SPAR TORPEDO VESSEL ACHERON.

About eighteen months ago the government of Sydney, Australia, voted £8,000 for the construction of two torpedo launches, and their design and supervision of construction were intrusted to Mr. Norman Selfe, of Sydney. As nothing over ten knots had ever been realized in launches there up to that time. Mr. Selfe sought for information in our own pages and those of our contemporaries; but editors are not at liberty to publish all they know concerning such craft for obvious reasons, so Mr. Selfe had to rely on his own resources. He had to begin at the beginning, and work the whole thing out. Since the boats have been in hand he has learnt a few particulars, but the original design has not been departed from in the slightest degree. One vessel is launched, and on a trial in a very heavy sea realized over fifteen knots; but Mr. Selfe is confident of getting thirty or forty more revolutions at the least, as he only had 330 revolutions, and steam blowing off abundantly. When he decided to use a balance rudder, he had never heard of a similar vessel being fitted with one. With regard to the air pump, he could not understand how an ordinary air or feed pump could work noiselessly at from 300 to 400 revolutions, so he designed special pumps, the air pump with two buckets in one barrel moving in opposite directions, and dividing the stroke between them. It has turned out a great success, works noiselessly at any speed, and Mr. Selfe informs us that he gets 26½ inches to 27½ inches of vacuum; the feed pump also works well. In the present case the blower is driven direct by friction rollers made of disks of leather, brought into contact with a large wheel or pulley on the engine shaft, and a small pulley on the fan shaft, by a pair of levers worked by a screw in such a way as to nearly equalize the pressure on the fan bearings. The fan is of a silent type, with gun metal frame and steel blades of No. 30 gauge, and works well. A turn of a hand wheel throws the leather pulleys out of gear, and stops the fan at once. The boiler is of the Belpaire fire box type, with Cudworth's mid-feather. The engine is all steel and wrought iron, except the cylinders. The crossheads and guide blocks are all forged of steel in one piece to save height, and few engines of 14 inch stroke with such long connecting rods have ever been made so low before. The steel plates were telegraphed for from England, but the steel for the engine and screw, copper for fire box, and other materials, had to be rummaged out from all over the colony, and Mr. Selfe had often to adapt what he could get. The propeller blades are of hammered steel on a wrought iron boss.

Our engraving below is from a photograph. The engine has two cylinders, 11 inches and 19 inches diameter by 14 inches stroke; the boiler has 300 1¼ inch tubes; the pressure is 140 lb.; the length of the boat is 80 feet; per beam, 10 feet 3 inches.—*Engineer.*

The Intravenous Injection of Ammonia.

Dr. Gasper Griswold, House Physician to Bellevue Hospital, of this city, states in the *Medical Record* that while serving as assistant in the physiological laboratory of Bellevue Medical College, in 1877–8, he made a number of experiments on dogs with reference to the action of intravenous injection of ammonia. For this purpose he used the ordinary aqua ammoniæ, diluted with an equal bulk of water. For his experiments he chose dogs in which the viscera had been exposed during vivisection, and which had become exhausted with loss of blood, etc. He waited in such a case until the heart had almost ceased to beat, and its inefficient contractions no longer deserved to be called pulsations. He then injected half a drachm of the ammonia solution into a convenient vein. After a period, varying with the distance of the vessel from the heart, and with the rapidity of the circulation in the particular case, a marked change was observable; the systole suddenly acquired new energy, which emptied the distended right ventricle into the lungs, and filled the aorta with fresh oxygenated blood; and the heart itself became bright red again as the new supply flowed in through the coronary arteries. The circulation was almost immediately re-established, and the animal, if anæsthesia were not complete, moved and showed signs of life.

