

TRIPLE EXPANSION ENGINES.

We illustrate below a set of triple expansion marine engines, constructed by Messrs. R. & W. Hawthorn, Leslie & Co., Limited, Newcastle-on-Tyne, and which are now being shown by that firm at the Newcastle Exhibition. These engines, says *Industries*, are of the inverted cylinder direct-acting surface-condensing type usually designed by this well known firm for use in torpedo cruisers, and they certainly appear to combine the maximum of power with a minimum of weight. The cylinders are in size respectively 20 in., 27 in., and 42 in. diameter, the stroke being 18 in. The i. h. p. averages as much as 1,800 with a boiler pressure of 160 lb. per square inch. In proportion, general design, and workmanship, these engines appear to be all that could be desired. Lightness of weight, combined with

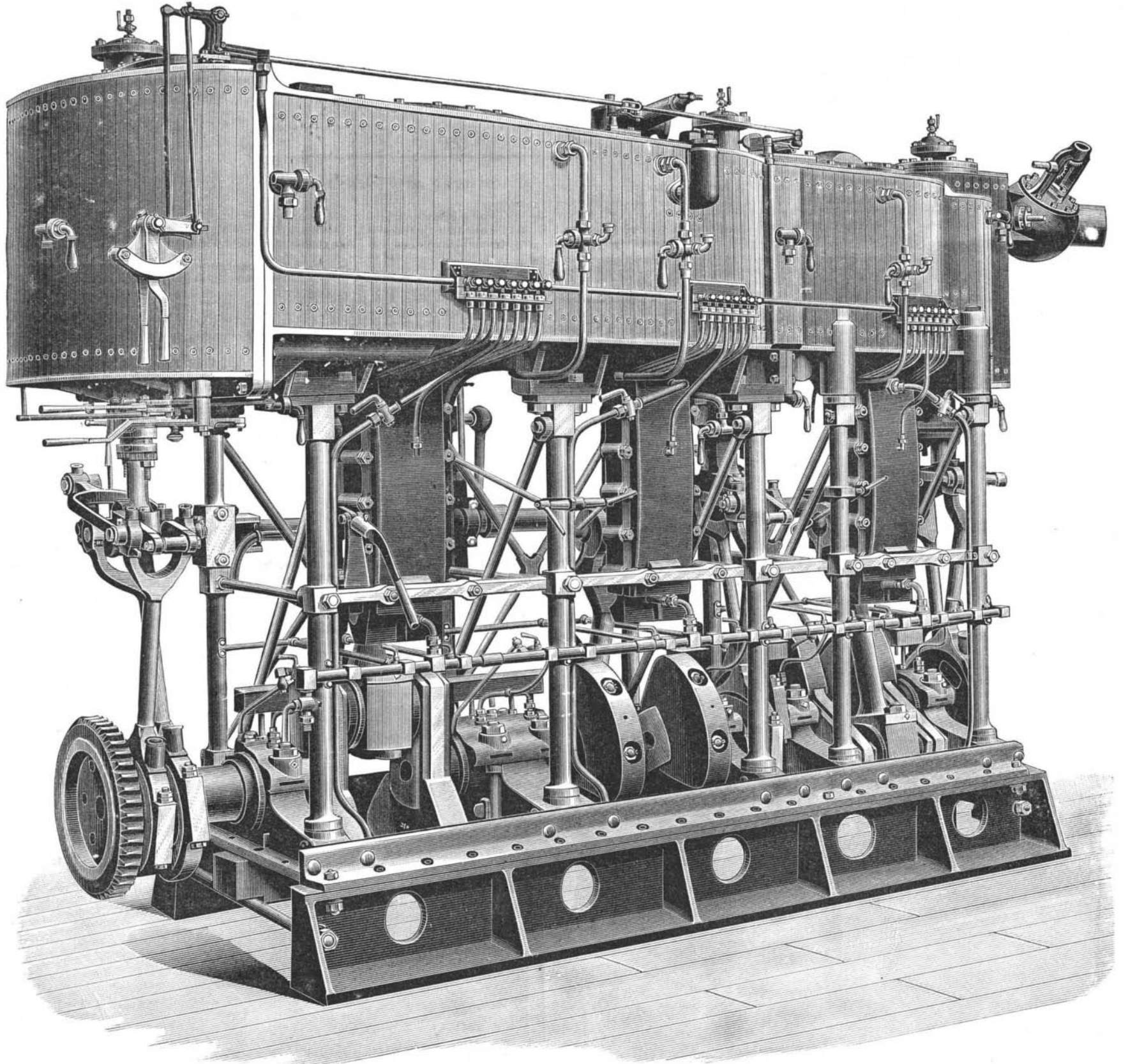
Coloring Copper and Nickel.

