# Scientific American

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC. MECHANICAL AND OTHER IMPROVEMENTS.

VOL. XIV. NEW YORK, NOVEMBER 13, 1858. NO. 10.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At No. 128 Fulton street, (Sun Buildings,), New York,
BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns of the United States.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in this city Brooklyn and Jersey City.

Sampson Low, Son & Co., the American Booksellers, 47 Ludgate Hill, London, Eng., are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months.

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### Agricultural Science—Sandy Soils.

At a meeting of the Farmer's Club held at the American Institute, on the 2d inst., an able essay on soils was presented by Professor S. W. Johnson, of Yale College, New Haven, Conn. The following are some of the views contained in it:—

"The labors of chemists to discover positively all the causes of the fertiliy of soils have not yet met with conclusive success. The mechanical structure of soil is of primary importance. Naked rock grows lichen—the same rock crushed into coarse grains, grows a much higher order of vegetable—pulverized fine, the cereals grow in it. Geology, chemistry, botany, physiology, meteorology, mechanics, hydrodynami s, heat, light and electricity, are all intimately combined in the grand process of vegetation. There are sandy soils in our Eastern States, whicb, without manure, yield meagre crops of rye and buckwheat; but there are sandy soils in Ohio, which, without manure, yield on an average eighty bushels of Indian corn an acre, and have yielded it for twenty to fifty years in unbroken succession, the ingredients of these soils being, by chemical analysis, the same. At present no difference is known between them, except the coarseness of the particles—the first being coarse, while the Ohio sand is an exceedingly fine powder. The power of soils to attract and imbibe moisture and oxygen was well shown by Schubler, of Hoffen, 40 years ago. Of 13 different soils quartz sand absorbed in thirty days over 1-1000 parts of oxygen and no moisture, while humus absorbed 13 of oxygen and 120 of moisture."

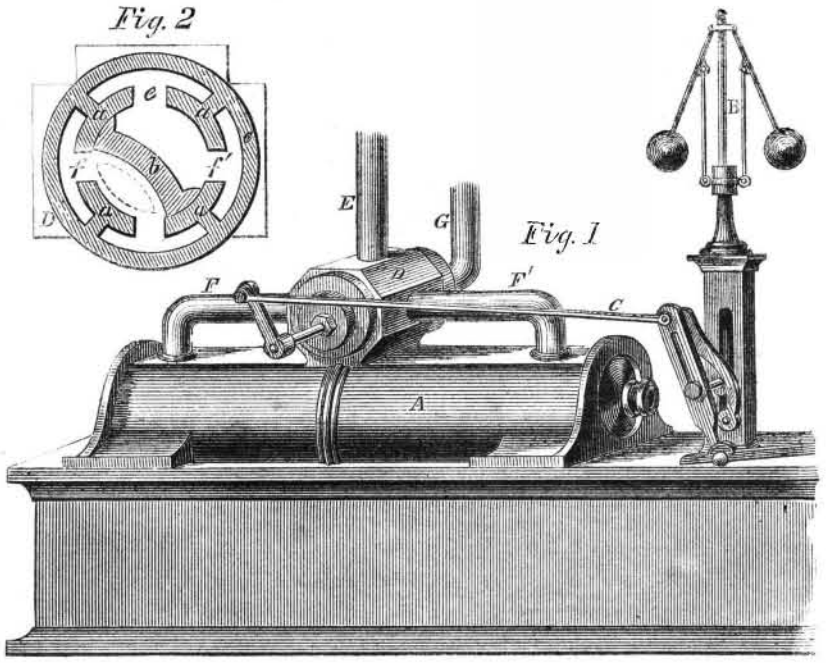
### Patent Law Question.

MESSRS. EDITORS—If A, of New York, buys of an inventor in Boston a patent machine, the use of which is confined, by papers signed by both parties, to A's own business in New York, and A exchanges his old machine with the inventor for a new one, and the inventor sends an order on A to B in New York to take possession of the old machine, which B does, and sells it to C, who knows nothing about how B came by it, can C use the machine in New York, or in any other place he chooses, or can the inventor stop it, or is any one liable for damages? M. B.

[The inventor or patentee has the sole right of "making, using, and selling;" therefore C has no right to use the machine which he purchased from B, without the consent of the patentee. Ignorance in the case of purchase is not a valid excuse for the infringement of a patent right.—EDS.

THE lightest substance at present known is hydrogen, which is sixteen times lighter than air, hence it is used to fill balloons.

## COMBINATION STEAM VALVE.




Could the shade of immortal Watt once more revisit the earth, it would feel a sense of satisfaction when contemplating the varied and numerous improvements which have been made to the steam engine since his day, and how greatly steam has been economized by mechanical devices during the past half century. It is our pleasant task to chronicle these improvements, which have, to the true thinker, a deeper meaning than money-making; each improver or simplifier of means to an end, being an aid to progress—a help to civilization. Such an improvement is the combination steam valve invented by Robert Stewart, of Elmira, N. Y., and which is fully explained by the accompanying illustrations. It combines in itself a steam valve, a regulating valve, a graduating cut-off, and a stop valve.

