June 17, 1924.

1,497,899

E. F. FLETCHER

ROTARY WIRE BRUSH

Filed Jan. 2, 1923

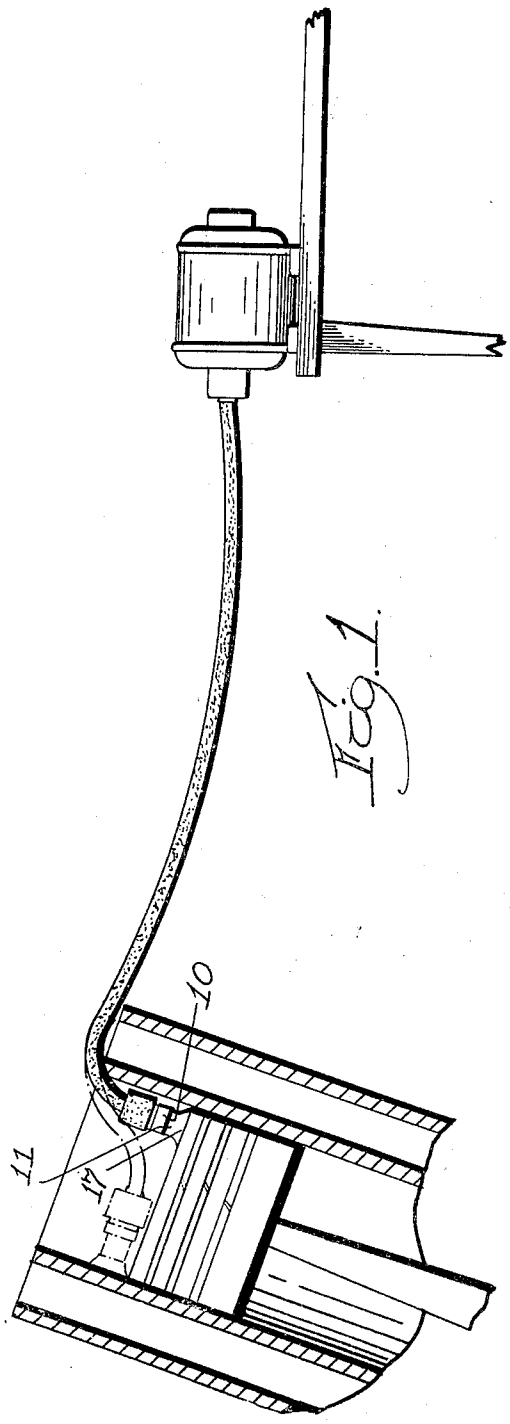


Fig. 1.

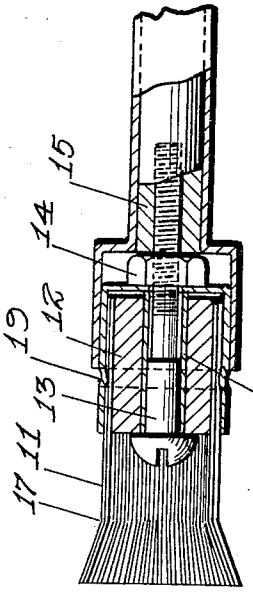


Fig. 3.

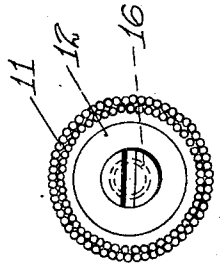


Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWARD F. FLETCHER, OF SHREWSBURY, MASSACHUSETTS.

ROTARY WIRE BRUSH.

Application filed January 2, 1923. Serial No. 610,100.

To all whom it may concern:

Be it known that I, EDWARD F. FLETCHER, a citizen of the United States, residing at Shrewsbury, in the county of Worcester and State of Massachusetts, have invented new and useful Rotary Wire Brushes, of which the following is a specification.

This invention relates to a wire brush for use in various industries, as for example, for removing the carbon from the cylinder of a gas engine, removing paint and varnish from painted surfaces, snagging castings, and in fact, for removing any foreign substance or any kind of coating from a reasonably hard surface either flat, curved or any other shape.

The invention involves the provision of a rotary hollow wire brush formed particularly for the work above mentioned and provided with a plug having means by which the fastening of the wire bristles between the plug and external comparatively heavy metal casing will be possible and practical and whereby the brush can be mounted on the end of the shaft, particularly a flexible shaft axially in alignment therewith. It involves the construction of the brush as well as the elements for mounting it on the shaft and fastening the bristles in it so that the brush can clean in corners.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a side view of a flexible shaft with a brush embodying this invention applied thereto and showing it in use in a gas engine cylinder;

Fig. 2 is an end view of the brush, and

Fig. 3 is a central longitudinal sectional view thereof.

