

No. 863,045.

PATENTED AUG. 13, 1907.

W. A. RANKIN.
ROASTING FURNACE.
APPLICATION FILED DEC. 4, 1905.

Fig. 1.

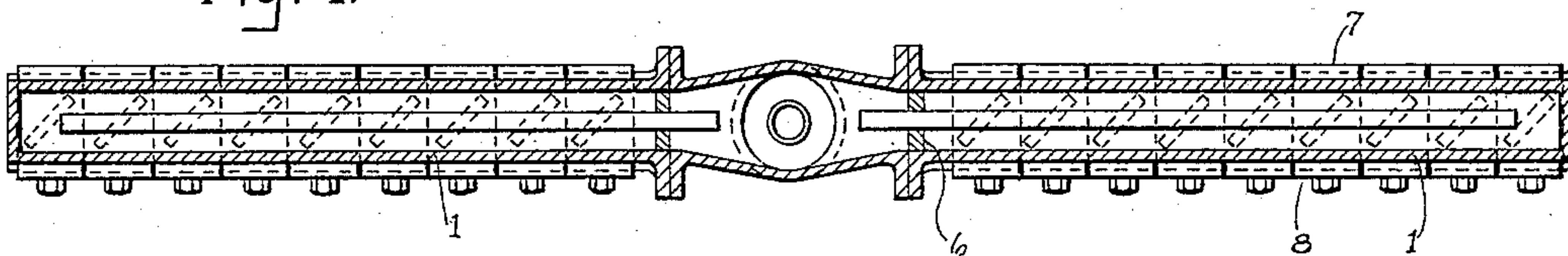


Fig. 2.

