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Special Notice.

All subscribers to the SCIENTIFIC AMERICAN who have paid the full subscription price (two dollars) for the complete volume which has heretofore terminated in September, are informed that by remitting \$1 60 more, their subscriptions will be continued for one year on the New Series commencing July 1st.

CLUBS of subscribers who have paid up to September, and wish to renew their subscriptions or form new clubs at that time, can do so at the club rates, deducting 30 cents each from all the present subscribers and complying to our advertised rates on new ones; for instance a club of 10 subscribers who have paid \$15 for one year's subscription up to September, may have their subscriptions continued till the end of Vol. II., New Series, or one year from July 1, 1859, by remitting \$12.

Plowing by Steam.

Illinois appears to be taking the lead of all the other States in agricultural progressive-ness. A prize of \$6,500 has been placed at the disposal of the its State Agricultural Society for the best steam plow, and, from a circular sent us, we learn that a company has been formed in the city of Chicago, with a capital of \$50,000, for introducing into practical use the traction locomotive rotary tiller of Thomas Kiddy.

This subject is by no means a new one, although but little attention has been given to it until within two or three years past. We will endeavor to present some information showing what has already been done by others, so that the ground may be better understood than it now is.

England has been the experimental farm for steam plowing, efforts having been made twenty-seven years ago to reclaim and cultivate Chat Moss by steam machinery. An engine, stationed at one end of a plot of land, was employed to drag plows through the soil by means of ropes passing over the drum of a windlass. With some modifications of machinery, this system appears to have been the most successful that has yet been attempted. The person who has done most to render plowing by steam, in England, as economical in cultivating land as animal power, is Mr. John Fowler, an agricultural engineer, who has expended no less than \$100,000 for this purpose. He employs a portable engine on wheels, stations it at one end or headland of a field; then at the other end he puts up a frame called an anchor, on which there is a drum, and the distance between this anchor and the engine is the length of the furrow to be turned over. An endless wire rope extends from a windlass on the engine around the drum on the anchor frame, and to this rope is attached a frame carrying six plowshares—the one placed a little behind the other—and these turn over six furrows at once. The engine winds the wire rope on one end of its windlass while it is given off at the other end, and the plows are then dragged forward towards the anchor, and when they arrive at this point they are reversed, the anchor frame moved a little forward at one headland while the engine moves itself forward for the next six furrows, and the six plows are then dragged back, turning over six other furrows in returning. The engine and anchor frame are thus moved at intervals on the headlands, in parallel lines, but are stationary while the plows are working. This system is very simple, and no power is expended, as in a locomotive steam plow, by dragging the engine through the soft soil. It is stated that the anchor frame can be shifted and the plows reversed at the end, turning nearly as fast as a team of horses

can be turned. By the same method of operating the engine and windlass, other implements for cutting up the soil have been tried as substitutes for the plow, such as rotary cultivators, resembling a series of revolving scrapers for plunging into and stirring up the soil. Mr. J. Smith, of Wolston, England, has employed this method for five years with great success, and has found it best to apply it in the Fall. It brings all the weeds and sods to the surface, exposes their roots to the frosts of winter, and kills them; and it is recorded that stiff clay soils, by this process of cultivation, have become mellow and easily worked.

Another system of steam plowing, different in principle, was illustrated on page 401, Vol. VI. of the SCIENTIFIC AMERICAN, and consisted of a locomotive having broad-faced wheels, which moved over the field to be plowed, drawing a transverse frame, in which were a series of revolving plows on an endless chain. As the plows operated at right angles to the forward motion of the wheels, the action of this plow was very defective. Another plow, upon the same principle of operation by a locomotive engine, was illustrated on page 297, Vol. VII., of the SCIENTIFIC AMERICAN. It carried five rotary cultivators, and its action impressed us favorably, but it has not been able to contend with Fowler's, which has taken nearly all the steam plow prizes offered by the agricultural societies in Great Britain. A locomotive steam plow, with a broad spiral cultivator dragging behind the engine, has also been tried in England, but with no success.

