(No Model.)

C. E. DOTY.

STEEL WIRE BRUSH.

No. 338,719. Patented Mar. 30, 1886.

Fig. 1.

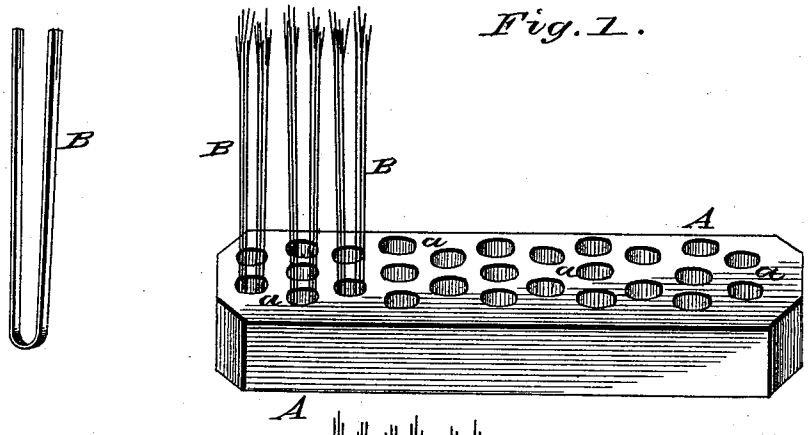


Fig. 2.

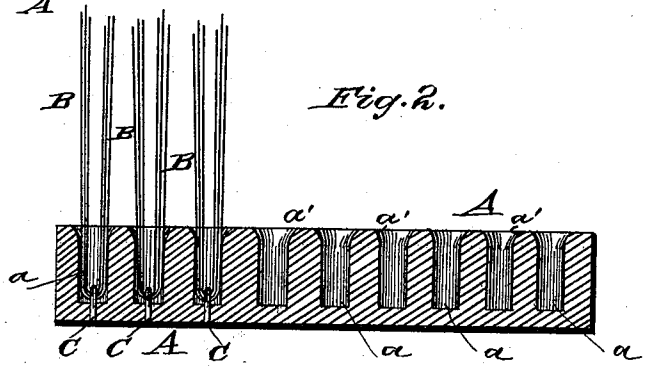
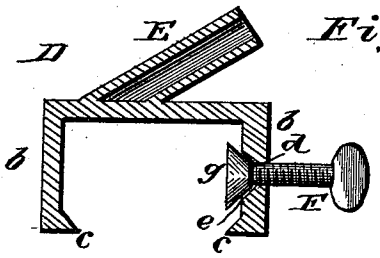


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES E. DOTY, OF ROCK FALLS, ILLINOIS.

STEEL-WIRE BRUSH.

SPECIFICATION forming part of Letters Patent No. 338,719, dated March 30, 1886.

Application filed April 5, 1884. Serial No. 126,821. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. DOTY, a citizen of the United States, residing at Rock Falls, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Steel-Wire Brushes and Brooms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention belongs to the class of steel-wire brushes and brooms intended for heavy brushing or sweeping, and pertains more especially to a novel mode of fastening such wires in the brush-back and the arrangement of such teeth in a uniform manner, so that their largest diameters shall be in the same direction, and the back of the brush may be in one piece and yet present a smooth exterior.

In such brushes and brooms as heretofore made, so far as I am informed, the back of the brush has been constituted of two or more pieces, which in use were liable to become separated or split. Again, the wires were fastened by transverse wires interposed between the parts of the back, which were liable to become loosened, and, projecting beyond the edges of the brush, lacerate the hand of the operator. Again, the wire teeth, being flat, had more elasticity in the direction of their shortest diameter, and being placed miscellaneously, some teeth had more elasticity in the direction of the pressure than others, which left the latter to alone sustain such pressure, and therefore liable to break, besides causing the brush to fail in a uniform action on the surface brushed. Again, so far as I have observed, the holes in which the wires were placed had perpendicular walls, which concentrated the bend of the wires at the outer edge of such holes, thus giving the wires a tendency to break at that point. These deficiencies, which singly and combined caused the brushes under the rough usage to which they are subjected to soon wear out or become worthless, I have obviated in my invention, which I will proceed to describe.

In the drawings, Figure 1 is an oblique side elevation of a brush embodying my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 exhibits the mode of attaching a handle when my invention is used as a broom.

A is the back of the brush, consisting of one integral piece and having the wire-holes *a* formed in its inner surface, but not passing entirely through such back.

