New Inventions.

Substitute for Gutta-Percha.

In a communication to a Paris periodical, M. Serres states that a gum is obtained from the *Acros Balata* (a tree that grows wild in the West India Islands) which is more elastic than gutta-percha, and preferable to it for covering telegraphic wires and such other purposes. It is formed of the juice of the balata, is of a spongy rose color, and possesses the quality of softening at a temperature some degrees higher than that at which gutta-percha becomes plastic. We have no doubt but there are many trees and shrubs in various parts of this country, the sap of which is capable of making gums similar in character to caoutchouc and gutta-percha. Our southern pines supply more turpentine and resin than those of any other country: some of our other trees may yet be hunted up to supply an equal proportion of "elastic gum."

Enfield Rifles.

We have taught England an important art in providing munitions of war, namely, the manufacture of small arms by machinery. Prior to the late war in the Crimea all the small arms for the British army were made by private parties, with whom contracts were made for this purpose, Sheffield and Birmingham being the headquarters of British musket-making. Most of the parts of these small arms were forged and fitted by hand labor, consequently the one was never an exact duplicate of the other. When a screw, spring or pin broke in the hands of the soldier, as no exact counterpart was provided, an armorer was required to make the repair. This oftentimes caused much trouble, and was fatal to prompt and efficient action in many cases. This defective system was made apparent during the war referred to, and information of the success of the American government armories having been carried across the ocean, a commission was appointed to visit the United States and obtain positive knowledge regarding the facts of the case. The result of this Commissions' labors was the establishment of a large factory at Enfield, not far from London, for the manufacture of army rifles, and great success has attended the movement. We are not surprised at this, because the most skillful and experienced American mechanics were at once employed by the British authorities to conduct and carry on the operations; Mr. Burton, of Harper's Ferry, being the Superintendent. Quite a number of American machines were imported for making the separate parts, each a duplicate of the other, so as to avoid the evils that had attended hand-made muskets. It is now stated that the best soldiers' rifles in the world are manufactured at Enfield, and that Mr. Burton has invented several improvements which have greatly conduced to this result. The Enfield rifles for the army are muzzle loaders; but the marines in the navy are about being provided with breech-loading rifles, and all the most efficient agencies are employed for personal offense and defence. In the war of the Revolution, and of 1812, American rifles told fearfully upon the British ranks, but in another war, we would find their soldiers equally as good, if not better shots than our own.

Improved Callipers.

The instrument called "callipers" is one of the most useful appliances for measuring goods, whether in bales, bundles or boxes, large or small, and the device which forms the subject of the above illustration is designed to ensure an accuracy of measurement never before attained, and a facility of reading off minute fractions of an inch up to hundredths, two hundredths, or more.

The head of the calliper, B, has secured to it, at right angles, a graduated bar, A, which is divided into inches, and which has a rack, *b*, sunk into its upper edge. The movable leg of the calliper, C, slides on A by a groove, the lower side of which, *a*, is in contact with the lower or even side of A; the upper part of C has an arbor, *d*, through it, that, at the back, Fig. 2, carries a toothed wheel, *c*, that fits in the rack, and in the front, Fig. 1, a pointer or index, *e*. To the front of C a disk, D, is fixed, having graduations, *f*, all around it, dividing it into any number of inches and

GOULD'S CALLIPERS.

