

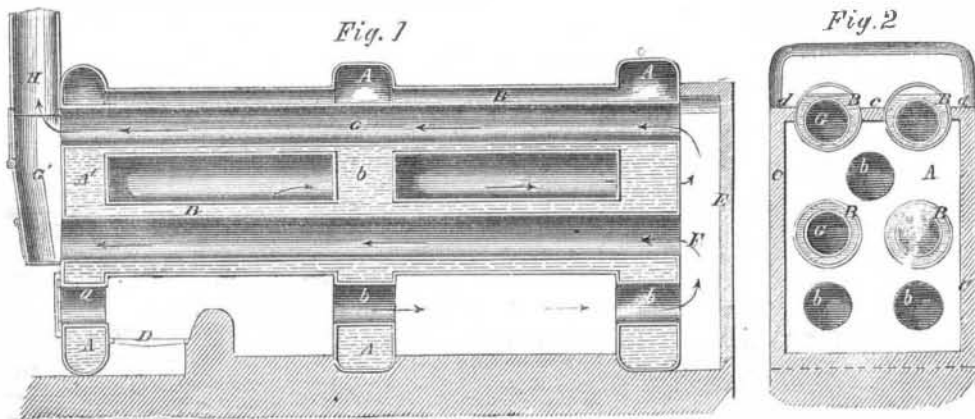
IMPROVED STEAM BOILER.

Notwithstanding all the improvements that have been made in steam engines, it is probable that those in use consume, on the average, at least 6 pounds of coal per hour per horse-power of the engine, while it has been demonstrated, by a number of engines in actual use, that a horse-power may be produced by the consumption of about 1½ pounds of coal per hour. When we consider the immense extent of the use of the steam engine, and the tremendous force of self-interest in prompting men to adopt the most economical processes in their operations, this enormous waste of fuel is one of the most surprising facts which have come to our knowledge. There are two modes by which this waste of fuel is to be avoided; one consists in extracting all the power from the steam after it has been produced, and the other in applying all the heat to the production of steam. The first embraces the cylinder, valves, pipes, &c., of the engine, and the latter the form, construction and setting of the boiler. Both of these departments have occupied the attention of numerous and able intellects, and yet the study is very far from having been exhausted.

like those on the earth can live upon it, but it has been recently asserted that a limited atmosphere has been discovered. M. de la Rive and Father Secchi, of France, and Mr. Schwabe, a German astronomer, have lately asserted that the moon has an atmosphere; and the latter states that it has also some vegetation on its surface. He says, in the *Astronomische Nachrichten*, that the surface of the moon presents to the view numerous narrow streaks similar in appearance to furrows, which, at times, appear laid over in straight, at other times in circular lines. According to his theory the streaks which extend from the summit of the Tycho, one of the most elevated of the mountains of the moon, have, at certain periods, a greenish tint, which they lose at the end of a few months. Hence he infers that there exists in the moon vegetables, which shoot forth at a season corresponding with our Spring, and die at a season corresponding with our Fall, like all the plants of our globe. But what now becomes of the assertion, commonly admitted, that there exists no water on the surface of the moon? If the vegetation, which Mr. Schwabe has remarked on our satellite, reflected a blue, red or yellow ray, we could admit that its nature was different from that which exists on our

work done and economy of first cost and expense of keeping them in repair, &c. Mr. Whipple has been "over the pond" during the past winter, and (I understand) has sold his English patent for a handsome sum; he is now about returning, if not already returned home. So you see we have the machinery, if manufacturers only have the spirit to adopt it. L. L. R.
Manchester, N. H., May 15, 1860.

METHOD OF CLEANING AND RESTORING OIL PAINTINGS.—Good paintings have often been coated with varnish with a view of preserving them; but the varnish being of a bad quality has after a few years done more harm than good by its becoming discolored. To restore such paintings it is necessary to remove the discolored varnish. This may be done either with strong spirit, or with soft soap and water; both means, of course, requiring great care. We prefer the use of spirit because the varnish is dissolved by it, but the oil colors are not; but when the artist's touches are on the glaze, spirit must not be used. One ounce of soft soap melted in a quarter of a pint of water brushed over the painting will so dissolve the varnish in the course of half-an-hour or so, that it may be removed with a sponge and warm water, and thus leave the picture clear; still, the age of the varnish and its nature may be such that this operation has to be repeated several times. It must be remembered, however, that when the varnish is thus removed the oil colors will also be attacked by the soft soap; hence careful manipulation becomes necessary. Very strong spirit laid on the varnish will also dissolve it, and it must be removed with a sponge or camel's hair brush as soon as it becomes tacky. This process is more expensive for cleaning pictures, but there is no fear of the spirit dissolving the oil colors unless they are the touches often added by the artist on the glaze. When the painting is free from its artificial coat the colors may be brightened by brushing them over with Thenard's peroxyd of hydrogen. This, however, being both expensive and difficult to procure, M. Schoe-bein, of Basle (the inventor of gun-cotton) has suggested the use of oxydized oil of turpentine for the same purpose. The turpentine is placed in a shallow vessel, and fully exposed to the sun, and being at the same time frequently agitated for two months, it becomes oxygenated in a high degree. This liquid being brushed over lead colors that are discolored by the sulphur in the air, they rapidly assume their pristine beauty. In cleaning pictures with spirit, the painting must be rubbed over with a little sweet oil after the spirit is removed; this prevents further action of the spirit on the color. It is a good plan to apply the spirit with a sponge covered with a linen rag in the manner and with the rotary motion of French-polishing.—*Septimus Piesse.*



ARMSTRONG'S IMPROVED STEAM BOILER.

