

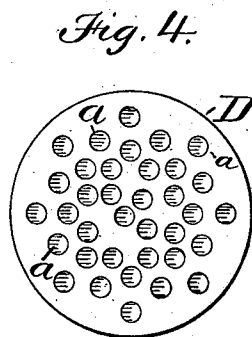
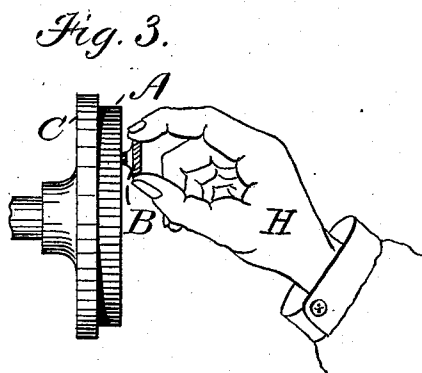
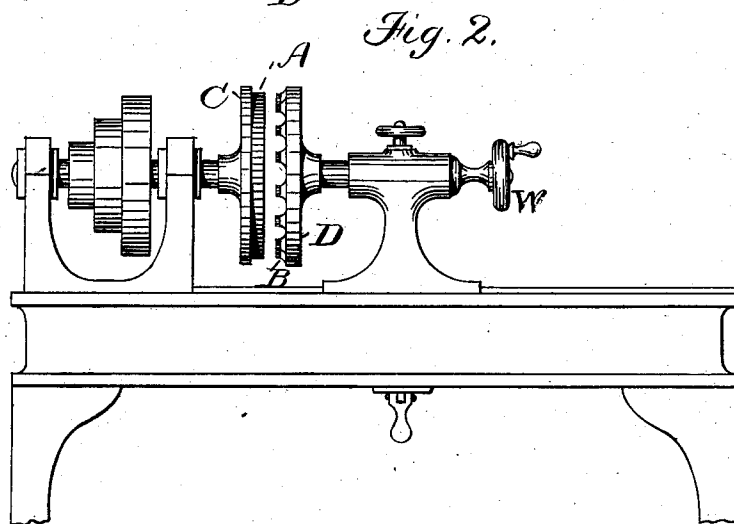
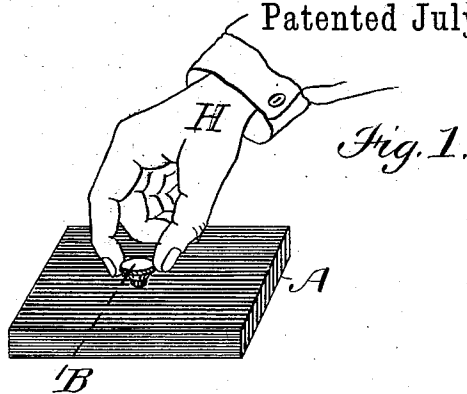
(No Model.)

C. W. BROWN.

SMOOTHING AND POLISHING THE SURFACES OF CARBON ELECTRODES.

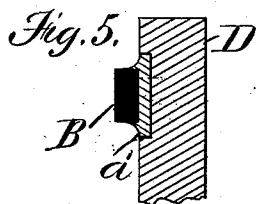
No. 261,511.

Patented July 18, 1882.



Witnesses.

Geo. W. Pierce
Thos D Lockwood



Inventor.

Chas W. Brown.

UNITED STATES PATENT OFFICE.

CHARLES W. BROWN, OF WAKEFIELD, ASSIGNOR TO THE AMERICAN BELL TELEPHONE COMPANY, OF BOSTON, MASSACHUSETTS.

SMOOTHING AND POLISHING THE SURFACES OF CARBON ELECTRODES.

SPECIFICATION forming part of Letters Patent No. 261,511, dated July 18, 1882.

Application filed November 17, 1881. (No specimens)

To all whom it may concern:

Be it known that I, CHARLES W. BROWN, of Wakefield, in the county of Middlesex and State of Massachusetts, have invented certain
5 Improvements in the Smoothing and Polishing of Carbon Surfaces, of which the following is a specification.

This invention has particular reference to the preparation of carbon buttons or electrodes for
10 use in battery or contact telephones—such, for example, as the carbon button, which forms one of the distinctive features of the well-known Blake transmitter.

To obtain the best results in clear articulation, quality of tone, and volume of sound from this and similar microphonic telephones, it is well known that the surface of the carbon electrode, besides being perfectly homogenous and free from minute holes and possessing a
20 hard and smooth face, must be highly polished, such high polish having the effect of diminishing the initial or normal resistance at the point of contact, preventing the scratching and rattling sounds so frequently heard in transmitters of an inferior character, and aiding in
25 the maintenance of a constant adjustment. In the preparation of carbon buttons for this use it is requisite that the finest grades of carbon shall be used, and it is therefore the practice to saw the individual buttons from rods of electric-light carbon. The buttons so formed are fixed in a setting of brass, as set forth in Letters Patent granted to Thomas A. Watson, No. 217,561, July 15, 1879, after which their outer
35 faces are ground down to a plane and true surface, a polish is given them, and they are attached to a spring and fixed in place.

