

(Specimens.)

P. H. HOLMES.
COMPOSITION OF MATTER.

No. 469,142.

Patented Feb. 16, 1892.

FIG. 1

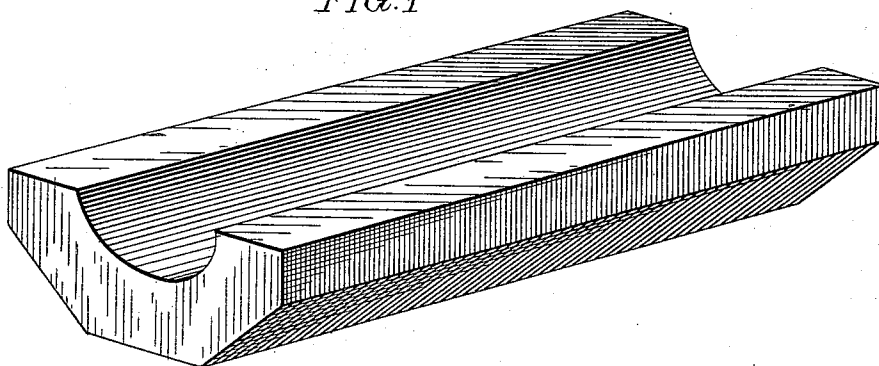


FIG. 2

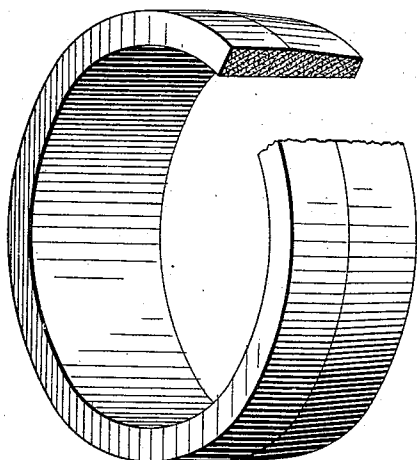
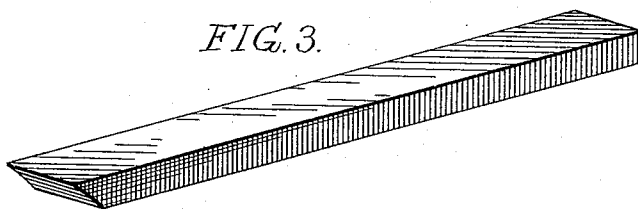


FIG. 3



Witnesses:
A. V. Grouper
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Inventor:
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by his Attorneys
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UNITED STATES PATENT OFFICE.

PHILIP HENRY HOLMES, OF GARDINER, MAINE, ASSIGNOR TO THE HOLMES
FIBRE-GRAPHITE MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS.

COMPOSITION OF MATTER.

SPECIFICATION forming part of Letters Patent No. 469,142, dated February 16, 1892.

Application filed June 23, 1891. Serial No. 397,188. (Specimens.)

To all whom it may concern:

Be it known that I, PHILIP HENRY HOLMES, a citizen of the United States, and a resident of Gardiner, Kennebec county, Maine, have
5 invented a new Composition of Matter, of which the following is a specification.

My invention relates to an improved composition of matter adapted for the manufacture of journal-bearings, packing, projectile-
10 rings, commutator-brushes, and various other articles where two parts come into frictional contact. The composition of matter can also be used as a conductor of electricity, as fully described hereinafter.

15 My invention is based on the invention set forth in the patent granted to me on the 16th day of June, 1891, No. 454,354.

In the accompanying drawings, Figure 1 is a perspective view of a bearing made in accordance with my invention. Fig. 2 is a perspective view of a projectile-guiding ring,
20 partly broken away; and Fig. 3 is a perspective view of a commutator-brush.

In carrying my invention into effect I preferably take plumbago in a finely-divided form and float it, so as to obtain as pure an article as possible. This I mix with fiber, preferably in a finely-divided state. In order to thoroughly mix these two substances, I first mix
25 the fiber with water and then add the plumbago, so as to form a mass that will be semi-fluid. The relative proportions of plumbago and fiber may vary somewhat, depending upon the character of the article to be produced; but in the majority of cases the plumbago is in excess. This is especially so when
30 the material is used as a bearing, in order to obtain the most efficient lubricating service consistent with strength.

40 For bearings I can use proportions extending from four parts, by weight, of plumbago to one of fiber up to thirty-five parts, by weight, of plumbago to one of fiber. These proportions may be varied, however, and still
45 insure good results.

The material, when thoroughly mixed, as before, is placed in a mold, preferably corresponding in shape to the article to be produced. It is there subjected to powerful
50 pressure for the purpose of expelling the wa-

ter from the material and for molding the mass into the form required. As in the prior patent, the fiber acts as an entangling material for the fine plumbago powder, and acts also as a filter, retaining the plumbago and
55 preventing it from escaping with the water through the perforations in the mold. After the article has been pressed it is removed from the mold and dried in any suitable manner, and the article is then impregnated or saturated with a semi-drying oil, such as
60 cotton-seed oil, and in order to get the best results I heat the oil to such a temperature that it will impregnate the article. The mass may be saturated more or less with oil, according to its character and to the use for
65 which it is intended. I then preferably heat the oiled article in a closed vessel in order to assist in driving the oil into the interstices of the composition; but this step may be omitted in some instances. The article is then
70 thoroughly dried, preferably by artificial means, by being placed in a suitable retort or oven and subjected to a sufficient degree of heat to harden, set, and solidify the mass by transforming a portion of the semi-drying oil
75 into a resinous film throughout the intimate mixture of fiber and plumbago, the portion of the oil which is not resinified remaining and serving as a lubricant in addition to the
80 plumbago and also rendering the composition more elastic. In these respects, therefore, the composition differs from that forming the subject of my patent before alluded to, in which the oil used is a drying-oil capable of
85 being completely resinified.

The article thus formed is especially adapted for bearings for journal-boxes (shown in Fig. 1) and other articles subjected to frictional wear, and, being solid and dense, makes
90 an excellent guiding-ring for projectiles, (shown in Fig. 2,) as it will be grooved or formed by the rifling of the gun; but at the same time the ring will withstand any lateral pressure, and thus the projectile is turned by
95 the rifling through the medium of the ring. I have also found that a commutator-brush for dynamos or electric motors (shown in Fig. 3) gives very satisfactory results both as to wear and electric conductivity, and also can
100

be used for contact-points and arc-light pencils with good results.

In some instances I may dispense with the use of fiber or use a very small quantity of fiber in proportion to plumbago, the portion of fiber depending upon the strain or pressure to which the article is to be subjected.

I claim as my invention—

1. A molded and hardened composition of matter consisting, essentially, of plumbago and a semi-drying oil, whereby a portion of the oil acts as a binder for the plumbago and the balance of the oil acts as a lubricant with the plumbago, substantially as described.

2. A composition of matter consisting, essentially, of a mixture of plumbago, fiber, and a semi-drying oil molded into the desired

form and solidified and hardened by heat, substantially as set forth.

3. A composition of matter consisting, essentially, of plumbago and cotton-seed oil solidified and hardened by heat.

4. A composition of matter consisting of plumbago, finely-divided fiber, and cotton-seed oil molded under pressure into the desired form and solidified and hardened by heat.

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

PHILIP HENRY HOLMES.

Witnesses:

JNO. E. PARKER,
HENRY HOWSON.