AN IMPROVED CAR FENDER.

This fender is of inexpensive yet substantial construction, and may be quickly attached to or removed from a car, or conveniently folded up against the dashboard, as shown in the small figure, when not required for use. It has been patented by Mr. Herman B. Ogden, of No. 204 Carroll Street, Brooklyn, N. Y. It consists of two frames hinged together and covered with wire netting, the upper frame having hooks adapted to engage the draught rings on the end of the car formerly used for tow horses, and being supported at the right inclination by chains extending to eyes

OGDEN'S CAR FENDER.

near the top of the dashboard on either side. The frames have abutting meeting rails or cross bars which prevent the outer frame from swinging too low or sagging. Depending from the sides of the lower frame are arms which carry a roller just above the roadbed, which it strikes when unusual pressure comes on the fender, or with the rocking of the car. The fender is so constructed as to come in contact with the roadbed without injury. A forward extension of the fender projects in front of the roller, the side arms of this extension being held in keepers on the side bars of the lower frame. When one is run down by the car, the extension is designed to trip up and throw the person uninjured into the netting, the weight of the falling body then causing the roller to come into contact with the roadbed and furnish a firm support for the fender.

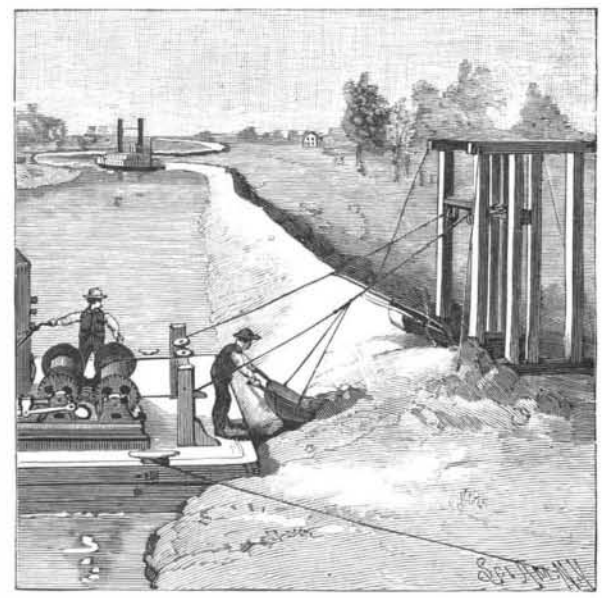
The motor man cannot fail to use the fender at night, as the headlight cannot be put on the dashboard till the fender is down in place. The fender takes up no room when the cars are stored in the sheds, being then folded up out of the way.

THE SPEED OF VESSELS. — Lloyd's latest publication shows that out of the 13,000 steamers recorded in the "Registry," only 45 vessels have a speed of 19 knots and above, and of this number 18 are credited with a speed of 20 knots or over. Of the former number 25, or more than half, were built on the Clyde, while of the 20 knot boats 12 are Clyde built, 3 have been constructed in other parts of the kingdom, leaving 3 for abroad. Foreign builders constructed a dozen of the 45 of 19 knots and over, but, on the other hand, foreigners own 20 of these 45. The remarkable fact is that of the 20 knot boats 9 are paddle steamers and 9 twin screw, none being single screw. For high speeds, therefore, the single screw is of the past; and it might also be said that the side paddles are giving way to twin screw propulsion. The difficulty hitherto has been the draught of water available, the paddle requiring less water in which to work than the screw propeller, which must be completely immersed. But when it is remembered that in action the screw propeller is similar to a wheel revolving, it will be understood that by increasing the revolutions it is possible to reduce the diameter and still get the same speed. A few years ago 90 revolutions was high; now 200 is exceeded in several vessels and 400 has been reached in torpedo craft.

Another circumstance which makes the screw preferable is that it has, as a rule, only half the slip of the side paddles. Slip is used in the same sense as in the case of a locomotive wheel. The slip of a 20 knot paddle steamer is 26 to 30 per cent the forward motion, against 13 to 15 per cent in a twin screw steamer. Again, the proportion of weight of machinery to the total weight of the steamer is less in a screw steamer, since more has been done to lighten the parts than with the paddle engine. In the latter 8½ I. H. P. has been got per ton weight, in the former 11 I. H. P. per ton. In a paddle steamer 45 per cent of the total weight goes in engines; in a screw steamer, where more provision is made for cargo, only 31 per cent of the total is for machinery.—Glasgow Herald.

AN EXCAVATOR FOR USE ON RIVER BANKS, ETC.

The illustration represents an apparatus of simple construction designed to be especially effective in forming embankments along rivers, etc. It has been patented by Mr. John P. Griffin, of Cincinnati, Ohio (southeast corner of Sixth and Smith Streets). The driving engine, on any suitable flatboat, is connected by gears and readily operated clutches with two drums on which wind the ends of a rope extending outward over pulleys held in a suitable framework on the stern of the boat, the arrangement being such that as the rope is wound upon one drum it is unwound from the other. The rope extends from the boat up the embankment and passes over pulleys in a suitable framework held in place by anchor ropes, the framework being of such description that it may be readily shifted to new positions along the embankment. On the up and down runs of the rope are attached branch ropes connected with shovels or scrapers, and when the engine is running, the operator, by means of shifting devices which throw one drum out of gear and the other into gear, causes one of the scrapers to be drawn up the embankment and automatically dumped, while the other scraper is being returned to be filled. Thus the scrapers travel in opposite directions, and are alternately filled and emptied and returned to their place of starting.



