

**No. 674,094.**

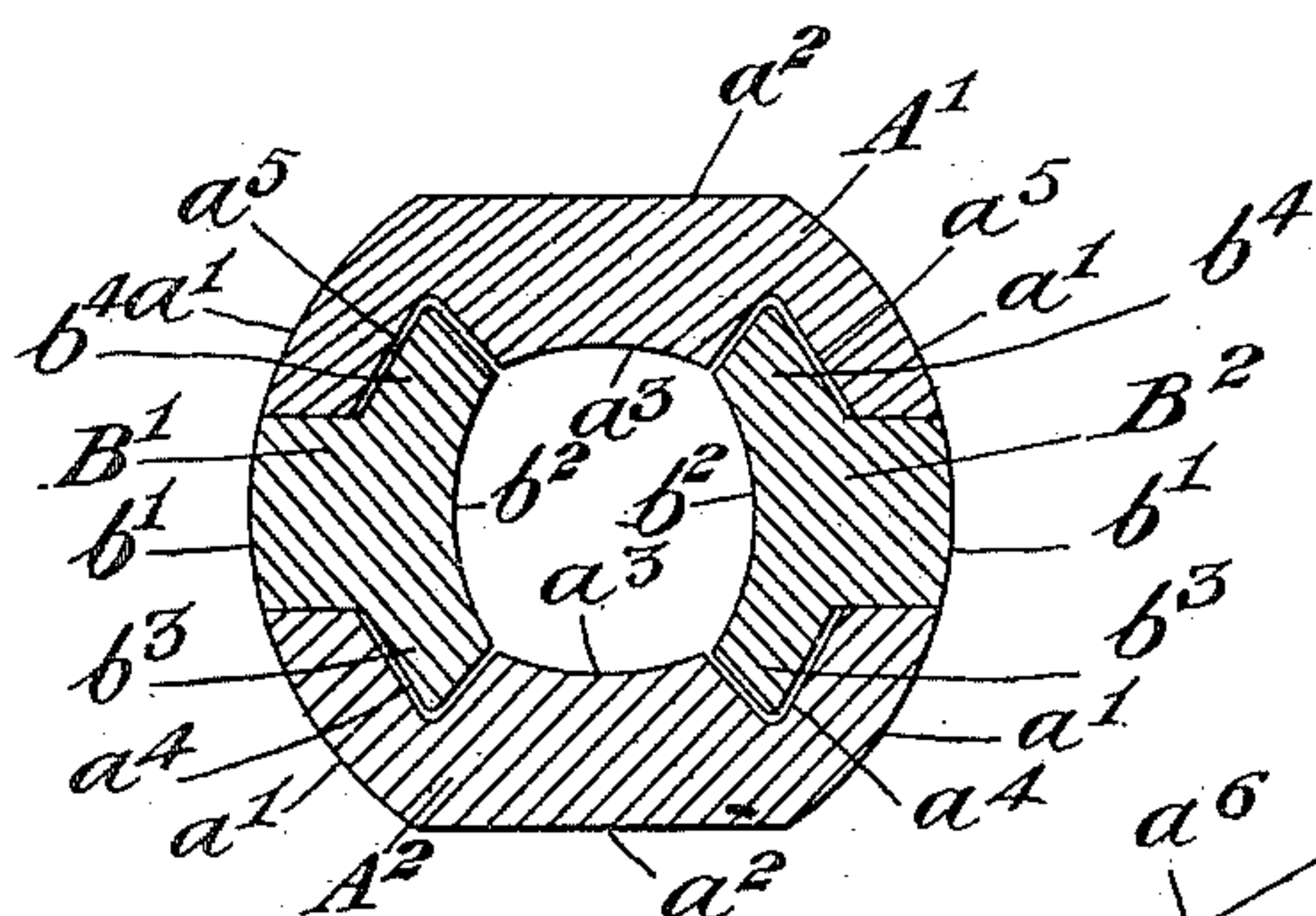
**Patented May 14, 1901.**

**J. C. NICKLIN.**  
**PILE FOR TUBES.**

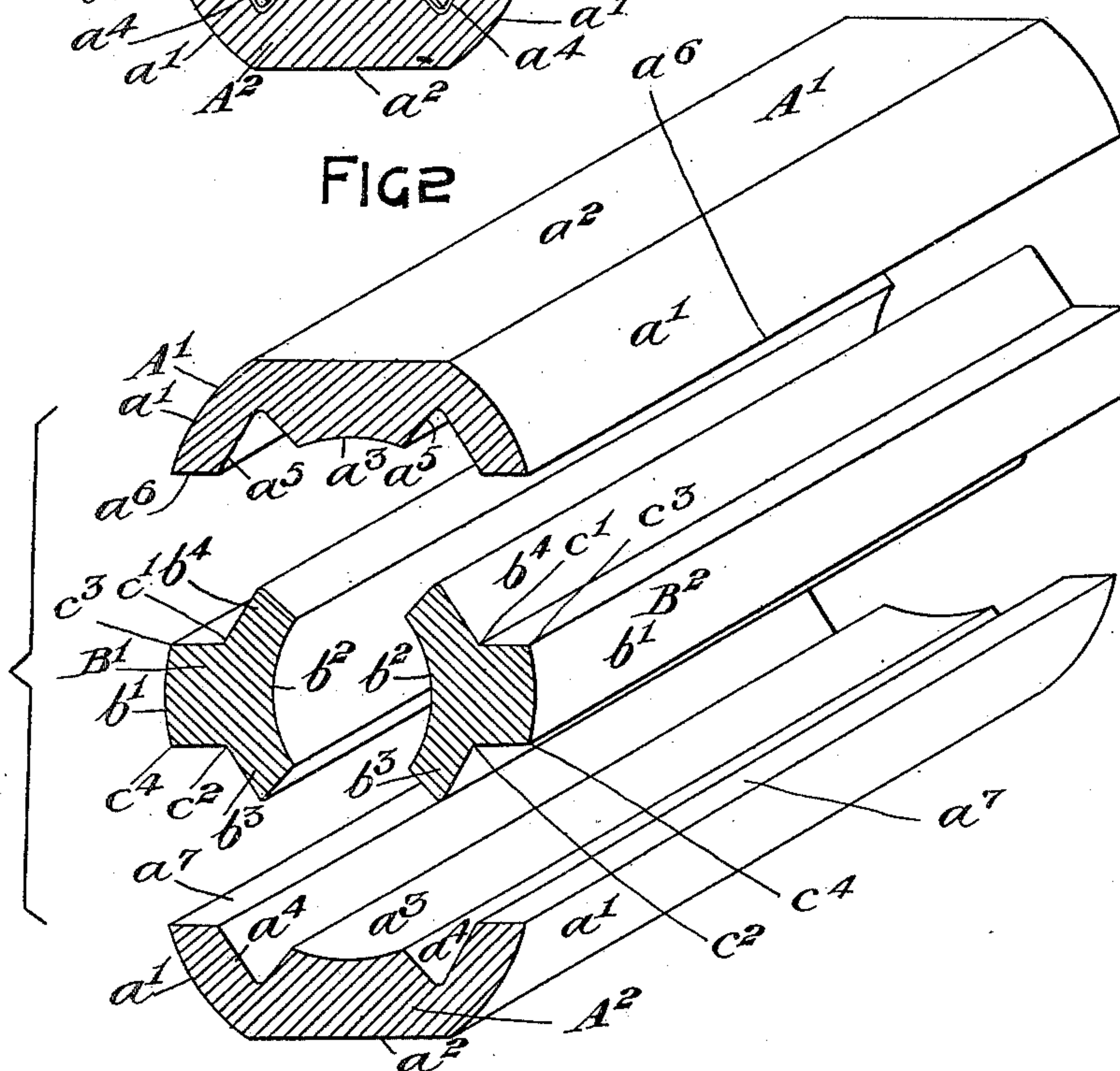
(Application filed Feb. 5, 1901.)

(No Model.)

FIG 1



# FIG 2



**WITNESSES.**

Charles Brewster Kelley  
Thomas John Rowe.

***INVENTOR.***

James Croft Hicklin



# UNITED STATES PATENT OFFICE.

JAMES CROFTS NICKLIN, OF SMETHWICK, ENGLAND.

## PILE FOR TUBES.

SPECIFICATION forming part of Letters Patent No. 674,094, dated May 14, 1901.

Application filed February 5, 1901. Serial No. 46,127. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES CROFTS NICKLIN, iron and steel merchant, a subject of Her Majesty the Queen of Great Britain and Ireland, residing at Summer Hill House, South road, Smethwick, in the county of Stafford, England, have invented certain new and useful Improvements in the Manufacture of Iron and Steel Tubes, of which the following is a specification.

