

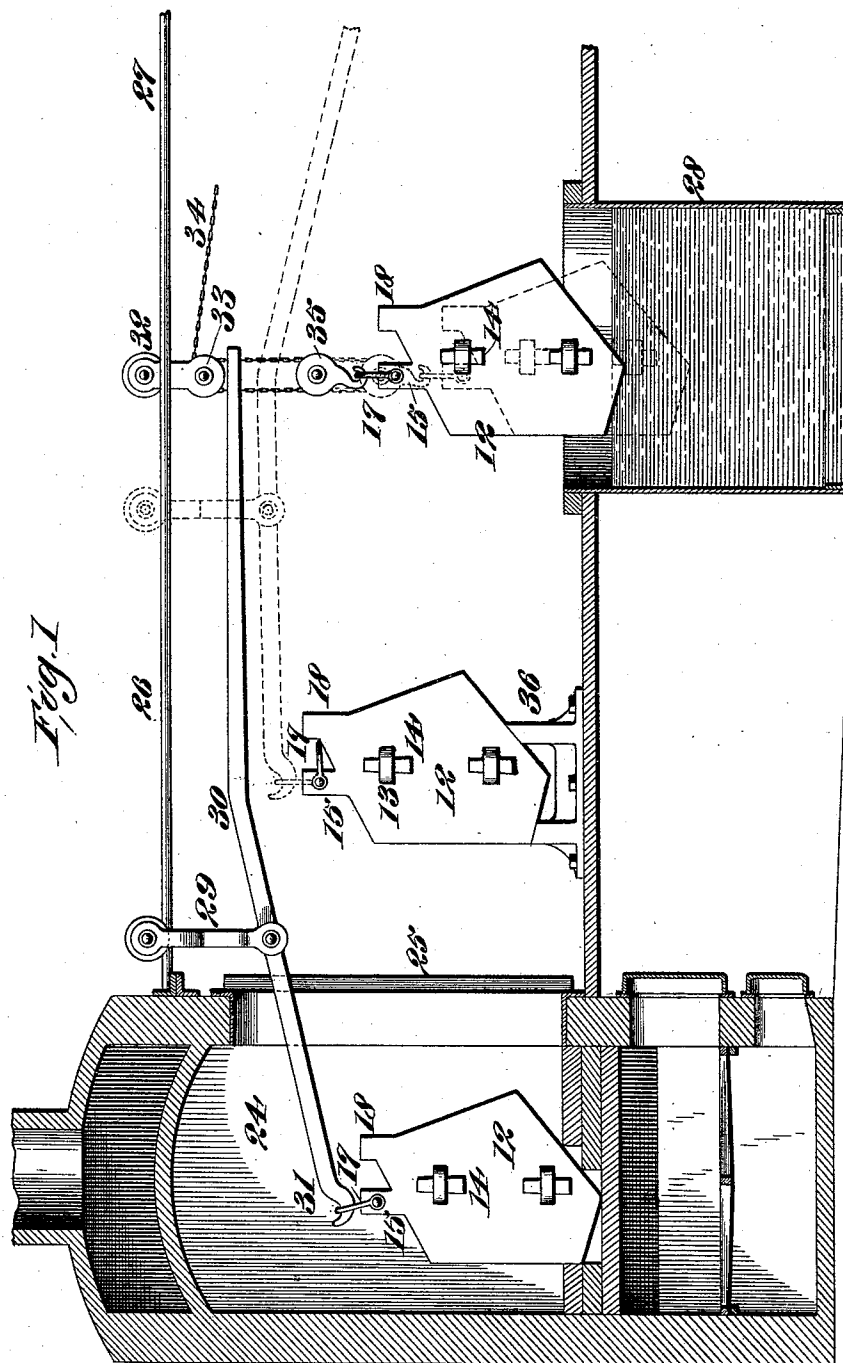
(No Model.)

3 Sheets—Sheet 1.

L. J. CRECELIUS.
PROCESS OF CASTING METALS.

No. 537,277.

Patented Apr. 9, 1895.



Attest:
[Signature]
S. C. Sweet.

Inventor:
Louis J. Crecelius
by *[Signature]*
Att'y.