Encouraged by these successes, Dr. Griswold has since frequently injected one drachm of ammonia solution into the veins of patients apparently moribund, and states that he has always succeeded in stimulating them much more powerfully than he could do by other methods; the prompt and marked effect in some cases being startling to those who have been accustomed to see hypodermic injections of whisky and ether, inhalations of nitrite of amyl, etc., employed to no purpose under like circumstances. From his experience with a number of cases, some of which are described in the article under consideration, the author believes that he has satisfactorily established: (1) That the intravenous injection of ammonia is a prompt and powerful means of stimulation, acting efficiently in cases where other measures are of no avail; (2) that no bad effects follow its employment. These deductions have a special significance in connection with those operations whose object is the removal of mechanical obstructions to respiration—particularly laryngotomy and tracheotomy.

These operations, performed in cases of croup, etc., generally fail to save life because done too late, the patient being too much exhausted to breathe in the air for which a new entrance has been made. The author asks: Would not the intravenous injection of ammonia, in connection with artificial respiration, save many of these patients? It being proved that the treatment is without danger, and followed by no bad effects, this question should not long remain unanswered.

Fusible Metals.

Under the name fusible metal or fusible alloy is understood a mixture of metals which becomes liquid at temperatures at or below the boiling point of water. There are several such mixtures known, some of which *New Remedies* has gathered from one source and another, and placed in convenient order, as follows:

1. D'Arcet's: Bismuth, 8; lead, 5; tin, 3 parts. This melts below 212° F.

2. Walker's: Bismuth, 8; tin. 4; lead, 5 parts; antimony, 1 part. The metals should be repeatedly melted and poured into drops, until they can be well mixed previous to fusing them together

3. Onion's: Lead, 3; tin, 2; bismuth, 5 parts. Melts at 197° F.

4. If, to the latter, after removing it from the fire, one part of warm quicksilver be added, it will remain liquid at 170° F., and become a firm solid only at 140° F.

5. Another: Bismuth, 2; lead, 5; tin, 3 parts. Melts in boiling water.

Nos. 1, 2, 3, and 5 are used to make toy-spoons to surprise children by their melting in hot liquors. A little mercury (as in 4) may be added to lower their melting points. Nos. 1 and 2 are specially adapted for making electrotype moulds. French cliché moulds are made with the alloy No. 2. These alloys are also used to form pencils for writing, also as *metal baths* in the laboratory, or for soft soldering joints. No. 4 is also used for anatomical injections.

Higher temperatures, for *metal baths* in laboratories, may be obtained by the following mixtures:

1 part tin and 2 parts lead melt at 441·5° F. 1 part tin and 1 part lead melt at 371·7° F. 2 parts tin and 1 part lead melt at 340° F. 63 parts tin and 37 parts lead melt at 344·7° F.

Hard vs. Soft Water.

It may be pleasant to those who live in a region of our country where nothing but hard water is to be had, to be informed, by so good authority as Dr. Tidy, the well-known chemist, of the results of his observations on the use of hard water for culinary and domestic purposes:

(1) Hard water is the best dietetically, because of the lime.

(2) It makes better tea, although not so dark colored, owing to the fact that soft water dissolves the bitter extractive matters which color the tea, but ruin the aroma.

