

## TWENTY FEET LOOM FOR WEAVING FELT.

Our illustration on these two pages represents the largest loom in the world. This loom is at work at Bdry, Eng, and produces a fabric 20ft. wide, known as woollen "felt' for paper machinery. The shuttle is a sled shuttle without wheels, and the loom makes thirty-five picks per minute. There is worm and wheel taking-up motion and 12in. d'ameter lagged cloth roller; the yarn beam is 15in. diameter There are four shaft tappets, four to the round. A 34in. diameter wrought shaft goes right through the loom, with tappets for working the slay. The tappet shaft is 24in. diameter, driven by combound gearing, and to drive the loom a 16in. diameter pulley with only a 24in. strap is used. There are three headles, though but two are shown in our engraving. The loom is provided with apparatus for winding on the warp without taking the warp beam out of the frame. The weight of the whole is 6 tons 16 cwt. 1 q.

## AUTOMATIC STEAM FIRE-EXTINGUISHER.

It is not necessary to quote dry statistics in order to show what amount of valuable property there is yearly destroyed by fire. Every one who reads newspapers must be quite impressed with the frequency with which his eye meets accounts of the destruction of property more or less extensive, nor does it need statistics to prove that by far the greatest proportion consits of manufacturing premises. Fire-proof construction is still a matter of controversy; no engineer or architect has as yet, so far as we are aware, succeeded in constructing his buildings so as to resist destruction by fire, and the design that will do so has yet to be brought to the practical test, if, indeed, it is in existence. The occasional perfect helplessness of structures under fire appears strange sometimes, usually, however, a little closer inquiry explains all. This is strange when we consider the very great strides that have of late years been made in perfecting the means of extinguishing fires. Not only are our fire-engines very much superior to what they were, but we have well-trained and effective fire-brigades which are only waiting for the moment to act. This does not, of course, ap-ply to country places; but there is scarcely a village which has not its organisation provided for such emergencies. In spite of all that, enormous losses, not only individual but national, occur again and again, each and all representing so

means hitherto available to check this destructive agent, have been brought to such a state of perfection that the ordinary observer is altogether hopeless of seeing any further improve. ment, it is but natural that we should inquire for a remedy of a character different to that used hitherto, either as a total or partial substitute for that in present use. It seems at first sight almost discouraging to find nothing better than waterthe medium at present almost exclusively employed-discouraging, when we consider how efficiently it masters combustion in nearly every instance when it is experimentally applied, we say nearly, because there are substances the combustion of which water cannot possibly prevent; we advisedly also use the word "experimentally" because, when we come into ac-tual practice, we find affairs subject to very different conditions. Thus, while there is nothing more certain than the extinction of all combustion on any piece of wood for instance, if sufficient water is applied, in practice there are the difficulties of obtaining sufficient water, to have at hand the necessary apparatus to apply it at all, and lastly, to apply it at the right place. And these are not the only difficulties; the number increases with the variation of the material to be operated upon, so as not to destroy it with the medium applied to extinguish the combustion It is a fact that very much more damage is often done by water than by the fire, if the latter is not very extensive ; and if it is, the amount of property destroyed by water alone is sometimes quite appalling.

Undoubtedly the great point is to detect the fire immediately after its outbreak, and before it has reached any considerable dimensions, because the less in quantity there is to deal with the easier will the dealing be. This suggests at once, that if fire could be made to signal its appearance, and still better if it could be made to actually start an apparatus operating against it, that this must be the acme of perfection. To do this, when water is the only substance at our disposal for quenching the fire, is practically impossible; and this must be so apparent that it is nunecessary to waste any space upon it. It requires for the purpose a material much more elastic, one that will distribute itself, and not one that cannot get beyond the spot on which it drops.

waiting for the moment to act. This does not, of course, apply to country places; but there is scarcely a village which has not its organisation provided for such emergencies. In spite of all that, enormous losses, not only individual but national, occur again and again, each and all representing so much capital of which the nation is deprived. If, then, our