

IMPROVEMENTS IN FIRE ENGINES.

The old controversy as to the merits of rotary pumps is likely to be revived at Philadelphia, when the comparative excellence of the fire engines on exhibition has to be decided by the judges. The Silsby Manufacturing Company, who have constructed the machine shown in Fig. 1, make use of the Holly pump, as shown in Figs. 2 and 3. For the rotary pump, as for the rotary steam engine, many points may be urged to demonstrate the superiority of the rotary over the reciprocating principle, such as continuous action, diminished wear and tear, and the absence of jarring and jerking, which are especially to be avoided in fire engines, as they seriously diminish the effect of the machine. But again, as in the case of the rotary engine, the results attained by the rotary pumps have been exceeded by those of their reciprocating rivals. If, however, practical trials bear out the claim of the Silsby Company for this machine, a considerable step in the improvement of the fire engine will have been made.

The construction of the Holly pump is shown in the sectional view, Fig. 2. The steam enters at A, and passes out at B, turning the two revolvers, c and d, in its passage. The sides of these revolvers are packed, as shown, by blocks of metal inserted in grooves in the long cogs, and kept out by the momentum of the cams, assisted by springs. The ends of the revolvers are ground to the ends of the cylinders in which they turn. The pump is precisely like the engine, the revolvers being carried around by gears on the outside of the cylinder, to save wear. The revolution of the cams draws the water in at A, as shown by the arrows, again converging the advancing streams at the discharge, B.

The improvement on this pump made by the Silsby Company is shown in Fig. 3, three toes being added to each rotor to insure perfect steadiness of the emitted stream.

In Fig. 4 is shown the form of boiler now used in this fire engine. The operation will be clearly understood from the engraving. The boiler, as shown, embodies some slight improvements in details, the water tubes, C, having been shortened, the smoke flues, D, lengthened, and the grate surface

Fig. 2.

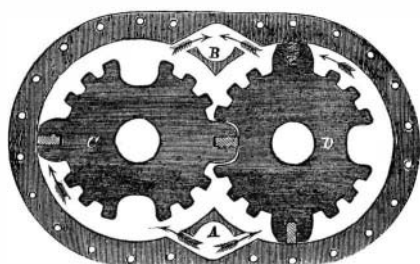
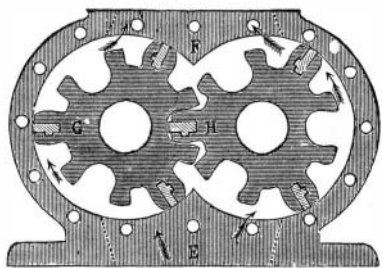


Fig. 3.



increased. One of the water tubes is shown separately at the left of the engraving.

We are indebted to the *Polytechnic Review* for the engravings.

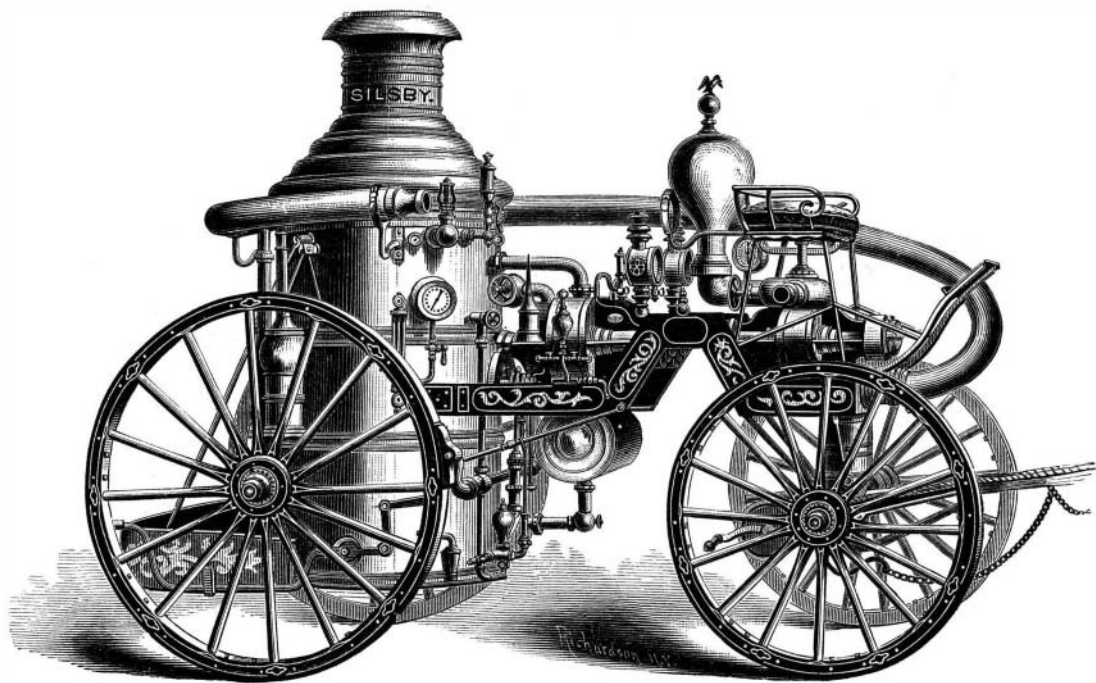
The Nijni-Novgorod Fair.

