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IMPROVED SHUTTLE BOX SWELL.

Mr. J. Whalley, Patentee, Cicely Bridge Mill, Blackburn.

A very heavy item in the working expenses of a manufacturing establishment, especially in the case of mills, is the great cost and wear of shuttles, pickers, and picking bands. These are grouped together and constitute "a tailor's stores" or the greatest part of them. The shuttle of course carries the web through the warp, and considering the rapidity of its movement in these times of quick-running looms, it would form a very much more powerful simple by which to represent the rapid flight of time than in the days of Job, who wrote "My days are swifter than a weaver's shuttle." The wonder at the present time is that the destruction of shuttles by rapid wear, great though it is, is not greater than actually find it to be. Still the cost is heavy enough, as every manufac-
turer knows. The pickers is a well-known piece of the furniture of a loom. Its function is to project the shuttle from side to side of the loom through the open shed. As the shuttle is metal tipped and the tips have fine points, their destructive effect upon the pickers is naturally very great, and all the greater if the projection of the shuttle be made with greater force than is requisite for the purpose. This is certain to be the case if the loom is not kept in the best of order. The wear and tear of pickers under the most favourable circumstances yet devised has hitherto been an unavoidably large item of expenditure. Picking bands are steel or leather by which the connection between the picking stick and the picker, in a Blackburn or side-pick loom, is made. It naturally sustains a considerable strain, as by the movement of the picking stick it is made to project the shuttle across the warp shed by means of the pickers, the weight of which it has also to carry. This stroke is made in the case of each picker from 60 to 120 times per minute. The shuttle enters each of the two boxes of a loom this number of times. It will therefore be seen how important it is that the shuttle should be protected in its journey with just the proper amount of force, and neither more nor less, and that the picker in the box to which it is going should be in the proper position to receive it. It is for the point of the tip to strike right in the centre of the hole it has made. Should it strike otherwise, the shuttle will get bangled about from side to side of the box, thus wearing it on the sides excessively. But if the picker has been drawn well back in the box the first check given to the motion of the shuttle is by its

coming in contact with the shuttle box swell, and this is perhaps most frequently the case. Here comes into action the most destructive factor in the case. The shuttle having entered the box it comes in contact with the front of the swell, shown in our illustration, Fig. 1. This deflects it from a straight course, and naturally throws its rear end sharply into contact with the side, from which it will next probably rebound against the front side before it is stopped. It is this knocking about which is so destructive to shuttles. In the fast-reed loom a very heavy burden is placed upon the shuttle, as it has to work the picker and stop-

rod. In the loose-reed loom it is relieved from this, and there is therefore no reason why its working should not be made as easy as possible. All that is required is that the shuttle shall enter the box without rebouding, and be retained there and held with sufficient firmness until it responds properly to the project-
ing force. This duty is, or ought to be, performed by the swell, but in the old construc-
tion, which is still ordinarily in use, it is discharged very imperfectly, and hence the several attempts that have recently been made to improve its construction.

We have pleasure in bringing before our readers a newly patented swell, the invention of Mr. J. Whalley, manager, Cicely Bridge Mill, Blackburn, which has already received the commendation of extensive adoption. Our illustrations show front and back views. Its front view shows very little difference from the ordinary swell, but the back view exhibits its peculiar construction as being very different. The swell and the lever on which it is carried are cast in one piece, the upper part of the lever having lateral pivots, which rest in the brackets by which it is attached to the top of the shuttle box as shown. A flat spring, but much longer than the one shown in the illustration, which is simply engraved from a model, presses it into position. This pressure is not great, being we should say almost the minimum necessary for retaining the shuttle in its proper position. It will be seen that suspended in the manner shown the line of movement described when the swell is pressed back is actuated by a vertical circle. This is advantageous, as the result is to facilitate the lodgment of the shuttle upon the bottom of the box, always the best for its projection again across the warp. With the old-fashioned swell this could never be assured, as should it be lifted up at either end, or raised altogether from the bottom plate, it would be delivered from that posi-
tion, a fact which accounts for a good deal of the wear and tear of the shuttles and pickers. The inventor has also varied the construction from that shown in our illustration by attaching the pendulum bracket to a curved plate spring, curved almost into a tube, the spring being attached to the shuttle box back by screws. This dispenses with the pivot ends, the small brackets, and the flat plate spring shown, and also obviates any necessity for lubrication, and on several accounts may be preferred.

