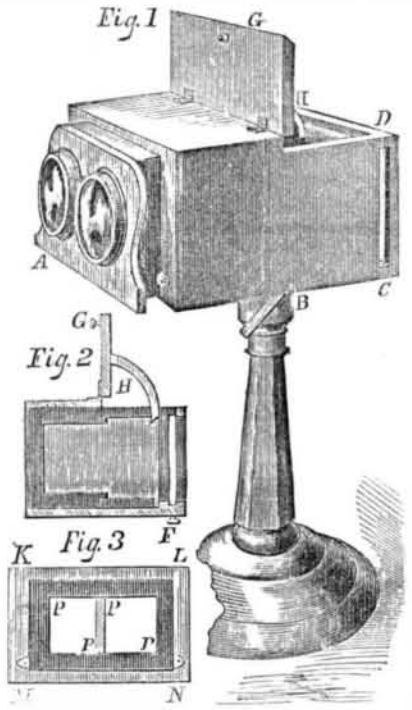
### Scott's Improved Stereoscope.

The stereoscope—an apparatus by which the eyes are enabled to receive the light from pictures in such a manner as to entirely rob them of their flat character, and cause them to apparently project like statuary or bass relief—has only risen to importance since the discovery of the daguerreotype art. The latter, by facilitating the production of fine cheap pictures, has elevated the stereoscope to a place of great importance, but it is yet far from perfect.

Stereoscopes, as hitherto constructed, are of two kinds: first, with two separate entire lenses, placed in the instrument at the same distance apart as the eyes of the observer. In this way the optical axes of the eyes are parallel, the right eye being directed in a straight line to the right hand stereoscopic picture, and the left eye to the left picture, and the rays from these objects being thus also parallel, the combined picture is seen in the same way as very distinct objects are seen, such as the sun, distant hills, &c.; and Second, by the rays of light from the two pictures being refracted by the lenticular arrangements adopted, so that they emerge from the eye-pieces as if they both radiated from a near object, as near as the stereoscopic pictures themselves, that is, about six or seven inches distant. Both these modes are objectionable; the first, because few eyes can




accustom themselves to look at a near object as if it were very distant; and the second, for the reverse reason, as from the unnecessary extent of refraction the combined pictures are shown as exaggerated and distorted miniatures of the real objects.

In the proposed arrangement a medium course is taken. The double eye-piece is so arranged that the rays from the two pictures come to the eye as if they radiated from a point of medium distance, such as that at which we are in the habit of looking at natural objects, the effect being that the eyes of the observer instantly form the combined picture, and the reality of the view is consequently much more strongly impressed on the mind, and the illusion much increased.

Fig. 1 is a perspective view of the complete instrument, Fig. 2 a longitudinal section, and Fig. 3 a view of the near end of the instrument, with the slide removed. It consists of a box, B, the front part of which has ground glass inlaid in it. Immediately behind the ground glass a perpendicular slot, C D, is made in the box, so as to allow the stereoscopic slides to be placed in the field of view. The front half of the top of the box opens as a lid, G, and the inside of the lid being covered with silver or gold foil, serves to reflect light on the pictures in the slot. This lid is retained in any position by a clip of brass, H, fastened to it, and clipping on to the longitudinal diaphragm, I, which stretches along the inside of the box, serving to divide it in two, and prevent the observer from seeing more than one of the two views with either eye at a time. The near end of the box, B, has an opening in it, K L M N, (Fig. 3,) so as to admit the eye-piece A, which slides out so as to suit different eyesights, as represented in Fig. 1. The box, B, is provided with a double diaphragm, which admits I within it so as to form a continuation thereof and is furnished with a transverse vertical diaphragm, fixed at one half of its length and having two square apertures in it, P P, of sufficient size to enable the observer to see the entire pictures through them, and no more. This diaphragm serves to assist in preventing unnecessary light reaching the eye of the observer, and detracting from the clearness of the pictures. The average distance between the centers of the eyes being about 2 3-8 inches, the most advantageous average distance apart of the lenses constituting the eye piece of the stereoscope is from 2 1-4 inches to 2 7-16 inches, and a very convenient size for each lens is 2 1-8 inches diameter, or when set in their frames, 2 inches aperture. At the distance mentioned, the vision of the stereoscopic objects is perfectly distinct for the great majority of individuals, but in exceptional cases adjustment may be applied to the instrument, by which the distance between the centers of the lenses may be varied. The lenses themselves may either be constructed of one material or made compound or achromatic. Plano-convex combinations, with the plane surface next to the eyes of the observer, have been proved to be highly advantageous for this purpose.

