(No Model.) 2 Sheets—Sheet 1.

W. D. WOOD.

APPARATUS FOR TREATING SHEET IRON.

No. 294,559. Patented Mar. 4, 1884.

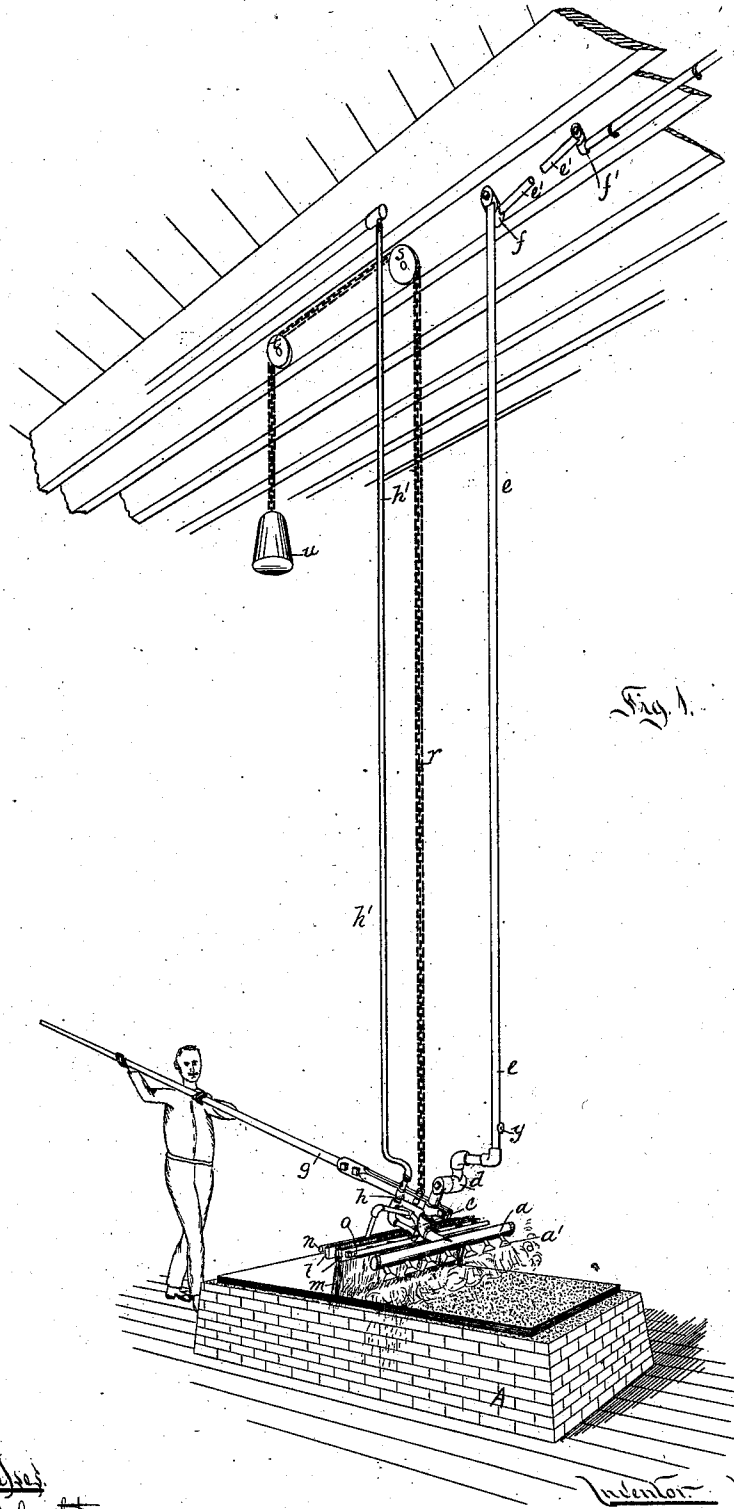


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

W. D. WOOD.

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