Little has been done in our own country in the way of steam plowing in comparison with the efforts made in Great Britain; still, we have made a beginning, and this is cheering.

In 1855, Obed Hussey, of Baltimore, the well-known inventor of the mowing machine, constructed a steam plow and tested it in October, 1856, as described on page 341, Vol. XII. of the SCIENTIFIC AMERICAN; but since that period we have not heard that it has ever been used, nor the reason why. On the 10th of November, 1858, the steam plow of Mr. Fawkes was exhibited and tested before the State Agricultural Society of Illinois, and although statements were then made that it had been very successful, it does not appear to have satisfied the farmers of the "Prairie State;" hence the prize we have mentioned which is once more offered by the State Agricultural Society. Mr. Kiddy's steam plow, to which we have alluded, is a locomotive that carries its own endless railroad to prevent sinking into the soil, and thus it is intended to save the power that would otherwise be expended to drag itself. It is, in principle, similar to that illustrated on page 353, Vol. III., of the SCIENTIFIC AMERICAN, and which, in England, is called "Boydell's traction system." Its tillers are not common plowshares, but double vertical revolving screw cutters for cutting and stirring up the soil, and they appear well adapted for this purpose. Every American steam plow that has yet been brought before the public embraced the locomotive principle of the engine moving over the entire field, dragging a set of plows, which is quite different in its nature from Fowler's, the one which has been most successful in Europe. The engine used for operating a steam plow should also be capable of being applied to threshing, grinding and other operations of a farm, as none of our farmers can well afford to keep an engine for plowing exclusively. In hilly countries the steam plow will never be able to supplant horses; but in such a State as Illinois, where the farms are very large, the soil mellow and the fields nearly level, and where fuel is abundant, the steam plow appears to be invited to success.

PROFESSOR BRUNNOW has arrived at Albany to assume the duties of his office at the Dudley Observatory. We hope the troubles of this institution are ended, and that it will go on prospering.

"Atlantic Science."

[Without for a moment disputing Dr. Holmes' self-evident proposition that "Boston is the hub of the universe," or that Harvard is the intellectual sun from which all knowledge is emitted, we should like to make one small observation on an article in the *Atlantic Monthly* for June, entitled "The Stereoscope and the Stereograph."] The writer of the aforesaid article commences with informing us that Democritus, of Abdera, "believed and taught that all bodies were continually throwing off certain images like themselves, which subtle emanations, striking on our bodily organs, gave rise to our sensations." We are further kindly informed that "Epicurus borrowed the idea from him, and incorporated it into his famous system of which Lucretius has given us the most popular version," thus pleasantly blending heathen philosophy and bad science for the delectation of the "Wise men of the East."

After dilating somewhat on these evanescent films, and slightly indicating that they cannot exist when light is withdrawn, the writer, with a film in his eye, proceeds to detail the processes of the daguerreotype, the photograph, the stereoscope and the stereoscopic picture, or, as he calls it, "the stereograph;" and joking apart, the impression left on the reader's mind is, that one of these films which are continually emanating from all bodies, being "caught flying" and fixed upon paper or metal, forms the picture; or in other words, that a photograph is an emanation of the thing represented. Altogether, the influence of the article will not be very beneficial in a scientific point of view, not because it is altogether untrue, but because the truth is not positively stated.

Why, we would ask, should Democritus, Epicurus and Lucretius be called from their graves to give their opinion on a subject of which they knew nothing, when Descartes, Euler and Huygens have but just passed away?

See how simple and beautiful is their theory, which supposes light to be the result of undulatory or oscillatory movements, in the ethereal or imponderable medium, filling up the interstices existing between the molecules of ponderable matter, and extending into space beyond the confines of our atmosphere. The image of an object then, like a note in music, depends on the number of vibrations it is capable of creating, and chemical decomposition is effected on the plate or paper to produce a photograph by the motion of the particles. How simple all this is, and how it opens up to the mental vision images of beauty and scenes of gorgeous undulatory loveliness, of which no "subtle emanation" is capable.

