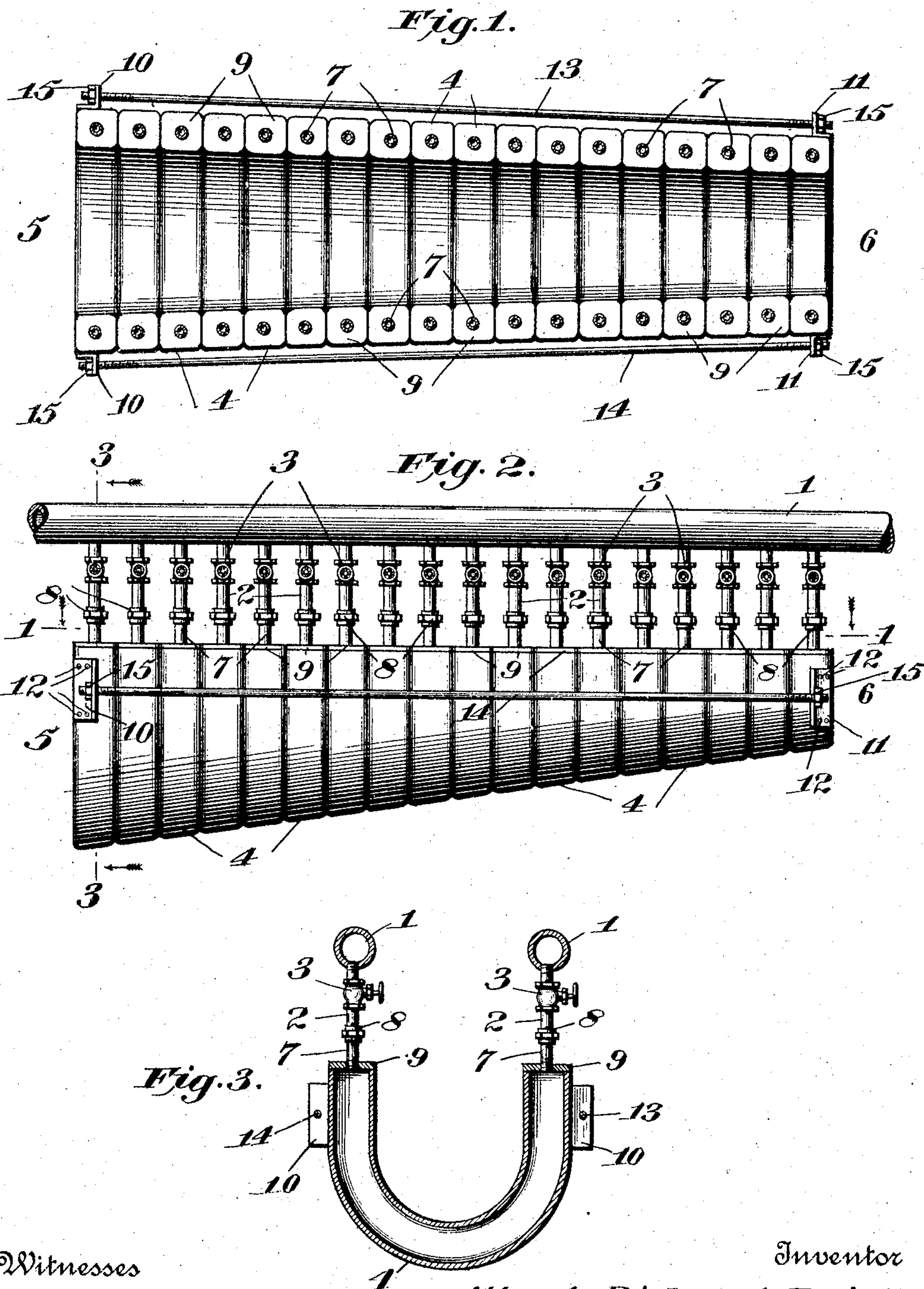


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A. R. BRINK.
SECTIONAL WATER TUBE MATTE SPOUT.
APPLICATION FILED OCT. 28, 1903.



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ALBERT RICHARD BRINK, OF ANACONDA, MONTANA.

SECTIONAL WATER-TUBE MATTE-SPOUT.

SPECIFICATION forming part of Letters Patent No. 780,592, dated January 24, 1905.

Application filed October 26, 1903. Serial No. 178,638.

