ing a hole ½ inch diameter at the end of the crack and sawing a kerf along the crack wide enough to prevent the edges from touching by the vibration of the bell. For the bell you describe the kerf should be ½ inch wide at the rim of the bell and narrower if convenient toward the hole.

(6695) G. G. C. asks us to explain the cause of sound in a steam whistle. A. The cause of sound in a steam whistle is the same as in any form of whistle or an organ pipe, viz. : A vibration of the atmosphere induced by a vibration set up in a steam jet directed agai st the edge of the bell, the vibration of the air or steam column in the bell influencing the tone according to its length and diameter.

(6696) Wm. N. C. asks the best way to cement a cellar floor 19 feet 8 inches by 26 feet 10 inches, the probable cost and which of the following suggestions is best if any are good: One suggested to me gravel for foundation and then a layer of cement. Another suggested broken brick or cobble stone pounded down for a foundation with cement between the pieces of stone or brick and then a layer of cement for the surface. Another suggested cement on the bare ground, then a layer of paving brick laid into the cement and on this another layer of cement. Also the quantity of sand and cement proportionately. A. If the cellar is liable to become very wet or have standing water, it should have a well rammed bed of concrete of broken stone or very coarse gravel, mixed with equal parts of cement mortar made with one part cement to two parts clean sand. When the concrete is set it should have a coat of cement mortar ¾ inch thick. The whole to be not less than 5 inches inches thick. If the cellar bottom is sandy and moderately moist, a thin coat of broken brick or stone rammed even with the cement mortar as above may be made with a half inch of cement plaster rubbed even with a trowel for a finish.

(6697) S. B. W. says: Will you inform me what is the best preparation and what is generally used to polish ivory and how to apply? Also the best preparation and methods for getting a high polish and finish on fine steel such as surgical instruments and dentists' tools when not nickeled. A. To Polish Ivory.—First use pumice stone and finish with putty powder; apply with a buff. To Polish Iron and Steel.—Usually the article to be polished is first rubbed down with emery of gradually increasing fineness, after which the article is moistened with alcohol or water and polished with Vienna lime, rouge or tin putty.

(6698) S. H. R. says. Will you publish a formula for a harmless color for the hair, producing medium chestnut? A. Where, from some personal idiosyncrasy, the color of the hair has disappeared and cannot be restored, a dye may be considered necessary, the following will be of service; but the nitrate of silver dyes should be avoided, and the use of any dye for prolonged time is detrimental to the hair.

1. Brown:

Walnut skins beaten to a pulp	4 oz.
Rectified spirit	16 "

The above is perfectly innocent in its character.

The following is original, and non-injurious:

2. Black:

Sulphate of iron	10 grn.
Glycerine	1 oz.
Water	1 pt.

The hair must be thoroughly washed with this, dried and brushed once daily for three days; then the following should be applied on a small tooth comb, but it should not be allowed to touch the skin if the other preparation has done so, as a temporary stain would result.

3. Gallic acid 4 grn.
Tannic acid 4 grn.
Water 1½ oz.

After the first application of formula 2, the hair should be allowed to dry and then be brushed. Subsequently, both formulæ may be used once daily at an interval of an hour or so, until a black color is produced. All preparations of lead and mercury are injurious if used for any length of time; they may, however, be legitimately used where some small portion of hair has, from personal idiosyncrasy, lost its color, which cannot be restored.

TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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