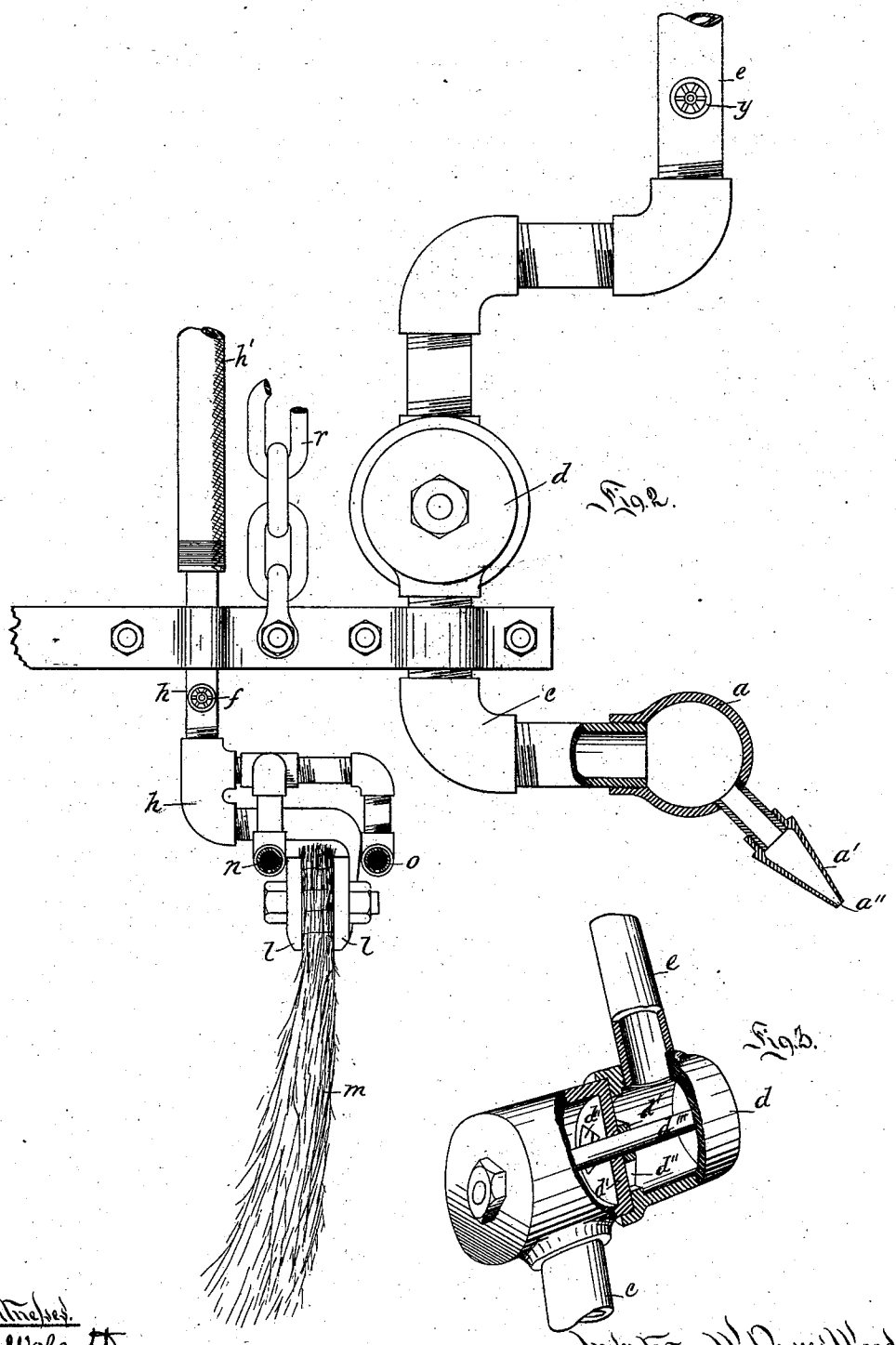


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

W. DEWEES WOOD, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR TREATING SHEET-IRON.

SPECIFICATION forming part of Letters Patent No. 294,559, dated March 4, 1884.

