Improved Bee-Hive Coke Oven.

John Fulton, M. E., Johnstown, Pa.

The general plan of the bee-hive coke oven has held its place in the manufacture of coke with great firmness. It is venerable with age, and indeed has been sneered at because of its antiquity. Notwithstanding all this, it has kept quietly on its way, producing the very best possible coke from the coal used in its manufacture.

Multiplied attempts have been made to displace this most ancient of ovens, but these have so far accomplished very little. The 15,144 bee-hive coke ovens now in operation in the Connellsville coke region bear testimony to the appreciated value of this oven. The Connellsville coke is a standard coke so far as known on the continent of North America.

The physical and chemical properties of this bee-hive oven coke are fully shown in the table in the foot note below.

Its use in blast furnaces fully maintains the character given in the table. At a large furnace 1897 pounds of this coke produces one gross ton of Bessemer pig iron, and the output of the furnace is correspondingly large (8,478 gross tons per month), exhibiting the energy and economy of this fuel.

In Virginia and West Verginia excellent coke is also being produced in the bee-hive oven, some of which approximates very closely to the Connellsville standard.

The Cumberland Valley Colliery Company, of Pineville, Ky., make a most excellent coke in their bee-hive ovens, one of which has been a surprise in the degree of its purity and physical properties, being somewhat superior to the standard Connellsville. Hence so far as the quality of the coke produced in this oven for metallurgical purposes, it is the peer of any other class of oven. It may seem strange that through its long years of faithful service very little improvements have been made in its general form or its details. Quite recently, however, the size of the oven has been enlarged so that the standard oven of the Connellsville region at present is 12 feet in diameter across its floor, and the height from the center of the floor to the top of the dome under charging port is 7 feet. This enlargement has been made with a primary view of increased output, and also reducing the percentage of waste at the door of the oven where air has to be admitted to mix with gases and support combustion in the dome above the charge of coal in the oven. The door of this oven has been enlarged and its height increased so as to permit the air to be introduced at a level above the charge of coal in the oven, so as to have as little contact with the coal in introducing the air into the oven as possible, thereby lessening the ashes or waste that is made in this way.

The accompanying cuts (made from actual working drawings) illustrates the dimensions and manner of construction. In Fig. 1 is shown a transverse section of a bank of these ovens, the one at the left being shown completed, the right hand drawing illustrating the manner of construction. Fig. 2 shows the ovens in plan and Fig. 3 in elevation.

It will be noted also that in the general method of building these ovens a thinner variety of building stones are used. In fact, stones from three to four inches thick, make the best bond, and have greater endurance than the larger stones hitherto used in such structures.

The iron frame to the oven door has been modified by removing the arch piece, which was found in its expansion and contraction to shatter the masonry above the door. The frame, with its three sides, is sufficient to protect the jambs and posts of the doorway from the friction of the rabbling irons.