The annexed engravings illustrate a newly-invented boiler which embraces some decidedly novel features in the combinations of the water vessels with the flues and furnace, and in its general arrangements. Fig. 1 is a vertical, longitudinal section, and Fig. 2 a transverse section, from which the boiler will be readily understood. The water is contained in three or more rectangular vessels, A A A, one at each end of the boiler and one or more between, and in the cylinders, B B, which unite the vessels, A A A. The steam occupies the upper portions of the vessels, A A A, and of the upper tier of the cylinders, B B. The fire is made on the grate, D, and the smoke passes around the water cylinders, B B, through the short tubes, b b, to the chamber, F, and then returns through the long flues, G G, which are enclosed in the water cylinders, B B, passing out through the chimney, H. The walls, C, which enclose the boiler are carried in at the top, as shown at d d, against the cylinders, B, and the space between the cylinders is filled with masonry, as shown at c. The lower parts of the shafts, A A A, being below the level of the fire-grate, D, the water in them remains comparatively cool, to receive the sediment, and these may be provided with mud valves for blowing off the deposit as it accumulates. The door of the fire-box is framed in the end of the boiler, as shown at a, Fig. 1. The object of these arrangements is the construction of a convenient boiler which will produce steam economically with the consumption of the fuel.

The patent for this invention was granted, through the Scientific American Patent Agency, March 6, 1860, and persons desiring further information in relation to it will please address the inventor, John Armstrong, at New Orleans, La.

PECULIARITIES OF THE MOON.

The moon has generally been considered by men-of-science as an entirely mineral sphere, without water, an atmosphere, or any living organism. When viewed through a telescope, it has an appearance of utter desolation. Its surface is apparently dotted with huge craters, and scarred with seams of lava. If it has no atmosphere, of course no living creature possessing a material frame

earth; but as it is green, must we not conclude by analogy that it is the result of the same chemical combinations? Water should then become a necessity.

As a photograph of the Lord's prayer, taken on a piece of paper the size of a pin's head, can be read distinctly with a microscope, it was supposed with some degree of reason, that a large photograph of the moon would reveal very minute objects on its surface by the microscope. Quite a number of such pictures have been taken but not a single grain of golden sand has been added to the treasury of our knowledge thereby. We have examined stereoscopic pictures of the moon, taken by the Rutherford telescope in this city, and the luminary appeared like a huge ball of sandstone; there were neither signs of water nor life upon it. In several pictures which were taken at different times, all of them exhibited a great depression near the upper side, as if there had been a vast basin scooped out of the solid rock and worn smooth by water and abrasion. This appearance may have been caused by the instrument in which the pictures were taken; we merely mention the fact in order to direct the attention of astronomers to it.

CARDING AND COMBING MACHINES.

MESSRS. EDITORS:—I noticed an article on page 305 of the present volume of the *SCIENTIFIC AMERICAN*, in regard to the above subject, in which it is stated that you were "unable to ascertain whether any of these machines have yet been introduced into this country." Perhaps I can throw a little light on this subject. The English combing machine has been in use in this country in the Pacific Mills, at Lawrence, Mass., for at least five or six years, for combing the wool for the fine qualities of delaines, but whether it was the invention of Heilman or not I do not know. The Manchester Delaine Mills, of this city, have in use a comb, the invention of Cullen Whipple, of Providence, R. I. (the well-known inventor of the screw machinery of the New England Screw Company's works, of that city). There are twenty of his machines in operation; and, though not wishing to detract anything from the merits of the Heilman machines, I must say the former are pronounced to be superior to the English machines, both in quality and quantity of

INVENTORS, MACHINISTS, MILLWRIGHTS, AND MANUFACTURERS.

The *SCIENTIFIC AMERICAN* is a paper peculiarly adapted to all persons engaged in these pursuits, while to the Farmer, House-keeper, and Man-of-Science, it will be found of equal interest and use.

The *SCIENTIFIC AMERICAN* has been published FOURTEEN YEARS, and has the largest circulation of any journal of its class in the world. It is indispensable to the Inventor and Patentee; each number containing a complete official list of the claims of all the patents issued each week at the United States Patent Office, besides elaborate notices of the most important inventions, many of which are accompanied with engravings executed in the highest degree of perfection.

To the Mechanic and Manufacturer the *SCIENTIFIC AMERICAN* is important, as every number treats of matters pertaining to their business, and as often as may be deemed necessary a column or two on the metal and lumber markets will be given; thus comprising, in a useful, practical, scientific paper a Price Current which can be relied upon.

The *SCIENTIFIC AMERICAN* is published weekly in a form suitable for binding, each number containing sixteen pages of letter-press, with numerous illustrations, making a yearly volume of 522 pages of useful matter not contained in any other paper.

Terms.

To mail subscribers: Two Dollars a Year, or One Dollar for Six Months. One Dollar pays for one complete volume of 416 pages; two volumes comprise one year. The volumes commence on the first of JANUARY and JULY.

Club Rates.

Five Copies, for Six Months.....	\$4
Ten Copies, for Six Months.....	\$8
Ten Copies, for Twelve Months.....	\$15
Fifteen Copies, for Twelve Months.....	\$22
Twenty Copies, for Twelve Months.....	\$28

For all clubs of Twenty and over, the yearly subscription is only \$1 40. Names can be sent in at different times and from different Post-offices. Specimen copies will be sent gratis to any part of the country.

Southern, Western and Canadian money or Post-office stamps taken at par for subscriptions. Canadian subscribers will please to remit twenty-six cents extra on each year's subscription to pre-pay postage.

MUNN & CO.
Publishers, No. 37 Park-row, New York.