C. W. E. BOEGEL & J. C. LEWIS.

PNEUMATIC CLEANING APPARATUS.

APPLICATION FILED OCT. 31, 1908.

921,669. **Patented May 18, 1909.**

2 SHEETS—SHEET 1.

Fig. 1.

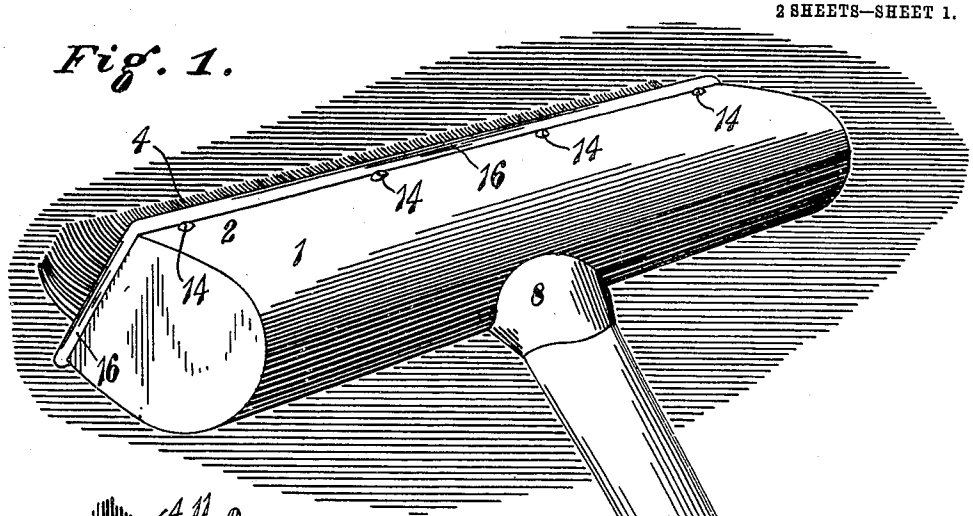


Fig. 2.

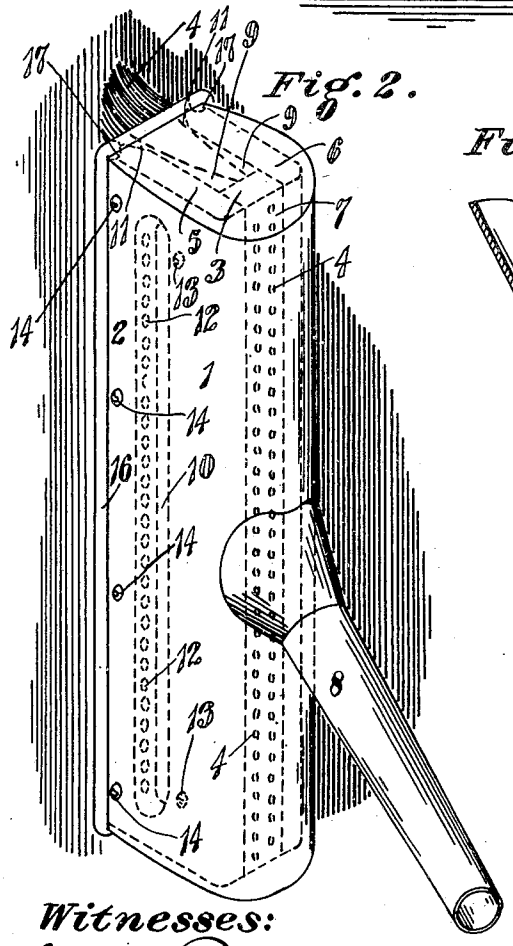
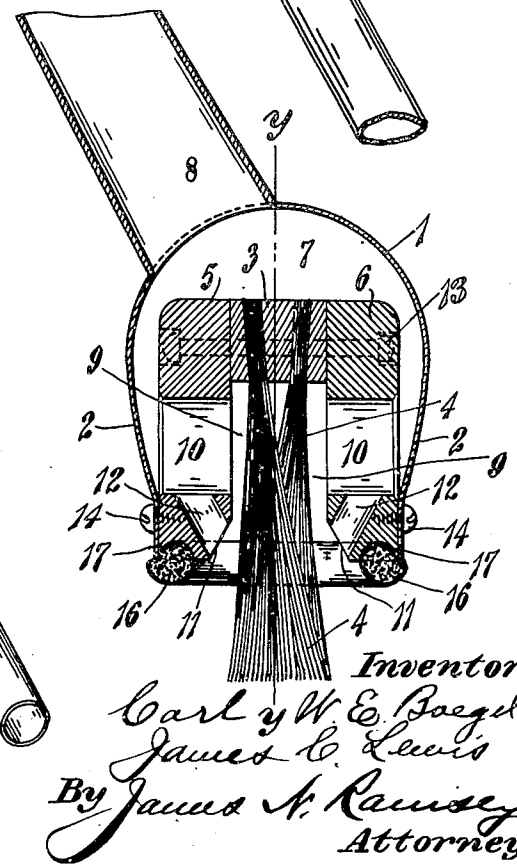


