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NEW SERIES.

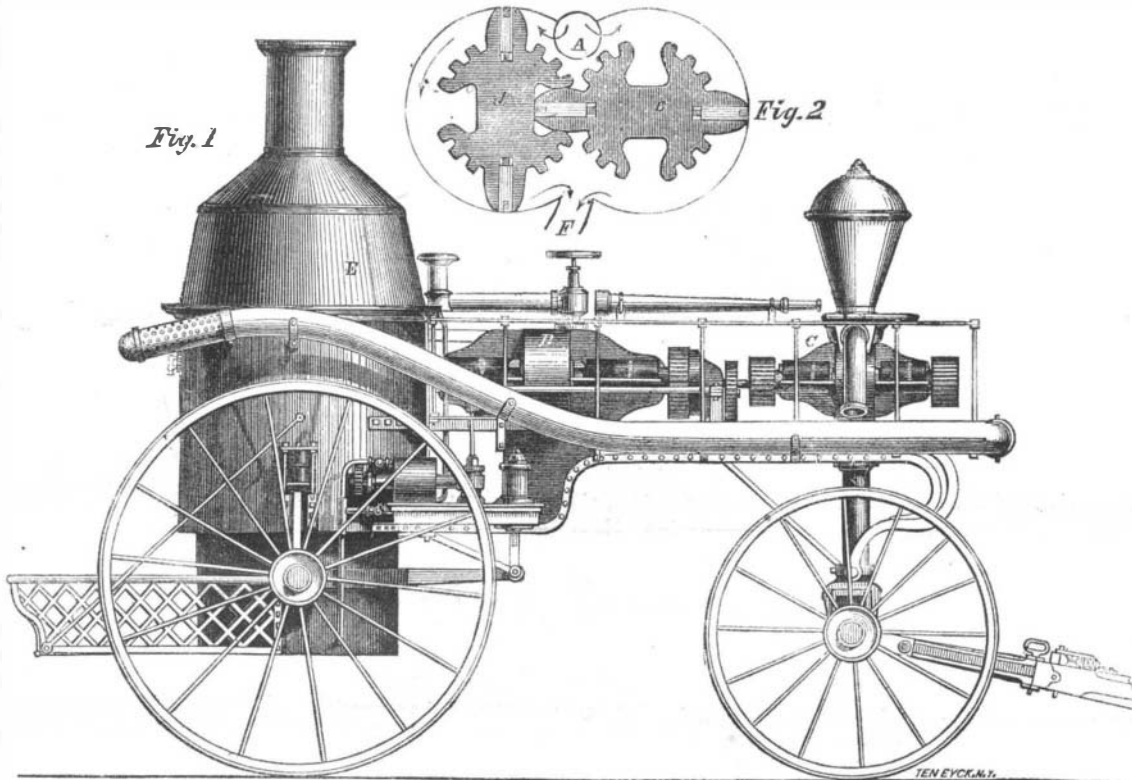
IMPROVED STEAM FIRE ENGINE.

The superiority of a rotary motion for a steam engine is so manifest that it is not strange that many attempts have been made to overcome the practical difficulties to which it is subject. One of these difficulties—indeed, the principal one—has been the packing of the part which performs the office of the piston in the straight cylinder. Robert Stephenson expressed the opinion a few years ago, that a rotary engine would never be made to work profitably on account of the difficulty of packing. For our own part, though we have cautioned our readers that the field had been gone over many times by men of rare genius, our experience has so impressed us with the fertility of resource among our inventors that we have always entertained a lingering hope of seeing the defects in the rotary engine all removed, and its great advantages rendered available. The most palpable of these advantages are the reduction in the size of the engine in proportion to the power (resulting from the greater velocity of the piston)

avoidance of the tremendous strain, especially in propelling ships, and finally a great saving of power which is expended in the reciprocating engine in overcoming inertia, in changing the direction of the motions. This last subject is forcing itself more and more upon the attention of mechanics, and its importance is not yet by any means fully appreciated. These advantages adapt the rotary engine in an especial manner to the driving of a locomotive fire engine; and when our readers are told that this application has been made, that all difficulties have been surmounted, and that the packing, after 18 months' trial, has been found perfectly tight, they will sympathize with us in our interest in these statements. They are made by Silsby, Mynderse & Co., in relation to the engines which they manufacture on the plan invented by Birdsill Holly, and patented in 1855. We have already given two engravings of engines made on this plan, but the important modifications which have been made in the mode of constructing them, combined with the great interest felt both in rotary engines and in steam fire engines, induces us to give this third illustration