This invention has reference to that method of manufacturing iron and steel tubes in which iron or steel bars of particular sections are laid together to form a hollow pile which is heated to a welding heat in a furnace to weld the bars together and is then without reheating rolled out into the required tube by being passed through rolls on a mandrel or by other well-known means. When iron tubes are being manufactured, the hollow pile is by preference formed of puddle-bars, and it is most important that these puddle-bars should be of such sections that their edges will be even and as little ragged as possible, so as to insure perfect welds in the finished tube, as if the edges of the puddle-bars are very ragged they are not properly welded during the heating and rolling processes and a tube with one or more slits or bad places is the result.

My invention consists in the manufacture of iron and steel tubes from an approximately-circular-section hollow pile formed of four bars of the particular sections and arranged as I will now describe, and which bars can readily be rolled with comparatively even edges, and thus insure perfect welds throughout the finished tube.

On the accompanying drawings, Figure 1 is a cross-section of a hollow pile formed in accordance with this invention, and Fig. 2 shows separately the four bars of which the said hollow pile is formed.

The same letters of reference indicate the same parts in both figures.

In carrying out my invention I form the approximately-circular-section hollow pile of four outside bars, (marked, respectively,  $A' A^2 B' B^2$ ), of which the bars  $A' A^2$  are both of the same section and form the top and bottom of the pile, respectively, and the two bars

$B' B^2$  form the two sides of the pile. The outer surfaces  $a'$  of the bars  $A' A^2$  and the outer surfaces  $b'$  of the two bars  $B' B^2$  are rounded to conform with the circular form of the outside of the pile, and the bars  $A' A^2$  have each a flat face  $a^2$  for the pile to stand on. The inner surfaces  $a^3$  of the top and bottom bars  $A' A^2$  and the inner surfaces  $b^2$  of the two side bars  $B' B^2$  are hollowed, so as together to form the circular or approximately circular inner surface of the pile. In order to keep the four bars in correct position relatively to each other and to form wide laps where the bars weld together, the two side bars  $B' B^2$  are each rolled with two projecting ribs, (marked, respectively,  $b^3 b^4$ ), which take into corresponding longitudinal grooves  $a^4 a^5$ , which are rolled in the upper face of the bottom bar  $A^2$  and in the lower face of the top bar  $A'$ , so that the bars fit together, as represented in Fig. 1, and their adjacent surfaces weld together when the pile is heated to a welding heat in the furnace. The side bars  $B' B^2$ , which take between the bottom bar  $A^2$  and the top bar  $A'$ , must be no wider across from  $c'$  to  $c^2$  (see Fig. 2) than from  $c^3$  to  $c^4$ ; otherwise the bar cannot be readily rolled. In order that the surfaces of the grooves  $a^4 a^5$  in the bars  $A' A^2$ , and also the adjacent surfaces of the projecting ribs  $b^3 b^4$  of the side bars  $B' B^2$ , may when the pile is being heated in the furnace get hot as soon as the outer surfaces of the bars, it is preferred to roll the grooves  $a^4 a^5$  a very little larger than the ribs  $b^3 b^4$ , so that the surfaces do not quite touch, as shown in Fig. 1, and the heat can get between them.

It will be understood that after the hollow pile has been heated to a welding heat in the furnace it is while at a welding heat rolled down into a tube in the well-known way by being rolled onto and over a plug in ordinary breaking-down rolls and then being further rolled down to the required thickness by other well-known machinery, which forms no part of this invention.

By making the side bars  $B' B^2$  form portions of the outside of the pile between the top and bottom bars  $A' A^2$  any inequalities in the edges  $a^6 a^7$  of the bars  $A' A^2$  are in the

process of rolling down the tube filled up by the portions of the side bars B' B<sup>2</sup> which are located between these edges.

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

1. A hollow pile comprising the side bars having upper and lower ribs and flat portions at the bases of said ribs, and the top and bottom bars having grooves to receive said ribs, the overhanging edges of said grooves resting on said flat portions, substantially as described.

2. A hollow pile comprising the side bars having upper and lower ribs and flat portions at the bases of said ribs, and the top and bottom bars having grooves to receive said ribs, the overhanging edges of said grooves resting

on said flat portions, said grooves being larger than the ribs, substantially as described.

3. A hollow pile comprising the side bars or sections having inwardly-inclined top and bottom flanges of angular cross-section, and flat faces in rear of said flanges, the top and bottom bars or sections having V-shaped grooves adapted to receive said flanges and having overhanging edges resting on said flat portions, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JAMES CROFTS NICKLIN.

Witnesses:

CHARLES BOSWORTH KELLEY,  
THOMAS JOHN ROWE.