My invention concerns certain features of novelty and advantage in the stock-feeding mechanism of wood-working machines and pertains more particularly, but not necessarily restrictedly, to appliances of this character associated with, or forming parts of, end-matching machines.

One of the leading aims or purposes of the invention is the provision of a construction of this character which will reverse the operation of the feeding means to back out an improperly advanced piece of stock and at the proper time feed the board into the machine again by restoring the normal action of the feeding mechanism, this reversal action continuing until the stock passes through or is removed from the machine.

The invention, as presented in this application, is depicted in connection with belt-driving means for the machine, but nothing more than ordinary mechanical skill would be involved in adapting the principles herein set forth to a direct motor drive.

To enable those skilled in this art to have a clear understanding of the invention and its various advantages, in the accompanying drawings, forming a part of this specification, and throughout the several views of which like reference characters have been used to designate the same parts, I have illustrated a present desirable and preferred embodiment of the invention.

In these drawings:

Figure 1 is an elevation of the machine; Figure 2 is an elevation of the machine at right angles to that of Figure 1; Figure 3 is an enlarged horizontal section on line 3-3 of Figure 2; and Figure 4 is a detail view of a portion of the mechanism.

As is shown, the improved machine comprises a suitable and appropriate frame 11 of the irregular form shown in the drawings, such frame adjustable supporting an electric-motor 12 which actuates or rotates the horizontal cutter or saw 13 which forms the grooves in the ends of the boards, it being understood, of course, that the invention is equally adapted for satisfactory employment in end-matchers for providing the tongues on the ends of the stock.

Another motor 14, likewise adjustable supported on the frame, rotates a cut-off saw 15, as is usual in constructions of this character.

The stock is fed or advanced through the machine by an endless chain conveyor 16 extended around suitable sprocket-wheels 17 and 18, the latter of which is adjustable by convenient screw means 19 so as to enable the chain to be maintained at the desired degree of tautness.

Sprocket-wheel 17 is mounted on and rotatable with an appropriately journaled shaft 21 operatively connected by reduction-gearing 22 in an enclosing casing 23 to another shaft 24 fitted with two tight pulleys 25 and 26 and two loose pulleys 27 and 28. Such pulleys are connected to an elongated drum or pulley 29 driven by an electric-motor 31 by a straight-belt 32 and a crossed-belt 33.

The means for shifting such belts will be described hereinafter.

Spaced cross lugs or bars 34 are mounted on the links of the conveyor chain 16 and are provided for the purpose of pushing the stock accommodated therebetween through the machine so that the saws or cutters may act thereon.

In thus passing through the machine, the boards travel below an upper, horizontal guide or hold-down member 35 which may, if desired, be vertically adjustable on the frame.

A presser-bar 36, having a front rounded nose 37, is fulcrummed at 38 on the member 36, and it is pressed or forced down by a leaf-spring 39, a suitable stop or abutment being provided to limit or restrict its descent, so that in its lowest position, its undersurface will be in approximate register with the bottom face of the hold-down member 35 as depicted in Figure 2.

Two pairs of bearings 41 and 42 on the member 35 accommodate a pair of spaced, parallel, slide-rods 43, 43 and to each of these there is secured a detector 44 having a screw and slot connection 45 with the part 35.

Each such reciprocatory rod or shaft 43 is supplied with a collar 46 fixed thereto and having an inwardly-projecting pin 47, such pair of aligned pins occupying slots in the spaced bifurcated legs or sections 48, 49 of a lever 49 fulcrummed on the element 50 at 51, the lever at its top end having an operating-handle 52 by means of which it may be manipulated.

A coil, contractile spring 53 is fastened to the lever and tends to rock its upper portion.
to the right as the parts are viewed in Figure 2.

A link 54, adjustable as to length, connects the top part of lever 49 to an arm 55 secured to the upper end of a vertically-disposed, appropriately-journed rock-shaft 56, the lower end of which is equipped with an offset or bent arm 57, strengthened by a rib 50, the bottom end of arm 57 being pivotally connected to one end of a link 58, the opposite end of which is forked to receive a lateral pin 59 on the lower end of a lever 61 fulcrumed at 62, a contractile spring 63, fastened to the lever and to a clip 64 mounted on the link, affording a certain amount of yield or flexibility to the pivotal connection between the elements.

The forked, upper end of lever 61 coacts with a cross-pin 65 of a collar fastened to a rod or shaft 66 slideable in bearings 67 and 68, such rod carrying two pairs of belt-shifting arms 69, 69 and 71, 71 on opposite sides of the two belts and adapted to simultaneously shift them in either direction by engagement with their edges, all as will be readily understood.