B are the wires, which are made flat, so as to have greater elasticity in the direction of their shortest transverse diameter.

C are short staples which bestride the loop formed at the center of the wires B, and are clinched on the back of the brush, thus firmly holding such wires in place. The holes *a* at their open ends have convex walls *a'*, which permit the wires, when in use, to bend in a curve, thus reducing their liability to break.

In the manufacture of my brush I first prepare the back A by forming the holes *a* therein. I next lay such back, with the holes *a* upward, on a hard smooth metallic surface and place the center of the bunch of wires for one hole over such holes in the direction the brush is intended to be used, and with the flat sides of such wires in a horizontal plane. I then place the staple C over the center of such bunch of wires, with the points of such staple inserted in the hole *a*. A plunger which will enter the hole *a* is then brought down upon the staple C, and the latter, with the central portion of the bunch of wires, is forced into the hole *a*. This force is sufficient to force the loop thus formed in the center of the bunch of wires against the bottom of the hole *a* and drive the ends of the staple C through from the bottom of the holes *a* to the opposite side of the back A, where such ends of the staple, coming in contact with the metallic surface aforesaid, are bent and clinched smoothly in such opposite side outside of the back A.

In order to give the outer row of wires B a slight lateral divergence, the back A is turned slightly from the perpendicular in the insertion of such wires B in their respective holes.

My invention when used as a brush is moved endwise, so the wires B in such brush are placed with their flat sides at right angles with the length of the brush; but my inven-

tion when used as a broom is moved in the direction of its shortest diameter, and in the construction of an intended broom the wires B are placed with their flat sides parallel with the back A.

Fig. 3 exhibits a socket or clamp, D, to which is attached in a suitable way a handle, E, which socket is attached to the back A when my invention is intended for use as a broom. The clamp D is made of malleable iron and furnished with sides *b b*, fitted to inclose the back A on three sides, and with its open ends *c c* bent slightly inward to extend slightly over the face or wire side of the back A. The brush is placed in the clamp D by being pushed endwise into it.

In a threaded hole, *d*, in the inner wall of the clamp D is seated a thumb-screw, F, and on the inner face of such wall and surrounding the inner end of such hole *d* is formed a recess, *e*, in which is loosely placed a small metallic plate or cushion, *g*, against which the inner end of the thumb-screw F abuts.

When the back A is pushed endwise into the clamp D to a proper position, it is rigidly fastened therein by tightening the thumb-screw F.

The plate *g* is forced by the thumb screw F against the adjacent side of the back A, and serves to prevent the end of such screw from bruising or entering the back A.

When by use the wires B are bent or worn in one direction, the back A can be removed from the clamp D and be replaced therein in reversed position.

There are several advantages in my invention.

By using but one piece for a back I effectually preclude any separation thereof, and the back is made of such thickness as not to be liable to split.

I also dispense with the usual nails or screws commonly used to hold the parts of the back together, and which were likely to check or split such back and render the same uncomfortable for handling.

By arranging the wires B uniformly with their flat sides or longest transverse diameter in the same plane I impart to each wire the same degree of elasticity under pressure, and thus compel all of the wires to equally co-operate in the work to be accomplished, and render the breakage of any such wires less likely; and where the pressure of all of the wires is thus uniform the operation of the brush is more effectual.

By forming the holes *a* with convex sides *a'*, I permit the wires B to yield or bend in a curved line, and thus reduce, if not entirely avoid, the likelihood of such wires breaking from too much tension at any one point.

In my invention there are no parts to become loosened or protrude, and therefore the brush or broom has greater durability and is always safe and comfortable in use.

The brush is designed, primarily, for cleaning castings as they come from the mold, particularly such parts as are too large to be placed in the scouring-box; but it is applicable to work where heavy brushing is required.

When used as a broom, my invention is adapted to sweeping streets, stables, or wherever heavy sweeping is needed.

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

As a new article of manufacture, the combination of the back A, constituted of one piece, and provided with holes *a*, having convex walls *a'*, the flat metallic wires B, arranged with their greatest diameters in the same direction, and the staple C, placed astride of the central point of each tuft of said wires, and having its pointed ends driven through the closed ends of the holes *a* and clinched in the opposite side of the back A, as shown, whereby the centers of such wires are firmly held against the closed ends of the holes *a*, and the flexibility of such wires extends into such holes and is uniform in the line of pressure thereon.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. DOTY.

Witnesses:

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