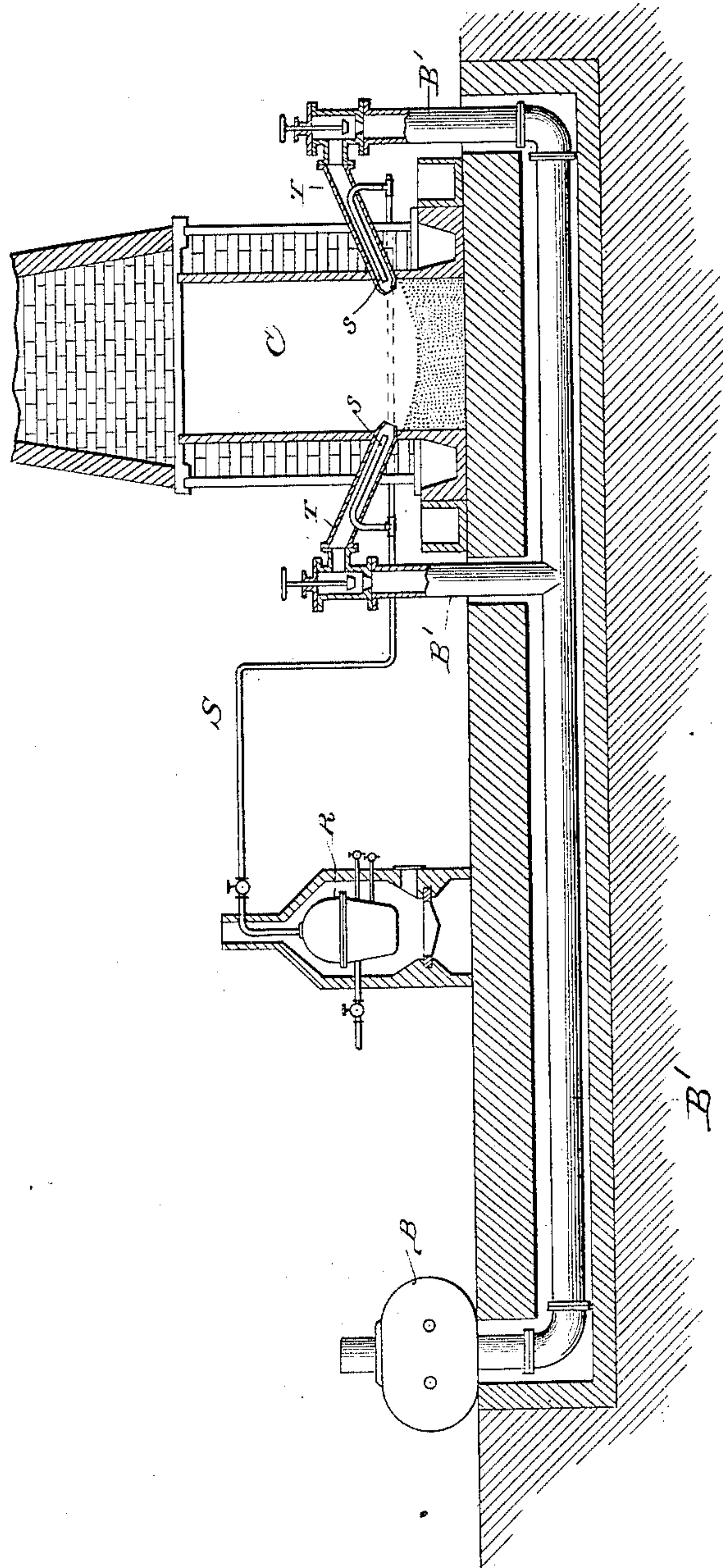


(No Model.)

T. R. TIMBY.
PROCESS OF PURIFYING IRON AND STEEL.

No. 462,602.

Patented Nov. 3, 1891.



Witnesses:
Harry S. Rohrer.
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UNITED STATES PATENT OFFICE.

THEODORE R. TIMBY, OF WASHINGTON, DISTRICT OF COLUMBIA.

PROCESS OF PURIFYING IRON AND STEEL.

SPECIFICATION forming part of Letters Patent No. 462,602, dated November 3, 1891.

Application filed October 27, 1890. Serial No. 369,510. (No model.)

To all whom it may concern:

Be it known that I, THEODORE R. TIMBY, a citizen of the United States, residing in the city of Washington, District of Columbia, have invented a new and useful Process of Purifying Iron and Steel, of which the following is a specification.

My invention relates to a process of ridding molten iron from sulphur, silicon, and other impurities, as well as from excess of carbon, to which end I employ a jet of hot air mixed with decomposed or superheated steam and with the addition of vaporized animal-oil, preferably fish-oil or whale-oil, as hereinafter described.

In carrying out my invention I prefer to take from five to ten or even fifteen per cent. of fish or whale oil, together with water, in a suitable boiler, highly heating the oil and vaporizing the water, and introduce this combined heated oil and water-vapor in jets into the cupola through suitable pipes or nozzles within the tuyeres through which the air-blast is introduced. The superheated steam and oil mixed with the hot-air blast effect the rapid combustion and discharge of carbon, sulphur, silicon, and other impurities, the oxygen, with the air-blast, decarbonizing the metal and the hydrogen of the decomposed steam with the oil-vapor having a greater affinity for the sulphur, &c., combining with and carrying off the same, resulting in the refining of the iron and decarburizing to any extent desired, governed by the length of time and ascertained by observation of the combustion of the resultant gases, as in the Bessemer and other processes of converting iron.

My process is employed in the production

of steel of various grades and of refined iron ready for blooming.

It will be understood that my improved process is applicable to the manufacture and conversion of iron and steel in cupolas, blast-furnaces, and converters of various kinds.

The accompanying drawing is a sectional elevation of a cupola with suitable boiler or vaporizer and blast attachments by which my invention may be carried into effect.

R represents the vaporizing boiler or retort, C the cupola, and T T the compound tuyeres, each provided with an internal steam-nozzle and communicating by pipes S with the vaporizing boiler or retort R, so as to discharge the united steam and oil into the cupola C or other blast-furnace or converter in connection with the air-blast, which is forced by a suitable blower B through pipes B' and delivered through the tuyeres T T. The air-blast may be heated by any suitable means.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The process of converting or decarburizing and purifying iron, which consists in introducing mingled jets of animal-oil and decomposed or superheated steam into the molten metal, substantially as set forth.

2. The process of converting or decarburizing and purifying iron, which consists in introducing mingled jets of hot air, decomposed or superheated steam, and animal-oil into the molten metal, substantially as set forth.

THEODORE R. TIMBY.

Witnesses:

OCTAVIUS KNIGHT,
SAMUEL H. KNIGHT.