

No. 753,255.

PATENTED MAR. 1, 1904.

W. GIBSON.
COOLING RACK FOR GALVANIZING PLANTS.

APPLICATION FILED MAR. 18, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1

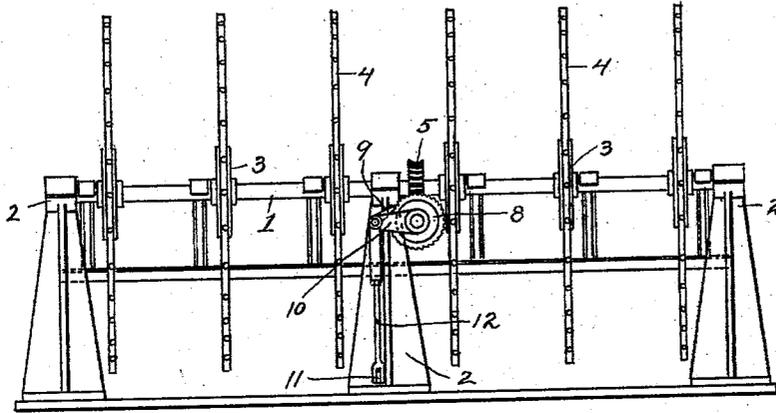
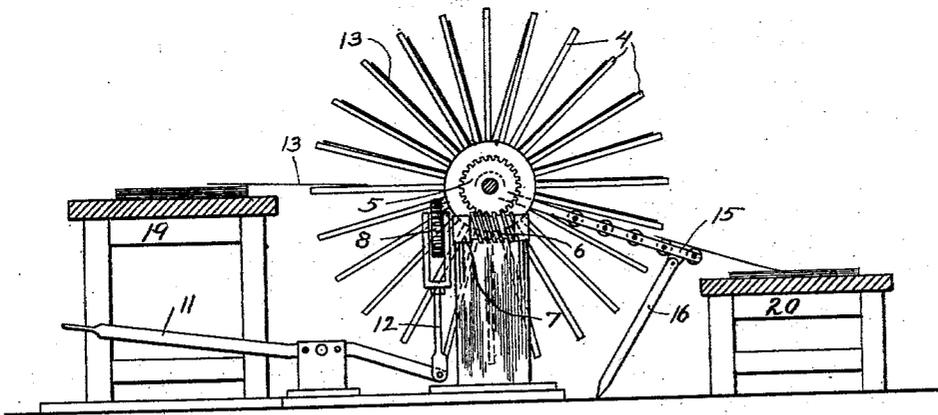


Fig. 2



Witnesses.
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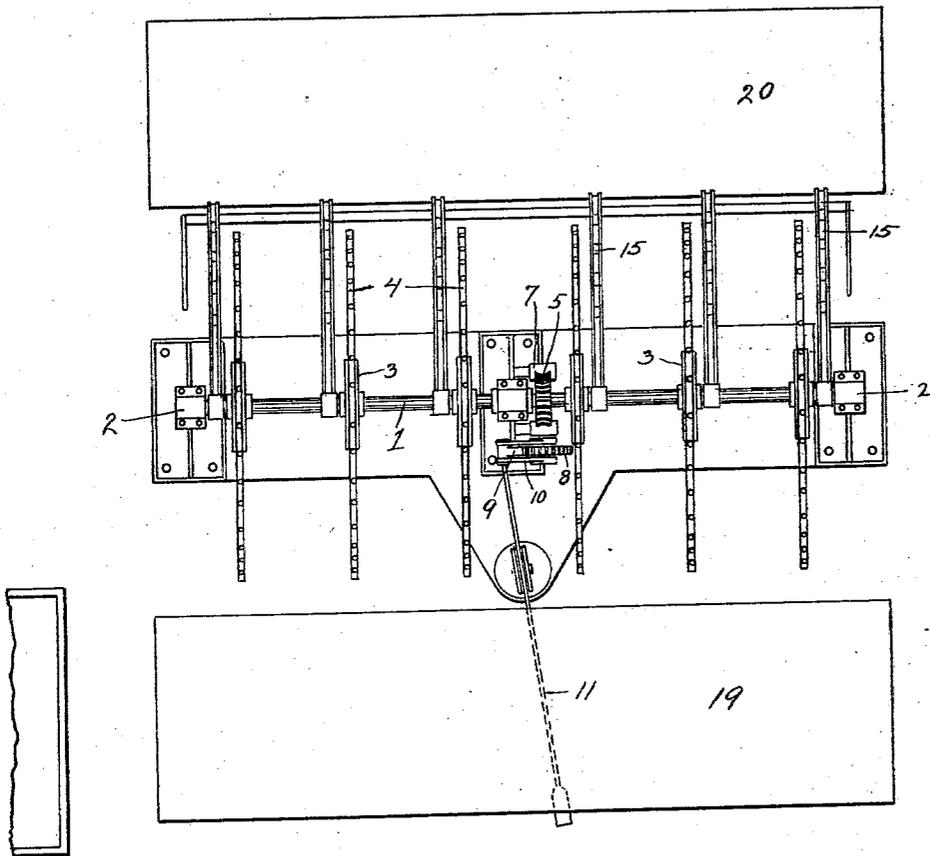
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2 SHEETS—SHEET 2.