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 5.

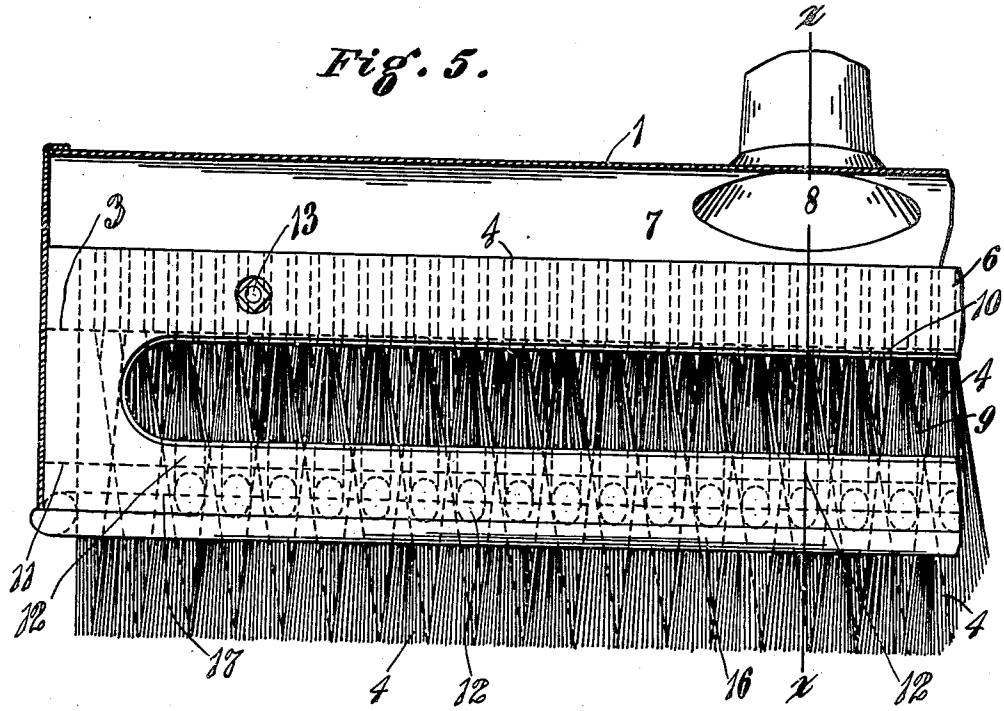


Fig. 4.

