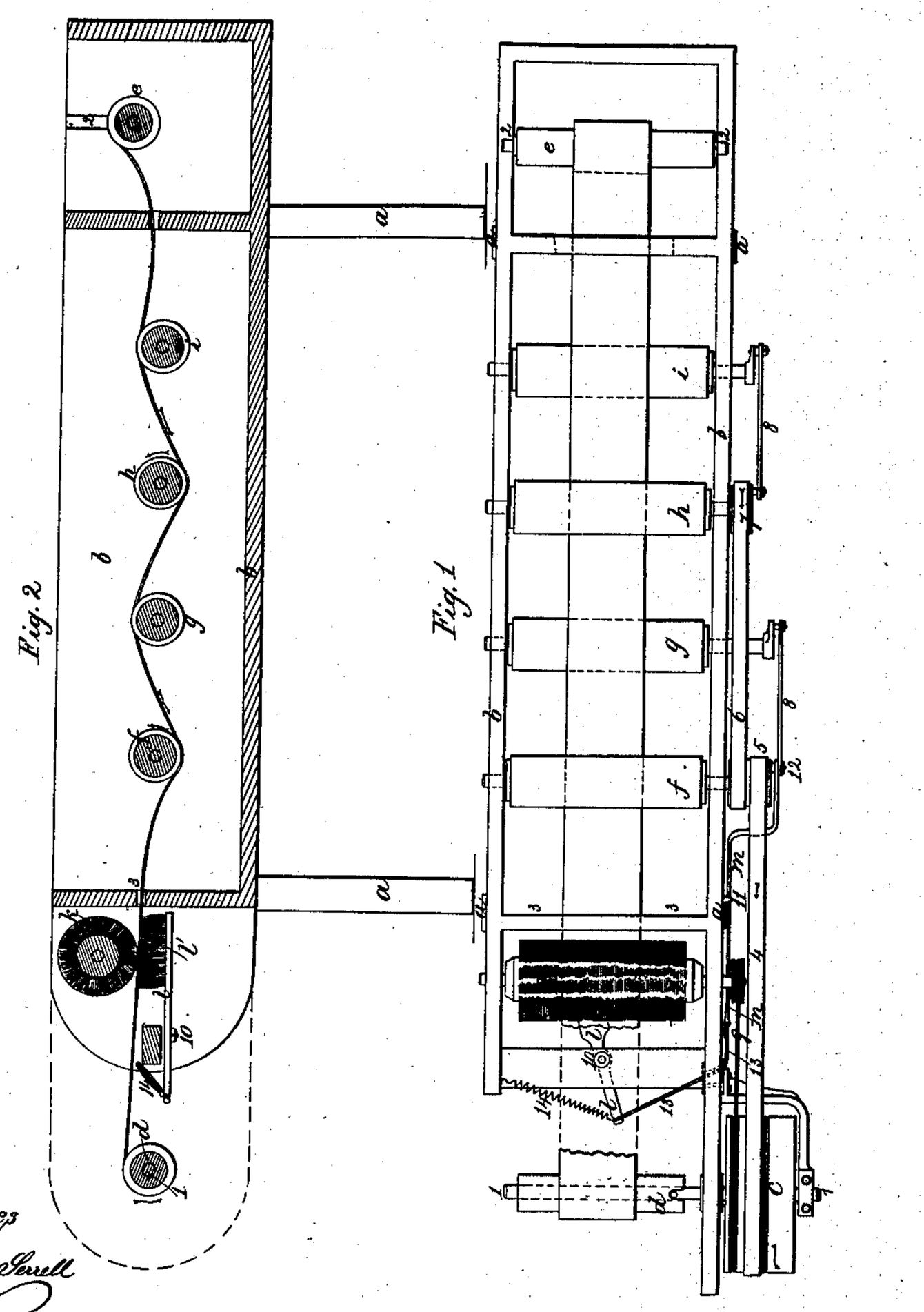
C. E. L. Holmes.

Drying Sheet Iron.

No. 80,179. Patented Jul. 21, 1868.



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CHARLES E. L. HOLMES, OF WATERBURY, CONNECTICUT.

Letters Patent No. 80,179, *dated July* 21, 1868.

IMPROVEMENT IN MACHINE FOR DRYING AND SCOURING SHEET METAL.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, CHARLES E. L. HOLMES, of Waterbury, in the county of New Haven, and State of Connecticut, have invented, made, and applied to use certain new and useful Improvements in Means for Scouring and Drying Out Sheet Metal; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a plan, and

Figure 2 a vertical section of the apparatus used by me.

Similar marks of reference indicate the same parts in all the figures.

Sheet metal, and particularly sheet brass, in the process of finishing, has to be scoured or ground upon its surfaces, in order to remove the scales or other inequalities which accumulate on the surface in the course of the manufacture, and after the sheet has been rolled for the last time, annealed, and scoured, it has to be immersed in acid, to cleanse the surface, then washed in water, after which, the sheets have to be dried. Heretofore, such sheets have been scoured with sand and passed through fine saw-dust, and wiped off with a cloth by hand, which was a slow and expensive as well as imperfect method of scouring and drying such sheets.

In order to overcome the difficulties, imperfections, and expense in scouring and drying sheet metals in the manner heretofore practised, and do the work in a machine, instead of by hand, is the object of this invention; and it consists of the arrangement of a series of scouring or grinding-rollers and rubbers, covered with some elastic or fibrous material that will hold the sand used in scouring when the rollers and rubbers are in motion and in contact with the metal, and in the peculiar motion given to the rollers and rubbers in the operation of scouring the sheets of metal in passing through the machine, and also in the method of cleaning off the surface of the sheets after being scoured and dried.