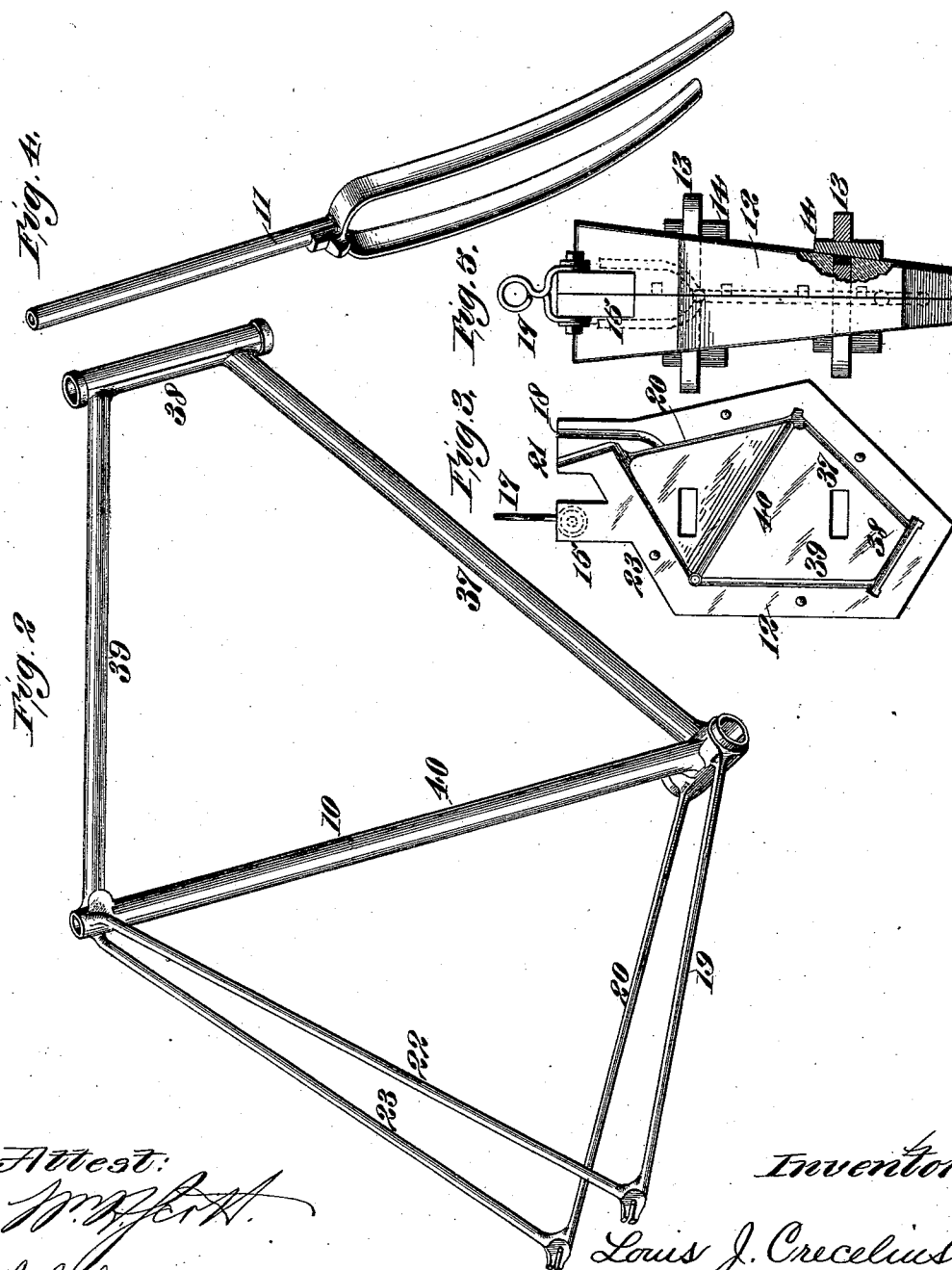
(No Model.)

3 Sheets—Sheet 2.

L. J. CRECELIUS.
PROCESS OF CASTING METALS.

No. 537,277.

Patented Apr. 9, 1895.