This great Russian fair, opened on June 25 (old style), and will come to a close early in September. The value of the merchandise actually sold at the fair has risen to nearly \$10,000,000. Tea was sold last year to the value of upwards of \$600,000. Along the banks of the lake enormous pyramids of chests of tea are heaped upon the ground, covered only with matting made from the inner bark of the birch tree. These chests of tea, called "tsibiki," are so packed as to be impervious to rain or damp. Outside the ordinary wooden chest is a covering of wickerwork of cane or bamboo, round which, at Kiakhtha, raw bull hides are tightly stretched, with the hair inwards. These chests arrive at Nijni from China, having been received in barter on the Chinese border of Russia, for Russian manufactures of cotton or wool. It is these "tsibiki" which contain that peculiar Kiakhtha and Baikhoff tea, whose taste and aroma are unequalled by any other kind of tea imported into Europe from China. But Kiakhtha tea now encounters a formidable rival in the tea imported through the Suez Canal and Odessa, as well as from England, and which bears the name of Canton tea. Articles of almost every description are sold, also large sales are made of corn, leather, fruits from Persia, of

madder and wine from the Caucasus, and of cotton and skins from Bokhara

The Improved Leclanche Battery.

The Leclanché element, which is now widely used, is, as is well known, composed of a mixture of peroxide of manganese and crushed retort carbon, inclosed in a porous vase around a large carbon plate. The vase is plunged in a solution of sal ammoniac, and a rod of zinc serves as the posi-

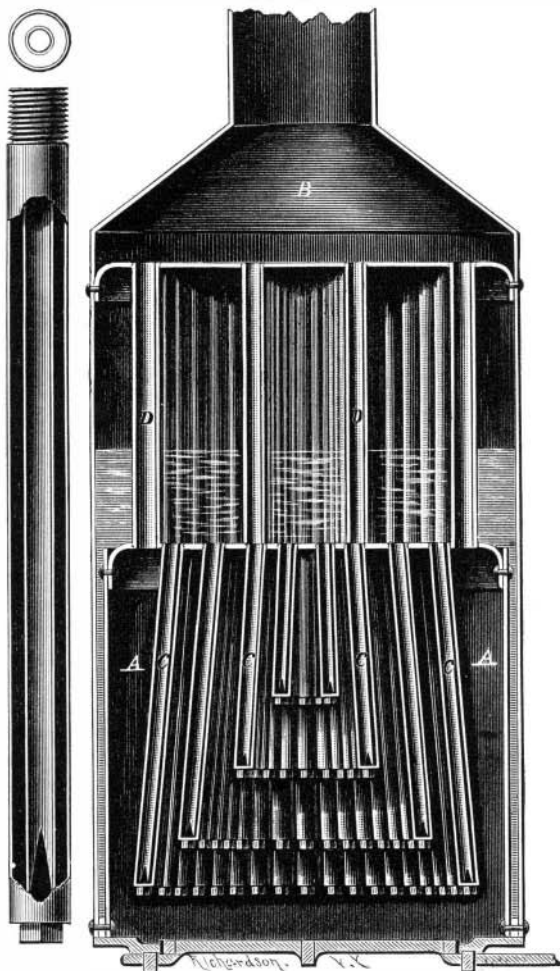


SILSBY'S ROTARY STEAM FIRE ENGINE.—Fig. 1.

tive electrode. With this combination the expenditure of zinc occurs when the circuit is closed and is proportional to the work of the battery. Depolarization is effected as in other batteries, by the disoxygenation of the peroxide.

