A CHANCE FOR INVENTORS—A GREATER THAN WHITNEY WANTED.

MESSRS. EDITORS:—Through the medium of your truly valuable sheet, I wish to call the attention of the inventive genius of some of your friends to an invention (yet to be made) that, if successful, will be to the inventor an everlasting fortune and an eternal income: I refer to the cotton gin. The plan now adopted for separating the seed of the cotton from the lint (and which has been in use from the first raising of cotton in the country to the present time) is, as you are well aware, the saw gin, and it does saw the cotton in every sense of the word. It cuts the staple, knocks it, tears it, and, in fact, in a great measure destroys it; and an improved cotton gin that would do away with these objections would enhance the value of cotton one-fourth at least. Here is a pretty margin, and some one must embrace it. Let the prime, main object of the inventor be to preserve the staple of the cotton entire. The staple of the cotton is what sells it; cotton may be unexceptionable in color, free of dust, leaves and all kinds of trash, and yet, with the staple destroyed, in a measure, by the process of ginning, the price obtained will be merely nominal.

I have made these suggestions with the hope that some scientific genius will give the subject a thorough investigation, and as I before remarked, whoever invents a cotton gin that will accomplish the ends required will be remunerated to an extent unheard of in the line of patents. I shall be happy to give information to any one as to any question that may arise concerning cotton in any or all its stages, or relating to the process now in use for ginning. There has been as little improvement made in cotton gins as ships' anchors. Who will reap the harvest?

A. J. H.

Camden, Arkansas, March 14, 1860.

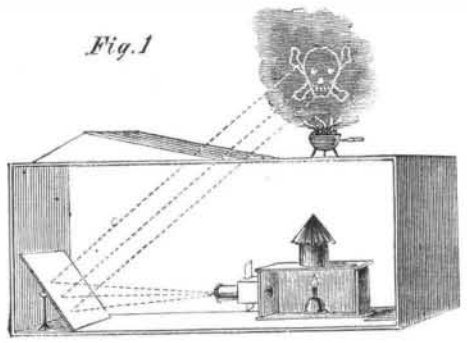
[This has been a favorite field for inventors, and it is very remarkable that a merely mechanical obstacle to the accomplishment of so very great a desideratum should have so completely baffled the inventive genius of the country. In the winter of 1792, as Mrs. Greene, widow of the famous revolutionary general, was one day entertaining at Mulberry Grove (her place near Savannah) some gentlemen of the neighborhood, the conversation turned on the subject of the cultivation of cotton, which had been recently introduced to a small extent in the country. As it required the labor of an entire day to separate the seed from a single pound, it was manifest that unless some mode could be devised for doing the work more rapidly, the production of the article could never be carried to any great extent, and a strong desire was expressed by the company that some machine could be invented for ginning the short staple or green seed cotton. Mrs. Greene told the gentlemen that they had better apply to her young friend, Mr. Whitney; she presumed he could do it, for he could do almost anything. Mr. Whitney was at this time studying law, having recently graduated at Yale College; and he was spending a short time with Mrs. Greene at her hospitable invitation, having made her acquaintance on their voyage from the North. On learning what was wanted he addressed himself to the task; and not being able to procure cotton with the seed in it in the neighborhood, he visited Savannah for that purpose, and after a search through the warehouses of the city, he succeeded in finding a small quantity. Taking it home he soon devised that famous machine which has wrought such changes in the condition of this country and of the world. Whitney's machine cleaned 300 lbs. in a day, and did it better than one pound could be done by hand in the same time. In the saw gin the cotton is seized by rows of teeth formed of strong wires projecting from a roller, or by teeth like those of a saw made upon circular plates of iron. These pass between grate-bars set so closely together that the seed cannot pass through, but the cotton is drawn in and swept off by a cylindrical brush. Notwithstanding the immense improvement which was embraced in this machine over the old process of cleaning by hand, we are informed (by the above correspondent) that it is still very imperfect, and that it destroys the enormous amount of one-fourth of the value of the whole cotton crop. Here is a field for inventors! A chance to save $40,000,000 per year! The practical mode for our correspondent to forward his object is to distribute samples of cotton in the seed to inventors, and it will be very wonderful indeed if they are not able to surmount a merely mechanical obstacle to the accomplishment of so great an object.

CURIOUS OPTICAL PHENOMENA.

MESSRS. EDITORS:—Of all our senses, the *sight* is certainly subject to the greatest illusion. We every day discover new phenomena, and doubtless many more are reserved for posterity. It frequently happens, moreover, that a discovery which at first seemed of little consequence has led to matters of the highest importance. The accompanying diagrams are demonstrations of two experiments, an account of which I have been induced to send you by recently seeing in the SCIENTIFIC AMERICAN (page 142) an answer to a correspondent, stating "No mirror can throw an image into the atmosphere." I did not doubt your statement, but I thought that my experiments seemed to contradict it. If I am wrong, please place me in the right.

Experiment I.—Take a wooden box (Fig. 1), and place within it a magic lantern. At the end towards

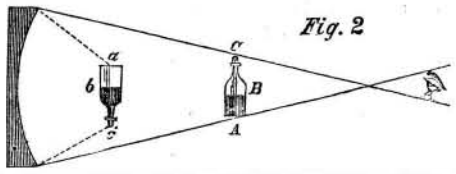
Fig. 1



which the lantern points, place a mirror at any suitable angle with the end, say 45°. Cut an aperture in the top, and near it place a chafing dish, in which burn some charcoal or more suitable substance that will create a dense smoke; for example, some incense. Procure a glass slide, on which a phantom or more pleasing figure is painted; and after lighting the fire in the chafing dish, throw the incense upon it, and insert the picture in the lantern, and a magnified view of the phantom or other picture will be obtained in the cloud of smoke!