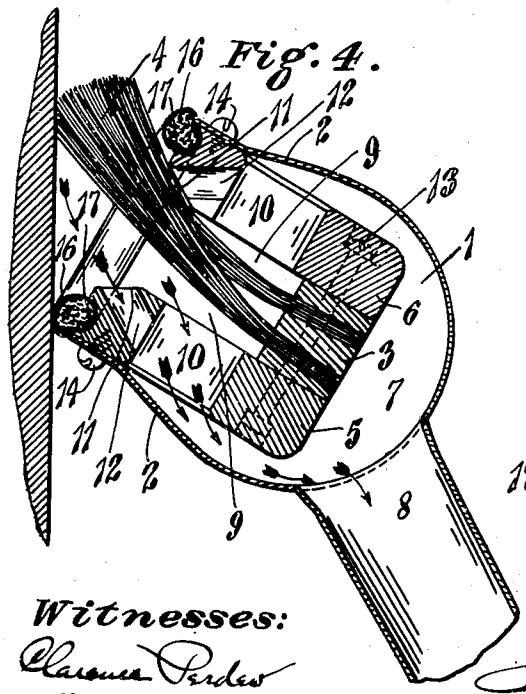
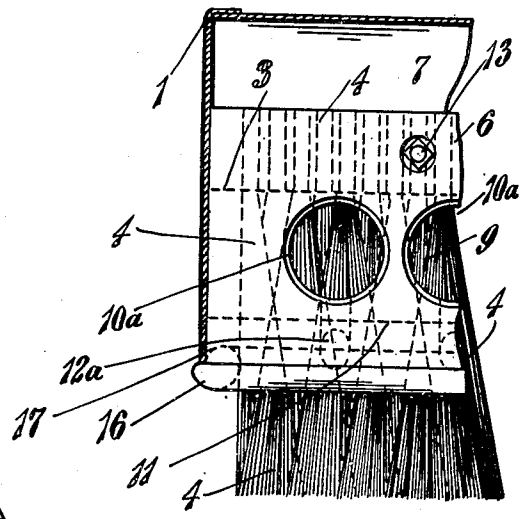


Fig. 6.



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PNEUMATIC CLEANING APPARATUS.

No. 921,669. Specification of Letters Patent. Patented May 18, 1909.

Application filed October 31, 1908. Serial No. 460,396.

To all whom it may concern:

Be it known that we, CARL W. E. BOEGEL and JAMES C. LEWIS, citizens of the United States, residing, respectively, in Lima, in the county of Allen and State of Ohio, and in Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Pneumatic Cleaning Apparatus, of which the following is a specification.

Our invention relates to cleaning apparatus, and has for its object the provision of an efficient device for removing dust from surfaces of walls or floors without injuring the covering of the surface, such, for instance, as paper on a wall.

Our invention consists in an air nozzle provided with separate inlets, or series of inlets, in combination with a brush, the fibers of which are situated intermediate of the air inlets or series of air inlets, and extend beyond the limit of the nozzle to make contact with the surface to be cleaned.

Our invention also consists in the parts and in the details of construction and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawings: Figure 1 is a perspective view, illustrating the use of our improved apparatus in cleaning the surface of a wall. Fig. 2 is a perspective view, illustrating the use of our improved apparatus in cleaning a wall where two of its surfaces meet at an angle, as in the corner of a room. Fig. 3 is a cross section through the middle of the device on a line corresponding to the line *x*—*x* of Fig. 5. Fig. 4 is a cross section also on a line corresponding to the line *x*—*x* of Fig. 5, illustrating the apparatus in a position corresponding to that in which the device is illustrated as being in Fig. 1 of the drawings. Fig. 5 is a longitudinal sectional elevation of part of the apparatus, the section being through the casing on a line corresponding to the line *y*—*y* of Fig. 3. Fig. 6 is a longitudinal sectional elevation, also on a line corresponding to the line *y*—*y* of Fig. 3, illustrating a modification of the apparatus.

As we prefer to construct our improved pneumatic cleaning apparatus, an elongated casing 1 semi-cylindrical in its upper part, and with walls 2 slightly converging downward from the terminations of said upper part, and having closed ends and an open bottom of elongated rectangular formation. The brush, as illustrated, consists in the narrow elongated back 3 and bristles 4 arranged in two rows of tufts throughout the length of the back. As shown, the tufts of one series are inclined toward the tufts of the other series, so as to intermingle the lower separate ends of the diverging bristles, as is well known in the construction of brushes. Brush supports 5 and 6 are provided, these supports being approximately equal in length to the back 3 of the brush but being of such width relative to the size of the casing 1 and the length of the bristles 4 of the brush, that when the lower edge of one of the supports 5 or 6 is approximately coincident with the lower edge of one of the walls 2 of the casing 1, around the open bottom, and the upper side of the back 3 of the brush is approximately coincident with the upper edge of said supports 5 or 6, the bristles 4 of the brush will extend past the limit of the nozzle formed by the casing 1 and the brush and its supports a sufficient distance to allow the bristles to make operative contact with the surface to be cleaned, as is best illustrated in Fig. 4 of the drawings. When the brush supports are thus attached to the walls of the casing and to the back of the brush, a space 7 will be defined in the interior of the casing, extending down along the converging walls 2 at the sides and terminating where the brush supports are attached to the walls.