Attest:

S. C. Sweet.
S. C. Sweet.

Inventor:

Louis J. Creelius
by *Wm. Sprar*
ATTY.

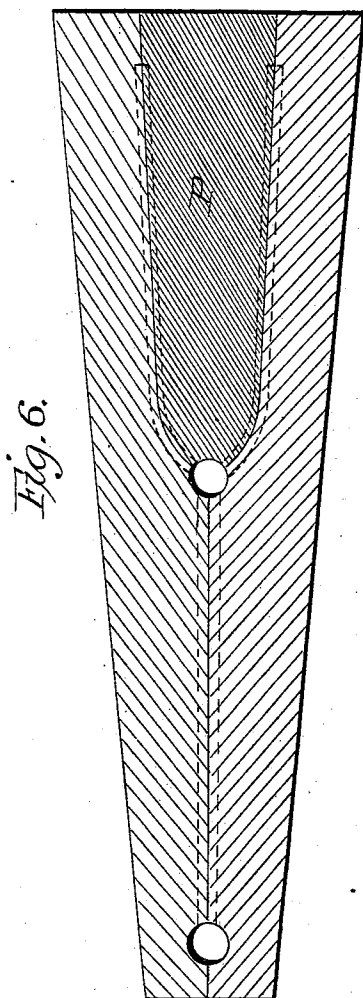
(No Model.)

3 Sheets—Sheet 3.

L. J. CRECELIUS.
PROCESS OF CASTING METALS.

No. 537,277.

Patented Apr. 9, 1895.



Attest
Walter Donaldson
Wm. F. Hall

Inventor
Louis J. Crecelius
by Ellis Spear
JH

UNITED STATES PATENT OFFICE.

LOUIS J. CRECELIUS, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
WILLIAM GRAYSON, OF SAME PLACE.

PROCESS OF CASTING METALS.

SPECIFICATION forming part of Letters Patent No. 537,277, dated April 9, 1895.

Application filed October 19, 1894. Serial No. 526,389. (No model.)

To all whom it may concern:

Be it known that I, LOUIS J. CRECELIUS, a citizen of the United States, and a resident of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Processes of Casting Metals, of which the following is a specification.

The object of my invention is to provide a method of casting metals of medium fusibility so as to provide for the uniform and homogeneous shrinkage of the casting, and the expulsion of all gases and foreign substances from the mold.

My invention consists in the process of casting metals by the provision of a mold of high fusibility, pouring molten metal of relatively lower fusibility into said mold, and cooling said mold and casting therein gradually and progressively.

My invention consists further in the process of casting which comprises introducing molten metal of relatively medium or low fusibility into a mold of relatively high fusibility, retaining said cast metal at a fusible temperature, and conjunctively, gradually and progressively, subjecting said mold and casting to a cooling influence, said cooling influence being first exercised on the mold at the end thereof opposite to the gate or vent thereof, whereby the gases and dross are driven out of the mold by the cooling, and the casting and mold gradually conjunctively shrunken.

My invention consists further, as a process, in casting metal of a known fusibility and shrinkage in a metallic, plumbago or clay mold of a higher fusibility.

Referring to the drawings:—Figure 1 is an elevation, partly in section, of an apparatus which may be employed to practice my process. Fig. 2 is a perspective of a bicycle frame cast by my process. Fig. 3 is a sectional elevation showing one part of the mold in which the bicycle frame is cast, and the frame therein. Fig. 4 is a perspective of a bicycle fork cast by my process. Fig. 5 is an end elevation of the mold, partly in section. Fig. 6 represents a section of the mold showing the interior block.

It is desirable to provide a process and apparatus whereby aluminum castings may be

made, in complicated shapes, diversified dimensions and vari-angled connected bars, which castings will be homogeneous and of fine fiber.

In the drawings the numerals 10, 11, designate castings of the condition above referred to, and in their production I first provide a mold 12 of metal and formed in divisible parts or sections connected by transverse lugs 13 having the keys 14 or by clamps or bolts. It is composed of two main parts and a block or supplemental part P, for the divided part of the frame, as shown in Fig. 6.

