J. D. AND W. R. ANDERSON.

LADDER.

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1,436,138. Patented Nov. 21, 1922.

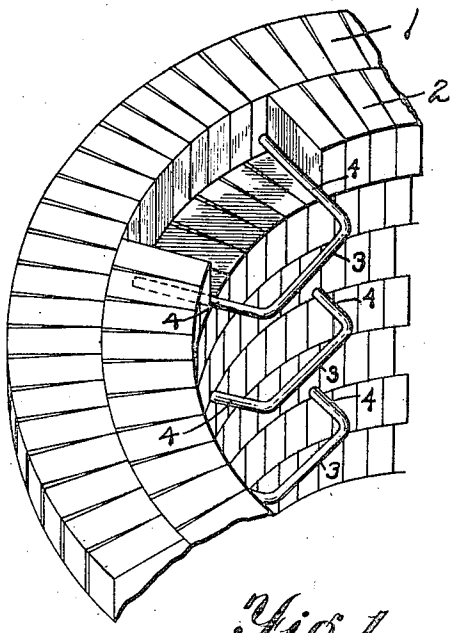


Fig. 1

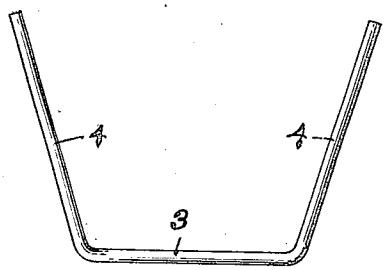


Fig. 2.

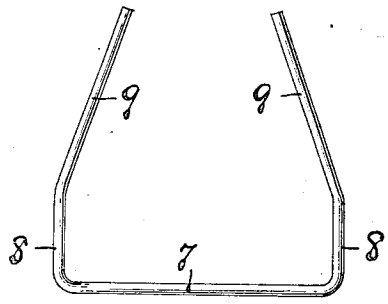


Fig. 4.

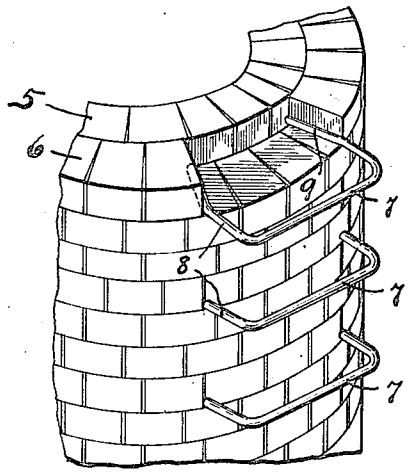


Fig. 3.

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UNITED STATES PATENT OFFICE.

JAMES D. ANDERSON AND WILLIAM R. ANDERSON, OF DETROIT, MICHIGAN.

LADDER.

Application filed November 8, 1921. Serial No. 513,840.

To all whom it may concern:

Be it known that we, JAMES D. ANDERSON and WILLIAM R. ANDERSON, citizens of the United States, residing at Detroit, Wayne County, Michigan, have invented a new and Improved Ladder, of which the following is a specification.

This invention relates to the rounds or metallic members which are embedded in masonry to constitute ladders whereby workmen may ascend and descend the outer and inner sides of structures such as chimneys, sewer man-holes and other cylindrical structures, and its object is to provide simple and effective articles of manufacture which can be quickly embedded in the masonry to constitute rounds of a ladder and which cannot be withdrawn without bringing with them portions of the structure in which they are embedded.

This invention consists in a bar of metal having a central portion which constitutes the ladder round and two end portions which are embedded in the masonry of a cylindrical structure, these end portions being at such an angle to each other and to the middle portion that when embedded in the cylindrical masonry structure these end portions will be radial to the structure.

It further consists in the details of construction illustrated in the accompanying drawing and particularly pointed out in the claims.

In the drawing, Fig. 1 is a perspective of a section of a sewer man-hole. Fig. 2 is a plan of a ladder round especially adapted therefor. Fig. 3 is a perspective of a section of a chimney. Fig. 4 is a plan of a ladder round especially adapted for the chimney.

Similar reference characters refer to like parts throughout the several views.

At present it is customary to form the metal ladder rounds which are built into sewer man-holes, shafts and chimneys with substantially parallel side arms connecting to the ends of the step portions of the rounds and these side arms work out of the masonry in which they are embedded. To prevent this, the ends of the arms are often bent at right angles, in which case a recess must be formed in the masonry to receive these bent ends. The cost of bending these ends is considerable because a second operation is necessary whether they are produced by machinery or by hand.

In the present case we have shown in Fig. 1 a section of sewer man-hole or other cylindrical construction consisting of outer and inner rows 1 and 2 of bricks and ladder rounds embedded therein consisting of central step portions 3 and side arms 4. These side arms are at such an angle to each other that they extend radially of the cylindrical structure and can therefore be laid between the joints of the brick constituting the structure. It is customary to knock off the corners of the bricks which are in contact with these rounds so that they can be laid with the ordinary mortar course. Very little time is lost in placing these rounds, as the brick layers find so little trouble in fitting them in place.

After the wall has been laid and the mortar set, it is substantially impossible to withdraw these rounds without destroying the wall, the angle between the side arms being such that they, together with the bricks between them, act like the keystone of an arch. Absolute destruction of the structure immediately adjacent these rounds is necessary to free them.

While a ladder is shown on the interior of a cylindrical structure in Fig. 1, Fig. 3 shows a ladder on the exterior of a similar structure. In this case there are two cylindrical rows 5 and 6 of brick and each ladder round consists of the central step portion 7, and parallel arms 8 having radial extensions 9. It is evident that instead of having parallel portions 8 the arms may extend radially from the central step portions 7 which may have any other desired form. The rounds are mounted in the brickwork in the same manner as before and are held as firmly in position.

The rounds when being manufactured will be bent so that the arms will be in radial lines when positioned in the structure on which they are to be used and the angles between the side arms will vary with the diameters of the structures. A few standard sizes may be kept in stock and side arms bent to the correct angle before the rounds are positioned.

We claim:—

1. Ladder rounds for cylindrical structures comprising central portions and side arms all in the same plane, the side arms being in the radial lines of the cylindrical structure for which the rounds are intended.

2. A ladder for the interior of a cylindrical structure consisting of rounds, each round comprising a step portion and arms extending radially into the structure.

3. A ladder for cylindrical sewer manholes which consist of rows of radial bricks, the ladder being formed of rounds, each round comprising a step portion and arms at the ends thereof, each arm extending between adjacent bricks and radially of the structure.

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