

Posselt's Textile Journal

Vol. I.

December, 1907.

No. 3.

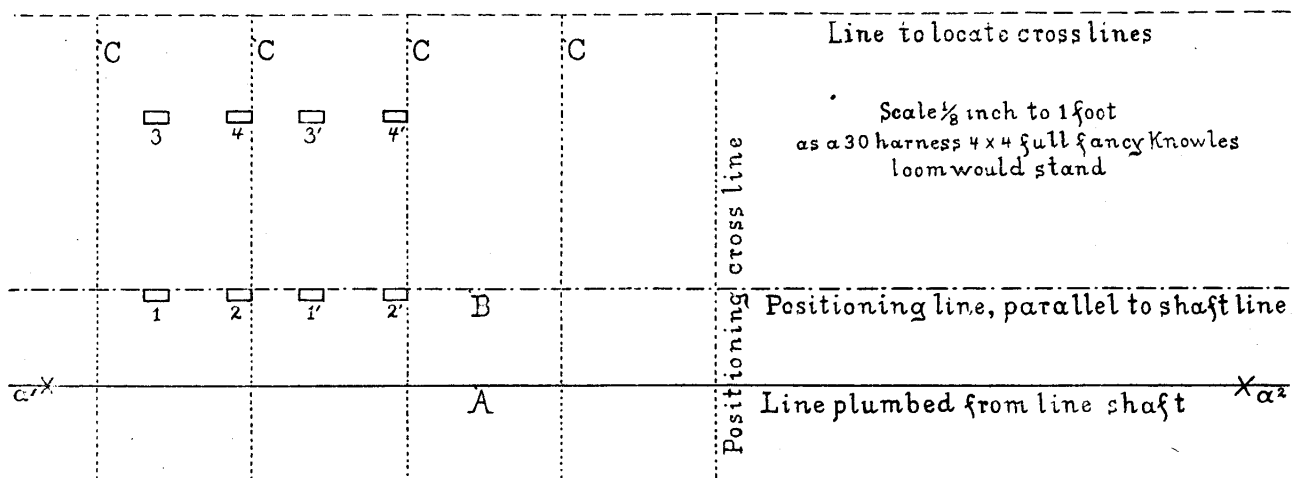
A PRACTICAL TREATISE ON THE KNOWLES FANCY WORSTED LOOM.

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The object aimed at in writing this series of articles is to give to loom fixers a "companion" to which they can refer when in trouble or in doubt of how to proceed in their routine work. However, more particular will these articles be of the greatest interest to persons learning the business of fixing looms, since no practical work of value on this subject exists. In writing this series of articles, the author has taken the position of a person who as-

a simple and at the same time an accurate way. Parallel to this line, at a distance which will meet the inside of the loom frame (on the pulley end) when the loom is in its desired position on the floor, then stretch or draw another line the same length as the first line. At right angles to these lines next draw lines which will extend from the line drawn under the shaft line to a point a few inches beyond the opposite end of the loom. As it is desirable to have these shorter lines for guidance in positioning the loom lengthways, they must be so placed that when the looms are in position, the line will meet either the front of the loom sides if locating from the front of the loom, or the back of the loom sides if locating from the back of the loom.



sumes that the party, in whose interest these articles are written, has all to learn, nothing is taken for granted, a feature which is absolutely necessary, so as to make this series of lessons on loom mounting thorough and at the same time plain and readily understood by the student.

The Lining of the Loom to Its Proper Position in the Weave Room.

We will take for our subject the 30 harness, equal geared, 4 x 4 box loom, since the same is the type of a woolen and worsted loom met with in most instances in the weave room of modern mills.

