

G. CALVERT.
BURNISHING AND SCARIFYING DEVICE.
APPLICATION FILED MAY 14, 1910.

967,724.

Patented Aug. 16, 1910.

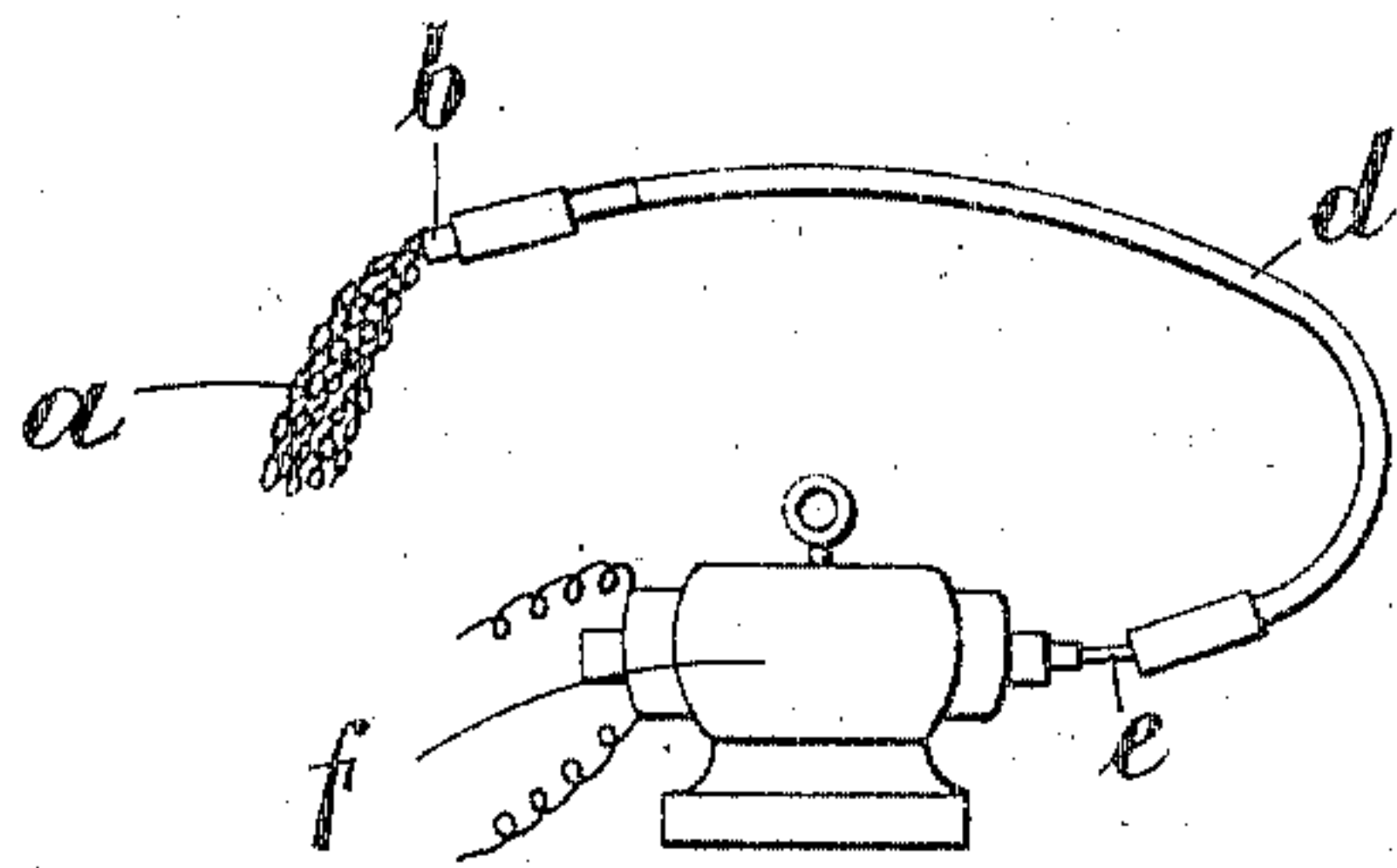


Fig. 1.

