Machinery and Appliances.

IMPROVED SHUTTLE BOX SWELL.

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LOOMMAKERS, BLACKBURN.

The almost perfect power-loom of to-day, when contrasted with the hand-loom which it has superseded, or with itself as first introduced to the world, by its inventor, the Rev. Dr. Cartwright, is a machine to excite our admiration. It is so completely, harmoniously, and perfectly performs all the movements that were formerly the work of the hand-loom weaver, and, withal, does it so unstringly, that it justly extracts a large amount of praise from even indifferent observers. Still the fact that efforts are being continuously put forth to improve it shows that when its various movements, and the mechanism by which they are accomplished, come to be examined, there is room for further progress.

enters the box, and in combination they do it with fair success. But they are only palliations of defects: with an accurate picking motion they would not be needed: the hand-loom weaver had, we believe, neither check-strap nor swell: he graduated the force applied to the projection of the shuttle to the requirement, securing his object also with a minimum of wear and tear. This in the power-loom is an improvement much wanted, and which still affords a good field for the display of the skill of the inventor.

Whilst waiting for advent of the genius who has to accomplish the above, the manufacturer must do the best he can with the palliatives now in use—the check-strap and the swell. Of the former nothing but a good word can be spoken: of the latter hardly a good one can be uttered. As commonly in use, it is defective in form and action, and of the wear and tear of shuttles, it may fairly be charged with more than 50 per cent. of the whole amount. In the fast reed loom it is inserted in a slot in the circumstances, we need not wonder at the wear and tear of box-wood that takes place, and the heavy annual bill for shuttles that manufacturers have to meet. Let us for a moment look carefully at the picking process, and follow the course of the shuttle, and we shall see how this arises. The shuttle being properly boxed, the loom is started, and the shuttle is projected through the shed to the opposite box. Entering this, which is sufficiently wide at the opening to receive the shuttle easily, it immediately meets with an obstruction in the shape of the swell, which bulges out from the back in a curved line. The shuttle travelling in a straight line comes in contact with this obstruction on its shoulder, and is deflected from its straight course, being thrown with its opposite extremity heavily against the box side, as it passes farther in; what with the force of the rebound from the impact against the side just mentioned and that derived from the change in the curve of the swell, it is next

![Fig. 1. Improved Shuttle Box Swell—Messrs. Henry Livsey, Ltd., Blackburn.](image)

![Fig. 2. Back View.](image)

One of the points that has often struck us as affording this room is the picking mechanism; what is wanted being a simple, easy, and accurate method of regulating its force. At present this seems to be almost entirely absent. The projection of the shuttle through the warp absorbs too much power, and this is destructively wasted in the excessive wear and tear of shuttles, pickers, picking band, and picking stick collars; also in fly spindles, check straps, and oil for lubrication. The inordinate amount of power spent in propelling the shuttle is seen in the rapidity and distance of its flight when it accidentally gets deflected from its proper course and in the injuries it inflicts when a weaver happens to become its target. With the old hand-loom weaver there was really no such waste of power; if his shuttle flew out it rarely went beyond the end of his shay. But with the power-loom, instead of endeavouring to control the force delivering the shuttle, there have been invented all sorts of ingenious contrivances to prevent its rebounding back into the shed when it has entered the box, such as the check strap and the shuttle-box swell, with their numerous modifications. The object of both of these is to retain the shuttle when it once

thrown with considerable force against the opposite side of the box. It thus receives three blows every time it enters a box, these being repeated immediately on its projection to the opposite side, though in this case they fall upon the opposite end of the shuttle. The injurious effect of this continuous battering may be imagined when it is stated that a loom making 300 picks per minute, and working ten hours per day, will make a total of 120,000 picks in that time; and in the fast reed loom, owing to its construction and the unfair duty put upon it, the shuttle can hardly avoid receiving daily almost three times that number of blows. From these, in a very large measure, it ought to be free. As might be expected, the injury quickly becomes visible on the four shoulders of the shuttle, and its rapid wear is the consequence. With the defects we have pointed out removed, the life of a shuttle, we have no doubt, would be three times as long as at present. This matter may be commended to the notice of inventors.

It will be seen that our remarks so far have mainly had reference to the shed as it is found in the fast reed loom. In the loose reed loom the case is not so bad. In the first place, the shuttle is relieved from the duty of protecting.
hardly ever be known. A great diminution of waste ought to result.

The patent has been issued to Mr. Henry Livesey and Mr. Thomas Gill, and the improvement is being made by Messrs. Henry Livesey, Limited, who will be glad to afford any further information that may be desired.

IMPROVED HYDRAULIC CALENDER.

In the hydraulic calender, represented in the accompanying cut, the two rollers are brought together or separated by the following arrangement: The hydraulic press is provided with a double-acting piston $d$ $d$, which acts directly on the supports of the first roller, while the pressing cylinder $C$, which takes it up, is connected with the supports of the second roller and acts upon them. The two pressure-spaces $f$ of the pressing cylinder are connected with a pressure chamber $E$, which consists of a constant supply of air, and a piston-barrel $F$ projecting into it. In this is inserted a piston $f$, which can be weighted according to the desired pressure by a lever $n$.

A NEW PICKING STICK COLLAR.

Our American cousins are certainly ingenious in several spheres—in one, at least, the adaptation of wood to uses that are a little apt to excite surprise in people with less versatility of ideas. The celebrated instance of wooden nutmegs is a case in point, but that is a record which we believe has not yet been broken. The subject of this notice, though not absolutely novel perhaps, is one in several respects sufficiently so to call for a brief description.

The picking stick collar, as it is called in this country, but the "log strap" as the Americans refer to it, is generally as well known, made of a leather band of length sufficient,