The first thing to be taken into consideration, after the shafting is lined, is the distance to be given between the looms. After such has been settled, the next thing to do is to ascertain the proper floor space for each loom. By this is meant that each loom must have, besides its own floor space, the proper amount of alley-way for the weavers to pass conveniently to and fro in their work. The proper way to lay out this floor space per loom is to plumb to the floor from each end of the line of shafting required to drive the looms. Between these two points found, then draw a line, *i. e.*, stretch your measuring cord tightly between these two points, this being

To illustrate to the student points thus far explained, the accompanying diagram of a floor plan is given with two looms shown placed in position so as to make matters as plain as possible to the student. In this diagram, letter of reference *A* is the line found by plumb line from points *a¹* and *a²* located at each end of shafting. Dot and dash line *B* indicates the line to which the inside of the loom frame is lined. The eight shaded rectangles 1, 2, 3, 4 and 1', 2', 3', 4' indicate the feet of two looms to which are bolted the floor plate for fastening the looms to the floor. Line *B* is parallel to the shaft line and is of the same length as the latter.

At right angles to lines *A* and *B* we next find drawn the division lines *C* (shown in dotted lines) which mark the space allowed for each loom, including its alley-way.

It will be noticed that the looms are placed on these lines in the position previously referred to, *i. e.*, the ends of the loom sides (2 and 4 and 2' and 4') are on a line with line *C*.

By following directions given we accomplish the following results:

(1) All lines running lengthways of shaft will be true parallels to the shaft line.

(2) All cross lines will form right angles to shaft lines.

(3) The loom space will be equally divided.

As each loom has been given its allotted space, regardless of measuring from another loom, and is squared to lines which are true right angles, the loom in turn will stand as square as the construction of its frame will allow. These are points to be well remembered, since they influence the leveling of the loom, and the true running of the belt—a point taken up later on, in its proper place.

If when lining looms to two lines as described, the setter-up should find that the feet of the looms will not meet both lines (*C* and *B*) exactly, he need not be surprised, nor can he expect this to be the case, for he must bear in mind that he is handling looms and not, for example, constructing a watch; a loom frame will not always come up exact to delicate measurements, besides this is not absolutely necessary. Lines *B* and *C* have been solely made by him for a guidance, in placing the looms in the best possible positions. He knows that these lines are absolutely true and in turn he must strike a medium where a loom frame varies a trifle, being sure that he is working on a true principle and when any slight deviation in a loom frame will not prevent him from getting good results, *i. e.*, placing the respective loom in its best possible position. If a setter-up of looms has not the right idea of lining looms, as thus explained, he will not know where he stands, and guesswork all around in all his work will be the final result.

The student has thus far been taught to draw lines (*C*) at right angles to the shafting line. To do this he may take his choice of the following methods.

First: Take your shaft line (*A*) as one line of a square, the length of which is eight feet, to this extend a line as nearly at right angles as you can, six feet in length from shaft line. Connect this line of eight feet and the line of six feet with a line ten feet in length, and you will have formed a triangle, two sides of which form a perfect right angle. Having formed a right angle you can now take a measuring line and lay out your floor space for the looms, taking all your measurements from the tape as follows: If the floor space per loom is six feet, the second division line will be found at the 12 foot mark on the tape, the third division line at 18 foot on tape and so on. Measure line *A* this way: Draw a line parallel to shaft line at the opposite end of loom from shaft line and space this line in same manner as line *A*. Then draw your cross lines and you have your right angles and spaces.

The second method of getting right angles is thus: Should you choose to use a large square, the proportions 3-4-5 or any multiple of the same connected as a triangle will give you a true right angle.

Leveling the Loom.

In leveling the loom, it is well to remember that the builders of the loom level the frame previously to

said loom leaving their erecting room, and that the person who sets up the loom in the weave room of the mill should follow the same method as practiced in the erecting room of the builders.