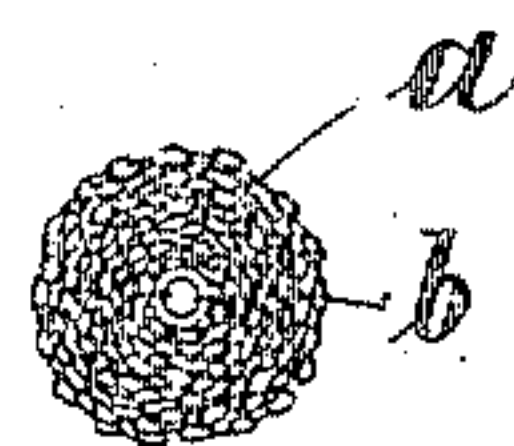


Fig. 2.

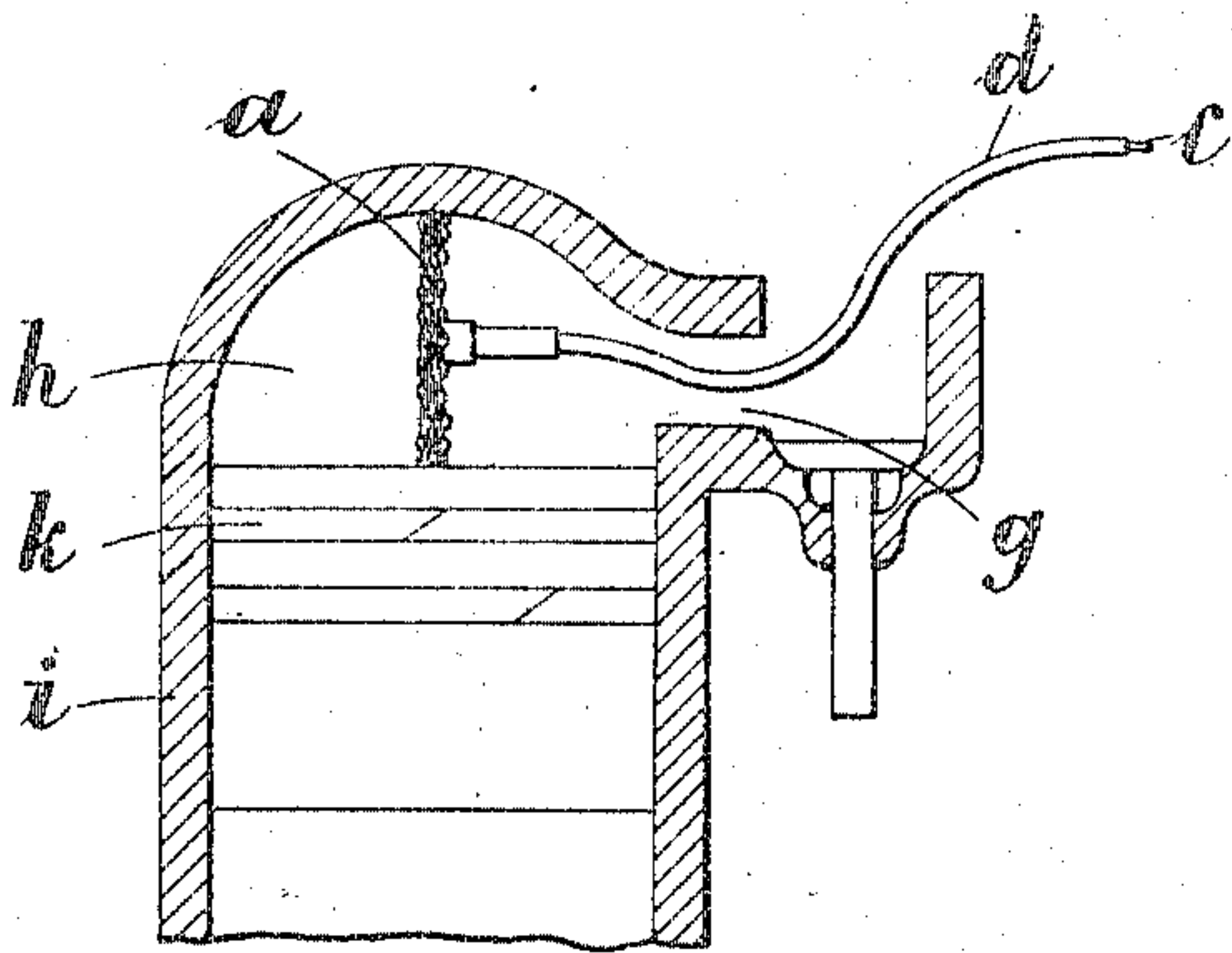


Fig. 3.