To all whom it may concern:

Be it known that I, ALBERT RICHARD BRINK, a citizen of the United States, residing at Anaconda, in the county of Deerlodge and State of Montana, have invented a new and useful Sectional Water-Tube Matte-Spout, of which the following is a specification.

This invention relates to water-jacket metal or matte spouts.

Spouts are used in connection with blast-furnaces for conveying off the molten metal, matte, copper, and slag to the settler, where the slag is separated from the metal. The great heat renders the spouts in general use at the present time short-lived, because while it has been proposed heretofore to use a water-jacket for the spout the nose or end of the spout where the metal flows from the spout to the settler is the part which is subjected to the greatest wear and tear, and the nose or end of the spout on being condemned makes it necessary to replace the entire spout with a new one at great expense, which causes a loss of time and a possibility of the furnace freezing up, while making it necessary at times to tap the furnace of all of the hot metal and slag when the nose or end of the spout is leaking.

The object of my invention is to provide an improved sectional water-jacket metal or matte spout which will overcome the foregoing and other disadvantages of water-jacket metal and matte-spouts now in common use, and with this end in view the invention contemplates the provision of an improved metal or matte spout made in two or more sections arranged side by side and each being self-contained and water-jacketed and detachable from the other sections, in connection with means for holding the sections together and pipe connections and valves whereby any section can be removed when damaged without disturbing the other sections of the spout and replaced with a new section, which can be fastened in position and connected to the water supply and outlet.

With the foregoing embodiment of the present invention when the nose or end of the spout becomes damaged and is condemned the section or sections thereat can be quickly and

easily removed and replaced with new sections and the only loss is the section which is removed and the one which replaces it, thus effecting a great saving in time and cost over metal and matte spouts now in common use, while obviating all of the drawbacks incident to other spouts, as outlined heretofore.

The present spout is capable of manufacture at a reduced cost over spouts now generally employed.

Instead of carrying out the present invention as heretofore set forth it may assume the form of a single water-jacketed nose-section detachably connected to the delivery-nose of any ordinary metal or matte spout, such as commonly used on blast smelting-furnaces, because, as heretofore set forth, the greatest wear on the spout by heat and friction of the metal passing therethrough is at the delivery end or nose, and by employing this construction an ordinary spout can be made to serve indefinitely by replacing at very small cost the water-jacketed detachable nose-section with another similar section when the one in use is worn out. In carrying out the invention in this manner I am enabled to effect a very great saving in cost, time, and labor.

The following specification sets forth a convenient embodiment of my invention, the novelty of which is embodied in the appended claims.

In the drawings which illustrate the present embodiment of the invention, Figure 1 is a plan view on line 1 1 of Fig. 2; Fig. 2, a side elevation of the invention; and Fig. 3, a vertical section on line 3 3 of Fig. 2, showing the supply and take-off pipes and the construction of the nose-section of the spout, which is illustrative of the form and construction of the other sections of the spout.

The numerals 1 represent the supply and take-off pipes or mains for the water which cools the sections of the spout, either of these pipes being used as a feed and the other as a take-off. Depending from the pipes 1 are branch pipes 2, spaced at suitable intervals apart along the pipes 1 and in communication with the interior thereof, these branch pipes 2 having suitable hand-valves 3 for regulat-

ing the flow of the water to and from the U-shaped hollow tubular sections 4 constituting the spout. The sections 4 are all alike in general form; but they decrease in size from the nose or delivery end of the spout 5 to the receiving end 6, and each section is complete and self-contained and closed on all sides except at the ends of the legs thereof, where they are provided with short pipes 7, connected by detachable unions 8 with the branch pipes 2, thus affording a convenient means for rapidly and easily attaching and detaching any section without disturbing the remaining sections, the valves 3 being provided for cutting off the water when a section is removed, and said valves can also be used for regulating the flow. The U-shaped sections 4 are tubular in form, and they can be produced by any desired operation, one of which may be by stamping. The material is preferably steel or iron. The pipes 7 are connected to caps 9, which are preferably of steel or boiler-plate and welded to the ends of the legs of the sections 4. To hold the various sections together side by side and prevent any leakage between them, angle-plates 10 and 11 are provided on opposite sides of the end sections, said angle-plates being secured to the sections by any preferred fastenings 12, such as patch-bolts. Rods or bolts 13 and 14 on opposite sides of the spout extend from the angle-plates 10 to the angle-plates 11 and are provided with screw-threads and nuts 15 for tightening said rods or bolts and holding the sections firmly together side by side.

