

UNITED STATES PATENT OFFICE.

EDWIN S. HOLMES, JR., OF WASHINGTON, DISTRICT OF COLUMBIA.

PRINTING-SURFACE.

SPECIFICATION forming part of Letters Patent No. 464,968, dated December 15, 1891.

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To all whom it may concern:

Be it known that I, EDWIN S. HOLMES, JR., a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Printing-Surfaces; and I do 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.

My invention relates to printing-surfaces and the process of making them; and it consists, broadly, in mixing a hard granular substance with an adhesive material which under certain circumstances will become solid and substantially unyielding, whereby an imprint or impression of any desired object—as a type, cut, &c.—may be formed upon the face of the compound while in its plastic condition and can then be used as a printing-surface after it has become hard and solid.

Without limiting myself to the particular ingredients mentioned or to the particular application of the compound after it has been made, I will describe how my invention may be applied to the making and using of it in the form of stereotypes for printing. In doing this I prefer to use graphite in some of its various forms, as black-lead, plumbago, &c., as the granular substance, which forms the larger part or body of the compound, and rubber as the adhesive or binding substance, to which is added a fibrous substance, as asbestos. These are thoroughly mixed or mingled in any suitable manner, as by grinding or heating, in about the proportion of two parts of graphite to one part of rubber and one part of asbestos, with enough sulphur to harden the rubber, or about one part, by weight, to five parts, by weight, of rubber. The ingredients may be used loosely in a mass, or they can be formed into a sheet, as desired, the latter being more convenient to handle.

A mold of the type, &c., which it is desired to stereotype is made in the usual manner out of any material that will stand a certain amount of heat. The mold and press for making the imprint upon the composition are then heated to such a degree as to harden or vulcanize the rubber, say 350° or over. The mold is then filled with a sufficient quantity

of the compound as will fill it compactly and cause a clear clean imprint to be made upon the face of the compound. Pressure is then applied and the mold left under pressure until the compound has thoroughly hardened, which will take about half an hour. It is then taken from the press and the compound removed from the mold and trimmed down and fitted to a block and used in the usual manner. If desired, however, the entire block can be made out of the compound instead of a sheet, as above described, although the sheet will answer every purpose and is much cheaper, except, perhaps, for small objects.

Although the lubricant qualities of the graphite will act to prevent the adhesion of the compound to the mold, a small quantity of soapstone may be sprinkled over the mold and the excess removed with a bellows in the usual manner, or the soapstone can be sprinkled over the surface of the compound itself before it is put into the mold.

I find that a stereotype made from the compound as above set forth possesses many advantages over any compound with which I am acquainted, as it is light in weight, cheap, and is substantially indestructible, and especially from pressure in the press, as I find that it will be found entirely uninjured when subjected to a pressure that would crush an ordinary stereotype. In fact it possesses just sufficient elasticity to enable it to give being injured, but not to such an extent as to affect its printing qualities. It can also be used over and over again without any loss or trouble, as all that is necessary is to warm it sufficiently to soften it, place it in the mold, and apply pressure, as in the first place, and let it cool or harden. It can also be used for making cylindrical stereotypes by first forming a flat stereotype, and after it is hardened or just before it gets completely hardened it is bent into the cylindrical form, and then permitted to cool or harden, when it can be used in the same manner as other cylindrical surfaces are used. In this manner all the trouble and expense of forming a second or cylindrical mold and filling it with the stereotype compound is avoided. After it has thus been used it can be warmed and

straightened out into a flat sheet and used for taking another impression, it being best to invert the sheet and form the imprint upon the flat smooth surface.

- 5 Owing to the difference in weight between my compound and the ordinary stereotype metal, a greater stock of it can be carried in stock without danger of breaking the building, and by the extremely rapid and simple
10 means by which the impression can be taken upon it and it can be got ready for use a great saving of time is effected; and, if necessary, the work can be expedited by placing the compound in cold water as soon as the im-
15 pression has been formed upon it, which will harden it at once. In doing this it may be necessary to relax the pressure during the process of making the stereotype just enough to permit any air or gas to escape which might
20 be in it, and then applying the pressure again for a few minutes.

- Heretofore in making stereotypes in which rubber was employed to any great extent it has been found impossible to secure satisfactory
25 results where the rubber was vulcanized or hardened, as must necessarily be done for use in a printing-press, for the reason that certain parts of the surface were almost invariable defective in some way or another.
30 Besides this, the large amount of rubber required made it too costly to be practical, and its weight was almost as much as the heavy type-metal. Hence the use of rubber has been limited to the use of hand-stamps, in
35 which the printing-surface is not subjected to very great pressure and in which, if the

pressure should happen to be too great, the blur of the type caused thereby would not be so objectionable. I have found, however, that the addition of asbestos to the rubber
40 and graphite completely obviates all of the objections to the use of vulcanized rubber, as the stereotype made from the compound as above described comes from the mold or
45 matrix in a perfect condition, and the addition of the asbestos reduces the cost and weight to such an extent that it can compete with the heavier type-metal; and by being
50 able to use the material over and over again by simply heating it and putting it into a new mold there is not so much loss as with type-metal, which forms a very large percentage of dross every time it is melted.

Having thus described my invention, I claim—

1. A printing-surface composed of graphite, asbestos, rubber, and sulphur, substantially
55 as described.

2. A printing-surface composed of plumbago, asbestos, rubber, and sulphur, the as-
60 bestus and rubber being equal in amount to the plumbago and the sulphur being about one part, by weight, to five parts, by weight, of rubber, or only sufficient to harden the
65 rubber, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses:

EDWIN S. HOLMES, JR.

Witnesses:

SAML. A. DRURY,
HARRY T. DE GROOT.