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**Form of Sound Waves.**

In an article on page 302, this volume, SCIENTIFIC AMERICAN, on "the cause of sound and music," the opinion was expressed that the different qualities of sound (those of voices and various instruments) were caused by the form of the sound waves or vibrations. Experiments have recently been made to prove the correctness of this view; and an account of these has been published in the *Franklin Journal* (page 407) for this month. This is taken from the *Cosmos*—a European publication. The experiments were made by M. Leon Scott, whose apparatus consisted of a tube flaring out widely at one end, like a trumpet, and closed at the other end by a thin membrane, to the middle of which was attached a very light pencil. This tube concentrated the sounds which entered by its wide mouth, and the vibrations of the membrane thus produced were written with the pencil upon paper, which was carried with a uniform motion under the pencil by clock-work. The figures formed by the pencil on the paper were very different, both in form and dimensions, according as wind or stringed instruments, or the human voice were used. It was established by experiment that the series of vibrations formed by the sound of an instrument or voice was more regular in proportion as it was agreeable to the ear, or what is termed "pure." Shrill cries, harsh sounds, and disagreeable voices produced very irregular and unequal marks—ungraceful lines—upon the paper.

**Large Ships.**

The Liverpool *Albion* says that two vessels of greater length, and of a more remarkable character than the *Leviathan*, have been advancing to completion in Liverpool, without the general public being even cognizant of their existence. These vessels are each seven hundred feet long. They have been constructed by Messrs. Vernon & Son, for the Oriental Inland Steam Company, and are intended for the navigation of the Indian rivers. The purpose of their peculiar features of construction is to enable a large cargo to be carried at a good rate of speed upon a light draft of water. The great rivers of India, though penetrating far into the interior, and though containing large volumes of water, are, nevertheless, shallow during the dry season. The vessels navigating them must, therefore, float very light, and yet they must have displacement enough to carry a good cargo. They must have strength enough not to suffer injury if they should get aground, and they must present such little resistance to the water as to be able to achieve a satisfactory rate of progress against the stream. All these requirements are admirably fulfilled in these vessels.

**SPRENKEL & BASFORD'S OSCILLATING ENGINE AND PUMP.**

Fig. 1

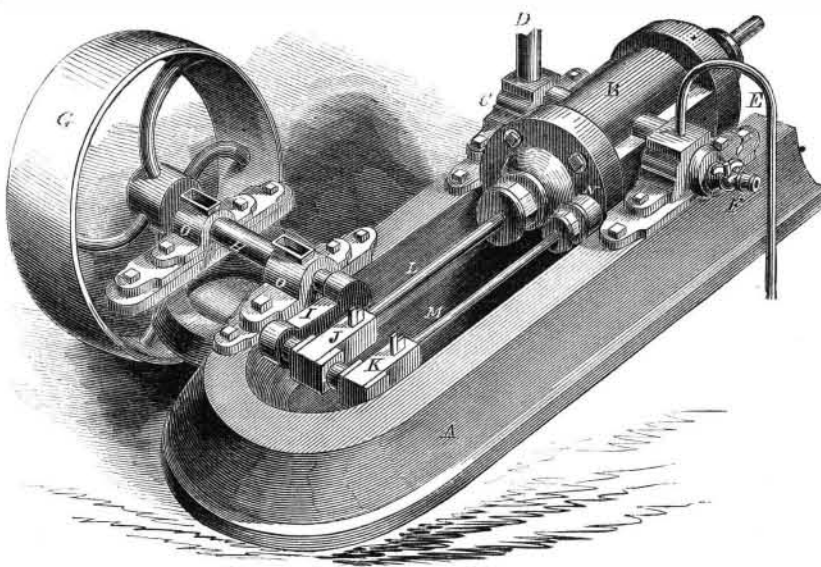


Fig. 2

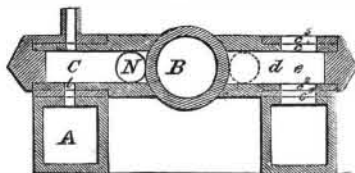
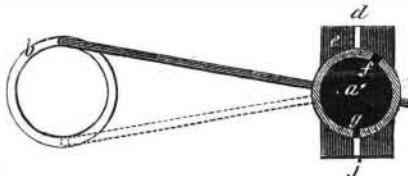


Fig. 3



The successful combination of a feed pump, with an oscillating cylinder, in a compact and cheap form, has long been desired as an important addition to the oscillating steam engine. This has been done by J. G. Sprengel and T. W. Basford, of Harrisonburg, Va., whose invention forms the subject of the accompanying illustrations. Fig. 1 is a perspective view of their engine, Fig. 2 is a transverse section through the trunnions, and Fig. 3 is a diagram illustrating the action of the pump.