The complete spout is shown in the drawings. If any part thereof becomes burned out or worn, the bolts 13 and 14 are loosened and the unions 8 in the injured section detached, whereby the injured section can be removed and replaced by another section, the valves 3 having first been closed. After the substituted section is in position the rods 13 and 14 are readjusted to clamp the sections together and the valves 3 of the substituted section are opened. The substitution of one or more sections, if injured, can be accomplished very quickly and at comparatively small expense. The circulation of the water in the respective sections keeps the spout properly cooled at all times.

I am aware that it is not necessary for the spout to be constructed in numerous independent water-jacketed sections, and in my claims I purpose to also cover the use of only two sections placed side by side and constituting, in continuation, the spout. In my claims when referring to the sections as "constituting, in continuation, the spout" my purpose is to cover two or more sections, as found desirable in use, for I am aware that the spout can be made of one large section with but one detachable water-jacketed section on the end or nose, which could be made detachable and

a new end piece put on when the end becomes worn.

The invention as covered by claim 14 may also be carried out by detachably connecting to the delivery-nose of any spout commonly used on smelting-furnaces a single water-jacketed nose-section which can be removed when worn out by the heat and friction of the metal passing thereover and another similar water-jacketed section substituted therefor.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A spout of the class described comprising a plurality of water-jacketed self-contained detachable sections placed side by side and constituting, in continuation, the spout.

2. A spout of the class described comprising a plurality of hollow detachable sections placed side by side and constituting, in continuation, the spout, and means for introducing water independently into said hollow sections.

3. A spout of the class described comprising a plurality of independent detachable water-jacketed sections placed side by side and constituting, in continuation, the spout, and means for introducing water to said sections independently of each other.

4. A spout of the class described comprising a plurality of substantially U-shaped hollow detachable sections placed side by side and constituting, in continuation, the complete spout, and means for introducing water into each section independently of the other sections.

5. A spout of the class described comprising a plurality of water-jacketed detachable sections, means for introducing water into each section independently of the other sections, and a valve controlling the supply to each section.

6. A spout of the class described comprising a plurality of water-jacketed detachable sections, means for introducing water into each section independently of the other sections, and an independent valve for each section which controls the water-supply to said section.

7. A spout of the class described comprising a plurality of detachable water-jacketed sections placed side by side, a water-feed pipe, branch pipes from the water-feed pipe leading independently to the respective water-jacketed sections, a detachable connection between each of said branch pipes and said water-jacketed sections, and means controlling the flow of water to the respective sections.

8. A spout of the class described comprising a plurality of detachable water-jacketed sections placed side by side, a water-feed pipe, branch pipes from the water-feed pipe leading independently to the respective water-jacketed sections, a detachable connection be-

tween each of said branch pipes and said water-jacketed sections, and independent valves one for each water-jacketed section, independently controlling the flow of water to said section.

9. In a spout of the class described, the combination with a plurality of detachable water-jacketed sections placed side by side and constituting, in continuation, the spout, of supply and take-off pipes, and detachable branch connections between each water-jacketed section and said supply and take-off pipes.

10. In a spout of the class described, the combination with a plurality of water-jacketed sections, of supply and take-off pipes, detachable branch connections between each water-jacketed section and said supply and take-off pipes, and a pair of valves for each water-jacketed section, one valve controlling the supply to the section and the other valve controlling the take-off of the water from said section.

11. A spout of the class described comprising a plurality of detachable substantially U-shaped water-jacketed sections placed side by side and forming, in continuation, the complete spout, independent supply and take-off water-pipes, branch pipes leading from the supply and take-off pipes to each section, detachable connections between said branch pipes and the water-jacketed sections, and valves controlling the branch pipes.

12. A spout of the class described comprising a plurality of water-jacketed independently-detachable sections placed side by side and forming, in continuation, the complete spout, and means for holding said sections firmly together.

13. A spout of the class described comprising a plurality of substantially U-shaped hollow independently-detachable sections placed side by side and forming, in continuation, the complete spout, means for holding said sections firmly together in a detachable manner, independent supply and take-off water-pipes, branch pipes having detachable connections and leading from each section to the supply and take-off pipes, and valves controlling the supply and take-off for each section.

14. A spout of the class described having at its delivery-nose a water-jacketed section detachable from the spout, and means detachably connecting the said nose-section to the spout, whereby the water-jacketed nose-section can be removed at will.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT RICHARD BRINK. [L. s.]

Witnesses:

JOHN FUTE,
WM. A. MARSH.