An outlet pipe 8 is provided on the upper part of the casing, leading from this space 7, and this outlet pipe is also adapted to form the handle, or the means for attaching the handle, for the apparatus. The handle which is attached will, of course, be in the form of a tube or pipe, adapted to conduct the air from the apparatus. Also, when the brush supports 5 and 6 are in position, another space 9 will be defined around the bristles 4 within the interior of the casing, this space being of a width and length equal to the width and length of the back 3 of the brush. As a means of communication between the space 9 around the bristles of the brush and the space 7 from which the outlet pipe 8 leads, the brush supports 5 and 6 are provided with transverse openings leading from one of said spaces to the other. These openings may be elongated slots 10, only one of which is provided in each brush support, as illustrated in Figs. 2, 3, 4 and 5 of the drawings, or they may be circular openings

10ª, a number of which are provided in each of the brush supports. Such circular openings are illustrated in Fig. 6 of the drawings. In either case it is desirable that the lower inner corners of the brush supports 5 and 6 adjacent to the bristles 4 of the brush be beveled throughout their lengths, as at 11, and additional openings 12 be provided, leading from the surfaces of the beveled parts of the brush supports 5 and 6 diagonally upward and outwardly into the transverse opening 10 or 10ª in the brush supports. These openings 12 may be circular in cross section, and where provided in combination with the elongated slots 10 may be placed as close together as the nature of the material of which the brush supports 5 and 6 are composed will permit.

Preferably, the brush supports 5 and 6 are of wood, as is also the back 3 of the brush, the brush supports and the back being secured together by means of bolts 13 passing through them and having the heads and nuts sunk below the outer surfaces of the brush supports to permit the structure composed of the brush supports and the brush to be readily inserted through the open bottom of the casing 1. When this structure has thus been inserted into the casing, it is secured to the walls 2 of the casing by means of screws 14 passing transversely through the walls near their lower edges into the brush supports near their lower edges. The casing 1 and its outlet pipe 8 are preferably constructed of tin plate.

Constructed as above described, the entire apparatus may be comparatively light and strong, its lightness being particularly desirable where it is used for cleaning walls or ceilings. In order to prevent the abrasion of the surfaces which are being cleaned, the lower edges of the brush supports 5 and 6 are provided with longitudinally extending grooves 15 in which is secured a cushion 16. Transverse grooves 17 are provided in the lower edges of the brush supports 5 and 6 near their ends, so that the cushion 16 may extend around from the longitudinally extending grooves 15 transversely from one of the brush supports to the other, past the ends of the series of tufts of bristles in the brush. Thus the cushion 16 may be continuous in the form of an endless cord, and being of sufficiently large cross section relative to the size of cross section of the grooves 15 and 17 and to their distance from the outer sides and ends of the supports, they may be made to extend outwardly past the lower edges of the casing 1, as illustrated. Thus, when the apparatus is used, the only parts which can come into contact with the surface being cleaned are the bristles 4 and the cushion 16 as illustrated in Fig. 4 of the drawings. Preferably, as shown, the outlet pipe 8 is placed on the casing 1 in such position that it will extend at the proper angle relative to the direction of extent of the bristles of the brush and the parts in combination therewith that the apparatus may be most conveniently applied when using the outlet pipe 8, or a continuation thereof, for the handle of the apparatus. It will also be noted that when the apparatus is used and the ends of the bristles 4 are brought into contact with the wall, the bristles will be distorted laterally of the apparatus and their entire mass drawn over against the inner side of one of the brush supports 5 or 6, as against the brush support 5 in Fig. 4 of the drawings, making contact with the surface of the beveled part 11 of the brush support and closing the communication between the exterior of the apparatus and the part of the space 9 adjacent to said brush support. Thus, the entire action of the air circulating apparatus is concentrated on the opposite side of the brush, adjacent to the bristles where they make contact with the surface to be cleaned. Thus, dust or dirt particles which are dislodged and carried by the bristles will also be acted upon by the air and will be carried from the bristles along with the other particles acted upon by the air into the space 9, and through the openings 10 and 12 into the space 7 in the casing 1, and thence outward through the outlet pipe 8 to a proper receptacle, which, not forming a part of this invention, need not herein be illustrated or described. Likewise, the apparatus for inducing a current of air inward through the nozzle need not be herein illustrated or described, since it also does not form part of this invention.