The novel and improved mechanism operates practically as follows:

When a piece of stock, because of reposing on another piece below it, or due to resting on top of one of the chain feed lugs or bars 34, or by reason of the stock being excessively warped or twisted, is at a sufficient height to engage the end of either one or both of the detector blocks 44, during its inward travel, occasioned by the action of the endless feeding-chain, it will rock the presser-bar 36 upwardly and it will push the detector-block or blocks in the same direction as its inward feed, thereby rocking lever 49 against the action of spring 53, and, through the connected parts 54, 55, 56, 57, 58, 61, 69 and 70 cause a shifting of belt 22 from the tight pulley 25 to the next loose pulley 27 and of belt 33 from the loose pulley 28 to the adjacent tight pulley 26, which action, of course, effects a reverse feed of the conveyor-chain 16 and the piece of stock producing the trouble.

As soon, however, as such piece of board, during such backward travel, releases the detector member or members, as the case may be, the contraction of spring 53 returns all of the parts to original position, thus re-establishing the forward feed of the conveyor chain and the piece of stock.

If such piece of stock, in the meantime, has become properly positioned, it will be now carried through the machine in the usual way, but, if it is still improperly or incorrectly positioned, it will again strike the detector block or blocks and cause a repetition of the preceding action, and such feed reversals will continue automatically until the piece of stock rights itself appropriately or is removed from the machine, whereupon the normal operation of the mechanism is automatically and quickly restored.

Stated somewhat differently, the machine makes a series of attempts to feed the incorrectly-positioned board through it, but it will not carry it through until it becomes properly positioned for that action.

At any time, the workman may cause a reverse operation of the feeding mechanism by merely pulling handle 52, and as soon as it is released, the regular or ordinary forward feed is restored.

It will be noted that the pressure-arm 36 extends forwardly beyond the front ends of the detector blocks, and, if it is able to hold the board down, so that it will not engage and actuate the detector blocks, then the board will pass through the machine without difficulty, but, if it cannot maintain the board depressed, it will yield upwardly and permit the board to strike the detector blocks and cause the peculiar recurrent reversal feeding action described.

Those acquainted with this art will readily understand that the invention is not limited and confined to the particular details of structure shown and that these may be modified within comparatively radical limits without departure from the heart and essence of the invention and without the sacrifice of any of its material benefits or advantages.

I claim:

1. In a wood-working machine, the combination of means to feed the stock to the machine, and means to automatically reverse the action of said feeding means upon the occurrence of an abnormal condition and to subsequently automatically restore the normal action of said feeding means.

2. In a wood-working machine, the combination of means to feed the stock to the machine, and means to cause said feeding means to operate alternately in a direction to feed the stock to the machine and in a reverse direction to feed it out of the machine upon the occurrence and during the continuance of an abnormal condition.

3. In a wood-working machine, the combination of means to feed the stock to the machine, and means to cause said feeding means to operate alternately in a direction to feed the stock to the machine and in a reverse direction to feed it out of the machine so long as a piece of stock continues to be abnormally presented by said feeding means.

4. In a wood-working machine, the combination of means to feed the stock to the machine, hold-down means above said feeding means, a yielding presser at the advance end of the machine adapted to press the stock down on to said feeding means to facilitate its passage below said hold-down means, a detector to the rear of the front end of said
presser, driving means for said feeding means, and means connecting said detector to said driving means, whereby the detector controls the action of said driving means.

5. In a wood-working machine, the combination of means to feed the stock to the machine, hold-down means above said feeding means, a yielding presser at the advance end of the machine adapted to press the stock down on to said feeding means to facilitate its passage below said hold-down means, a movable detector to the rear of the front end of said presser, driving means for said feeding means, means to reverse the action of said driving means, and means connecting said detector to said reversing means, whereby the detector controls the action of said driving means, means connecting said detector to said reversing means, whereby the detector controls the action of said driving means, and automatic means to restore said detector to normal position when the latter is unacted upon by incorrectly presented stock.

6. In a wood-working machine, the combination of means to feed the stock to the machine, hold-down means above said feeding means, a yielding presser at the advance end of the machine adapted to press the stock down on to said feeding means to facilitate its passage below said hold-down means, a movable detector to the rear of the front end of said presser adapted to be engaged and slid by stock improperly presented by said feeding means, driving means for said feeding means, means to reverse the action of said driving means, means connecting said detector to said reversing means, whereby the detector controls the action of said driving means, and automatic means to restore said detector to normal position when the latter is not acted upon by incorrectly presented stock.

7. In a wood-working machine, the combination of means to feed the stock to the machine, hold-down means above said feeding means, a yielding, rocking presser at the advance end of the machine adapted to press the stock down on to said feeding means to facilitate its passage below said hold-down means, a slidable detector to the rear of the front end of said presser adapted to be engaged and slid by stock improperly presented by said feeding means, driving means for said feeding means, means to reverse the action of said driving means, means connecting said detector to said reversing means, whereby the detector controls the action of said driving means, and automatic means to restore said detector to normal position when the latter is unacted upon by incorrectly presented stock.

In witness whereof I have hereunto set my hand and seal.

ISAAC F. THAXTON. [L. S.]