Fig. 3



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM GIBSON, OF VANDERGRIFT, PENNSYLVANIA.

COOLING-RACK FOR GALVANIZING PLANTS.

SPECIFICATION forming part of Letters Patent No. 753,255, dated March 1, 1904.

Application filed March 18, 1903. Serial No. 148,402. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GIBSON, a resident of Vandergrift, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Improvement in Cooling-Racks for Galvanizing Plants; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to cooling-racks for use in connection with galvanizing-pots, rolling-mills, and the like; and its object is to provide a rack which occupies a minimum amount of space and whereby the sheets, bars, or other articles are thoroughly cooled and then automatically delivered therefrom.

My invention consists, generally stated, in a cooling-rack comprising a shaft or wheel provided with a series of bars or fingers thereon, thus providing spaces for receiving the sheets, bars, or other articles, together with mechanism for rotating said shaft or wheel slowly, thus allowing the articles to thoroughly cool.

The invention also comprises means for delivering the articles from the rack.

In the accompanying drawings, Figure 1 is a front elevation of my rack adapted for galvanizing plants. Fig. 2 is an end view of the same, and Fig. 3 is a plan view of the same.

In the accompanying drawings I have shown my invention adapted for cooling galvanized sheets, and as the invention can be as well illustrated in that connection as in any other I will describe the same as so applied, although it will be understood that the invention is not limited to the cooling of galvanized sheets, but is adapted equally as well for cooling metal articles of any kind or description, such as rods, bars, plates, tubes, and the like.

The essential feature of my invention comprises a rotary wheel-like rack placed, preferably, in a horizontal position, as shown. It comprises a shaft 1, mounted in suitable bearings 2 and provided at suitable intervals with hubs or disks 3, the number of the latter depending upon the character of article to be cooled on the rack. To each of the hubs or disks 3 are secured a series of radially-projecting bars or tubes 4, which form arms or fingers for supporting the articles to be cooled

and provide spaces between the same, in which the articles are placed. In operation the rack will be given a slow rotary movement, so as to carry the articles around in an orbital path. This movement can be imparted by any suitable mechanism, such as the worm-wheel 5, secured to the shaft 1 and engaged by a worm 6 on a shaft which is mounted in suitable bearings 7, so that the necessary slow movement can be given to the rack. This movement may be a continuous one, but preferably, in order to facilitate the placing of the articles into the rack, is an intermittent or step-by-step movement. This intermittent movement can be given to the rack by any well-known mechanism for accomplishing this result, that shown in the drawings comprising a ratchet-wheel 8, secured on the shaft of the worm 6 and engaged by a pawl 9, mounted in a rocking arm 10, journaled on the same center as the ratchet-wheel 8. This pawl-arm may be actuated by any suitable mechanism, either by automatically-operating power mechanism or by hand-controlled mechanism. A convenient means for actuating it when used for galvanizing purposes comprises a treadle 11 within reach of the workman's foot and connected to the rocking arm 10 by means of a connecting-rod 12. At each operation of the treadle 11 the rotary rack will be given a forward step-like movement.

The article to be cooled is slipped into the space between two adjacent sets of arms or fingers, as indicated at 13, Fig. 2, when said arms or fingers are practically in a horizontal position. The rack is then given a forward step-like rotation in the direction of the arrow and another article is slipped into the next space, and so on continuously. The size of the wheel will be such and the number of spaces of a sufficient number so that the articles will remain in the rack a sufficient length of time to thoroughly cool. After being carried through somewhat more than a semi-rotation of the wheel they are delivered from the rack, preferably by automatic mechanism, although any other delivering or push-out mechanism may be employed. The delivering means shown comprise a series of stationary guide-bars 15, projecting inwardly be-

