LINING UP 2-1 BOXES.

Lining up consists in placing both boxes on a line with
the race plate of the loom. Start from the first or top box.
Get this box on a line with the race plate by turning the
adjusting nuts C, Fig. 98. A steel straight edge will be found
useful for this work. When the first box has been lined up,
push in the sliding tooth O, Fig. 98, and turn the loom over
so that the second box will rise. Now test the second box
to see if it lines up with the race plate of the loom. If this
box should be 1/8 in. too high the stud K, Fig. 98, is too far
out from the center of the box-crank L. To remedy this
fault loosen the stud K and move it towards the center of
the crank L, but be sure to move it so that the boxes will
move only one-eighth or one-half of the distance in excess
of that required. Then bring the first box in position again

and line this box with the race plate. Regardless of the
distance that the box moves, whether too much or too little,
take only half of this distance by the stud K on the box
crank L. Be sure to come back again to the first box and
get the other half from the adjustments on the bottom of the
box-rod.

If it is found, when coming from a level first box to the
second, that the second box is about 1/8 in. too high or too
low, get the adjustments from the stud F on the forward
end of the box lever. Moving this stud out will give more
throw to the boxes; moving it in will give less. This slot
is used to get a rise or fall of only 1/16 in. to 1/8 in. Under
no circumstances should the stud I be moved after it has
once been centered with the center of box crank. It is bad
practice to get this stud off of the center.

TIMING THE BOXES.

The boxes must not begin to move until the loom crank
has passed the bottom center. The movement must be com-
pleted before the crank reaches the top center. They must
be level and at rest when the pick is to be delivered.

One method of timing the boxes is as follows: With the
loom crank on the bottom center push in the sliding tooth
O and move the segment gear Q until the first tooth is fully
engaged with the projection or knuckle of the sliding tooth.
Tighten up the segment gear, otherwise the weight of the
boxes will cause it to slip. The only objection to this method
of timing is that no two fixers will set the loom crank in the
same position for the bottom center, and the distance
of one tooth is the difference between right and wrong timing.

A method practiced by experienced loom fixers is to take
the shuttle out of the box and draw the lay of the loom for-
ward until the dagger strikes the bunter. With the loom
 crank in this position the boxes should be raised or lowered
a full 1/8 in. This is easily determined by watching the back
lip of the box where it runs parallel with the lower edge
of the picker slot. This is almost a standard setting with
box-loom builders. Many of the later types of box looms are
built with the segment gear Q keyed on the bottom shaft
with the timing as described here.

ADJUSTING THE RELEASE MOTION.

A release motion is intended to guard against breakage.
If the shuttle is half in and half out of the box when the
boxes are changing, it is obvious that something would have
to break if some means were not employed to prevent it,
and the use of a release motion, which works well if ad-
justed correctly. The spring E must be strong enough to
keep the two parts of the motion together when working

under normal conditions, but must open up when the shuttle
gets fast. Sometimes the shuttle will be so tightly bound
in the box and in contact with the picker than when the boxes
are changing the pressure will be too great, and the release
motion will be forced open.

Some fixers remedy this condition by putting two springs
on the release motion. This will effect a cure in one way,
but on account of the additional pressure the teeth and the
knuckle of the sliding tooth O will wear out very quickly.
By the exercise of care this can be avoided. Place the shuttle
half in and half out of the box. Have the sliding tooth fully
engaged. Move the loom by hand and it is then easy to
determine the amount of pressure required to open the release

FIG. 101.—A 4 AND 1 BOX GINGHAM LOOM.
motion. Too much pressure is liable to break the teeth on the segments or break the end of the box lever G. Too little pressure leaves the boxes with a weak foundation. There is no hard and fast rule governing the strength of the spring. This is a matter of judgment.

Pickers play an important part in the running of a box loom. Pickers should never be bought from stock or without regard to the looms on which they are to be used. The manufacturer of pickers usually measures the loom parts in order to get the proper fit. A new picker should need no trimming. A rawhide picker should make its own hole. Pickers not in use should never be allowed to dry out. They should be kept in a bath of linseed oil. The wooden plug should not be taken out except when the picker is about to be used. After running a few weeks the picker will gather dirt and lint which clogs up the passage. Do not use a file to take out the dirt. A half-inch twist drill will clean out the picker, leaving a smooth passage. Pickers should be oiled by the weaver at least twice a day.

When a new bracket is put on the loom it often fits so as to bring too near to the boxes the end of the spindle at the end of the lay. This is a dangerous condition, because it causes a tendency to throw the shuttle out towards the weaver. If there is any variation the spindle should be a little farther from the boxes at the beginning of the pick than at the finish. This will cause a tendency to push the shuttle towards the reed.

All adjustments must be made when the shuttle is on the box or dobby side of loom. This should not be forgotten. Otherwise many bad warp breaks will be made.

4 AND I BOX MOTION.

The fixer who has paid strict attention to the explanation of the 2 and 1 motions will have little difficulty in handling the 4 and 1 box motion. The same methods are employed in leveling the boxes, adjusting the picker and picker spindle, timing the boxes and fixing the release motion. The only difference is in the timing of the boxes and operating the boxes for the different patterns. What is termed “boxing” the colors requires some judgment. The main point is to avoid skip boxes; that is, jumping from box 1 to box 4 or from box 4 to box 1, or even from box 1 to box 3 and the reverse. While the box motion is built to skip boxes, it is good practice to avoid them because the easier and shorter the lift or drop, the longer the motion will run without fixing. There are times when skip boxes cannot be avoided. If the boxes are set to skip unnecessarily, the fixer, weaver and manufacturer suffer from the consequences.

Fig. 101 shows a 4 and 1 gingham loom of the ordinary type. This 4 and 1 box loom is frequently equipped with a head motion, as shown in the upper right-hand corner of Fig. 101. This loom is of very solid construction and gives little trouble to the fixer.

Fig. 102 shows the box lifting mechanism and illustrates the directions for lining up the boxes, which is really the only difficult operation in fixing this loom. AA are the boxes; B, box rod; C, check collar; D, rod guide bolted to the rocker shaft; E, adjusting nuts; F, release motion; G, adjusting slot in box lever; H, box lever; I, eccentric; J, rear slot in box lever; K, box crank adjuster; L, box crank; M, star wheel; N, frame holding the entire motion.

Particular attention must be given the eccentric I, the box crank adjuster K and box crank L.

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