Application filed September 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, W. DEWEES WOOD, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Apparatus for Treating Sheet-Iron; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—like letters indicating like parts—

Figure 1, Sheet 1, is a perspective view of my apparatus. Fig. 2, Sheet 2, is an enlarged detail view, certain parts being shown in section. Fig. 3, Sheet 2, shows the hinged joint, the side of the joint being broken away to show the steam-ports.

In an application, No. 96,919, filed June 21, 1883, I have described and claimed a process of manufacturing what is known in the art sometimes as "Russia" and sometimes as "planished" sheet-iron. This process consists, in general terms, in forming or building up on the surfaces of the sheet a comparatively-heavy oxide coating, which is subsequently "revived," as it is called, or converted into nascent iron, and which latter is converted into a black or magnetic oxide, such that by subseqent heating and hammering the described polished surface is produced. One of the steps of this process consists in subjecting the sheets, just as they are taken from the reheating or annealing furnace, and at a bright-red heat, and covered with ashes and unconsumed charcoal—with which latter material they were packed previously to being heated or baked—to the action of superheated steam, thereby producing a black or magnetic oxide on the surfaces of the sheets. The sheets are then immediately to be chilled or cooled, so as to reduce the surface of the sheets to a temperature below that at which any further oxidation or injurious action under atmospheric influence can take place. This chilling may be effected in various ways—as, for instance, sponging off the sheets with cold water, or by means of broom or sprinkling device attached to the steam-applying apparatus.

My present invention relates to an apparatus for applying steam against or on the sheet-iron, and for sprinkling and cleaning off the sheets after being acted on by the steam. The sheets are taken from the furnace in packs composed of fifty or sixty sheets, more or less, and immediately, while at a red heat, placed upon a suitable bed, A, and then successively subjected on one side to the action of superheated steam, chilled, and cleaned. The sheets are then turned over onto an adjoining and similar bed, and the other side of the sheet is similarly treated.

To insure a complete and uniform distribution of the steam, I employ a transverse horizontal pipe, *a*, of a length at least equal to the breadth of the sheets, and provided with perforations or fan-tailed nozzles *a'*, which are constructed with long narrow slits, so that the steam will be directed and distributed in broad thin sheets against or on the sheets, so as to be applied with practical uniformity over the entire surface. The perforations or nozzles are arranged in such close proximity to each other that the sheets of steam will cross each other, and at such angle to the sheets that the ashes, &c., will be raised up and blown off from the sheets by the action of the steam, thereby insuring the contact of the steam with every part of the surface of the sheet. This transverse pipe *a* is connected by a short elbow, *c*, to one part of a hollow hinged coupling, *d*, which may be of any known construction suitable for the purpose, the one shown in Fig. 3 being of the swing joint style or pattern, wherein the abutting walls or diaphragms *d'* are provided with ports or openings, d^2, which, by turning one part of the coupling, can be brought into register with each other. By this construction I enabled to cause a flow of steam from the nozzles *a'* by a slight turn of one part of the coupling on the rod d^3, which holds the parts of the coupling together. The other part of this coupling *d* is connected by an elbow to the long vertical pipe *e*, which, at its upper end, is connected by a hollow hinged coupling, *f*, to one end of a horizontal pipe, *e'*. The other end of this pipe *e'* is also connected by a similar hollow coupling, *f'*, to the pipe e^2, which is connected with a suitable steam generator and superheater. By this arrangement of pipes and couplings I am enabled to raise and lower the transverse pipe *a*, to bring it the proper distance from the pack on the table A. The pipe *e* is of such a length and is

pivoted at such a distance from the bed A that the arc of the circle in which the transverse pipe *a* swings is practically parallel to the bed.