The new swell has already been thoroughly tried in Cicely Bridge Mill, and other places, there being already over 12,000 at work. In the mill just mentioned there are 644 looms averaging about 50 in. reed space, and making all the stuff of cloth from the finest to the heaviest picks. The total expenditure for the six months from July 1st to Dec. 1st in shuttles, pickers, and picking bands has been a sum which shows 25.12d. per loom or 45.21d. per annum. This has been accomplished under the disadvantage of the new swell having had to take over as it were the half worn stocks of these articles from the old swells. This is a reduction of only 50 to 70 per cent. per loom, as our practical readers can easily ascertain by making comparison with their own expenditure in the same time. But this is not all. There has been a considerable increase in the production, and an improve-
ment in the quality, as owing to the fewer breakages of pickers there are less damages in the cloth, fewer oil stains, and less blacking of the web. We were shown one loom which had been supplied amongst the earliest with the new swell, and at the same time with new shuttles, both now a year and a half ago. The shuttles were not more than a quarter worn, and may certainly be expected to wear at least as much longer. In the same loom the pickers had lasted six months, and the bands had done correspondingly well.

With a record like the above the new swell requires little from us in commendation. The inventors will be pleased to shew interested persons the new swell at work as described, and afford any other information that may be desired upon application at the above mill. Messrs. Willan and Mills, Blackburn; J. & R. Shorrock, Darwen; and Howarth and Hartley, Hasling-
den, are licensed to make them.

THE "PYRO" COMBINATION FOR BOILERS.—It is well known that steam boilers are subjected to very destructive strains when the furnaces are first started for raising steam. This is due to the fact that those portions of the boiler surrounding the furnace quickly become highly heated, while the more remote parts remain for a long time comparatively cold. Hence there is unequal expansion, and many other results that are very prejudicial. The "Pyro" combination consists in introducing into the furnace flue-hot-hanging chimney of the same strength as the boiler. These chimneys, which do not interfere in any way with the grate surfaces, are, as starting filled with water from the bottom of the boiler, or from any point in the hearth where there is no cire-

lution. A small fire is lighted in the furnace at first, which heats up the water in the chambers, and by degrees the remainder of the boiler becomes heated, and the shell is also gradually warmed, a uniform temperature being thus attained.
During this period there is neither pressure nor steam used, and as soon as the circulation ceases by reason of the accumulation of temperature the bulky bolters, assisting with the suddenness and suddenness of the working pressure. The primary work of the heaters has been accomplished, they are now used without water. The feelers, instead of going into the boiler direct, is diverted into the boiler and is reduced to a temperature of about 220° Fahrenheit. It will thus be seen that the arrangement is that of a combined automatic circulator, which does not rob the boiler of steam, but assists and utilizes heat which would otherwise be wasted, or rather worse than waste, as the result of the steam in the shank, which is an impediment.

The steamship on which this apparatus is operated is the steamship "Cardiganshire," of 1,750 tons. The results of its application are stated by the engine room in the simplest form, and the final result is that there has been no trouble whatever with it, and the temperature in the stockhole is found to be reduced by some 27°. A further important point is the fuel economy, a saving of 7 per cent. being shown on the average of five voyages.

**Bleaching, Dyeing, Printing, etc.**

**PAPERS ON BLEACHING.**

**INTRODUCTION.**

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**Bleaching Textile Fibres**

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**The Textile Mercury.**

This paper, as indicated in its title, is intended not only to bring you questions which are frequently asked, but also to promote a discussion in order to elicit your views as to the commercial interpretation of the various terms and phrases used in dyeing. In this connection, it is evident that the word "fast" in dyeing and printing is either elastic or it is necessary to have a relative or comparative interpretation, otherwise it would convey the idea that it is very difficult if there are no absolutely fast colours produced in the fibre. If there be any error, we hope that there will be no attempt to bring the reader before you this evening. Probably we have no ground for complaint against the commercial interpretation that has been placed upon the words "fast colours," as in our daily work we produce large quantities of fast work, commercially speaking, and much of which is fast. However, all the influences which the best work is not only fast, but also of great strength, and it is employed for the purpose of dyeing and printing. This paper is intended to bring you the general impression, and to call the attention of the reader to the importance of the words "fast colours." In our daily work we produce large quantities of fast work, commercially speaking, and much of which is fast. However, all the influences which the best work is not only fast, but also of great strength, and it is employed for the purpose of dyeing and printing. This paper is intended to bring you the general impression, and to call the attention of the reader to the importance of the words "fast colours."