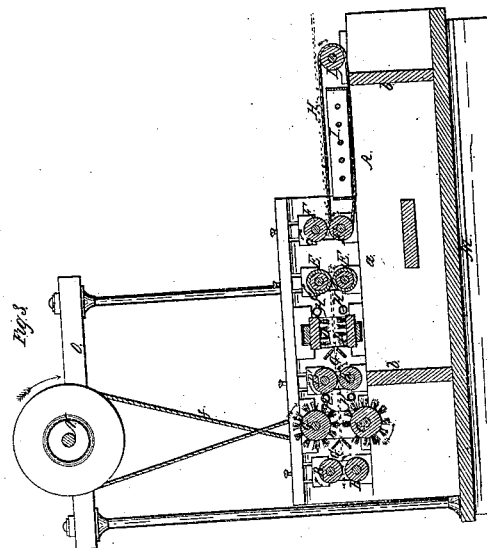
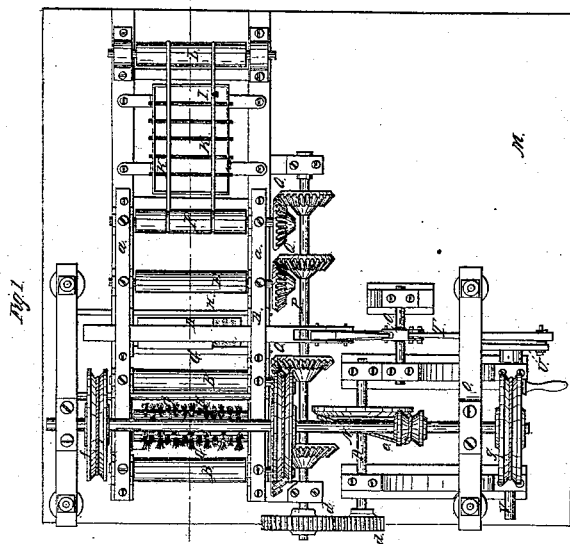
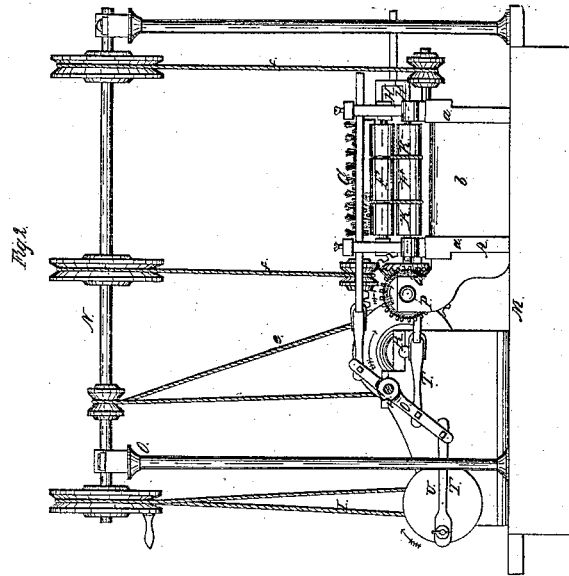


E. A. Harvey,
Cleaning Sheet Iron,

N^o 47,103.

Patented Apr. 4, 1865.



Witnesses:
Wm. Brown
Geo. E. Smith

Inventor:
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UNITED STATES PATENT OFFICE.

EDMUND A. HARVEY, OF WILMINGTON, DELAWARE.

IMPROVED MACHINE FOR CLEANING SHEET-IRON.

Specification forming part of Letters Patent No. 47,103, dated April 4, 1865.

To all whom it may concern:

Be it known that I, EDMUND A. HARVEY, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and Improved Machine for Cleaning Sheet-Iron; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan or top view of my invention; Fig. 2, an end view of the same; Fig. 3, a side sectional view of the same, taken in the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

In the manufacture or rolling of sheet-iron two different processes are pursued. One consists in rolling the sheets at the last rolling in layers of three one sheet being directly over the other, in contact, and then tearing the sheets apart. This process, commonly termed the "English plan," causes the surface of the metal sheets to have a rough appearance, owing to the partial welding they receive in passing between the pressure-rollers. The other process, commonly termed the "American plan," consists in throwing the dust of bituminous coal between the sheets so as to prevent them from sticking together under the pressure of the rollers, and thereby cause the sheets to have a smooth surface. This latter plan or process, although far superior as regards the appearance given the finished rolled sheets, possesses one great disadvantage—it leaves the surfaces of the latter with a filthy coating of coal-dust, which soils the hands and clothes of the workmen engaged in using or working it up, and the articles manufactured from it are also more or less dirty.

The object of my invention is to obviate this difficulty; and it consists in washing the dust from the finished sheets and drying the same, substantially as hereinafter set forth, whereby they are rendered perfectly clean, equally so as those rolled or manufactured on the English plan, and at the same time have the advantage of the smooth surface.