This is an English invention, patented in Great Britain, November 3, 1856. It has not been patented in this country.

### The Agricultural Machine Exhibition.

We condense from the New York *Daily Times* the following remarks by the reporter for that journal in relation to the National Exhibition at Syracuse:—

On Friday morning, the last test of the dynamometer was applied to the mowers, and all went through without breaking the instrument, so that the committee of judges were able to make complete notes of the motive power which each machine requires to work it. Scientific gentlemen present place much reliance upon the ability of the dynamometer to make accurate measurement of the power exhausted in moving these machines, and I have no doubt of the correctness of the theory upon which they are constructed; but practical men will not be long in discovering objections which justify them in doubting the accuracy of their measurement—especially when applied to any machinery propelled by horses—the drivers of which are seated on the machine. Some horses pull much harder on the bit than others. It is no uncommon thing on city avenues to see a fast horse taking the bit in his mouth and moving a light wagon with two persons, inside of four minutes, without any strain upon the traces. How easy it would be, then, for a good driver, with a team working well up to the bit, to relieve the drag upon the traces to which the dynamometer is attached, of from 50 to 100 pounds. As near as I could ascertain, the general average of the machines, as marked, required a power equal to 400 pounds—the range being from 325 to 450 and 500. Supposing a driver to take from the traces a draft of only 50 pounds, on a machine that required but 325 pounds to move it, and the deception amounts to 15 per cent.

I think it was at a late trial of mowers in Ohio, the dynamometer showed that Allen's machine only required a power of 275 pounds. Now, though Allen's machine is not by many pounds the heaviest of those in the field, yet any man can see that it cannot be moved through any grass by any such power; and I should feel perfectly safe in saying that a weight of 275 pounds would not move it on smooth ground with the knives at rest.

The greatest trial to which the machines were subjected, was to cut one and one-quarter acres of grass. It was entirely insufficient to test these only to the extent of less than an hour's work. A field of five acres allotted to each would have made the trial far more satisfactory. I think there were a half dozen machines that went through their acre creditably that could not have immediately repeated the dose, without becoming clogged, and in need of more care and tinkering than some of the other machines would have required in cutting ten acres.

The trial of the reapers was the great feature of the exhibition. All the reapers cut well; in that particular there was little to choose between them, but in delivering the grain the work was less satisfactory. The most of them scattered and dragged it too much. In very ripe grain this would prove a fatal objection to most of them. Decidedly the best were McCormick's, Wood's Manny, and Seymour and Morgan's self-raker. Adjoining the field selected by the judges for their test was a piece of grain, which it was proposed to have cut by the machines, so as to increase the amount of work which each should be required to do. But the judges, after examination, declared the ground to be too uneven and hilly. In fact, it was said that no reaper could go over it in safety.

After the official trials were over, and the machines dismissed from the observation and requirements of the Society, General Webb, on behalf of the McCormick reaper, challenged the field to test their metal on the ground which had been condemned by the judges. This challenge was accepted only by Wood's Manny. The two machines entered the field and went to work, soon showing that they, at least, could go wherever a team could travel, and do good work as they went. So regular was the working of these two machines that it was difficult to tell the bundles of one from those of the other—Gen. Webb, at whose instigation the test had been made, being himself at a loss to determine to which he should give the preference.

Such is a true and legitimate test. It was no sunshade parade, but the rough reality. A machine that could encounter such a contest and come out successful may be relied upon at all times and in all emergencies. After to-day's experience of their capacity and power it, would be safe, with either Wood's Manny, or McCormick's reapers, to challenge the world for a real "up hill and down dale" contest.

But nothing like a national exhibition ever can be satisfactory, either to the public or the inventor. It subjects the latter to unnecessary and unnatural competition, and results in loss and dissatisfaction to the other. The machinery is never submitted to practical tests, and, in nine cases out of ten, is tried in localities to which it is totally unfitted.—When the premiums are awarded they necessarily lead the public to give preference to the successful, without any knowledge of its peculiarities, and without any information which can qualify them to judge of its fitness for the work they desire it to perform.

I hope that this is to be the last exhibition of a national character that will ever call upon inventors to compete for premiums for superiority in such a class of agricultural implements, and that hereafter all such exhibitions will be confined to country societies.

