

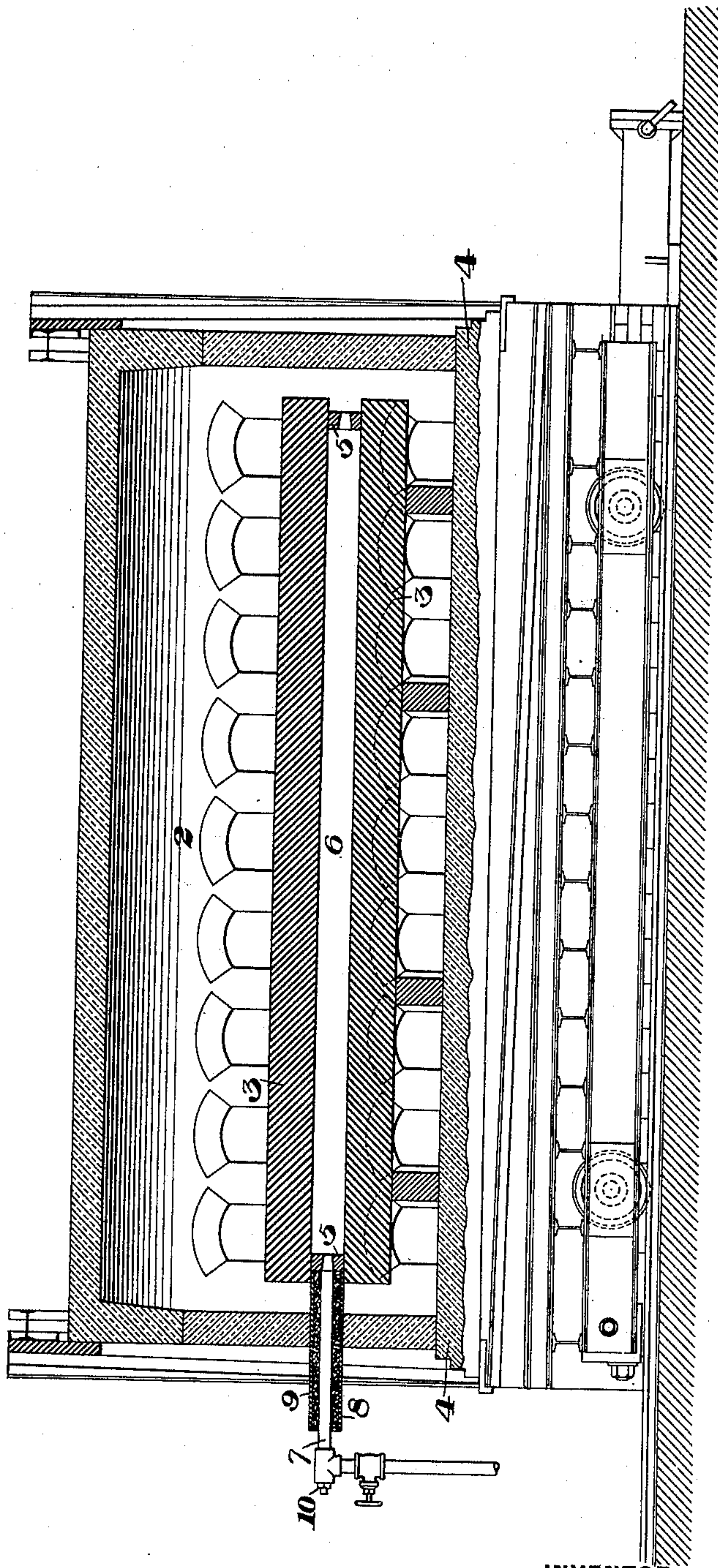
No. 627,159.

Patented June 20, 1899.

J. S. UNGER.
PROTECTING DEVICE FOR FURNACES.

(Application filed June 9, 1898.)

(No Model.)



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN S. UNGER, OF HOMESTEAD, PENNSYLVANIA, ASSIGNOR TO THE CARNEGIE STEEL COMPANY, LIMITED, OF PITTSBURG, PENNSYLVANIA.

PROTECTING DEVICE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 627,159, dated June 20, 1899.

Application filed June 9, 1898. Serial No. 682,984. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. UNGER, of Homestead, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Protecting Devices for Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, which shows in
10 vertical section a furnace provided with my improvement.

The object of my invention is to provide means for protecting metal parts of furnaces which are exposed to great heat.

15 I have specially designed the invention for the protection of the gas-supply pipe by which hydrocarbon gas is delivered to the space between armor-plates or like masses of steel while undergoing the gas-carburization process in a heating-furnace. The cutting action of the intensely hot gases in such furnace is very destructive to the gas-supply pipes, and the various expedients which have been
20 tried heretofore for the protection of such pipes, such as the use of water-jackets and asbestos wrappings, have not proved satisfactory.

My invention consists in applying to the surface to be protected a jacket of carbon, which, by furnishing carbon to combine with and neutralize all oxidizing-gases which may penetrate to the metal surface, affords a complete protection.

35 The mode in which I prefer to apply the invention to practice, and which I claim herein specifically, is to place around the gas-supply pipe an outer pipe or sheath and fill the intermediate space with bituminous coal or like coking material, so that when heated
40 it will be converted *in situ* into a jacket of coke, which, as it swells somewhat in coking, will make a very tightly fitting covering for the pipe.

45 In the drawing, 2 represents a heating-furnace of the usual construction.

3 3 are armor-plates supported on a hearth 4 and separated by supporting blocks or billets 5, so as to afford an intermediate space

6, into which the carburizing hydrocarbon gas is delivered from a pipe 7. Around the pipe 50 7 I place an outer pipe or sheathing 8 of larger diameter and I fill the space between the pipes with a body of bituminous coal 9. When the pipe so arranged is in the furnace, the intense heat of the latter will soon coke the 55 coal, driving off the volatile gases, which escape at the ends of the sheathing, and leaving in the sheathing a closely-fitting jacket of carbon, which will prevent access to the pipe of any oxidizing gases. A pipe thus 60 protected will be found at the end of a run of the furnace to be quite unburned, and although the exterior sheathing 8 may be oxidized this is a matter of but little moment, as it may be made of cheap material and is 65 therefore easy to replace.

For the purpose of cleaning the interior of the pipe from the carbon which is deposited therein by decomposition of the hydrocarbon gas I provide at its rear end a removable plug 10, on removing which a cleaning-rod may be pushed through the pipe. 70

Modifications of my invention in order to adapt it to other parts or places of a furnace structure may be made by those skilled in 75 the art, as will be readily understood, since

What I claim is—

1. As a protecting device for metal parts exposed to hot gases in furnaces, the combination with the metal part of a sheath and a 80 jacket of carbonaceous material interposed between the part to be protected and the sheath, and adapted to be coked *in situ*; substantially as described.

2. As a protecting device for metal parts exposed to hot gases in furnaces, the combination with the metal part of a sheath and a jacket of coal interposed between the part to be protected and the sheath, and adapted to be coked *in situ*; substantially as described. 85 90

In testimony whereof I have hereunto set my hand.

JOHN S. UNGER.

Witnesses:

THOMAS W. BAKEWELL,
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