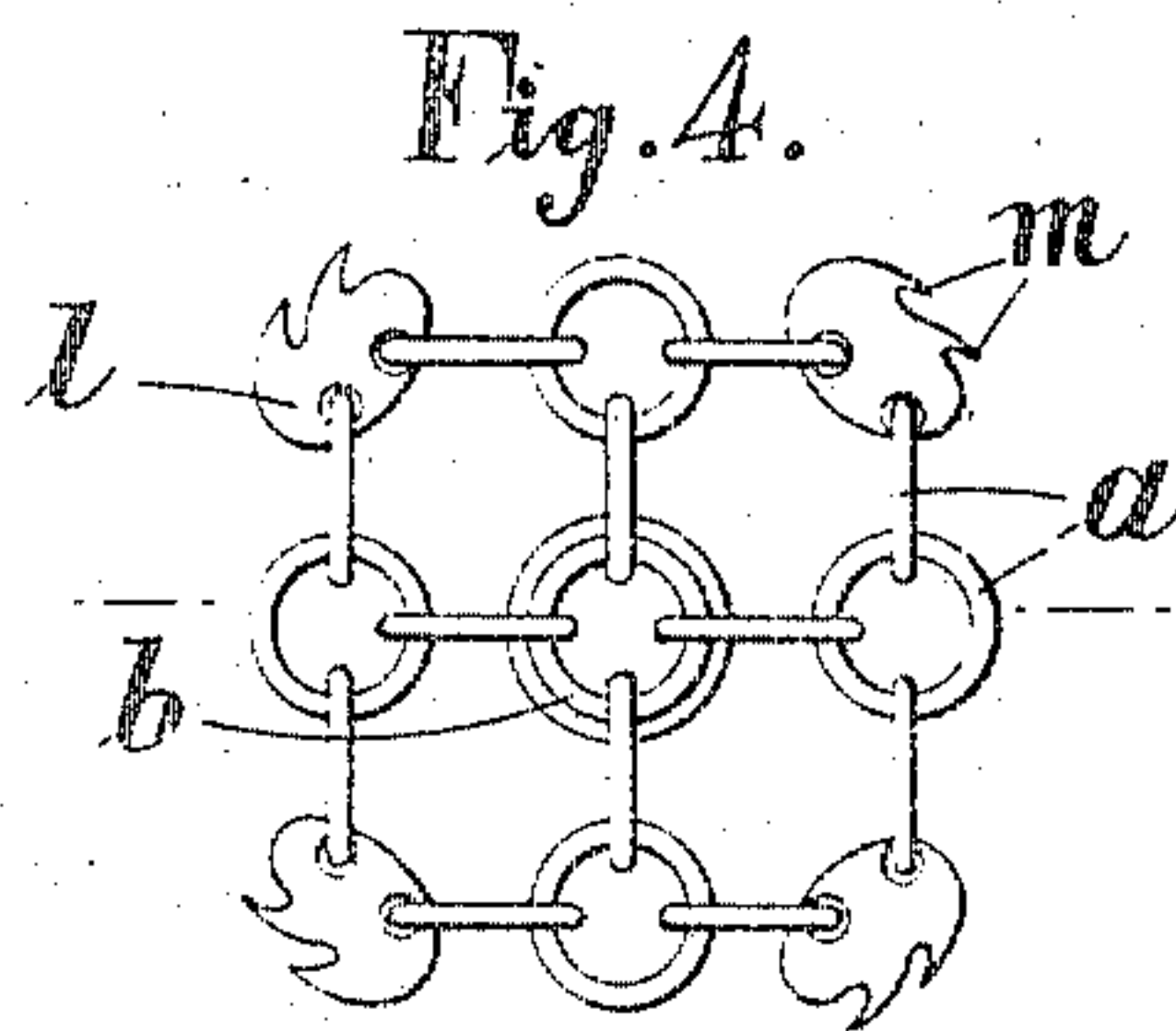
