Machinery and Appliances.

IMPROVED COTTON PULLER, OR BALE BREAKER.

MESSRS. LORD BROS., TODMORDEN.

The great principle that throughout every process of cotton manufacture ought to be carefully observed is to prevent the material being worked in excess of absolute requirement to attain the end sought which is the arrangement of the fibre in parallel order. A moment's reflection will render the reason for this strongly obvious. It is found in the natural form of the fibre, which is a collapsed tube twisted on its own axis. A properly matured fibre has what appears to be corded edges, but this is only in appearance, it being simply the result of the collapse of the tube and the failure of the action to break the wall of the fibre at the place where it is doubled over. The collapsing action also twists the fibre upon its own axis and gives it the convolute form seen under the microscope. It is this convolute form with the corded edges that renders cotton useful, as the values interlock in the spinning process and are retained in that position by the cords. Anything, therefore, which diminishes, injures, or destroys these features so far damages the cotton and deteriorates its value for its ultimate purpose. All opening, tearing, beating, drawing, and even twisting has this effect in a more or less degree. As, however, yarn cannot be made without manipulating it in this manner, the process should stop in every one when the end sought has been attained. The best machines are those which attain this end the soonest, and with the gentlest treatment of the material for the shortest time. Without further elaboration we may affirm that this is one of the most important principles to be found in the science of cotton spinning, and if due regard be paid to it by machinists and inventors in their examinations of existing machinery, they will find there is even yet room for improvement.

We have only to consider the application of this principle to a very limited extent, namely the opening process. Owing to cotton being the product of topical and semi-tropical climes, it has to be transported from long distances to the great centres in which it is manufactured, and of necessity has to be heavily compressed to facilitate transport. This compression injures its structure to some extent, and when it comes to be opened out the pulling and beating carries the injury further. In the ordinary manner of making a mixing of cotton the bales are opened, and their contents thrown together to form a stack, after being more or less pulled—and mostly the latter—by the men engaged in the work. From the more heavily compressed bales especially, the material is obtained in heavy matted flakes, or "caked" as it is called, and no hand pulling can properly separate it. It is fed in this condition to the opener, and, as may be expected, is subjected to very severe treatment before the matted mass can be disentangled.

The machine is engaged upon this task a long time, and the cotton is damaged to a corresponding extent, as the masses are literally beaten and torn. In all cases, and especially in the more heavily compressed cotton, much damage is committed at this stage which ought in the interest of good and economical working to be avoided.

The recent introduction of the bale breaker or cotton puller which enables this to be done is a decided step in the right direction. There are several types of this machine already being made, the one illustrated herewith being that of Messrs. Lord Bros., Todmorden, a firm well known for its high-class cotton machinery, and the numerous valuable inventions it has at various times introduced to the trade in connection therewith. As will be observed the machine is very simple, consisting merely of a feed plate and several pairs of rollers, three of the upper ones having a spiked periphery while the back one is fluted. The three front lower ones are all of iron and fluted, the fourth being of wood and plain. The several pairs revolve at different speeds, gradually increasing from the first pair. The spiral springs show that they are arranged to be self-adjusting. We show two views of the
THE "CROWN" SPRINKLER: A NEW FIRE EXTINGUISHER.

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The progress of invention has brought fire extinguishing appliances of the sprinkler type into the region of theory into that of practical utility. The question now is not "What are they?" but rather "Which is the best?" Competition has commenced and promises to become very fierce. It is to be hoped it will remain scrupulous and honest, and that a fair field and no favour will be shown to every invention of merit in this field by the Committee of Fire Insurance Companies, which properly in the interests of the companies is deputed to examine the efficiency of the respective appliances on the adoption of which spinners, manufacturers and mercantile houses naturally expect an abatement of the insurance premium.

At various times we have had the pleasure of inspecting many of the different sprinklers that are now before the public, and we are quite willing to acknowledge that even the most imperfect constitutes a great advance upon the condition of things under which our mills and factories of various kinds were practically unprotected. From the more perfect ones a large amount of, if not absolute, security may be obtained, and for those it is only proper that the spinner, manufacturer or merchant who adopts one should receive the advantage of a reduction in the fire premium corresponding not merely to his expenditure upon the appliance, but to the extent of the diminution of the risk brought about by its use. We are a little inclined to think that these benefits have not been accorded to the proportionate extent by the Insurance companies. If denied, however, the injustice will work its own cure, as should they very generally secure the safety of mills after being thoroughly tested by the outbreak of fire in mills in which installations of sprinklers exist, it will be a great argument indeed to induce the discontinuance of the practice of insurance altogether, and the payment of the very heavy tax upon the trade in the shape of insurance premiums. This, however, is speaking in advance of facts.

We have much pleasure in calling the attention of our readers to one of the last new candidates for their favour in this field of usefulness. This is the Crown Sprinkler, the invention of Mr. Aaron Bradshaw, Accrington. Our illustrations show its general structure. It consists of a water-tight body upon which the
the vent with great force impinges against the distributor, and by its grooves is scattered far and wide in every direction over a large area, falling in a drenching spray both near and far. In Fig. 2 the revolving distributor is represented. This has two branches, the ends of which constitute vents, and the impact of the streams of water rushing upward from the vent with great force impinges against the distributor, and by its grooves is scattered far and wide in every direction over a large area, falling in a drenching spray both near and far. In Fig. 2 the revolving distributor is represented. This has two branches, the ends of which constitute vents, and the impact of the streams of water rushing upward from the vent with great force impinges against the distributor, and by its grooves is scattered far and wide in every direction over a large area, falling in a drenching spray both near and far.