Fig. 1

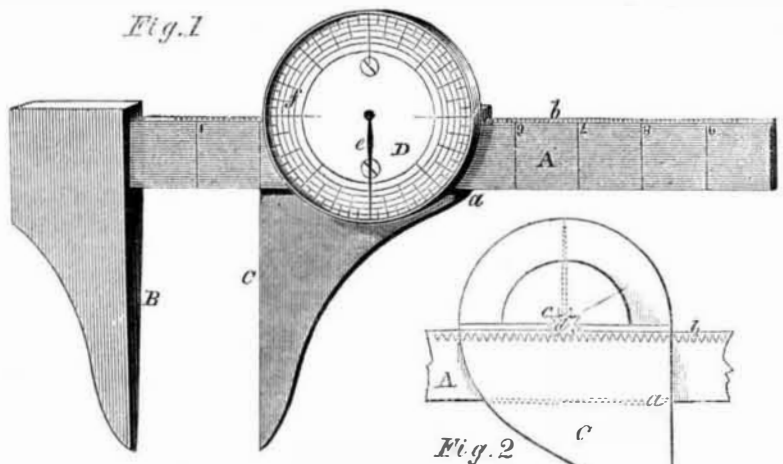


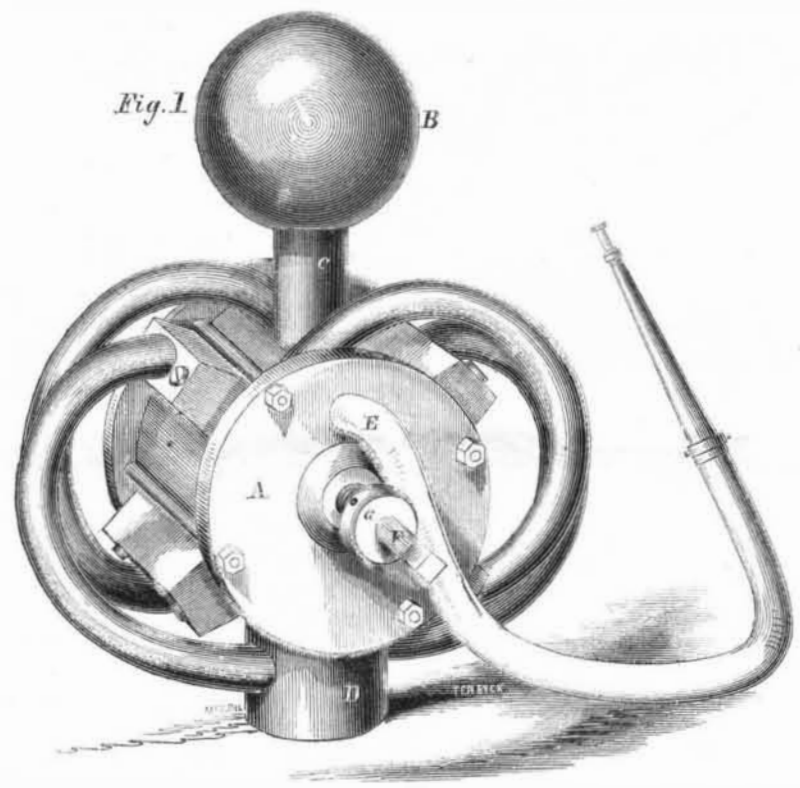
Fig. 2

parts of an inch, with relation to the inches on A, as may be desirable, so that, as C is moved the toothed wheel, *c*, rotates, carrying with it the pointer, *e*, by whose means the exact size of the object or the distance apart of the callipers may be accurately noted.

The inventor, Fayette Gould, of Huntington, L. I., will give any further information desired upon application to him. The patent is dated April 12, 1859.

LAWRENCE & SAFELY'S PUMP.

Fig. 1



Our engravings illustrate the exterior and interior arrangements of a pump invented by Edwin Lawrence and Robert Safely, 2d, of Lansingburg, N. Y.

Fig. 1 is a perspective view and Fig. 2 a vertical section. The cylinder, A, may be composed of any metal or alloy, and should be cast of such a thickness as strength and durability require, the diameter and length being determined by the capacity desired to be obtained, the whole being protected by a suitable frame. The arms or piston, F, is fitted to move inside the cylinder, and is provided with packing. The arms, F, are secured to a shaft, F', passing through the centre of the cylinder and through stuffing-boxes, *a*, on the heads of the cylinder. The pump may be operated by means of brakes and the rock-shaft ordinarily used upon fire-engines, or any suitable way of obtaining an oscillating circular motion. D is the suction hose, B the air-chamber, C the pipe leading to it, and E is the discharge opening. The air and vacuum chambers are designed to give regularity to the ingress and egress of the water to and from the pump, when the arm, 1, is elevated, water is raised into the vacuum chamber, G, through D, and out of it through the valve, *b*, and by the same movement of the arm, water is propelled through the valve, *c*, into the air-chamber and through the hose,

