compacted around the same and around the supports, and extends out at each end, as at *t*, around the hollow bar A until the fixed and removable heads *a*, *a'*, are reached corresponding in diameter to said heads *a'*, *a'*, and so forming the size of the openings *u*, *u'* required for the ends of the casting *v* afterward formed. These castings have the flange end *v'* and the round end *v*, the round end *v* materially aiding and enabling the operator to take out some of the parts composing the core-barrel from the interior of the casting, as hereinafter described.

The operation and use of my improved core-barrel are as follows:—The supports or braces *b* are first placed around the hollow bar A by means of the bearings *c* and adjusted to the desired distance apart, when by means of the wedges *i* coming in contact with the hollow bar A they are firmly held in place, the core-barrel is then placed in a core box, the inside of which is of the shape of the interior and slightly smaller than the casting to be formed, and the horizontal brace *g* laid upon the top of the semi-circular bars *e* of the supports or braces *b* which are hung from the hollow bar A and extend down near the bottom of the core, the top of the core requiring little or no support, being supported by the hollow bar A and the sand supported by the supports or braces *b*; sand is then fed thereto and the core duly formed, after which the core-barrel with its core is then taken out of the core box and put into the flask *k*, the outside circumference of the mold having been previously formed therein, the part or side of the core barrel containing the supports or braces *b* being toward the bottom of the flask *k*, the fixed head *a* and removable head *a'* of the hollow bar A resting in the openings *m* in the drag *o*. The cope *n* is then placed thereon, the openings *l* of which fit around the fixed and removable heads *a*, *a'*, the mold is then ready for the pouring of the molten metal into the same, the gases generated in casting pass through the openings *p* into the hollow bar A and escape through the openings *a'*, *a'*, in the fixed head *a*, thereby providing a core-barrel which will vent itself during the casting operation. After the mold has become sufficiently cooled to permit handling, the cope *n* and drag *o* of the flask *k* are then taken away, and the casting put upon its end, so that the sand contained therein will be forced out through the end opening *u'* of the casting when the operator by means of a hammer or other suitable instrument strikes the blows against the removable head *a'* or the free end of the hollow bar A, so forcing said hollow bar out through the casting and, at the same time, releasing the wedges *i* from contact with the hollow bar A, and thus allowing the supports or braces *b* to free themselves from the hollow bar A and so drop into the bottom of the interior of the casting. After all the sand has been taken out of the casting, the operator turns the cast-

ing on its end and shakes or rattles the same until the end of the horizontal brace *g* gets near or protrudes through the end opening *u'* of the casting, when it is withdrawn therefrom after the hollow bar A and sand have been taken out or with the sand from the interior of the casting. In order to get out the supports or braces *b* from the inside of the casting, all that is necessary is to turn the casting up on its end and shake or rattle the same until one of the supports or braces *b* gets near the lower end of the casting, or its end protrudes through the end opening *u'* when the operator, by catching hold of the protruding end, can easily withdraw the support or brace *b* out of the casting *v* in a circular line, and the round end *v* of the casting allowing the support or brace *b* to pass around the casting *v* until the bearing *c* reaches the opening *u'*, which, being larger than the bearing *c*, allows it to come out so that the whole support or brace *b* can be withdrawn from the interior of the casting *v*, as shown in Fig. 3. The other supports or braces *b* can be withdrawn in the same manner. It will thus be seen that my improved core-barrel will vent itself, thereby overcoming the objection heretofore found in having to make openings for the gases to escape after the molding operation. It can be easily operated and renders excellent support to the core so that there is no liability of the core-barrel breaking down as the structure is strong and durable in its parts, very inexpensive, and can be easily separated and taken apart and all its parts removed from the interior of the casting through a very small opening, and so overcoming the greatest difficulty heretofore found in the manufacture of these cylindrical castings.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. A core support or brace having a bearing for the core bar, an arm extending out therefrom and a semi-circular or curved bar formed only on one side of said arm, substantially as and for the purposes set forth.

2. A core support or brace having a bearing for the core bar, an arm extending out therefrom, and connected to a curved bar, said arm having a wedge thereon adapted to engage with the core bar and hold the support or brace in position, substantially as and for the purposes set forth.

3. The combination of a hollow perforated core bar, a support or brace having a bearing on said hollow bar, and an arm extending out therefrom and connected to a semi-circular or curved bar, substantially as and for the purposes set forth.

In testimony whereof I, the said JOHN VALENTINE SMITH, have hereunto set my hand.

JOHN VALENTINE SMITH.

Witnesses:

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J. N. COOKE.