Fig. 1 is a perspective view of the invention applied to a steam engine, A being the cylinder, B the governor, that by means of a slotted piece acts upon the link, C, which is also connected with the eccentric and stem of the valve, thus regulating its motion by the governor. D is the valve, G being the induction pipe, E the exhaust, and F F′ the pipes admitting steam to their respective ends of the cylinder.

The construction of the internal parts are better seen in the cross section, Fig. 2. A shell, *c*, has bearings, *a*, in it, provided with ports, *e f f′*, each of which communicate with their respective pipes, E F F′, and the intervals between the bearings and the shell form steam passages. The valve is seen at *b*; it is placed on a stem, which is connected with C, and the steam finds its way in through an opening in its end, represented by dotted lines. In the position which the valve is placed in, in the section, the steam would be passing to the end, F, of the cylinder, while F′ would be exhausting through the exhaust, E. By placing (with a hand lever or similar means) the valve so as to close both ports, *f f′*, it becomes a stop valve, no steam being then able to pass into the cylinder. The friction is very slight, and there is no hindrance to the steam passing directly to the cylinder from the boiler, as in the ordinary steam chest, and on the whole it is an excellent contrivance.

It was patented September 14th, 1858. The inventor will be happy to furnish any further information upon being addressed as above.

### Multum-in-Parvo Bath.

The above illustration, which we transfer from the pages of the London *Artizan*, shows a very simple and exceedingly valuable improvement in the construction of the most important of all domestic conveniences and requisites for health-maintaining purposes—the bath. Cleanliness is said to be next in degree to godliness, and anything which renders the attainment of daily ablution more easy, agreeable. and inexpensive, and more consistant with the economy and arrangement of general domestic life amongst the less wealthy and luxurious classes, should be hailed as a great boon to society at large. The chief cause of this much-to-be-deplored state of bodily uncleanliness is the almost impossibility of any but a wealthy or well-to-do person being able to afford the first cost of a reclining bath, and also that the very large quantity of water requisite renders it difficult to be readily obtained without help, or some other interfering cause steps in to render it difficult, expensive, troublesome, or impossible. The great disadvantage of the ordinary hip bath is, that it does not permit of the feet being immersed simultaneously with the posterior portion of the body, and the position of the bather is not the most favorable for cleansing the upper parts of the person.

This bath is only about the size of, and in appearance externally very much like, the ordinary hip bath, and being quite portable, may be kept in the bed-room or dressing-room; the small quantity of water which is necessary for enabling a complete and thorough cleansing of the person to be performed, renders it capable of almost instantaneous use, independently of any assistance from servants. In using the bath, the bather sits upon the seat, with his feet in the lower part, or foot-bath portion, just as if sitting in an arm chair; the splayed sides prevent splashing over. The seat has a movable pool or dish, which is used as a sponging bath, or a bidet, and which, upon being removed, allows of the lower part, or foot-bath portion, being used as a hip bath; thus this bath combines in one and the same apparatus, a sponging bath, a foot bath, a hip bath, and a bidet; and, by the addition of a pump and the usual poles and fittings, it may also be used as a shower bath. Now, a great domestic convenience such as this, commends itself directly to the serious and immediate attention of every one who values health—and there is no better promoter of bodily health than daily ablutionary exercise—and this is, by this new bath, rendered quite practicable for those to whom it was before absolutely impossible.

### Improvement in Steamships.

Although during the past few weeks we have occupied our readers' attention with remarks upon the construction of ships and the preservation of life at sea, and have incidentally made many suggestions upon these important topics, there is still left one idea which has not been touched upon, and which is a very important consideration in case of accident by fire or storm, this is the presence of the machinery. The weight of the engines and boilers of an ocean steamer varies from 300 to 700 tuns weight, and it must be recollected that this is dead weight, interfering with the buoyancy of the ship, and becoming a positive incumbrance the moment it is disabled. By the ingenious method of constructing steamships and placing the machinery invented and patented by Messrs. Salomon & Morris, of this city, the moment the captain discovers that the engine and boilers can be of no more service, they can be let fall into the water, thus lightening the ship in case of storm, and saving the cargo, or in case of fire affording a space into which the passengers can go and remain cool and safe from the ravages of the flames. There are other points in the construction of their boat which also deserve to be noticed, namely, the shape of the guards, and the life-preserving tubes which are secured underneath them, and the admirable method in which the hull is trussed, but we will desist, as it is only our intention to call the attention of practical shipbuilders to the invention.

### Tanning Deer Skins.

The method usually practised in preparing deer skins for market is as follows: The skins are placed in a barrel of water with enough ashes to make a weak lye. They remain there until the hair comes off easily with a graining knife, and they are then grained. They are then hung up to dry until hard and flinty, and then they are soaked in rain water with a little soft soap; the water being about blood warm. To dry them wringing is resorted to, and after this process, the wrinkles are pulled out by the hand. They should be next smoked with rotten wood or sawdust, in a long trench for a day or so, the skins being placed loosely in a box or barrel, and again washed in rain water. This process is repeated two or three times and a very well tanned skin is the result.