The following process is given in the *Journal des Appl. Electriques*, by which it is claimed eleven different tints can be produced upon copper and eight upon nickel. The articles are thoroughly cleaned and polished, and placed in the following solution :

Acetate of lead.....	31 grains.
Hyposulphite of soda.....	93 "
Water.....	1 quart.

The bath must be heated nearly to the boiling point before the copper or nickel articles are placed in it, when a grayish tint is first produced, which changes successively to violet, chestnut brown, red, and blue, including the intermediate shades. When any desired color is obtained, the articles are withdrawn from the bath, washed, dried, and varnished. This process is es-

with skins that have been treated with lime. The boracic acid will remove the excess of lime and render the skins more suitable for the tanning process, while the boracic acid absorbed by the skins at this stage will tend to prevent the decomposition of the tanning material when it is afterward applied. The soluble borate of lime contained in the washings may be mixed with the tanning material, as it will also tend to preserve that material from decomposition. Instead of treating the skins with boracic acid alone after they have been treated with aluminate of soda or aluminate of potash or with lime, they may be treated with a solution containing boracic acid and sulphate of alumina or other soluble salt of alumina. And instead of first treating the skins with aluminate of soda or aluminate of potash, or after so treating them, silicate of soda or



IMPROVED TRIPLE EXPANSION MARINE ENGINES.

strength of material, and easy access to every part—such are the leading characteristics of this excellent specimen of marine engineering; and visitors who take an interest in following out the latest developments of this branch of industry will find it well worth their while to spend some time in examining the details of this exhibit.

In its immediate neighborhood is also shown, by the same firm, a model of the triple expansion engines designed by them, and now being constructed by the Societa Hawthorn-Guppy, of Naples, for the royal Italian twin-screw ironclad *Sardegna*. These engines will be capable of developing the enormous aggregate power of 25,000 horses, and will be by far the largest hitherto erected in any vessel. Each propeller on the *Sardegna* will be driven by two sets of engines coupled in line, as shown in the model, and for ordinary cruising purposes, when a low power only is required, the forward engines may be disconnected and the aft engines alone used to propel the vessel.

pecially adapted to the coloring of buttons or similar small metallic articles.

Boracic Acid for Hides.

An improved process of treating hides or skins is employed by Mr. Joseph Townsend, of Glasgow. A compound or mixture is made of aluminate of soda or aluminate of potash, containing by preference 50 per cent of soda or an equivalent quantity of potash and 40 per cent of alumina and one gallon of water to each pound of aluminate. The skins are steeped in this mixture or are impregnated with it in any suitable manner; and after a few days of this treatment the hair can be removed. The skins, having by preference been washed with water, are next placed in a solution containing from 2 to 4 per cent of boracic acid, and are again by preference washed with water. The skins may afterward be tanned in the ordinary way or may be otherwise treated.

The treatment with boracic acid may also be used

silicate of potash may be used, of a strength of about 18 degrees Twaddell. When using an aluminate and a silicate, however, it is preferable to steep the skins for some time in the silicate alone, and after draining, to steep them in the aluminate, then to wash in water, and after removing the hair to steep in the solution containing boracic acid and a salt of alumina.

A New Boiling Well.

A roaring well has been discovered near Harlem, Columbia County, Ga., about thirty miles from Augusta. A noise can be distinctly heard down in the well resembling the sound of a swarm of bees, and a glance down plainly shows that it is boiling furiously. A lighted torch was let down in the well to see if it contained gas, but without result. This well was dug about one year ago, and has been acting like other wells until about three weeks ago, when it began to boil, and has continued to boil incessantly ever since.