The loom being lined to its proper position, the holes bored for floor screws, for fastening the feet of the loom to the floor of the weave shed, the next thing to do by the erector is to put the level on each end of the back girt and see that both ends stand level and that there is no inclination to warp or twist. Next use the level on the breast beam of the loom in the same manner. These two parts of the loom frame being leveled, the next thing to do is to look after the picking shaft which should stand true to level, when back girt and breast beam are level. If the picking shaft does not stand level with the latter, it is a sign that something is wrong, look for a strain or a loose casting, or a twist somewhere due to the handling of the loom in transit, *i. e.*, since leaving the erecting room of the shop and arriving on the floor of the weave room of the mill. The trouble in most cases will be quickly located.

The loom is now level lengthways, the next thing to look after is to test the loom frame endways, or in the direction of the countershaft which carries the bevel pinion gear and drives the loom. This shaft should stand level and the loom side at the same time should be level.

The level should also be put on the heel pin cap over the vibrator ends, or the top harness cylinder, both of which should stand level. At the same time the upright shaft should be a true perpendicular, *i. e.*, no matter where you place the level on any part of the circumference of the upright shaft, it should stand plumb.

The loom now having been thoroughly tested as to its levelness on all places quoted, is then bolted by its feet to the floor of the weave shed, securing by this all necessary blocking under countershaft frame, centre girt and all other places where blocking has been done, by screwing down all floor screws, into a stationary position.

The next, and so far as the running of the shuttle is concerned the most essential part to look after, is the lay, more particularly the shuttle raceway. If the same is not as it should be, a poor loom fixer is in for much worryment why shuttles do not box evenly. He may lay the trouble to the belt and friction, in fact on most every part of the loom but the actual cause for his misery, and quite frequently he sums up all his troubles in the scapegoat word "backlash."

The lay must stand level and anything in the imperfect lining of castings or braces which support and strengthen it, must be looked for at this time.

The lay is cut out in the centre so as to allow room for the stop motion wires to drop and it is this place which in some instances will be found to be out of line in place of being level with the rest of the shuttle race.

A lay may warp a little in spite of being well braced, and the time to attend to truing it is when you are leveling the loom. These are points which

the experienced fixer is on the lookout for, knowing that he cannot see them when the warp is in the loom, and the latter running. The point originally has been mentioned more particularly for the benefit of the beginner, who cannot think far enough for looking for his trouble in the right direction, in fact who will look everywhere else but the place which is at the bottom of his trouble and when the practical information thus given him will greatly lessen his labor and trouble.

The lay now being leveled, and in turn swinging freely, the reed line must be next looked after, and if it is not true, made true. It should be a perfectly straight line from lay sword to lay sword, and under no consideration let the idea get hold of you that in order to keep the shuttle in its travel during weaving on a straight course, you must "dish" the reed line a little towards the centre. This statement may be in opposition to the views of many loom fixers, but nevertheless it is the method of lining carried out in the erecting room by the loom builders and which they hold to be correct. All you need allow in lining the reed would be just enough to be on the safe side. If you can place the thickness of an ordinary sheet of writing paper between the straight edge and the reed, it is sufficient. On the other hand be sure the reed does not bulge towards the straight edge. Judgment must be used in handling a straight edge. The first thing to know is that your straight edge is true and does not deceive you. Take care to work by directions given, and other things will develop later which will keep the shuttle running straight.

When lining the reed to the box guide plates, it will be found that quite often the reed when in line with the box guide plates at the shuttle race line will not be in line with the same plates at the top of the reed near the hand rail. This should be made to line true by the loom fixer, since it cannot be fitted by the loom builders, since reed makers do not use a standard size rib.

These directions if properly adhered to, should now leave the loom well leveled and true to the shaft line for floor position. In leveling, the things to keep in mind can be summed up as follows:

First, level back girt, picking shaft and breast beam.

Second, level counter or loom pulley shaft, loom sides and head of loom at vibrator heel cap or top harness cylinder gear.

Third, try upright shaft and see that it stands perpendicular.

Do not expect all these points to come to an exact level.

Use your level faithfully just the same and remember the essentials here are to have a smooth working machine rather than one set up absolutely accurate to gauge, and when slight deviations from perpendicular and level will do little harm.

(To be continued.)