(No Model.)

F. C. WILLIAMS.

MACHINE FOR SPINNING METALS.

No. 291,253. Patented Jan. 1, 1884.

Fig. 1.

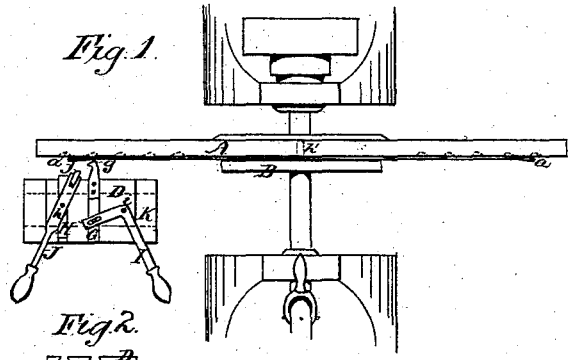

Fig. 3.

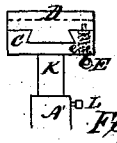

Fig. 2.

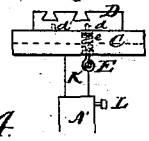

Fig. 4.

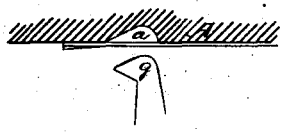

Fig. 7.

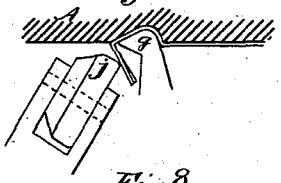

Fig. 10.

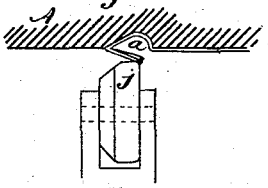

Fig. 5.

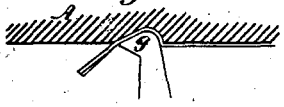

Fig. 8.

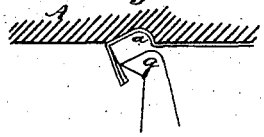

Fig. 11.

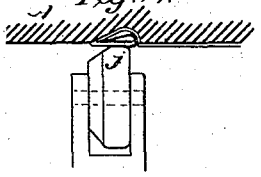

Fig. 6.

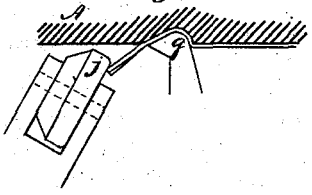

Fig. 9.

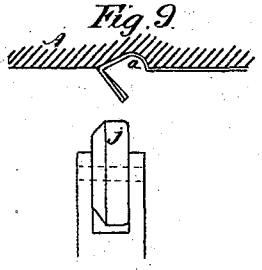

Fig. 12.

Witnesses:
B. E. Stafford.
Charles R. Searle,

Inventor
Frederick C. Williams
by his attorney
Thomas D. Stetson.

UNITED STATES PATENT OFFICE.

FREDERICK C. WILLIAMS, OF ARLINGTON, NEW JERSEY.

MACHINE FOR SPINNING METALS.

SPECIFICATION forming part of Letters Patent No. 291,253, dated January 1, 1884.

Application filed June 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK C. WILLIAMS, of Arlington, Hudson county, in the State of New Jersey, have invented certain new and useful Improvements in Machines for Spinning Metals, of which the following is a specification.

My improved machine is adapted for producing the combined bead and fold which is desired in the edges of the circular sheet-zinc platforms used under stoves. It is common to form the edge of the metal in sharp waves or short radial corrugations, extending inward three-quarters of an inch, more or less. Immediately within this corrugated border the metal is formed into a circular bead. After this bead is raised, the corrugated border exterior thereto is folded inward and caused to lie in the bead and fill the elevation thus produced. I will describe the invention as applied to accomplish this. The corrugations previously produced in the metal are not absolutely essential, but they perform a useful part in aiding to support the metal of the bead when the edge of the zinc is stepped upon or otherwise strongly pressed down. A proper holding-chuck being understood, I provide two operating-tools mounted on separate slides, lying in grooves in a sliding block or carriage. These grooves are parallel to the axis of the lathe, and the slides are freely movable therein. One of the tools forms the bead and the other folds over the metal exterior to the bead.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a plan view, showing the novel parts, with so much of the ordinary parts as is necessary to indicate their relations thereto. This figure shows the machinery in condition ready to commence work upon a plate of zinc. Fig. 2 is a front elevation, showing the novel parts. Fig. 3 is an end view of the same. The remaining figures are on a larger scale. They show the successive stages of the work. They are all plan views, partly in section. They will be described specifically further on.