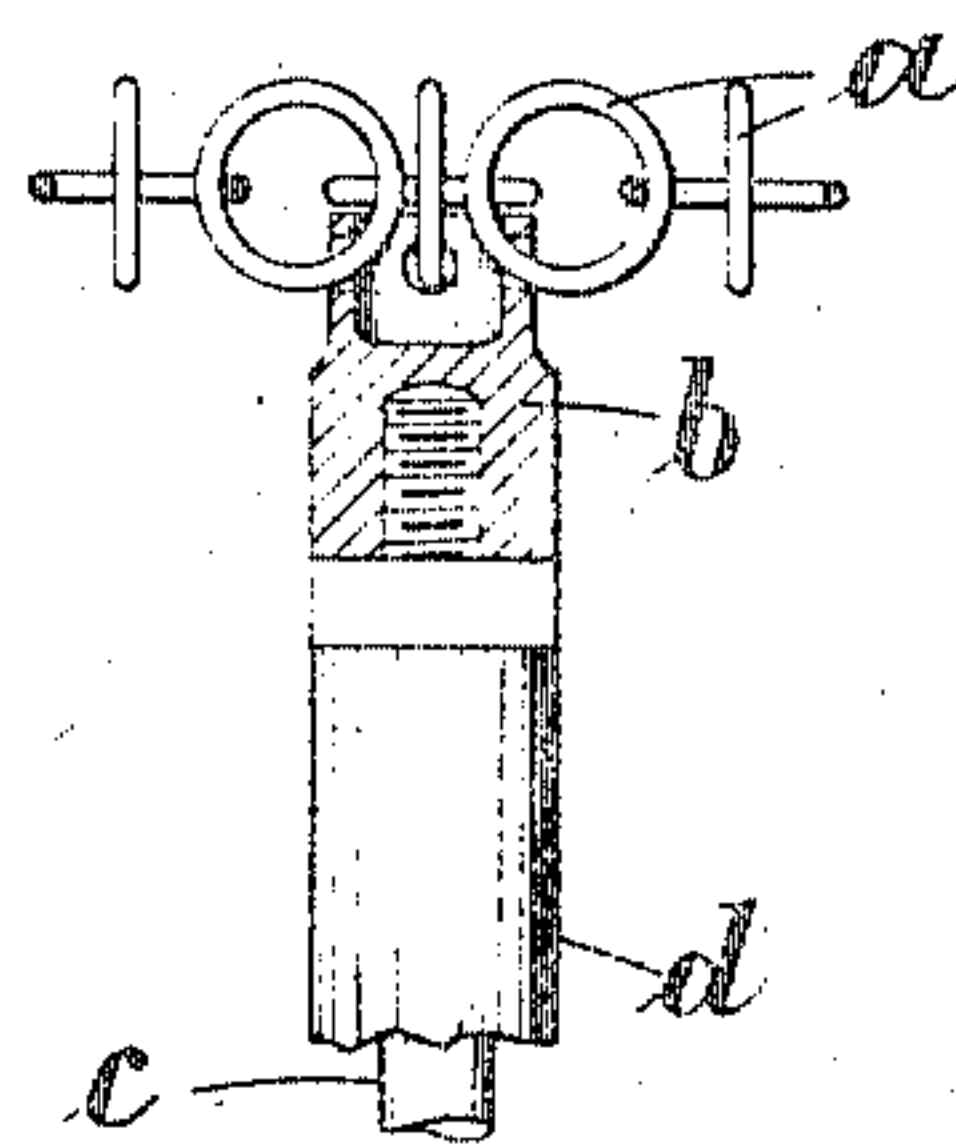


