

## A GLANCE AT THE METROPOLITAN SANITARY FAIR.

In our estimation, the people of this city have never witnessed such an exposition of valuable merchandise as that which was formally opened on the 4th of April last, and known as the "Great Metropolitan Fair." We are not alone in this opinion, and if we required backers to aid us in maintaining it we are very certain they could be found in great numbers.

The only fair that approaches it was held in the Crystal Palace; but that extended over a much larger area, was the united product of the skill and cunning of the whole world, and occupied much more time in its general arrangement and plan than our "Sanitary Fair." One fairly realizes the fables of olden times in contemplating the exterior and interior of those beautiful buildings, for, within a comparatively short time have been gathered in the most splendid and valuable assortment of works of art, of every description that it is possible to conceive of. Jewels, rare stuffs, silks, velvets, costly china and glass, vases of great value that might stand by the thrones of monarchs, richly decorated time-pieces, skillfully contrived machinery,

these are but a small part of the contents of those buildings. The individual contributions have been lavish without precedent. In five days, the average receipts from all sources, were between \$50,000 and \$100,000 daily; at this rate the aggregate amount will be enormous, and the comforts it will bring to the sick and wounded soldiers, for whose benefit this magnificent gift was planned and carried out, will show them conclusively that they are not forgotten. We cannot give a detailed description of all the various stands and the contents of them, as it would absorb more space than we have at our disposal. The mere recital of the attractions would have but little more interest than an auctioneer's catalogue, but there are some novelties which cannot be passed so unceremoniously.

## THE MACHINERY DEPARTMENT.

A sketch of some of the objects in the "Machinery Department" will, we presume, be interesting to most of our readers; and we have taken some pains to examine it in detail. The first thing that arrests the visitor's attention on entering at the upper door is a large horizontal steam engine very plainly finished; this is contributed by the owners of the yacht *Clara Clarita*, in which vessel it was placed for the purpose of driving her; it was found too small for the work and is to be supplanted by two others. Directly below this machine is the now celebrated—

## ROOT'S ENGINE.

We gave a full description and detailed illustrations of this remarkable steam engine on page 193, current volume of the *SCIENTIFIC AMERICAN*, and we have from time to time alluded to it in other paragraphs not only as an act of simple justice to an ingenious inventor, but with the object of bringing before the public one of the most remarkable and useful machines ever moved by steam. Some novel steam engines have been illustrated in past volumes of the *SCIENTIFIC AMERICAN*, but we never before saw so complete a realization of the force of steam power in the same space. Mr. Root has five engines of his invention at the fair, one of which drives the whole line of shafting in the building; attached to the shafting are several machines of one sort and another, which will be alluded to hereafter. The steam gage indicated but 2½ pounds pressure to the square inch, when this little engine (it stands in about two square feet) was running 150 revolutions per minute, without noise or rattle of any kind, and we are assured that half a pound is sufficient to overcome the friction. One of these engines is exhibited with the bonnet or cylinder head removed, so that visitors can see the internal arrangement; the engine attracts a great many by reason of its simplicity and ease of action. Just below this stand may be seen a pair of—

## ANDREW'S DOUBLE OSCILLATING ENGINES.

These are highly finished machines and are connected to work on the same crank at an angle of 45°. They run very rapidly and noiselessly, and are remarkable for their freedom from complexity, being without eccentrics, valve rods, links, or other attachments for admitting steam to the piston. This duty is performed in an accurate manner by the oscillation of the cylinders. The steam chest is placed beneath

the cylinder so that the wear of the trunnions is always towards the working faces, thus tending to keep the joint tight. These engines are also exceedingly compact and large numbers of them are made and sold annually.

In the "New Jersey Department," Mr. Reid exhibits one of his horizontal oscillating engines, which also admits the steam without the use of valves; the cylinder vibrating between steam chests having ports at the sides for the entrance of the vapor; the one now on exhibition works very well. Some other small steam engines were also in this department, but they had no novelties or new principles about them; one small model of a horizontal engine was in working order, and attracted much attention from youths and others; it was well made and was in its way an interesting sight.

## A MAGNIFICENT FOOT LATHE.

This lathe made by Schenck of this city, and presented by Colwell and Bros., iron founders, foot of 27th street (N. R.), is the most complete tool of the kind we ever saw. The workmanship is elaborate and in addition to the usual fixtures it has an index plate fastened on the main spindle fitted with all the appurtenances needed to cut gear wheels of quite a large size. Boring tools of many different standard sizes, and of a peculiar pattern, accompanied the lathe as also did a quantity of chucks, drills, and tools of all sorts. Mr. J. B. Root, who exhibits the engine spoken of previously, has purchased this lathe for \$600, and it was cheap at that price, as it has a "slide rest" capable of moving in any direction, change wheels for cutting screws, and also an apparatus for centering work.

## THE FLAX-DRESSING MACHINE.

The flax-dressing machine of Mallory & Sandford occupies a prominent position at the fair. We cannot say anything which will add to the value of this machine, or the estimation it is held in. Great bunches of long unbroken flax fiber, both rotted and unrotted, free from shoove or fragments of it, attested its utility for its class of work, and we are pleased to know that the orders of the makers are large. A number of other small machines occupy the attention of visitors, but we cannot enumerate them all. Wilcox and Gibb's sewing machine was shown driven by power and running at the rate, (so the operator informed us) of 2,000 stitches per minute! Messrs. Hoe exhibit one of their small cylinder-presses, and near by it there is another machine without name or label upon it to show its use, or inform visitors what it is intended for.