The mold 12 has an integral lug 15 on its upper end, and a bail 17 pivotally connected to said lug, whereby the mold is detachably connected to lifting and conveying mechanism about to be described.

A pouring gate 18 is formed in the mold 12 in the vertical plane of, and communicating with the portion of the mold in which the bars 19, 20, of the frame 10 is cast, and a vent 21 is formed in said mold and communicates with the portion thereof in which the jointures of the bars 19, 20, and the bars 22, 23, of the frame 10 are cast, said portion at which the vent is located being at the apex of the completed casting.

The sections of the mold are formed with fitting faces providing tight joints preventing the leakage of gases, water or metal.

A muffle furnace 24 is provided, which furnace has a door 25, and suspended carrying tracks 26, 27, lead from said furnace to a bath tub 28 containing cooling liquid. A hanger 29 is mounted for travel on the track 26 and has fulcrumed therein a lever 30 provided with a hook 31 at one end, adapted for engagement with the bail 17 of the mold 12, and a handle at the other end adapted for manual operation. A hanger 32 is mounted for travel on the track 27, and has a pulley block 33 connected by a chain 34 with a hooked pulley block 35, which block 35 is adapted for engagement with the bail 17 of the mold 12.

The mold 12 is made of metal, plumbago or clay, which fuses at a much higher degree of temperature than the aluminum, as for instance 2400° Fahrenheit to 1400° Fahrenheit.

It will be observed that the upper por-

tion of the mold 12 contains more metal, or is of greater volume, than the lower portion thereof.

The mold 12 may be made of a metal (an aluminum alloy is contemplated) having approximately the same expansion and shrinkage as the aluminum to be cast therein.

My process and the manner of carrying out the same are as follows: The mold 12 is mounted on the hook 31 of the lever 30 and inserted in the furnace 24, wherein it is heated to a degree higher than or equal to the fusibility of the metal to be cast. After heating, the mold 12 is withdrawn from the furnace by the lever 30 and seated on a support 36, and the metal to be cast poured into said mold through the gate 18. The metal in pouring follows the line of the bars 19, 20, 37, 38, 39, 40, and 23, 24 respectively, successively and progressively, driving the gases and dross ahead of it through the vent 21, thus filling the mold gate and vent with molten metal which is retained in a molten condition by the equal or higher temperature of the mold. The hooked block 35 is then attached to the mold 12. Said mold is elevated by draft of the chain 34, conveyed to the vertical plane of the bath tub 28, and lowered by the relaxation of the chain draft, gradually, and progressively, into the cooling solution in said tub.

It will be observed that the portion of the mold 12 farthest from the gate and vent is first introduced into the cooling bath; and it follows, therefore, that the lower portion of the mold being first cooled will contract or shrink upon the lower portion of the casting and render the said casting homogeneous, the downward pressure of the columns of molten metal pressing upon the portion of the casting being cooled and supplying metal to fill the space from which the gases and dross de-

veloped and driven upward by the cooling escape. The upper portion of the casting having the thickest envelope of heated mold, remains molten until the entire mold except the gate and vent has been submerged in the cooling bath.

If desired, a blast of cooling air may be substituted for the liquid, the application of the cooling influence being made at all times to and from the lower portion of the mold.

What I claim is—

1. The process of casting metal, which process consists in heating the mold in a furnace, withdrawing the heated mold from the furnace, introducing molten metal into said heated mold, and gradually introducing said combined mold, and casting into a cooling bath.

2. The process of casting metal, which process consists in heating a homogeneous mold, of high fusibility, to a degree higher than the fusibility of the casting, introducing molten metal of relatively lower fusibility into said heated mold, and subjecting said combined mold and casting to a cooling bath gradually applied thereto from the end opposite the gate or vent therein toward said gate or vent.

3. The process of casting metal, which process consists in introducing molten metal of known fusibility and shrinkage into a heated metal mold of higher fusibility, and subjecting the unfused mold and fused casting conjunctively to a gradual progressive cooling applied to the bottom of the mold, and extending upwardly along the sides thereof to the vent.

LOUIS J. CRECELIUS.

In presence of—

CHARLES PICKLES,
WM. H. SCOTT.