Heretofore carbon has been brought to a true surface and a polish imparted thereto by
40 rubbing it, first, upon emery paper or cloth of a very coarse grade, then of a finer grade until perfectly smooth, and finishing and polishing with the finest emery-paper procurable. Such has heretofore been the method adapted in
45 the carbon telephone-buttons hereinbefore referred to. It has been found, however, that this method has in practice several inherent defects which deteriorate from the scientific value of the carbon surfaces prepared by it.

50 I have found that the microscopic pin-holes,

which are found in even the best grades of carbon, become filled up with emery from the emery-cloth, by which the electrical qualities of the button are impaired. It also frequently occurs that when the process of polishing by
55 this mode is nearly completed a sudden slip of the hand of the operator will scratch the polished surface, so that the work has to be done over again. Such scratches are also caused by coarser grains of emery which occur in the fine
60 finishing emery-cloth.

To overcome these defects is the object of my invention.

I have discovered that by the friction of two carbon surfaces upon one another an extremely smooth and brilliantly-polished face is produced. My invention is based upon this discovery; and it consists in dispensing with the use of emery or any other foreign polishing agent or material, either attached to paper or cloth or in powder, and in polishing
70 the carbon button by rubbing it upon a flat block or surface, likewise of carbon. I have found by actual experiment that the polished surface thus secured is immeasurably superior
75 in homogeneity and luster to that produced by any other method heretofore employed.

In the drawings which illustrate my invention, and to which reference is herein made, Figure 1 shows the simplest way of effecting
80 the desired polishing. Fig. 2 shows a lathe having a carbon plate fixed to the face-plate, and a number of small carbon surfaces fixed in a second plate attached to the tail-stock, and illustrates my method of polishing a number of
85 such surfaces simultaneously. Fig. 3 shows a similar face-plate or chuck and a single carbon button applied thereto by hand. Fig. 4 shows the face of plate employed in Fig. 2, and illustrates the mode of attaching the buttons; and
90 Fig. 5 is an enlarged section through a part of said plate, and a carbon button in position.

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

In Fig. 1, A is a flat slab of carbon previously
95 made perfectly smooth on its upper surface in any way, preferably, however, by friction with a similar plate. It is not necessary that the plate A be highly polished, provided its surface be made perfectly smooth.

B is a button of carbon set in a brass setting, *a*, spun round the periphery of said button and firmly grasping it. In this method of carrying out my invention the hand H is represented as holding the button B upon the slab or plate A, and rubbing it thereon in any direction. In a very few minutes the surface of the button acquires a beautiful smoothness and a brilliant polish, and is ready for attachment to the telephone.

Fig. 3 shows the carbon plate A affixed to the revolving face-plate C of a lathe, against which the hand H presses the button B. When the process is performed in this manner the polish is given with a proportionate increase of rapidity, while the labor is diminished, since no movement of the hand is necessary.

In Fig. 2 the face-plate C of the lathe carries the carbon plate A and a number of small carbons, B, are attached to a second plate, D, in the manner indicated in Fig. 4. The plate D is then attached to the tail-stock of the lathe, as shown, and by means of the hand-wheel W gradually pressed against the large carbon plate. This latter mode is the most expeditious, because a great number of buttons can be simultaneously treated and polished. I adopt the arrangement of the carbon-sockets *a* (shown in Fig. 4) in order that the lines of travel on the plate-carbon A may be continually changed, and that no groove or rut may be formed therein.

Fig. 5 illustrates the method of attaching the several buttons B in their setting *a'* to the

sockets *a* of the lathe-plate D. It is only required that they should fit sufficiently tight to prevent them from falling out, as they can have no tendency to a rotary motion, and if they occasionally turn round it will accelerate rather than retard the process.

The amount of work to be done will of course determine which modification of my method will be used at any particular time. If there are but a very few buttons to be polished, it may be more expeditious to adopt the hand process, and vice versa.

In addition to other advantages gained by my invention, I have found that even poor grades of carbon or those of coarse texture are mechanically improved by its adoption, and that the texture of the surface is made fine by the abrasion upon a surface of a character identical with its own in its own powder.

I claim—

A carbon electrode or button for battery-telephones, having a surface such as is produced by polishing with carbon—that is to say, a dense and polished surface free from foreign matter, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of November, A. D. 1881.

CHAS. W. BROWN.

Witnesses:

THOS. D. LOCKWOOD,
GEO. WILLIS PIERCE.