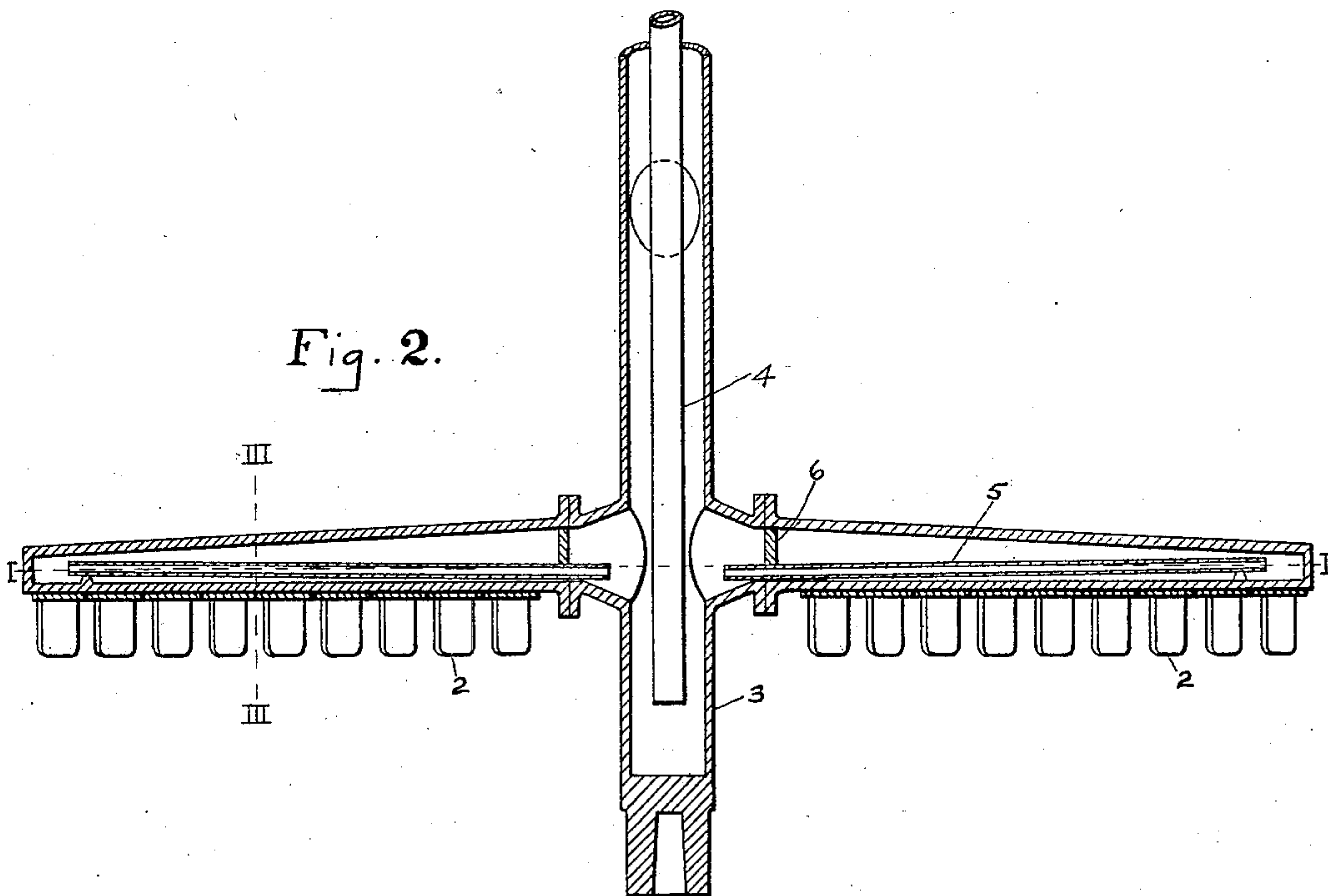


Fig. 3.

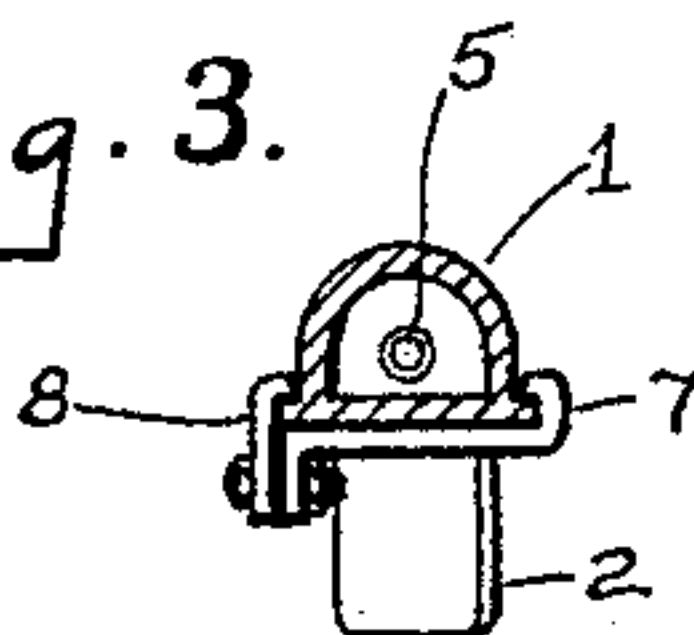


Fig. 4.

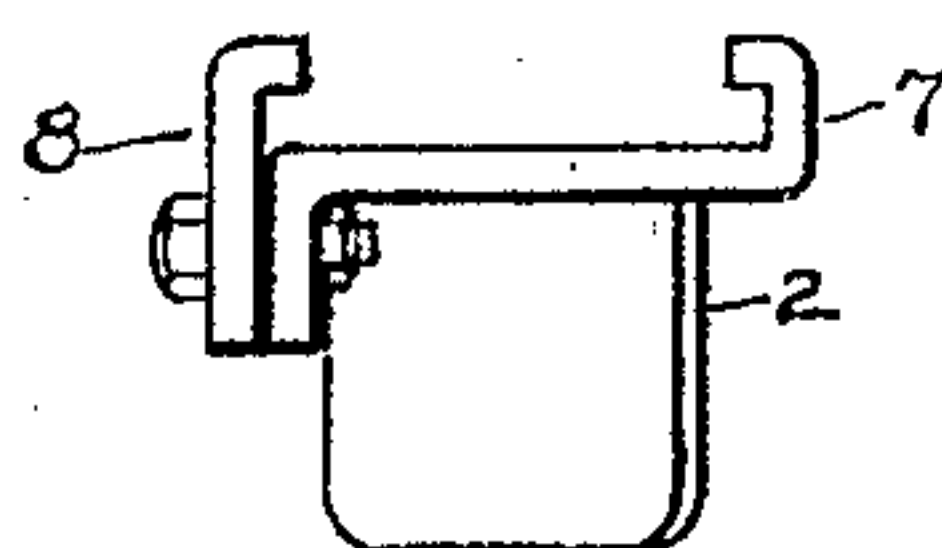
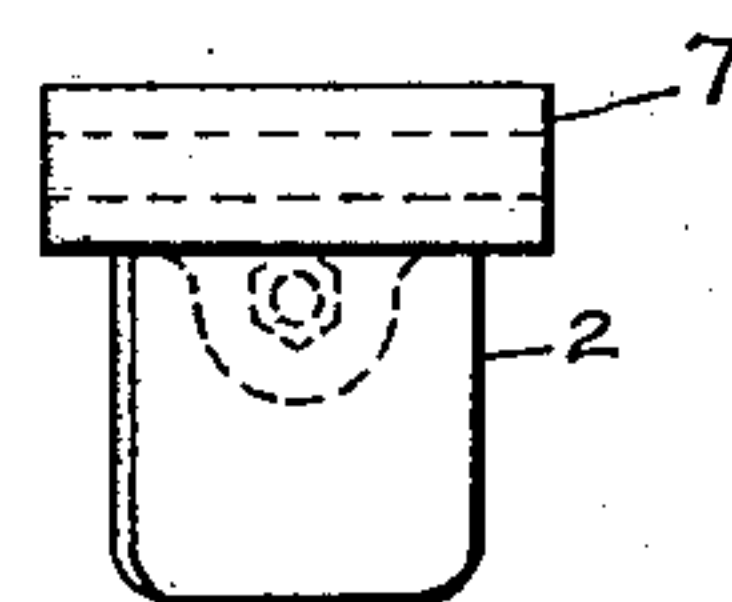