Similar letters of reference indicate corresponding parts in all the figures.

A is the face-plate, mounted on a horizontal shaft, and equipped with cone-pulleys, allowing it to be rotated at a high velocity by belting from any suitable power. (Not represented.) The face of the plate A is grooved annularly, as indicated by *a*. The sheet of zinc, previously formed with a small central hole turned to an exact circular form and corrugated around the edge, is chucked on the face-plate by the aid of a pressure-pad or back center plate, B, which is capable of turning freely in bearings in line with the axis of the face-plate A. Means are provided for moving this pad B longitudinally, so as to alternately hold and release the several sheets of zinc, as required.

So far as has yet been described the mechanism is old, and has been long approved.

C is an adjustable block, secured on an adjustable standard, K, which latter is held at various heights on a hollow vertical post, A′, by means of a pinching-screw, L.

D is the carriage, mounted in a transverse guideway on the block C, and capable of being moved freely from right to left, except as it is confined by a spring-dog, E, which latter is mounted in the block C, and is subject to a constant lifting force exerted by a spiral spring, *e*. The under face of the slide D has two holes, *d d′*, either of which is capable of engaging the dog E and holding the slide firmly thereby. In the upper face of the slide D are two slides, G H, moving in ways at right angles to the face-plate A. The slide G is actuated by a bell-crank lever, I, turning on a pivot, *i*, and engaging with the slide by a slot and pin, as shown, so that a turning of the hand-lever I moves the slide G nearer to and farther from the face-plate at will. The end of the slide G adjacent to the face-plate carries a peculiarly-shaped head, *g*, which I will term a "duck-bill," the shape being such as is required to spin the zinc into the groove *a* and produce the desired bead or ridge of the sheet metal extending around near the edge of the stove-board. The circular piece of metal with its previously corrugated edge is of a diameter larger than the groove *a*, the portion extending out beyond such groove being just sufficient to afford the required amount to be folded inward by the operation of the machine, so as to bring the corrugated edge into the hollow of the bead produced by the duck-bill *g*. The slide H carries, mounted on a

pivot, *h*, a hand-lever, J, the forked end of which carries a freely-revolving roller, *j*, turning on a horizontal axis, and having the form represented. This hand-lever J may be moved to and from the face-plate A by moving the slide H longitudinally. It may also be turned to any required extent on the pivot *h* as a center. The several stages of this operation are illustrated in the detail figures 4 to 12, inclusive.

To operate the invention, the pad or back center, B, is drawn back by a hand-lever or other means in the usual manner, and the sheet of zinc is chucked by applying it in the right position on the center pin, *h'*, and allowing the pad to be moved endwise by the force of the hand. This presses the broad circular disk of the zinc gently against the face-plate A, and causes it to revolve therewith. I give to the face-plate a high rotary velocity. For stove-boards of the ordinary size the rotations may be six hundred per minute. So soon as the zinc has fairly acquired the high rotary motion of the face-plate, I move the duck-bill *g* into contact therewith by turning the hand-lever I. This sinks the sheet metal into the groove *a*, and somewhat throws the corrugated edge of the metal forward out of the plane. The parts are so proportioned that by turning the lever J on its pivot *h*, and moving the slide H slightly endwise, I present the roller *j* beyond or behind the corrugated edge of the zinc. I am now at liberty to fold it over upon the duck-bill *g*, which I proceed to do by turning the lever J gently. I now let go of the hand-lever I, draw down the spring-catch E in opposition to the force of the spring *e*, and, by the force of the hand or otherwise, move D and its attachments bodily to the right. This movement brings the duck-bill *g* out of the groove, automatically moving the slide G and turning the lever I. So soon as the duck-bill is fairly disengaged from the partially-imprisoning fold of the edge metal of the stove-board, I move the slide D vigorously to the right until the spring-catch E engages in the hole *d'*. This insures that the slide H is directly opposite to the folded portion of the stove-board. Now, by moving the slide H endwise, I bring the roller *j* into direct contact with the front face of the corrugated and folded portion of the stove-board, and force it home into the bead. The whole is now finished, and I rapidly return the slide D and its connections to their original positions, remove the stove-board, and, after properly introducing another, repeat the process indefinitely.