The removal of carbon from the interior of gas engine cylinders is a matter that involves considerable difficulty for several reasons that are well known and some of the difficulty is present wherever a foreign coating is to be removed whether the surface is concave, flat or any other shape.

For the purpose of providing for the progressive motion of the cutting edge of a metal brush in such a way as to permit of its use in a practical way for these purposes with a great reduction in the time required and improvement in the results, I provide a brush of the general type in which a hollow circular series of wire bristles are inserted in a cylindrical cup of sheet metal and forced firmly against the walls thereof by an internal plug. But I have provided certain improvements in this type of brush, as will appear.

In the first place, the cylindrical cup 10 has to be impressed upon the bristles 11 at a point between the base and the face of the cup. This is done ordinarily by forming a groove 19 around the cup by means of rollers or the like and forcing the metal of the cup firmly against the bristles so that none of them will come out. This, of course, requires that inside there shall be a body sufficiently strong to stand the pressure and that will not be permanently distorted by that operation. For this purpose, I have provided a hollow wooden plug 12 fitting within the cylindrical series of bristles. This is made hollow for the passage of a bolt 13 which is secured to the base of the cup by a nut 14. This bolt is attached to the end of a shaft 15, preferably a flexible shaft, so that the brush is axially in alignment with the end thereof and projecting therefrom and rotates on the axis of the shaft. Freely rotatable on the shaft is a hand grip 18.

In order that the wooden plug may stand the extreme pressure to which it is subjected in grooving the cup, I provide a sleeve 16 of pressed metal inside the passage through the plug fitting the screw that passes through it. This sustains the pressure back of the wood and prevents the distortion of the wood in fastening the bristles into the cup in the manner above mentioned.

For the purpose of securing the right cutting action by the end of the bristles of the brush, I flare these bristles out at 17 near their ends so that while the bristles will be held in the cup in a cylindrical form, the active portion of the brush will be of conical form with the base at the free ends of the bristles. This gives each bristle an angular position as it cuts and furthermore spreads the cutting surface so that it will cut through a wider field than would a cylindrical brush alone of the same size. Each bristle acts on the surface to which it is applied in an angular position. I provide the conical shape by pressing the cylindrical brush in dies of conical form to flare out all the bristles equally all around the center of the brush. This shape is of importance in this line, particularly for use in mechanically cleaning the carbon out of the interior of a cylinder of a gas engine. The flaring edge of the brush permits of

getting it into corners and cleaning clear up to a surface at an angle to that being cleaned. By reason of the flexible shaft this operation can be performed very conveniently and quickly by this instrument.

This brush can be used for such wide uses as the snagging of castings and the cleaning of barnacles off ships, doing both kinds of work much more effectively than any method now known to me. I find in practice that by these improvements, a very great saving of time is secured and that there is also a saving of the brushes themselves because one of these brushes used in this way will outlast a great number of the ordinary brushes with the bristles used in the ordinary manner of reciprocation.

Although I have illustrated and described only a single form of the invention, I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims.

Therefore, I do not wish to be limited to all the details of construction herein shown and described but what I do claim is:—

1. As an article of manufacture, a circular brush comprising a casing and a core therein, with a series of wire bristles inserted between the core and the casing, the ends of said bristles being bent in an outward direction all around, said core having a central passage therethrough, said casing being compressed to hold the bristles in place, a sleeve fixed in said passage for resisting the pressure required in compressing the casing, a bolt passing through said sleeve and having its end inside the brush, and a shaft in axial alignment with the bolt and brush to the end of which said bolt is fixed.

2. As an article of manufacture, a circular brush comprising a casing and a wooden core therein, a series of wire bristles inserted between the core and the casing, the ends of said bristles being bent in an outward direction all around, at a distance from the end of the casing and the circumference of the casing being compressed from the outside all around to form a groove on the outside and a circular projection on the inside, bearing against the bristles and wood to hold the bristles firmly against it.

3. As an article of manufacture, a circular brush comprising a metal casing and a hollow cylindrical wooden core therein, a circular series of wire bristles located between the core and the casing, the ends of said bristles being bent in an outward direction all around, and the circumference of the metal casing being compressed against the bristles and wood to hold the bristles firmly against it, said wooden core having a central passage therethrough, and a metallic sleeve fixed in said passage for resisting the pressure required in fixing the bristles in the casing.

4. As an article of manufacture, a circular brush comprising a metal casing and a wooden core therein, with a series of wire bristles inserted between the core and the casing, the ends of said bristles being bent in an outward direction all around, and the circumference of the metal casing being compressed against the bristles and wood to hold the bristles firmly against it, said wooden core having a central passage therethrough, a metallic sleeve fixed in said passage for resisting the pressure required in compressing the casing, a bolt passing through said sleeve and having its head inside the brush, and a shaft in axial alignment with the bolt and brush to the end of which said bolt is fixed.

In testimony whereof I have hereunto affixed my signature.

EDWARD F. FLETCHER.