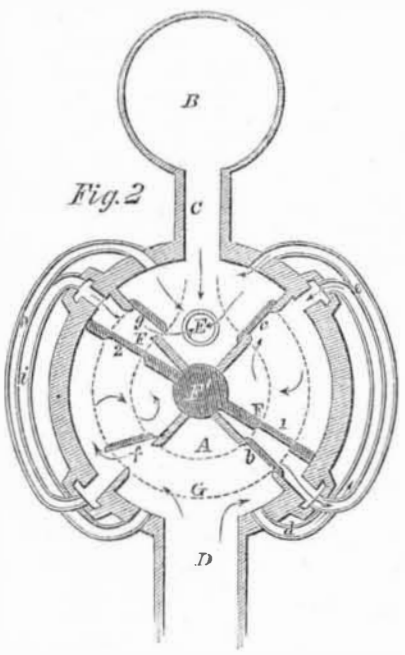


Fig. 2

while, by the simultaneous downward movement of the arm, 2, water is raised through the suction pipe, D, tube and valve, *h*, and tube and valve, *i*, into E. When the arm, 2, is elevated, water is raised by suction through D into G, and out through the valve, *f*, into its chamber, and the water previously in its chamber into the air-chamber by the valve, *g*, while, by the simultaneous downward movement of the arm, 1, the water is forced through the pipe, *e*, into E, and drawn through *d* into the chamber in which I works.

There are many situations to which this pump is peculiarly adapted, and the simplicity of its parts and its ease of action entitle it to receive consideration by all who use this convenient mechanical appliance.

The patent is dated March 1, 1859, and the inventors will be happy to furnish any information upon being addressed as above.

Dionysius Lardner.

The news of Humboldt's decease has been rapidly succeeded by intelligence of the demise of Dr. Lardner, one of the most popular lecturers and writers on scientific subjects that ever lived, and who was well known in this country. He was a native of Dublin, Ireland, in which city he was born in 1793, and was therefore 66 years of age at his death, which occurred on the 8th of May, in Naples, where he had been residing during the past two years. His father had sufficient wealth to give him a good university education at Trinity College, intending him for the legal profession. His tastes, however, were adverse to spouting in courts of law, and so he devoted himself to scientific pursuits, and with such success that he took sixteen prizes, while a student, for scientific essays. In 1817 he left Ireland and took up his abode in Cambridge, England, where he soon distinguished himself for attainments in mathematics and natural philosophy. He also acquired a deserved popularity as a lecturer on scientific subjects by a happy faculty of perspicuous illustration; and at the same time, as an author and a contributor to the Edinburgh *Encyclopædia*, he established his reputation for general and correct information on astronomy and mechanics. At 34 years of age he was appointed professor of natural philosophy in the London University, and for several years he was the most popular scientific personage in that city. In 1840 he came to the United States under a compulsory visit, with the young wife of a British captain, and the affair caused much public comment at the time. In order to secure the means of support he commenced a series of popular scientific illustrated lectures in this city in 1841, and afterwards repeated them in all our large cities. They were very successful, and were far superior to anything that had been attempted among us before. We can add our personal testimony to his wonderful powers as a clear expositor of scientific subjects; he was perfectly at ease before the most imposing audience in discoursing on astronomy, electricity, chemistry, or mechanics. These lectures were published afterwards in our city, and we sometimes refresh our memory of the lecturer by a perusal of them. After a residence of five years in our country, he left for Europe and took up his abode in Paris, where he has almost constantly lived since, and where he contributed to several British periodicals and scientific works. He was not a very original thinker or writer, but he was a very clear and popular one. His elementary works on astronomy and the steam-engine have been the means of extending useful knowledge among the millions, and thus he has left a broad mark upon the age in which he lived.

PATENT EXTENSIONS.—During last month the following patents have been extended: Stephen R. Parkhurst, machine for ginning cotton and wool; Richard M. Hoe, printing-presses; Francis L. Hedenberg, stoves; Chas. Goodyear, manufacture of india-rubber fabrics. All the above parties reside in New York city.