Experiment II.—Take a glass bottle, A (Fig. 2), and fill it half full with clear water, leaving the upper part

Fig. 2

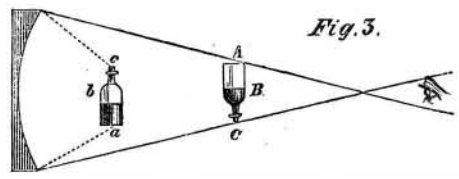


empty, and cork it in the common manner. Place this bottle opposite a concave mirror, and beyond its focus, that it may appear reversed and before the mirror. Place yourself still farther distant than the bottle, and it will appear to you in the situation, *a b c*.

Now it is remarkable, in this apparent bottle, that the water which, according to all the laws of catoptrics and all the experiments made on other objects, should appear at *a b*, appears on the contrary at *b c*, and consequently the part *a b* appears to be empty!

If the bottle be inverted and placed before the mirror

Fig. 3.



(Fig. 3), its image will appear in its natural erect position; and the water, which is in reality at B C, will appear to be at *a b*.

If, while the bottle is inverted, it be uncorked, and the water permitted to run gently out, it will appear that while the part B C is emptying, that of *a b*, in the image, is filling; and (what is likewise very remarkable) as soon as the bottle is empty, the illusion ceases, the image also appearing entirely empty. Likewise, if the bottle be quite full, there is no illusion.

If, while the bottle is inverted and partly empty, some drops of water fall from the bottom, A, towards B C, it seems in the image as if there were formed at the bottom of the part *a b*, bubbles of air that arise from *a* to *b*, which is the part that seems full of water. All these phenomena constantly appear. The remarkable circumstances in this experiment are, first, not only to see an object where it is not, but also where the image is not; secondly, that of two objects which are really in the same place, as the surface of the bottle and the water it contains, the one is seen at one place and the other at another; and we see the bottle in the place of its image, and the water where neither it nor its image is.

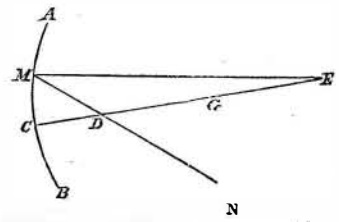
It has been conjectured, with some appearance of reason, that the above-described illusion arises partly from our eyes not being accustomed to see water suspended in a bottle with the neck downward, and partly from the resemblance there is between the color of the air and that of water, which induces us to imagine that we see them where they usually are; and this is rendered more probable by putting any colored liquid into the bottle, for that will appear in its proper place.

E. S. B.

Commack, L. I., March 21, 1860.

REMARKS.

Our correspondent has not correctly quoted the answer to which he refers. It is as follows: "No mirror can *form* an image in the atmosphere." We considered that it was a correct answer to the question asked, and do so still. We understood it to mean the forming of an image in the atmosphere, similar to the one in Fig. 1 (which can be found in several published works), in which the image is shown by the reflection of the solid particles arising from the dense gas, which is quite a different condition. There is a looseness of expression in many works of science regarding the action of mirrors, such as "the image is behind the mirror," for "the image *appears* to be behind the mirror;" and "the image is formed in the atmosphere," instead of "*appears* to be in the atmosphere." The accompanying diagram explains the action of concave mirrors.



A B represents a mirror forming part of a sphere, whose center is at G; and C G is the radius. Let us suppose an object, E, to be very distant from the mirror, its image will appear before the mirror at D, the middle point of the radius, C G; for a ray of light, E M, from the object, E, falling on the surface at the point, M, will be reflected thence in such a manner as to pass through the point, D; and when the eye is placed at N, it will see the object apparently at D. This image will be to the object in the ratio of C D to C E, and (as a consequence) much smaller. By bringing the object from E nearer to the mirror, the image will retire; and when it is brought to the center, G, the image appears to be situated there; but you must look towards the mirror to see it—not from A or B to the atmosphere at G. If the object is now brought forward to D, the image will retire infinitely beyond E; but if the object be placed between C and D, the image will appear to fall *behind* the mirror, and will be greater than the object. A concave mirror either enlarges or contracts the size of the objects, according to the distance they are situated from it. If we look into a concave mirror at a point between C and D, the face will appear frightfully large; this is owing to the nature of reflection—the angle of incidence, E M A, being always equal to the angle of reflection, C M N. The image, A B C (in Figs. 2 and 3) is placed beyond the center.

There are many curious phenomena connected with optics; but everything relating to the reflection of rays by mirrors is reduced to two things—the one is the *place* of the image which the reflected rays represent, and the other is the *relation* of the image to the object; in other words, *where* the image is, and *how* it is. When we look into a plane mirror, we see our own image behind the glass; that is, if we are situated two, three or more feet from the mirror, our image appears to be at the same distance behind it, and it is customary thus to speak of it; but, in reality, there is only a shadow behind the opaque mirror. It would, therefore, be more correct to say "the image *appears* to be behind the mirror," and "the image *appears to be in the atmosphere before the mirror*," as in the case of concaves; and so on. A convex mirror represents objects in miniature; a concave mirror magnifies objects placed near to it, but when they are