tween the series of arms 4, preferably being pivoted or hinged on the shaft 1 and of such length as to project outwardly beyond the ends of the arms 4. These guide-bars 15 are held stationary, so that in the rotation of the rack the sheets or other articles will be carried around until they come into contact with the bars. The further rotation of the rack will cause the sheets to be raised off the arms on which they rest and be supported entirely by the guide-bars 15. The latter are placed in an inclined position, as shown, so that the sheets or other articles will slide down the same, and thus be delivered from the rack. Preferably the guide-bars will be provided with rollers or like antifricition devices which will permit the sheets to slide downward by gravity and out of the rack. The guide-bars 15 will have their outer ends supported in any suitable way, preferably so that their inclination can be adjusted. This can be accomplished by means of the struts or supporting-bars 16, connected to the guide-bars 15 and having their lower ends resting on the floor or other convenient place. By merely changing the inclination of these struts the inclination of the guide-bars 15 can be varied. In the use of my cooling-rack it will preferably be placed between two tables, such as shown at 19 and 20, the former being the receiving-table and the latter the delivery-table. The character of these tables will depend upon the particular use to which the rack is applied—as, for instance, in a bar rolling-mill or the like the former will be the receiving-table, leading from the finishing-pass of the bar-mill, while the table 20 may be the shear or similar table. When used in a galvanizing plant, as illustrated in the drawings, the table 19 will be the receiving-table, on which the galvanized sheets are placed when removed from the pot 21, while the table 20 will be the bundling-table or the like. The common practice in galvanizing plants is to inspect each sheet on both sides after galvanizing, and the inspector will then slip the sheet into the space between two adjacent sets of arms on the rack. He will then operate the treadle 11, thus rotating the rack a step forward, and the next sheet after being inspected by him will be slipped into the next adjacent space, and again the rack will be moved a step forward, and so on continuously. During this operation the sheets are carried around slowly in an orbital path, thus having time to thoroughly cool, and when they reach the guide-bars 15 they are lifted off the arms 4 and slide down into the bundling-table 20.

My invention is adapted for cooling metal articles of any kind, not only sheets, as shown, but also bars, slabs, tubes, and the like, and the operation will be essentially the same as that described. The arms or fingers 4 will vary in length according to the width or thickness of the article to be cooled, and the num-

ber of wheels or hubs 3 will vary according to the length of the article to be cooled.

The particular mechanism shown for rotating the wheel and the particular means for delivering the article from the wheel are not absolutely essential, as various other arrangements of mechanisms for these purposes may be employed. In any event, however, the article will be shoved into the rack on one side, carried by the latter around and delivered on the opposite side, the movement of the rack being sufficiently slow to permit the article to thoroughly cool in transit. The rack occupies a minimum amount of space, yet serves to efficiently cool the articles.

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

1. A cooling-rack comprising a wheel having a plurality of series of radial projections, the projections of the several series being in line with each other so as to support the article to be cooled at a plurality of points, and mechanism for imparting a slow rotary movement to said rack.

2. A cooling-rack comprising a wheel having a plurality of series of radial projections, the projections of the several series being in line with each other so as to support the article at a plurality of points, and mechanism for imparting a step-by-step rotary movement to said wheel.

3. A cooling-rack comprising a wheel having a plurality of series of radial projections, the projections of the several series being in line with each other so as to support the article at a plurality of points, mechanism for rotating said wheel, and means for delivering the articles from said wheel.

4. A cooling-rack comprising a horizontally-disposed shaft, a plurality of hubs or disks thereon, a series of radially-disposed fingers or arms on said hubs, and mechanism for rotating said shaft.

5. A cooling-rack comprising a horizontally-disposed shaft, a plurality of hubs or disks thereon each provided with a series of radially-disposed arms or fingers, and mechanism for imparting a step-by-step rotary movement to said shaft.

6. A cooling-rack comprising a horizontally-disposed shaft, a plurality of hubs or disks thereon each provided with a series of radially-disposed arms or fingers, mechanism for rotating said shaft, and means for delivering the articles from said rack.

7. A cooling-rack comprising a horizontally-disposed shaft, a series of radially-disposed arms or fingers carried thereby, mechanism for rotating said shaft, and stationary inclined guides projecting between said arms and serving to deliver the articles from the rack.

8. A cooling-rack comprising a horizontally-disposed shaft, a plurality of hubs or disks thereon each provided with a series of

radially-disposed arms or fingers, mechanism for rotating said shaft, a series of stationary inclined guides projecting between said arms, and antifriction wheels on said guides.

5 9. A cooling-rack comprising a horizontally-disposed shaft, a plurality of hubs or disks thereon each provided with a series of radially-disposed arms or fingers, mechanism for rotating said shaft, guide-bars hinged on
10 the shaft and projecting beyond the ends of the arms or fingers, and adjustable means for supporting the outer ends of said guide-bars.

15 10. A cooling-rack comprising a rotary wheel having a plurality of series of radial projections, the projections of the several series being in line with each other so as to support the article at a plurality of points, a worm and worm-wheel for rotating said wheel, and mechanism for rotating said worm.

20 11. A cooling-rack comprising a wheel having a plurality of series of radial projections,

the projections of the several series being in line with each other so as to support the article at a plurality of points, a worm-wheel connected to said wheel, a worm engaging said
25 worm-wheel, and mechanism for imparting an intermittent rotary movement to said worm.

12. A cooling-rack comprising a wheel having a plurality of series of radial projections, the projections of the several series being in
30 line with each other so as to support the article at several points, and mechanism for rotating said wheel, said mechanism comprising a ratchet-wheel and pawl, and a treadle for actuating said pawl.
35

In testimony whereof I, the said WILLIAM GIBSON, have hereunto set my hand.

WILLIAM GIBSON.

Witnesses:

M. E. UNCAPHER,
S. A. DAVIS.