A is a hollow casting serving as a bed frame and condenser, the feed pipe from the pump to the boiler passing through it, so that it is surrounded on all sides by the escape steam from the exhaust port of the cylinder, which gives up its heat to the cold water. B is the cylinder mounted on hollow trunnions that serve as valves and which rest in the boxes, C'. D is the steam pipe, and the steam passes from it into the trunnion, d, Fig. 2, through the ports, c<sup>5</sup> c<sup>1</sup>, and exerts its force on the piston; then passing through the same side of the trunnion, which is divided into two parts by a vertical partition, e, it is exhausted through the lower ports, c<sup>2</sup> c<sup>6</sup>, into the condenser, A.

The advantage of this partition is that while the steam is entering one half of the trunnion by the upper ports, the steam that gave the last stroke is being exhausted from its half of the trunnion by the lower ports, so that half of the trunnion will be ready to supply steam for the next stroke while the other is exhausting. The fly wheel, G, seen in Fig. 1, with its axle, H, terminating in a crank, I, is supported in journal boxes, O, on a frame attached to A. This

crank, I, is put in motion by the piston rod, L, which is connected with it by means of gib and keys, J, and to a prolongation of the crank is attached by the gib and keys, K, the pump rod, M, working in the pump, N. This pump may be cast in one piece with the cylinder, as represented, in our engravings, or it may be separated, as most convenient. E is the feed water pipe, and at every stroke of the pump piston water is drawn through it and through the pump trunnion into the pump chamber, and at the return stroke it is forced through the passage, l, Fig. 2, into the pipe communicating with the boiler. When it is unnecessary to pump water, the cock, F, Fig. 1 is opened, and the external air is pumped in and out, without in any way wearing out the pump or adding to the work of the engine.

The diagram, Fig. 3, illustrates the motions of the pumping parts; b represents the circle described by the crank and end of the pump rod, which is represented by c; e is the trunnion box, with ports, d and j; a is the trunnion, with ports, f and g. In the position which the rod, c, is, in the diagram, it is forcing water through the lower port, g, of the trunnion, a, and through the port, j, of the box into the boiler, and it will be seen that all connection with the feed water pipe port or end, d, and the entrance port, f, is closed, but when the rod assumes the position indicated by dotted lines, then the water is drawn through d and f into the trunnion and pump, and cannot pass into the boiler feed pipe until the rod has assumed the required position in its stroke.

It was patented Dec. 22, 1857, and further information can be obtained by addressing Messrs. Sprengel & Rice, Harrisonburg, Va.

**Photography on Ivory.**

Some important inventions or improvements have just been brought into successful operation in the practice of photography by Messrs. Beard & Sharp, of Old Bond street, London. It is well known that ivory, notwithstanding its rare and valuable qualities for the purposes of the miniature-painter, has proved most intractable in the hands of the photographer, and until recently has baffled all attempts to bring it into successful use. Messrs. Beard & Sharp, however, have, to all appearance, succeeded in accomplishing this object. The process they adopt differs, we understand, very materially from any that has yet been made public, the ordinary chemicals being entirely disused in it; nor is any destructive agent used in "fixing," as in other processes. The metallic oxyd employed combines chemically with the substance of the ivory, and the consequence is a picture of great purity and brilliancy, which it is almost impossible to remove by time or any other agency. The importance of this discovery, when the value of ivory as a ground for miniature painting is considered, cannot be overrated; and some very beautiful colored specimens which we have inspected fully attest its practical availability, not for superseding, but for guiding and assisting, the labors of the miniature artist.—*Illustrated London News.*

**Horse Flesh as Food.**

Some tribes of Tartars have used horse flesh for food from time immemorial; and those who have partaken of it assert it is equal to beef for flavor and nutriment. It is now extensively used in most all the kingdoms and cities of continental Europe, especially in Austria and Prussia, where it is sold in the markets under the surveillance of the police. In Berlin alone, 350 horses are annually slaughtered for their flesh, and the Germans appear to be growing fast into genuine hippophagists. A strong prejudice was manifested against this flesh when its use was proposed, a few years since, in Germany, but this feeling seems to have vanished. In regard to this question, a writer in *Blackwood's Magazine* says:—

"Difficult as it may be to overcome a prejudice, no array of ignorance can prevent the establishment of a truth which is at once easily demonstrable and immediately beneficial. Prejudice may reject horse flesh, as it long rejected tea and potatoes. If horses are eaten, why not donkeys? The Greeks ate donkeys, and we must suppose they had their reasons for it. Has any modern stomach been courageous enough to try?"

**Wine-growing.**

At the recent wine-growers exhibition held at St. Louis, Mo., the first premium (\$100) was awarded to T. S. Yeatman, of the Fairview Vineyard, Cincinnati, Ohio. Our Teutonic cousins, whose delicious still wines have so long been celebrated, will need to look well to their laurels, else our countrymen will bear away the palm. Yeatman's still wines will bear favorable comparison with the best of the Rhenish wines.

**MACHINE FOR PEGGING BOOTS, &c.**—Within the past three weeks we have had several inquiries in regard to machinery to be used in the making of boots and shoes. There is wanted a simple and efficient machine for pegging boots and shoes. Something has been done in this line already, but, we understand, without success.