We claim:

1. In a pneumatic cleaning apparatus, an air nozzle comprising a casing having an outlet, brush supports mounted within said casing, a brush supported by the brush supports within said casing, the brush supports, brush back and casing defining a space between said parts adjacent to and communicating with the outlet and said supports and brush back defining a space adjacent to the bristles of the brush, each brush support being provided with an opening forming a communication between said spaces either of which openings is adapted to be partially closed by the bristles of the brush when said brush is brought into contact with the surface to be cleaned, substantially as and for the purposes set forth.

2. In a pneumatic carpet cleaning apparatus, an air nozzle comprising a casing having an outlet, brush supports secured within and to said casing, a brush mounted on said supports, the brush supports, brush back and casing defining a space adjacent to and communicating with the outlet and the brush supports and brush back defining another space adjacent to the bristles of the

brush, each brush support being provided with an opening communicating between said spaces and being provided with beveled parts with which the bristles of the brush are adapted to make contact, and said supports having openings leading from the beveled parts to the openings which communicate between the two spaces, substantially as and for the purposes set forth.

3. In pneumatic cleaning apparatus, an air nozzle comprising an elongated casing of semi-cylindrical closed formation in its upper part and with walls converging downward from the termination of said upper part, and having closed ends and an open bottom of elongated rectangular formation, an outlet pipe mounted on the upper part, a brush comprising a narrow elongated back and bristles arranged therein, brush supports secured to the converging walls of the casing and to the back of the brush, said supports, back of brush and the casing defining a space adjacent to and communicating with the outlet, and said supports and brush back defining another space adjacent to the bristles of the brush and communicating with the exterior of the nozzle, the brush supports being provided with openings forming a communication between said spaces, either of which openings is adapted to be partially closed by the bristles of the brush when they are brought into contact with the surface to be cleaned, substantially as and for the purposes set forth.

4. In pneumatic cleaning apparatus, an air nozzle comprising an elongated casing of semi-cylindrical closed formation in its upper part and with walls converging downward from the termination of said upper part, and having closed ends and an open bottom of elongated rectangular formation, an outlet pipe mounted on the upper part, a brush comprising a narrow elongated back and bristles arranged therein, and brush supports secured to the converging walls of the casing and to the back of the brush, whereby a space is defined in said casing adjacent to and communicating with the outlet pipe, said brush supports having extensions adjacent to the converging walls of the casing, said brush back and extensions defining another space adjacent to the bristles of the brush and communicating with the exterior of the nozzle, the brush supports being provided with openings forming a communication between said spaces and being beveled on their lower inner sides throughout their length with which beveled parts the bristles of the brush are adapted to make contact and also having openings leading from the beveled parts to the openings which communicate with the two spaces, substantially as and for the purposes set forth.

5. In pneumatic cleaning apparatus, an air nozzle comprising an elongated casing of semi-cylindrical closed formation in its upper part and with walls converging downward from the terminations of said upper part and having closed ends and an open bottom of elongated rectangular formation, an outlet pipe mounted on the upper part, a brush comprising a narrow elongated back and bristles arranged therein, and brush supports secured to the converging walls of the casing and to the back of the brush, whereby a space is defined adjacent to and communicating with the outlet between said supports and brush, and said casing, said supports defining with the back of the brush another space adjacent to the bristles of the brush and communicating with the exterior of the nozzle, the brush supports being provided with openings forming a communication between said spaces and being beveled on their lower inner sides throughout their length with which beveled parts the bristles of the brush are adapted to make contact, and said brush supports having openings leading from the beveled parts to the openings which communicate with the two spaces, and a cushion mounted on the lower edges of the brush supports extending throughout their entire length and extending transversely from one end of the brush supports to the other at the ends of the brush, said bristles and said cushion being adapted to make contact with the surface to be cleaned, substantially as and for the purposes set forth.

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