## ROPER'S HOT-AIR ENGINE.

This engine is at the lower end of the room and is most of the time—working rapidly and powerfully. Many of these engines are now in use in this city and elsewhere. From what we have seen of them in operation they seem well adapted to all purposes where only a small power is required. These engines, it will be borne in mind, are driven by heated common air, and do not require boilers or vapor, derived from any source. They are said to be exceedingly economical of fuel and repair, and require little attention while running. It was stated that this engine was intended to drive one of Hoe's small presses, and print the newspaper which is published at the fair; probably this will be done before the exhibition closes.

## DUDGEON'S STEAM HAMMER.

This hammer is exhibited in action, and two small lads handle one of these machines with great skill; a block of wood does duty for a bar of iron, and the force of the blow which can be given is shown literally in a "striking" manner. The hammer descends swiftly or gently as the steam (admitted by the attendants) is great or small in quantity.

## STEAM PUMPS.

There are a variety of these useful machines, the most notable of which are those of Condict and Stevens, of Jersey City, and Mr. William Sewell. The first of these two is very compact in design, and has a novel valve gear, whereby the main piston, aided by a long arm attached to it, moves the valve for the admission of steam at each stroke. There are also other details in connection with the valve through which the steam is made to act directly on it, and to aid in operating it. This pump works rapidly and without noise; it is highly approved of by those using

it. Sewell's pump is different in its design and construction, and is capable of being used for a donkey engine to pump up the boilers on board ship, for hoisting ashes or freight out of the hold, disconnecting heavy parts of the main engine—in short, for a variety of purposes. It is also arranged in such a way that the steam piston can be detached from the water piston directly opposite it, and the latter can be worked by hand; thus rendering it quite as efficient, through the agency of firemen, when there is no steam in the boilers.

## THE SHIP-BUILDING DEPARTMENT.

In the "Ship-building Department" we found a number of attractive objects. Some highly finished brass work made by Messrs. E. Hidden, of this city, and intended for the Italian frigate *Re Don Luigi di Portugallo*, drew much attention as did also the various models of ocean steamers and sailing vessels.

## BARNUM'S SELF-SEWER.

This article attracted much notice from the ladies and others interested in sewing machines; it is really a useful and novel instrument. It guides the cloth or other material to be sewed so that it is unnecessary to use the hands or eyes after the fabric is once adjusted. The operator may merely "work the treadle and, aside from that, do anything else that he or she chooses; read, whistle, sing or employ any other means for drowning dull care." The name is a detriment to the article, as it gives no idea whatever of its scope or purpose.

## MISCELLANEOUS OBJECTS.

In the way of small wares there are in the outer rooms an unusual variety of great excellence and value. Brady's patent skate is shown by the N. Y. Skating Club; these skates were either very heavily plated or else made of solid silver—we could not tell which. They are highly ornamented, and the three pair are to sell for \$150, or \$50 a pair. In the "Fire Department" there are two magnificently chased United States rifled muskets and their appurtenances, exhibited by J. M. Freeman, Esq.; and inside—in the "Wine and Liquor Department"—there is a basket containing twelve bottles of Madeira wine, between 60 and 70 years old! This basket and contents has been sold for \$100. An old gentleman in Massachusetts, 91 years of age, made two small sad-irons for smoothing clothes, which were sold for \$1.50 each. Howe's patent horse-shoe, faced with india rubber and warranted not to slip on the smoothest pavement, is also shown, but in a very disadvantageous and out-of-the-way place.

We have thus presented the briefest possible sketch of the "Machinery Department" of the fair, with a few other novelties that struck us in passing. To make a full report of the wonders of the "Curiosity Shop," the splendors of the "Picture Gallery," the glories of the "Arms and Trophies Room," or the luxuries of the "Restaurant," is out of the question. This is also true of the "Union Square Building," the "International Department" and the "Knickerbocker Kitchen," all of which are, even to us, sealed mysteries, for we have not found time to visit them. Such of the readers of the *SCIENTIFIC AMERICAN* who can make it convenient should not fail to visit our "Great Sanitary Fair."

**CHEAP PAINTS.**—The essential part of all good paints, properly so called, is linseed oil. Oil, if well boiled, may be applied alone, and affords an excellent protection to hard wood and implements, and upon floors. Sundry substances ground very fine are used to mix with the oil, and in proportion as they thicken the oil and form an opaque coating, they are said to possess "body." A pretty good cheap paint for outside work is made by mixing plaster of Paris with white lead, or zinc white, and grinding them together in a paint mill with oil. Plaster alone may be used, and it is said to form a durable and cheap paint. Of course any color may be given which is desired.—*American Agriculturist.*

An unpleasant development was made in Cincinnati, the other day, concerning Catawba brandy. Responsible vinters declared that the pure article would cost from five to eight dollars a gallon, adding that there was no genuine article of the kind in the market—the quality generally sold consisting of pomace, whisky, and fusel oil.