In the drawing—

a a are the legs supporting a box or frame *b*, at one end of which is a pulley or drum, *c*, receiving motion from any convenient power to drive the machine.

d is a roller, slipped on to the shaft 1 of the pulley *c*, and fitted with a key or slot by which the said roller is prevented from turning independent of the shaft, but allowing the roller to be slipped off the shaft with the sheet brass that is wound upon it during the operation of the machine, and the sheet metal may then be removed from the roller.

e is a roller, around which the sheet metal to be scoured or dried is wound, and it is journalled into and revolves in the grooves 2 2 in box *b*.

The sheet of metal is passed through an aperture in the end of box *b*, over rubber *i*, under roller *h*, over rubber *g*, and under roller *f*, in a serpentine course, presenting the surface of the sheet metal in a curved form upon the scouring-rollers and rubbers, and then passes out through opening 3, in box *b*, between revolving and reciprocating brush *k* and *l'*, and is wound upon roller *d*.

4 is a band from pulley *c*, giving motion to pulley 5, on the shaft of roller *f*, giving the shaft a continuous rotary motion. From pulley 5 is another band, 6, to a pulley 7, on the shaft of roller *h*, revolving it in the same direction as roller *f*. Short connecting-rods, 8, are used to give a vibrating motion to rollers or rubbers *g i*, which vibratory motion is due to and by reason of the crank-pins on the pulleys *f* and *h* not being coincident with the pins on pulleys *g* and *i*.

9 is a band from pulley *c*, turning a revolving brush, *k*, set in bearings in box *b*, and acting to brush off the dust from the top of the sheet after being scoured and dried.

l' is a brush on pivoted lever *l*, pivoted at 10, receiving motion from lever *m*, on pivoted lever 11 and is acted upon by a pin, 12, on pulley 5, and through cord 13 acts to pull lever *l* over to one side, when spring 14 compels it to reciprocate back to the opposite side and under the surface of the sheet metal, thereby brushing

off all dust or dirt adhering to the under side of the sheet of metal, and the sheet thus scoured, cleaned, and dried, passes on to roller *c*; and is wound into convenient rolls for use or transportation.

In using this machine for scouring metal sheets, sand is used in a wet state, and supplied to the sheets and rollers and rubbers, which act on both sides of the sheets as they pass through the machine, and in contact with the rollers and rubbers, as before stated.

When used for drying sheet metal, the box *b* is filled with fine saw-dust, covering the rollers and sheet metal, and, as the sheet passes through the machine thus provided, the saw-dust absorbs the moisture on the metal and covering of the rollers and rubbers.

The sheets of metal, in passing through the machine, whether for scouring or drying, are caused to travel in the opposite direction to the motion given the rollers *f* and *h*; but it is evident that when the sheet is thick, it might be made to pass under instead of over the rollers *g* and *i*, in which case the rollers *f* and *h* would turn in the same direction that the sheet of metal travels, and at greater speed.

It is evident that the brushes might be changed with relation to each other and the metal sheet without changing the invention.

I am aware that sheet-metal plates have been ground, by passing the sheets between revolving grinding-cylinders, and giving the sheet a motion contrary to the direction of the revolution of the cylinders, by forcing or drawing through between and against the direction of motion of the cylinders which grind the surfaces of the metal. Such is not my invention.

I am also aware that, in paper-calendering machines, the paper sheet is passed between and around a series of rollers, in order to produce a desired finish upon the surface of the paper. Such arrangement of rollers could not do what my invention does, for, in the paper-calendering machine, the paper sheet is passed between rollers that revolve, to carry the sheet in a given direction, and none revolve in a direction contrary to that which is given to the paper; nor does such machine use vibrating-rollers, which come in contact with the paper in their reciprocations or vibrations, as such motion would destroy the paper in passing through the machine.

Neither of which inventions would or could do what can be done with mine. Nor do I claim any such inventions or arrangements, in whole in part; or to grinding or scouring sheet metal on both sides simultaneously, as this has previously been done.

But I am not aware of any machine being in use where the operating parts are so arranged as to pass the sheet metal alternately above and below the scouring-rollers or rubbers, whereby a more perfect operation is obtained, because the bending of the sheet to thus pass over and under the rollers straightens out any irregularity in said sheet caused in rolling or annealing, and allows the rollers or rubbers to act uniformly on the surface of the sheet in its curved position; otherwise, if the sheets were passed through in a straight direction, the warped and twisted condition of the sheets would prevent a uniform and complete action upon all the surface of the sheet, and the curving of the metal over the rollers causes a greater surface of the metal to be in contact with the rollers and rubbers than could be if the direction of the sheet were straight when between the rollers and rubbers. Therefore, I am enabled, by my arrangement, to work more expeditiously, and perform the scouring and drying more perfectly than has heretofore been done with any machine with which I am acquainted.

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

The arrangement, in a machine for grinding, scouring, and drying sheet metal, of the rollers *f h*, revolving in a direction opposite to the direction of the passing sheet metal being operated upon, and rollers, *g i*, having a vibratory motion, and all the rollers acting upon the surface of the metal while in a curved position, substantially in the manner described.

I also claim operating the reciprocating brush *l'* by means of the lever *m*, cord 13, spring 14, and pivoted lever *l*, substantially in the manner and for the purpose set forth.

In witness whereof, I have hereunto set my signature, this 2d day of October, 1855.

C. E. L. HOLMES.

Witnesses:
LEMUEL W. SERRELL,
W. J. RENVILLE.