I provide a single face-plate, A, with a number of the annular grooves, *a*, adapting it to make stove-boards of correspondingly-different diameters. The block C is capable of being shifted to the right and left on the firm supporting-stand K by ordinary screw-bolts, to allow it to be readily adapted to the several diameters.

Fig. 4 shows the edge of the material which is to form the stove-board in the condition in which it is introduced in the machine. Fig. 5 shows the same after the duck-bill has formed the bead. Fig. 6 shows the same with the roller brought into position to commence to fold over the edge of the zinc. Fig. 7 shows the folding at an advanced stage. Fig. 8 shows the parts in the condition which obtains when the duck-bill is in the act of being removed. Fig. 9 shows the parts after the duck-bill is entirely removed and the roller brought into position. Fig. 10 shows the roller in the act of sinking the corrugated edge into the bead. Fig. 11 shows the same after the corrugated edge is sunk into the bead and the work completed. Fig. 12 shows the edge after it is removed from the machine.

Modifications may be made in the forms and proportions of the details. I have shown the duck-bill *g* as formed in a separate piece from the slide G, and secured rigidly thereon by two bolts. This makes a strong connection, and allows the duck-bill to be easily changed when it has been worn out of shape by the violent friction to which it is subjected in spinning the metal; but this may be varied. I can operate with some success without previously corrugating the edge of the sheet metal. I can use other metal than zinc. I use a tool in the form of a duck-bill with a rounded head, in order to produce a corresponding bead; but the shape of the tool may be varied to form any desired style of bead. I corrugate the edge of the metal in order not only to better support the bead when it is brought into it, but also, when I turn a wide hem under the bead, to facilitate the contraction of the circumference, which is necessitated by the folding inward of the metal. More slides may be operated in the same carriage, if desired. Instead of the nearly-cylindrical roller described, I can use a grooved roller. I can use plain-edged sheets and make by a grooved roller what is commonly called a "wire-edge."

I claim as my invention—

1. The combination, with the face-plate A, having a groove, *a*, and suitable chucking means, of the duck-bill *g*, and suitable means for guiding and presenting it to spin the metal into the groove, substantially as herein specified.

2. The lever J and roller *j*, capable of turning on a pivot, *h*, carried on a slide, H, in combination with the face-plate A, having the groove *a*, and with the duck-bill *g*, and means for operating it, as herein specified.

3. The dog E and its actuating-spring *e*, in combination with the slide D, having the two holes *d d'*, and with the duck-bill *g* and its operating means, face-plate A and chucking means, and the roller *j* and its operating means, arranged for joint operation, as herein specified.

4. The roller *j* and means for holding and operating it, in combination with a duck-bill, *g*, and means for holding and operating it, and with a face-plate, A, and means for oper-

ating it, combined and arranged to serve relatively to each other and to a circular sheet of metal having a previously-prepared edge, so as to form the bead and fold inward the corrugated edge and sink it into such bead, all substantially as and for the purpose herein specified.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 1st day of June, 1883, in the presence of two subscribing witnesses.

FRED C. WILLIAMS.

Witnesses:
WM. C. DEY,
B. E. D. STAFFORD.