Fig. 5.



Witnesses:

W. Williams
J. H. Troy

Inventor:

G. Calvert
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE CALVERT, OF LONDON, ENGLAND.

BURNISHING AND SCARIFYING DEVICE.

Specification of Letters Patent. Patented Aug. 16, 1910.

967,724.

Application filed May 14, 1910. Serial No. 561,451.

To all whom it may concern:

Be it known that I, GEORGE CALVERT, a subject of the King of Great Britain and Ireland, residing at 100 Evering road, Stoke Newington, in the county of London, England, have invented certain new and useful Improvements in Burnishing and Scarifying Devices; 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.

This invention relates to burnishing and scarifying apparatus, the object of the invention being to provide a burnisher or scarifier which can be readily passed through comparatively small and awkwardly shaped apertures or passages into interiors of various shapes and dimensions, and then expanded and rotated within said interiors so as to burnish or scarify the walls of said interiors or other parts therein, the burnisher or scarifier automatically adapting itself to irregularities or variations in the shape thereof when moved in relation thereto by the operator.

The invention is particularly applicable to the burnishing or scarifying of the combustion chambers, piston-heads and like parts of internal combustion engines, so as to remove carbon and other deposits therefrom without the necessity for dismantling the cylinders.

The apparatus, according to the invention, comprises a burnisher or scarifier, consisting of a plurality of steel or like elements loosely linked together and mounted on the end of a flexible shaft or extension thereof, which may be rotated at a suitable speed by any suitable means, such as an electric or other motor.

The elements are preferably in the form of steel links, wires or chain mail and are also preferably intermeshed and symmetrically arranged in the form of a flexible disk of circular, square or other outline mounted at or near its geometrical center on the shaft. Some of the elements, for instance, on the outer edge of the disk, may be provided with serrations or cutting teeth.

The accompanying drawings illustrate two forms of apparatus by way of example.

Figure 1 is a side view of one form of

burnisher in the condition assumed when stationary, the burnisher being shown as mounted on a flexible shaft connected to an electric motor. Fig. 2 is a front view of the burnisher in the distended condition assumed when it is rotated at a sufficiently high speed. Fig. 3 is a sectional elevation of the combustion chamber of an internal combustion engine in the process of being burnished or scarified by a burnisher of the form shown in Figs. 1 and 2. Figs. 4 and 5 are respectively, a front elevation and a side sectional elevation of a second form of burnisher in the distended condition.

In carrying out the invention according to one form the burnisher *a*, Fig. 1, comprises a plurality of steel links or chain mail so as to form a circular disk, when rotated, as indicated in Fig. 2. The disk is mounted at or near its geometrical center on a socket *b*, screwed or otherwise secured to the end of a flexible shaft *c*, which may be incased as usual within a covering *d*, and attached at its other end *e*, to an electric or other motor *f*.

So long as the shaft *c*, is still or only slowly rotating, the burnisher or scarifier *a*, remains in a collapsed and compact form as indicated in Fig. 1, and in this form may be easily inserted through any convenient orifice, such as a valve port *g*, Fig. 3, or spark plug hole, into the combustion chamber *h*, of the cylinder *i*, which is to be operated upon, the piston *k*, of such cylinder being brought into its innermost position as indicated in Fig. 3, thus preventing the machined portions of the cylinder being exposed to the action of the burnisher or scarifier. When the burnisher or scarifier *a*, is rotated it expands, under centrifugal force, and adapts itself to the irregular shape of the interior surfaces to which it is applied, and while rotating it may be moved in any required direction by the operator, by means of the flexible shaft *c*, or casing *d*, thereof, thus scarifying and loosening the deposits with which the burnisher or scarifier *a*, is brought into contact.

In another form of the invention indicated in Figs. 4 and 5, some of the elements of the burnisher or scarifier may comprise links *a*, as in the form previously described, but others, for instance, at the outer edges of the disk, may be in the form of plates *l*, having serrations or cutting teeth *m*.

Compressed air, vacuum, brushing or

washing may be used simultaneously with, or subsequently to the use of the burnisher or scarifier, to remove deposits thus loosened from the combustion chamber and piston head if desired.

The invention is applicable to the burnishing and scarifying of other machine parts than engine cylinders or for like purposes.

Claims:

10 1. A burnisher or scarifier comprising a plurality of steel elements loosely linked together to form a disk when distended, a flexible shaft, said disk being mounted near its geometrical center on said shaft, and
15 means for rotating said shaft.

2. A burnisher or scarifier comprising a plurality of steel elements loosely intermeshed, some of said elements having teeth, and means for rotating said burnisher or
20 scarifier, substantially as hereinbefore set forth.

3. A burnisher or scarifier comprising a plurality of steel wire links and a plurality of steel plates, the latter having teeth, said links and plates being intermeshed, a socket for receiving some of said links and a shaft for rotating said socket.

4. A burnisher comprising a rigid head, a plurality of loose chains forming a cutting disk when extended, said chains being normally collapsed and connected at their inner ends to the said rigid head, and means connected with said head for rotating the same to thereby form the cutting disk.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE CALVERT.

Witnesses:

A. W. MATHYS,
H. W. Cox.