GRIFFIN'S EXCAVATOR.

SWAMP MUSIC.

We have already made known to our readers the tentatives that have been made to translate the song of certain birds by musical characters, but such attempts have not been confined solely to the warbling of the songsters that people our groves and fields in the spring. A few observers, from the highest antiquity, have extended these interesting remarks to the original voice of frogs and toads, and, in general, of all the animals that can be arranged under the denomination of inhabitants of the swamps.

Such observations, at their inception, belonged rather to the domain of fancy, and it is not until the second half of the last century that we find notes upon this subject that have an essentially scientific character. Our contemporary Le Naturaliste has recently given an account of these, from which we extract the following passages:

It was the Bavarian scientist De Rosenhoff who was the first to furnish us with valuable information in regard to this interesting question. This writer gives a description, as detailed as it is circumstantial, of the voice of the frog and the noises that it makes, but does not occupy himself with the anatomical and physiological side of the question. The first anatomical and physiological explanation of the vocal apparatus of the animals under consideration was given by a very eminent French scientist, Professor Duges, of the University of Montpellier. On another hand, several eminent naturalists, such as Ekker, Robert Widersheim, Franz Leidig, and Hermann Landois, having become interested in the scientific work of Duges, endeavored to give their respective interpretations of the complicated, as well as interesting, operation of the vocal apparatus of the inhabitants of the swamps. It is to be remarked, moreover, that the physiological explanations of Muller and Landois relative to the constituent parts of the vocal apparatus of frogs and toads are of the highest interest. The others relate only to the anatomical side of the question. If we observe the green frog (Rana esculenta) in the act of croaking, we shall in the first place see two pouches inflating at the sides of the cheeks, and disappearing as soon as the frog begins to "sing." It is therefore useless to remark that the croaking of the frog is connected with the two membraneous pouches just mentioned. But this is only a secondary relation, as has already been shown by Aristotle, who tells us that "the frog emits sounds through its throat."

What, then, is the role of these famous membraneous pouches? They are probably resonators designed to re-enforce the sound, as is done, for example, by the hollow body of a violin. The fact must not be lost sight of that the frog croaks with its mouth closed in producing sounds with the same quantity of air and in causing a continuous circulation of the air of the lungs in the inflated pouches. Hence by reason of the elasticity of the walls of the latter, the air returns to the lungs by way of the larynx. As for the small quantity of air that escapes through the orifices of the nose, that is very quickly compensated for during the short pauses in which the frog begins to respire strongly. It must not be thought that the organism can suffer from so feeble an exchange of air, and this is why: In the first place, in the frog there is a very slight exchange of materials as compared with warm-blooded animals, and, on another hand, respiration is effected likewise through its moist and very delicate skin, which is provided with numerous veins and arteries. Thus, the air, feebly exchanged during the frog's croaking, is driven into the buccal cavity, while the animal's mouth is closed, through the contraction of the muscles of the sides of the body. As the vocal cords approach each other at this moment, the air passing between them separates them, a vibration is produced and a sound is made.

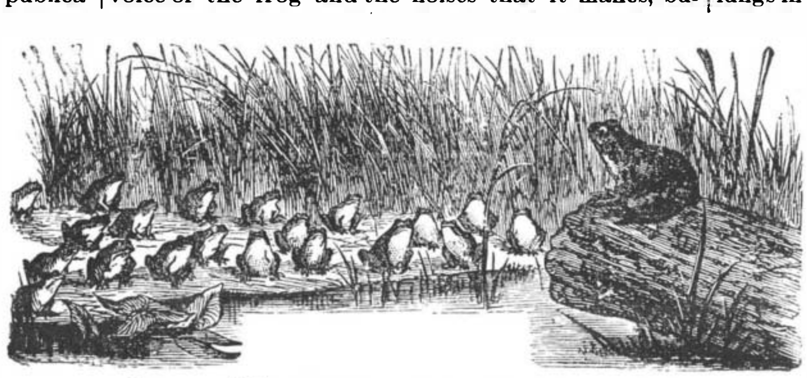


Fig. 1.—MUSIC OF THE GREEN FROG.

Fig. 3.—MUSIC OF THE SPOTTED FROG.

Fig. 4.—SOUND OF THE PELOBATIDES.

Fig. 2.—HANDEL'S ISRAEL IN EGYPT.

It is to be remarked that the production of the sound is effected by the same process, not only in the inhabitants of our ponds and marshes, but also in all their kin.

A few digressions, of small importance, as for the rest, are to be noted. Thus, in the spotted frog, the membraneous pouches are but slightly developed and are situated near the median line, so as to constitute but a single one.

Now that we are acquainted with the vocal apparatus of these animals, the question is to know in what measure they have interested musicians and artists. As regards this, it is to be remarked that the inhabitants of the swamps have been thoroughly neglected by modern artists, and to such an extent