A represents a framing composed of two parallel side pieces, *a a*, connected by cross-pieces *b*, and which supports the working part of the machine, said parts consisting of two

pairs of feed-rollers, *B B B' B'*, with a pair of rotary brushes, *C C*, between them, a pair of reciprocating brushes, *D D*, a pair of elastic rollers, *E E*, and another pair of feed or discharge rollers, *F F*, and guides *G G*. The relative position of these parts is shown clearly in Fig. 3, the feed-rollers of each pair, as well as the rotary and reciprocating brushes, being placed one above the other, and also the elastic rollers *E E*, the guides *G G* being formed of flat plates, inclined and placed one above the other in *V* form, as clearly shown in Fig. 3, a space being allowed between them for the metal sheets to pass through. These guides are in line with the center of the spaces between the brushes *C C D D*, so as to direct or guide the sheets properly between them.

The elastic rollers *E E* are constructed of india-rubber or are covered with it. Rubber would probably be the most preferable material, although other elastic substances might be used.

The bearings *c* of the upper feed-rollers, upper elastic roller, and upper rotary brush are adjustable or slide vertically, and are provided with springs and set-screws to regulate their pressure as may be desired.

H represents water-tubes which pass transversely through the framing *A*—one at the rear of each reciprocating brush *D*, and one in front of each feed-roller *B'*—said tubes being perforated to admit jets of water upon the metal sheets at the points specified, the flow of water through the perforations being caused by static pressure by a pump, or any suitable means.

I represents a heater, which may be a simple furnace of rectangular form at the rear of the feed or discharge rollers *F F*, or said heater may be composed of steam or hot-water tubes passing through a frame.

K K represent endless chains or wire ropes which pass around the lower feed-roller, *F*, and around a roller, *L*, at the rear or discharge end of the heater *I*, said chains or wire ropes passing over and under the heater.

The framing *A* is placed upon a slightly-inclined base, *M*, which causes the several working parts above described to be in an inclined plane, as shown clearly in Fig. 3.

The working parts are all driven from a shaft, *N*, placed on an elevated frame, *O*, the feed-rollers being driven from a shaft, *P*,

through the medium of bevel-gears Q, and the shaft P driven by gears *d* from a shaft, R, which receives its motion from the shaft N through the medium of a belt, *e*. The rotary brushes C C receive their motion by belts *f*, direct from the shaft N, and the reciprocating brushes D D receive their motion from the opposite ends of an arm, O, which is on a rock-shaft, S, motion being given the arm O by a connecting-rod, T, which is operated by a crank-pulley, U, at one end of a shaft, V, the latter receiving its motion by a belt, *g*, from shaft N.

The operation is as follows: Motion is given the shaft N by any convenient power, and the feed-rollers and rotary brushes are turned in the direction as indicated by the arrows. The sheets of iron, one at a time, are passed in between the rollers B B, which feed them between the first guides G G, and thence between the rotary brushes C C, the sheet being moistened by the jets of water issuing from the first tubes H. The brushes C C in connection with the water take off a considerable portion of the dust, and the sheet then passes between the rollers B' B', which assist in the feed movement, and thence passes between the second guides G G, which direct it between the reciprocating brushes D D, the latter completing the scrubbing or scouring operation. The sheet receives moisture from the tubes H at the rear of the brushes D D, and owing to the inclined position of the sheet, which is due to the inclination of the framing A, the water has a tendency to run toward the brushes C C D D. The sheet then passes between the elastic rollers E E, which press the water back toward the brushes D, or prevent it from passing with the sheet between them, and the sheet then passes between the rollers F F and upon the endless chains or

wire ropes K K, which convey it along over the heater I, the latter completely evaporating the moisture from the sheet, which is discharged over the roller L.

The elastic rollers K K are an important feature of the invention, as they prevent any superfluous moisture passing between them on the sheet, and admit of the latter being thoroughly dried while passing over the heater. It is highly essential that the sheets be quickly dried in order to prevent oxidation, and this result cannot be obtained unless the mass of the water be taken from the sheet before it passes on the heater. The elastic rollers perform this function in a perfect manner.

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

1. Cleansing sheets of metal by scrubbing and washing them, and preventing their being oxidized thereby by immediately afterward subjecting said sheets to heat, and thus causing all moisture to be evaporated from their surfaces, substantially as described.
2. The combination of the squeezing-rollers E E and a heater for quickly drying the sheets, substantially as described.
3. The rotary brushes C C, in combination with the reciprocating brushes D D and feed-rollers, all arranged substantially as and for the purpose specified.
4. The water-tubes H, in connection with the brushes and feed-rollers arranged to operate as set forth.
5. The heater I, when used in combination with the brushes and feed-rollers, and arranged to operate in connection therewith, for the purpose described.

EDMUND A. HARVEY.

Witnesses:

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SAM. D. SMITH.