If the living ass dare kick at the dead lion, we should advise the writers in our monthly friend to remember, that while it shows learning and research to state old theories and exploded ideas concerning science and the methods of it, yet it shows truth and the love of it to give the people the truest information positively asserted.

Howe's Sewing Machine Patent in England.

The decision recently made in the Court of Errors, confirming a decision of the Court of Queen's Bench, made in 1858, in England, as briefly set forth on page 297 of our present volume, has caused a number of enquiries to be made of us as to the probable effect of this decision upon sewing machine patents now in existence in the United States. As a general answer to such interrogations, we will state that it has no effect whatever upon any patent in this country. Patents in the United States are held under the authority of our Federal courts, and remain in full force until they expire or are declared invalid by "due process of law."

The English patent referred to, known as the Thomas patent, is, in fact, for the Howe machine; but upon a careful investigation of the matter, which we have been led to make in order to present to our readers who are interested in sewing machines a true statement

of the facts, we find the claim in the original English patent, on which the case in question was tried, to be quite different, in essential points, from those of Howe's American patent, which has thus far been sustained by our courts.

Since this decision in the Court of Queen's Bench, Mr. Thomas has filed a disclaimer to certain parts of his patent; and now, instead of claiming the needle and shuttle in combination, as described in the Fisher & Gibbons specification for a machine for embroidering, he now holds a patent under his disclaimer for the general arrangement of the several parts, and, as thus modified, it is now in force.

This plain statement will, we think, render the matter clear, and it is but just to all whom it may concern.

Websters' Dictionary Illustrated.

A pictorial edition of this truly national and valuable work—the principles of which are gradually working a revolution in the language of our sires—is shortly to be published by Messrs. G. & C. Merriam, of Springfield, Mass. As no household can be complete without the celebrated "unabridged," which is a library in itself, so none will be perfect without the illustrated edition; for while the older one will do for the student, the young folks will learn philology and study the meaning of words much more rapidly when they are assisted by pictures which are well drawn, well engraved and very truthful, and which will impress the definition upon their minds as the light daguerreotypes the image upon the metal plate. From the specimen number we have seen, we are favorably impressed, so much so that we cannot express our idea of the increased value which these illustrations will give to the work, making it more encyclopedic in its character than it has hitherto been, and achieving that most difficult of combinations—entertainment and instruction.

Several thousands of new words have been added, together with a table of synonyms by Professor Goodrich, and the illustrations will be 1500 or more. It is a great work and we wish it success.

Progress of Gas Lighting.

The smoking car in each of the night express trains on the New Haven line between this city and Boston is now lighted with gas, under Hill & Wood's patent of 1855, the gas being contained at the ordinary street pressure in a capacious box of sheet iron and expelled by the action of a meter which is worked by a clock spring so as to serve as a pump. The holder is suspended under the car body and is divided into two parts by a flexible diaphragm. When the upper side is opened to the atmosphere and the lower side is connected to the street mains by a rubber hose the gas flows in and rapidly raises the diaphragm. The filling of each in this manner occupies, we are informed, about five minutes, and is done while the cars are standing idle at the terminal stations. The charging completed, the meter, instead of serving its usual purpose, is by the action of the spring made active in forcing common air into the space above the diaphragm. The gas flows to the burners through pipes connected to the base of the holder in the ordinary manner, and a sufficient quantity is carried to supply 7 feet per hour, producing an amount of light equal by photometric measurement to about 4 times that of the large candles usually employed.

On the English railroads, the stupid custom is practiced of placing passengers' luggage on the tops of the carriages. Several disagreeable instances have lately occurred in which the luggage so exposed has taken fire by sparks from the locomotive. It is really surprising that Uncle John has not yet learned the good American custom of packing all the baggage in a special car where it is perfectly protected from fire and rain.

Mr. Bishop, Commissioner of Patents, entered upon the duties of his office about three weeks ago.