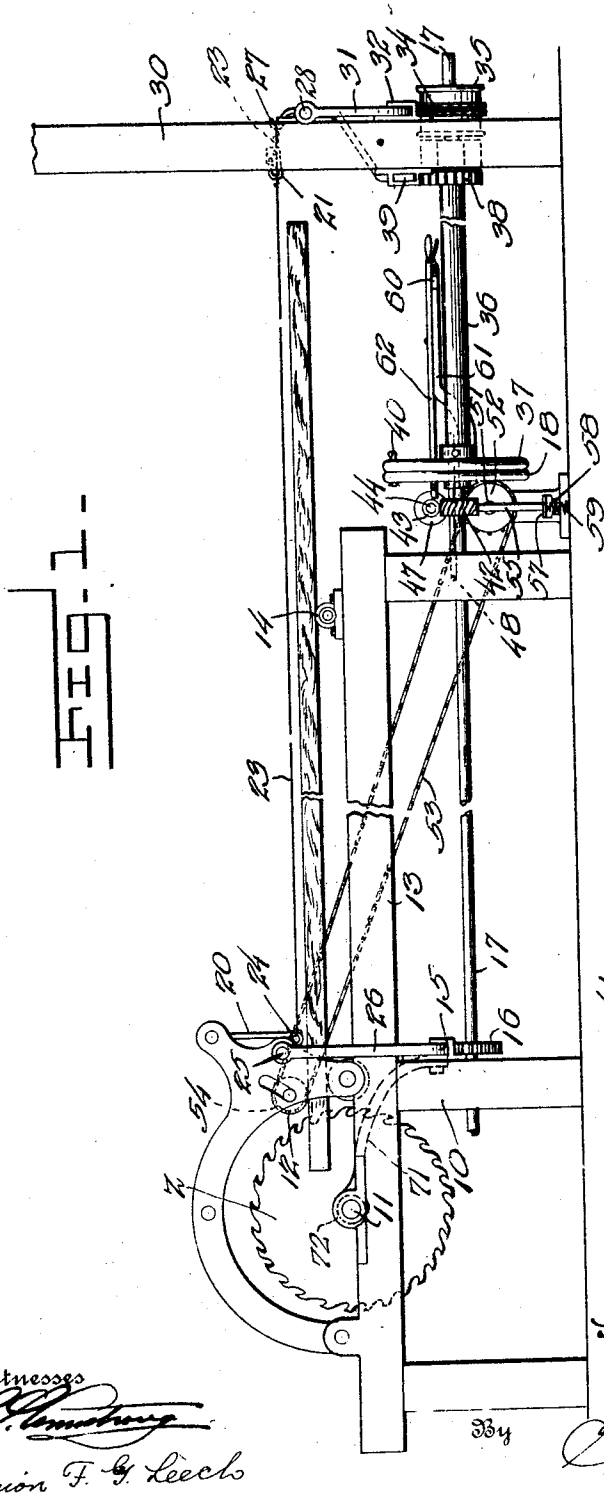
Oct. 9, 1928. 1,686,966

L. R. FOREMAN

ATTACHMENT FOR SAW MILL EDGERS

Original Filed July 18, 1913 3 Sheets-Sheet 1



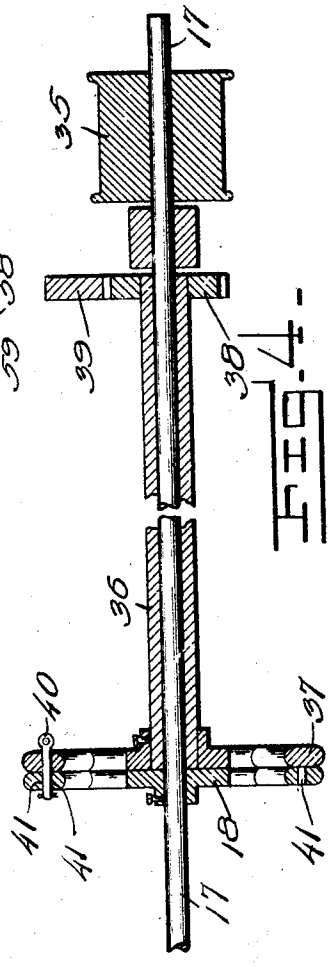


Fig. 1.