It often happens that this element presents a resistance quite considerable, which it is desirable to diminish. This, M. Leclanché states, he has succeeded in accomplishing, and he has already constructed over 30,000 elements of the improved battery for French railroads. The mixture which has given the best results is formed of 40 per cent peroxide, 55 of retort carbon, and 5 of resin (gum lac). These ingredients being intimately mingled are introduced into a steel mold capable of withstanding a pressure of 300 atmospheres, and are heated to 212° Fah. The whole is then reduced to a solid state by the hydraulic press. The electricity of this mass may be easily collected by a small rod of carbon inclosed therein. The addition of 3 or 4 per cent of bisulphate of potassa in the interior of the agglomerate contributes towards diminishing the resistance in a notable proportion, by acting as a solvent for the oxychlorides which are deposited in the pores, and diminish the conductivity of the mass. This resistance, M. Leclanché states in his communication to the French Academy of Sciences, becomes

Fig. 4.



so weak that a single element is capable of heating platinum wire red hot, and that he has thus been enabled to apply the battery to the electric lighting of gas. The electromotive force of the new pile is about 1.5, the Daniell element being taken as unity

Wooden Pavements in London.

Some two years ago permission was granted by the city authorities to the patentees of various systems to pave so much of Cannon street as would enable the former to arrive at a definite conclusion as to their respective merits. Accordingly, in May, 1874, a piece of wood pavement, constructed on "Norton's Patent Wood Slab Pavement" system, was laid down. The slabs are 7 feet 6 inches by 3 feet, composed of wooden blocks, which are cemented together by an original watertight substance. When laid down the proprietors asserted that this substance would prove to be wholly impervious to wet, thus obviating the chief objection to other wood pavements, namely, that the surface water percolates through the interstices of the blocks, and by so doing not only rots the wood, but creates a sanitary nuisance which at times might become exceedingly dangerous. A few days ago a slab of the pavement laid down in Cannon street was lifted, in the presence of a number of gentlemen interested in the question, and an engineer informs us that, when taken up, the pavement exhibited a wear of less than one quarter of an inch, and that, when the blocks were split up to ascertain the truth of the assertion that the water would not percolate through the interstices of wood, the timber was perfectly dry, while the earth grit on which it was laid was also found to be in exactly the same condition as on the day it was first put down.—*Builder*.

A NEW SOLDERING MACHINE.

Mr. W. H. Ireland Howe, of North Salem, N. Y., has patented through the Scientific American Patent Agency (June 13) a novel improvement in soldering machines, especially suited for soldering the end seams of cans. A, in the engravings, represents the frame of the machine, to which is attached a track, B, along which the cans are to be rolled. The track is flanged along its side edges to keep the cans, C, in place upon it, and has a side inclination, to cause the

Fig. 1.

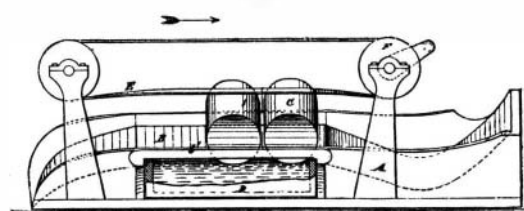
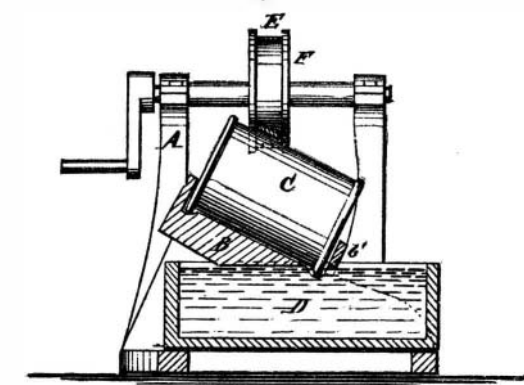


Fig. 2.



ends of said cans to rest upon the lower side flange, b', as they are rolled along said track. The track, B, is slotted in the lower side of its middle part, along the flange, b', to allow the end seam of the cans to project through into a solder bath, D, placed beneath it in the frame, and in which the solder is kept melted by a furnace. The bath, D, is of such a length that the cans may make at least one entire revolution with their end seams in the solder. The track, B, is made with an upward incline at one end, down which the cans are rolled in passing from the machine. The cans, C, are rolled along the track, B, by an endless band, E, which passes around the pulleys pivoted to the frame, and to one of which motion may be given by hand or other convenient power.

An Oyster on Horseback.

A tortoise was lately brought into Central Park having the shell of a full grown oyster grown upon its back. Frank Buckland recorded a similar instance in England a few years ago, and predicted that if the oyster shell were removed it would be found to have molded itself to all the rugosities of the surface of the tortoise' shell. The Central Park specimen rubbed the shell off its back a few days ago, and the pattern of the scales was found imprinted on the hard shell, showing the truth of the British naturalist's prophecy, that the valve of the oyster, which is attached to the fixed object, takes the precise form of its surface.