Fig. 5.



WITNESSES:

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ROASTING-FURNACE.

No. 863,045.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed December 4, 1905. Serial No. 290,074.

To all whom it may concern:

Be it known that I, WILLIAM A. RANKIN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Roasting-Furnaces, of which the following is a specification.

This invention relates to a device for increasing the efficiency of stirrers and more particularly those structures wherein it is desired to control the temperature of the stirrer and provide ready means for removal of defective blades and attachment of new blades, plows or rabbles.

The drawings show an embodiment of this device in a superposed hearth ore roasting furnace, Figure 1 being a section on the line I—I, Fig. 2; Fig. 2 a vertical section through a portion of the shaft and one pair of arms or bars; Fig. 3 is a section on the line III—III of Fig. 2; Fig. 4 is an end view; and Fig. 5 a side view of one of the blades, plows or rabbles.

The bar or arm 1 is provided with flanges, which flanges serve as attaching means for the blades 2. The arms are mounted on the hollow central shaft or stem 3, which stem has within it, the pipe 4 extending nearly to the bottom thereof. In each hollow arm or bar 1 is a hollow member or pipe 5 held therein by the wedge 6. This pipe has one end slightly higher than the other. As shown herein, the outer end is higher. The purpose of inclining this pipe is to promote circulation of a fluid.

Each blade or rabble 2 has a fixed flange 7 and a removable flange 8. The rabble so constructed may be applied perpendicularly to the axis of the arm or bar; that is, should a blade or rabble be broken, it may be removed by breaking the bolt holding the flange 8 and knocking loose the blade 2 and a new rabble brought directly into position perpendicularly to the axis of the bar or arm. This has great advantage, particularly in ore roasting furnaces, because the calcining operation corrodes the metallic parts materially, and to replace an inner blade it is necessary to remove all the blades between that broken blade and the end, which is often

a rather difficult task. It is to be noted that should the old form of rabble be used, it could be broken off and this type attached.

The operation of this means for increasing the efficiency of the stirrer bar or arm is as follows: The fluid, which may be a liquid, as water, is introduced at the top of the pipe 4 and escapes into the larger stem or shaft 3 at the bottom thereof, and as it rises will tend to pass into the bars or arms 1. As shown herein, the device being applied to a roasting furnace, the warmer surface will be the outside of the bar, and the fluid coming in contact therewith will be heated, made lighter, and tend to rise. In order to provide efficient means to bring about a circulation through the arm, the pipes extend toward the outer ends and incline upward so that the rising fluid will pass outward through the pipe, come into contact with the warmer outer walls of the bar or arm and work its way toward the central shaft and upward to the next set of arms where the operation will be repeated. Should the circulation system be used to increase instead of reduce the temperature, of course the pipes would be inclined reversely. The blades, plows or rabbles serve to stir or mix the substance being treated.

What is claimed and it is desired to secure by Letters Patent is:

1. A hollow stirrer having open-ended means therein to permit fluid circulation and a common exhaust and supply chamber for said means.

2. A hollow stirrer and an open-ended pipe therein and a common exhaust and supply chamber for said pipe.

3. A hollow stirrer and an open-ended inclined pipe therein.

4. A plurality of stirrers and open-ended pipes therein and a common exhaust and supply chamber for said pipes.

5. A plurality of stirrers and open-ended inclined pipes therein.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. RANKIN.

Witnesses:

H. C. CASE,

GEO. E. KIRK.