To swing the transverse pipe *a* and to turn it vertically in its hinged coupling *d*, I employ the handle *g*, attached to the elbow *c* between the coupling and the transverse pipe. To the handle *g*, just in the rear of the elbow *c*, is secured a short pipe-elbow, *h*, to the upper end of which is attached a length of hose, *h'*, leading to a suitable water-supply. The other end of this elbow *h* is suitably secured to one of a pair of clamp-bars, *l*, arranged parallel to the transverse pipe *a*, and between these clamp-bars is secured the broom *m*, the two bars of the clamp being drawn together by suitable bolts and nuts. On each side of this broom, and at the top thereof, are arranged transverse perforated pipes *n* and *o*, by which water is supplied and directed on the broom in such quantities as to keep it thoroughly wet. These transverse water-pipes *n* and *o* are supported by and connected to the pipe-elbow *h* by means of short pipes *p* and *q*. To hold these devices at the proper height and aid in adjusting them up and down, I attach to the handle *g* a chain, *r*, which passes up over a pulley, *s*, and down over another pulley, *t*, and has a weight, *w*, attached to its free end. In the pipes *e* and *h* are arranged stop-cocks *x* and *y*, whereby the flow of steam and water is regulated. After the sheets are placed on the bed A, the workman slightly raises the handle *g* to turn one part of the coupling *d*, thereby bringing the ports *d*² into line with each other, and allowing the steam to escape from the nozzles. He then swings the whole device forward over the sheets, thus directing the steam to every part of the sheets and insuring a uniform formation of a black or magnetic oxide over the whole surface. The broom, which immediately follows, chills the sheets on the side under operation and sweeps off from the sheets all the residue of ashes and unconsumed charcoal thereon, leaving the sheets in condition for further operation. The broom, in addition to cleaning off the sheets, acts as a distributer of the water, bringing it into contact with every part of the sheet, but in such limited quantities as to chill only the surface under operation. This limited cooling is important, for the reason that the other sides of the sheets are to be similarly treated.

In some respects the construction of the devices thus described may be modified or changed without any substantial departure from the scope of the present invention, and more particularly as regards the form and distribution of the jet openings or nozzles for the supply and distribution of the superheated steam, and as regards the construction of the water-distributing mechanism.

What I claim herein as my invention is—

1. In an apparatus for treating sheet-iron, the combination of a steam supply and distributing mechanism and a cooling or chilling mechanism, arranged for operation in immediate succession along the surface of the sheet under treatment, substantially as set forth.

2. An apparatus for applying superheated steam to sheet-iron surfaces, having a transverse pipe, *a*, provided with suitable jet-openings, for the uniform distribution of the steam over the surface of the sheet, and a valve, *d*, for turning on or shutting off the steam-supply, in combination with means for opening and closing the valve at will and reciprocating the transverse pipe over the surface of the sheet, substantially as set forth.

3. In an apparatus for treating sheet-iron, the combination of the steam supply and distributing mechanism, a water supply and distributing mechanism, and a mechanism for sweeping off the sheets by frictional contact therewith, arranged for operation along the surface of the sheet under treatment, substantially as set forth.

4. In an apparatus for treating sheet-iron, a steam supply and distributing mechanism and a water supply and distributing mechanism connected with the same operating-handle, *g*, in combination with a flexible supply to each, substantially as set forth.

5. In an apparatus for treating sheet-iron, the combination of the transverse pipe *a*, having perforations or nozzles, the pipe *e*, the perforated pipe *o*, and the hose *h'*, substantially as set forth.

6. In an apparatus for treating sheet-iron, the combination of the transverse pipe *a*, having perforations or nozzles, the hinged and ported coupling *d*, the pipe *e*, the perforated pipe *o*, the flexible pipe *h'*, and the handle *g*, substantially as set forth.

In testimony whereof I have hereunto set my hand.

W. DEWEES WOOD.

Witnesses:
D. S. WOLCOTT,
R. H. WHITTLESEY.