### Utilization of Night Soil.

Much of the solid material washed down by rivers is of little value in a commercial sense, and except for the objectionable shallows produced by the settlement of the heavier particles in the immediate vicinity of the mouths of the streams so as to obstruct navigation, it would be of no practical importance. The muddy Mississippi which discharges about 13,000,000,000,000 cubic feet of water per annum, has been proved by Professor Riddell to contain 1-3000 solid matter, which would amount to 7,000,000,000 cubic feet; sufficient to cover a square mile to the depth of 250 feet. The Ganges is believed to be equally or more muddy, and there are many other rivers which are conspicuous for the quantities of earthy matter they carry into the sea, but it is only to the portion of fertilizing material thus conveyed that we wish to invite especial attention. The Thames, below London, is odorous with the sewerage matter it bears from that metropolis, and there is scarce a stream flowing through a civilized community but is degraded to the occupation of a haut-boy by the adoption along the banks of itself and tributaries of more or less ingenious devices for dissolving and washing away rather than hoarding up and rendering useful the nitrogenized material which, properly applied, would enable the earth to yield the most bountiful harvests.

The *Rural New Yorker*, in an excellent article on this subject in a recent number, calls attention to the fact that the manure from the fowl is more valuable than that from the ox, because the fowl feeds on more highly concentrated food, being principally grain and flesh. The food of man, whether from the animal or vegetable kingdom, is generally highly concentrated, containing more nitrogenized matter and inorganic salts than the food upon which most of our domestic animals subsist. Of their comparative value, many estimates have been made, and several analyses published; none, however, place it lower than double that of the horse or pig.

It is estimated that nine-tenths of this valuable fertilizer is lost to the world, while millions of dollars are annually spent for guano to make up for this waste. The disagreeable odor of night soil is the principal reason for the very general neglect of its importance. Its efficient use is now confined almost entirely to those countries where the need of fertilizers is more seriously felt and their value better appreciated than here. To get rid of the odor, so as to make its use tolerable, is the great desideratum.

One of the best methods of deodorizing nightsoil, without destroying its fertilizing properties, is to mix powdered charcoal with it We have never learned the proportions required to render its use as endurable as ordinary stable manure, and cannot speak with any confidence of the economy of this method of preparing it. Peat is, however, a quite powerful deodorizer, as well as a good manure for most soils, and the treatment of nightsoil where this swampy product is accessible must be cheap and easy. The same firm whose letter on peat fuel appears on another page, add that they know by experience it is a powerful deodorizer, and think it one that every farmer possessing it should use, if only to purify the air of his stables and outhouses.

Night carts may be emptied into an area of suitable size enclosed by small banks of earth to the depth of about one foot, and the whole covered with peat to the thickness of several inches. After remaining till quite thoroughly dry, it may be turned over with a spade, and mixed with more peat, when it is ready to be spread on or plowed into the land. A process substantially similar to this is much practiced in Great Britain. The English, however, use common earth instead of peat, commencing the preparation of a heap in the early part of summer, and either applying the manure to the land, or getting it under cover in the Fall.

We have on several former occasions adverted to the practice of preparing liquid manures, and applying it from a sprinkling cart. In Flanders, where night-soil is more systematically preserved than in any other country, it is generally used in a liquid form. In China, on the contrary, where the greatest number of human beings that can be sustained on a given area is very nearly reached—where the compounding and manufacturing tastes of the people are carried out to such an extent that even tea is made up into bricks, and very extensively used as money in the trade with the Siberians—in that country night soil is mixed with clay and formed into cakes, which, when dried, are sold under the name of "taffo." This manure, we have learned, is much esteemed by the Chinese, and is quite an article of commerce.

Lime is sometimes used to remove the odor from night-soil, but it lessens the value of the manure, as it expels the ammonia. Sulphate of iron is an excellent deodorizer, as it fixes the volatile ammonia; and being cheap and readily obtained, is peculiarly valuable for this purpose. The almost inodorous material poudrette is variously prepared and of various degrees of value, but this sulphate is very extensively employed in the manufacture of some of the best samples. The great opportunities for fraud in the preparation of poudrette must always operate against its use; but the general introduction of any cheap and simple process which will make the material valuable to the agriculturist with the application of but little skill, and avoid the present waste into streams, would produce results of no ordinary importance.