APPARATUS FOR WELDING IRON AND STEEL.

SPECIFICATION forming part of Letters Patent No. 760,600, dated May 24, 1904.

Application filed December 20, 1902. Serial No. 136,716. (No model.)

To all whom it may concern:

Be it known that I, ABRAM C. ALLEN, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Apparatus for Welding Iron and Steel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the art of forging iron and steel, and more particularly to the welding of large or long pieces of iron or steel or of iron and steel.

In the method most generally in use at the present time the parts to be united are placed in a furnace and brought to the desired condition, when they are taken from the furnace and cemented by hammering either by hand or power. It is evident that if the heated parts are brought from the furnace the same must be united within a very short space of time or the welding will not be successfully accomplished, on account of the rapid cooling of the heated metals when exposed to the air.

In case of failure, which is of frequent occurrence where the parts to be welded are thin and of considerable extent, the parts must be again reheated, involving loss of time and more or less impairment of the parts themselves. To avoid this, I cement the heated parts together in a highly-heated atmosphere and in preference in the furnace itself.

In the accompanying drawings I have shown a furnace devised by me to carry out this method, and my invention is disclosed in the following description and claims.

Figure 1 is a longitudinal vertical section of my improved furnace. Fig. 2 is a horizontal section on the line 2 2, Fig. 1. Fig. 3 is a section of the anvil on line 3 3, Fig. 2; and Fig. 4 is a section of the same on line 4 4, Fig. 2.

The furnace A is of the usual form of a gas or oil burner heating-furnace. This furnace is provided at the end nearest the door with an anvil B, projecting slightly above the floor of the heating-chamber. This anvil is firmly supported and has its upper end recessed, and connected therewith are water-pipes b b' for providing a current of water into and out of said recess in the furnace for cooling the same in a well-known manner.

Above the furnace is operatively mounted the hammer C, and the roof of the furnace is provided with an opening a directly beneath the hammer. The hammer is so located and supported that it can drop through the opening upon the anvil. This hammer is supported in guideways controlling its upward and downward movements and may be raised and dropped by hand or by power mechanism, as preferred. Provision is also made for retaining the hammer when not in use above the roof of the furnace, as shown in the drawings. When raised to this position during the heating of the parts to be united, the aperture in the roof of the furnace is closed by the cover a'.

D is the door of the furnace, and e e e are the gas or oil burners.

In operating this device the parts to be united or welded are placed in the furnace beyond the anvil. The burners are ignited and kept in operation until the parts to be welded have been raised to the required temperature. The cover a' is then removed, the parts are drawn forward on the anvil, and the hammer dropped upon them. If the parts are of such extent that they are not completely united by this operation, they are then drawn forward and the hammer again dropped, and this is repeated until the parts have been completely welded or cemented together.

What I claim, and desire to secure by Letters Patent, is—

1. A welding-furnace having a heating-hearth for heating materials to be welded, and an anvil within said furnace adjacent to the heating-hearth, whereby the materials to be welded may be heated upon said hearth in said furnace and welded upon the anvil without removing any of the parts from the furnace, substantially as described.

2. A welding-furnace having a heating-hearth for heating materials to be welded, an anvil within the furnace adjacent to the heating-hearth, and a hammer arranged to fall...
upon said anvil, whereby the parts to be welded may be heated in said furnace and subjected to the action of the hammer without removing any of the parts from the furnace, substantially as described.

3. A welding-furnace having a heating-hearth for heating materials to be welded, a water-cooled anvil adjacent to the said heating-hearth, and a hammer arranged to fall upon said anvil, the whole combined and operating substantially as described.

In testimony whereof I have affixed my signature in the presence of two witnesses.

ABRAM C. ALLEN.

Witnesses:
EUGENE G. KENNEDY,
GRAFTON C. KENNEDY