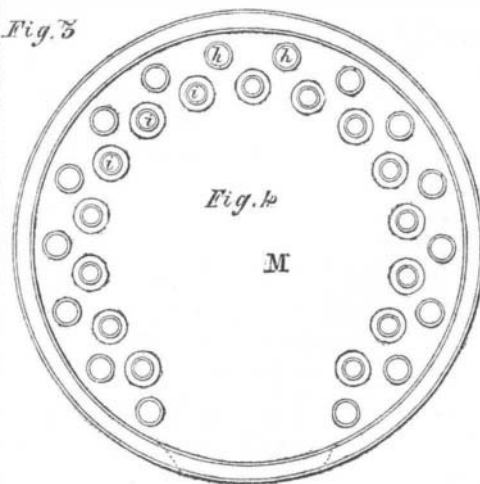
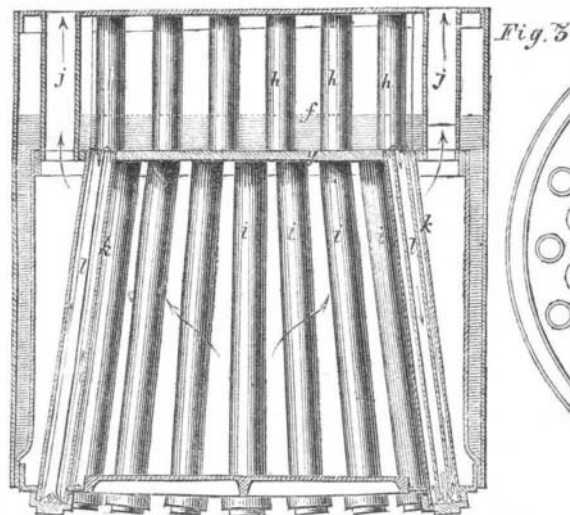
in order to keep our readers informed in regard to the progress of improvement in both these machines.

Fig. 1 is a view of the whole machine, E being the boiler, B the engine, and C the pump. The construction of this engine is illustrated in Fig. 2. The steam enters at A, and passes out at F, turning the two revolvers, c and d, in its passage. The sides of these revolvers are



SILSBY, MYNDERSE & CO.'S STEAM FIRE ENGINE.

packed as represented, by the blocks of metal inserted into the grooves and pressed out by the elastic springs. The ends of the revolvers are ground to the ends of the cylinders in which they turn; and we are assured that, after eighteen months' use, these ends still fit absolutely steam-tight. The pump is made precisely like the en-



3 is a vertical, and Fig. 4 a horizontal section. The fire-place is represented at M, Fig. 4, with the vertical water-pipes, i i i, passing directly through the fire. These pipes are closed at the bottom, and open at the top where they pass through a water-tight plate, g, and communicate with the water in the boiler which rises to the level of f. They are represented in section at the sides,

k k being the external, and l l the internal tubes, both open at the top, and the internal tubes having openings at the bottom. This arrangement causes a constant current, the water rising on the outside of the tube, l, as it is heated, and its place being supplied by a current flowing downward through the tube from the boiler. The smoke and flame pass among the tubes, i i i, and up through the flues, k k k, which are represented in section at the sides, j j. It seems to be now the pretty general opinion that steam can be generated more rapidly in vertical tubes than by any other plan yet tried.

The inventor of this improvement in boilers is M. R.

Clapp, who has assigned his interest to Messrs. Silsby, Mynderse & Co., of Seneca Falls, N. Y., to whom persons desiring further information in relation to these boilers or engines will please address.

EXPERIMENTS WITH WATER WHEELS AT PHILADELPHIA.

As we have had many inquiries regarding the experiments with water wheels at Philadelphia, under the supervision of Chief-engineer Birkenbine, we would state, for the general information of all, that they are not yet quite finished. Two or three wheels have yet to be tested, but it is expected that these operations will be completed this month, and that some time during the month of March a report on the entire subject will be made out. We shall endeavor to present the same to our readers as early a date as possible. We know that a very great interest

is felt in the subject by our hydraulic engineers, millwrights, and mill-owners, because it is conceded by all those who have been witnesses of the experiments that they are conducted in a most fair and trustworthy manner.

The principal improvement in this fire engine, made since our last illustration, is in the boiler, of which Fig.