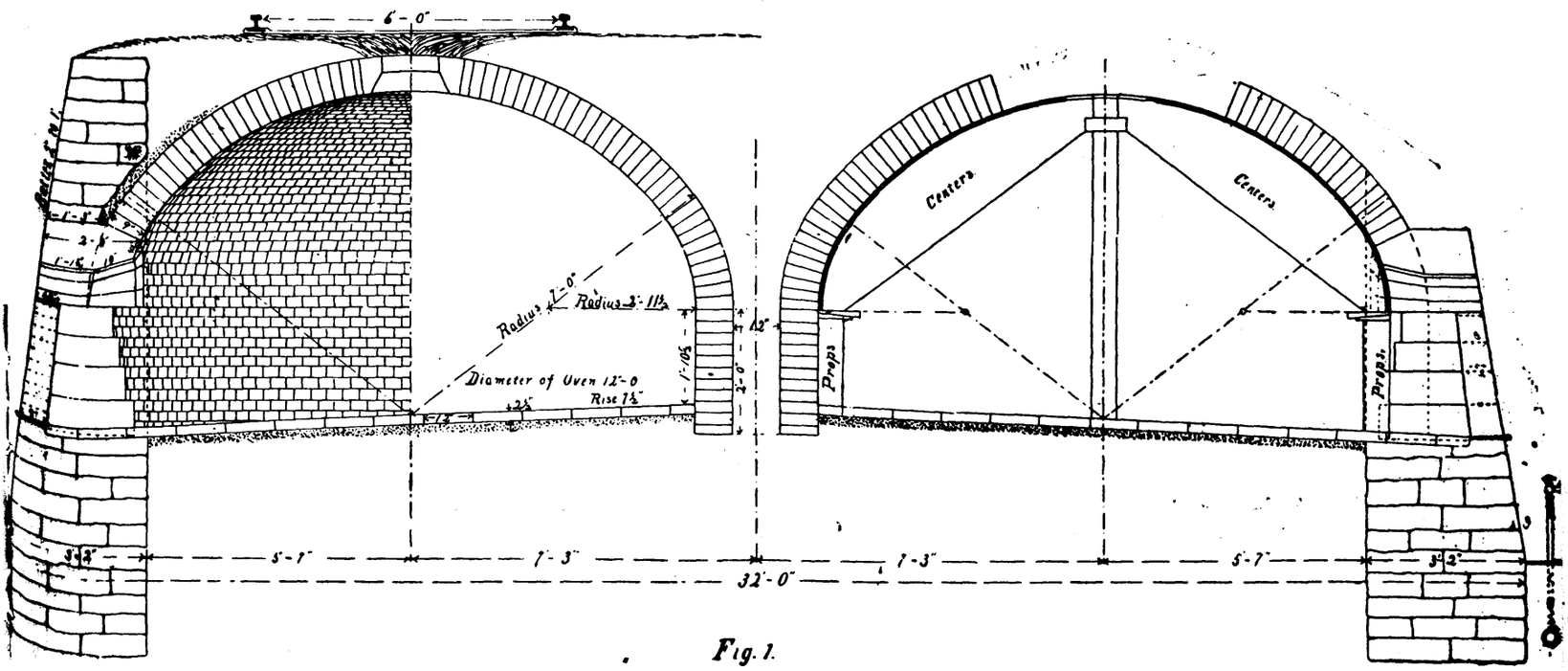

Fig. 1.

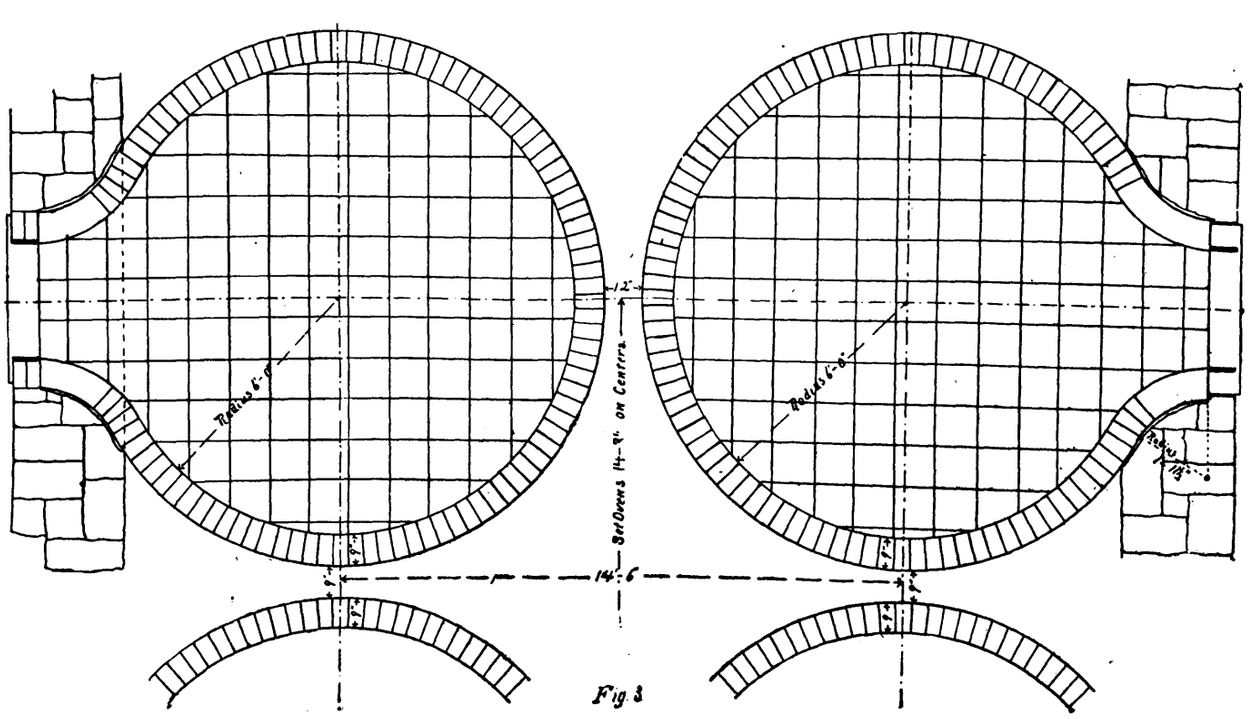

Fig. 3