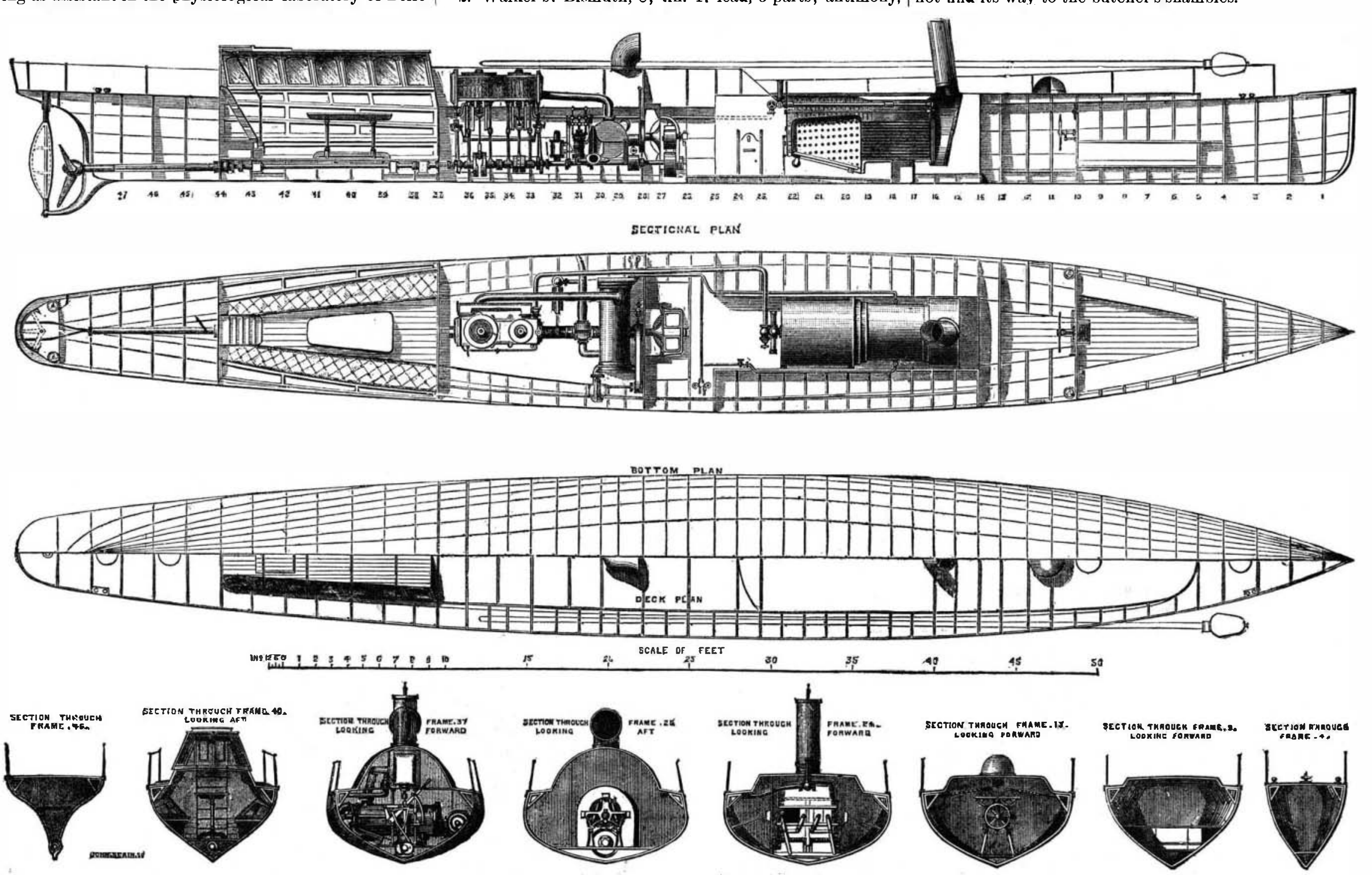
(3) It relieves thirst, which soft water does not.

(4) It does not dissolve lead or organic matter, which soft water does.

(5) It is generally good colored, soft water being as a rule dark colored and unpleasant looking; hence, in places like Manchester, supplied with soft water, they always put it (in hotels) in dark bottles, to hide the color. A soft water, however, is a better detergent, and requires less soap. For a residential town a water which has over ten degrees of hardness would be best. For manufacturing towns a soft water would be the most advisable, for commercial considerations only.

Life Time of a Locomotive.

The iron horse does not last much longer than the horse of flesh and bones. The ordinary life of a locomotive is thirty years. Some of the smaller parts require renewal every six months; the boiler tubes last five years, and the crank axles six years; tires, boilers, and fire boxes from six to seven years; the side frames, axles, and other parts, thirty years. An important advantage is that a broken part can be repaired, and does not condemn the whole locomotive to the junk shop; while, when a horse breaks a leg, the whole animal is only worth the flesh, fat, and bones, which amount to a very small sum in this country, where horse flesh does not find its way to the butcher's shambles.



THE SPAR TORPEDO VESSEL ACHERON.