Fig. 4.

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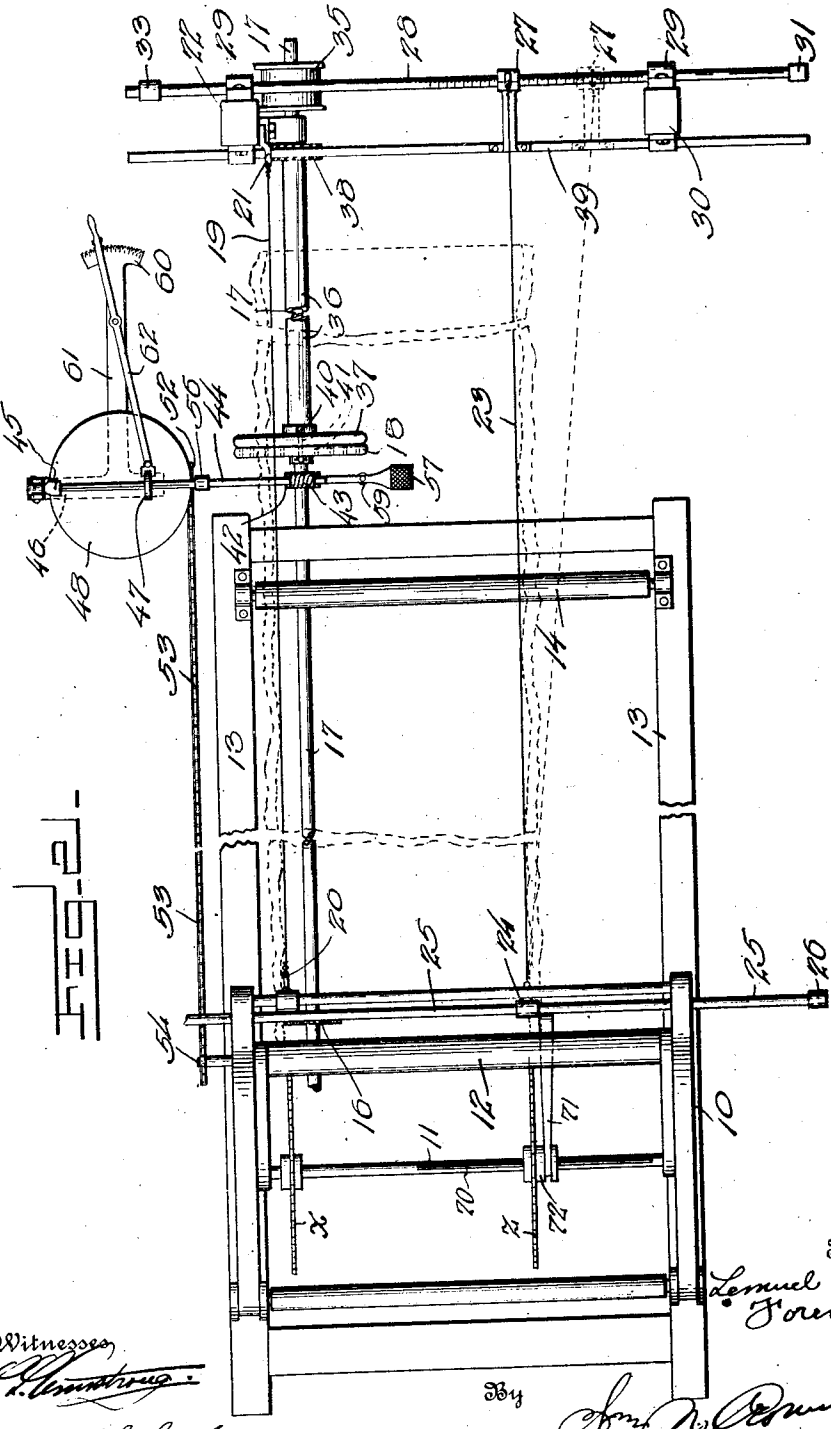
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ATTACHMENT FOR SAW MILL EDGERS

Original Filed July 18, 1913 3 Sheets-Sheet 2



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ATTACHMENT FOR SAW MILL EDGERS

Original Filed July 18, 1913 3 Sheets-Sheet 3

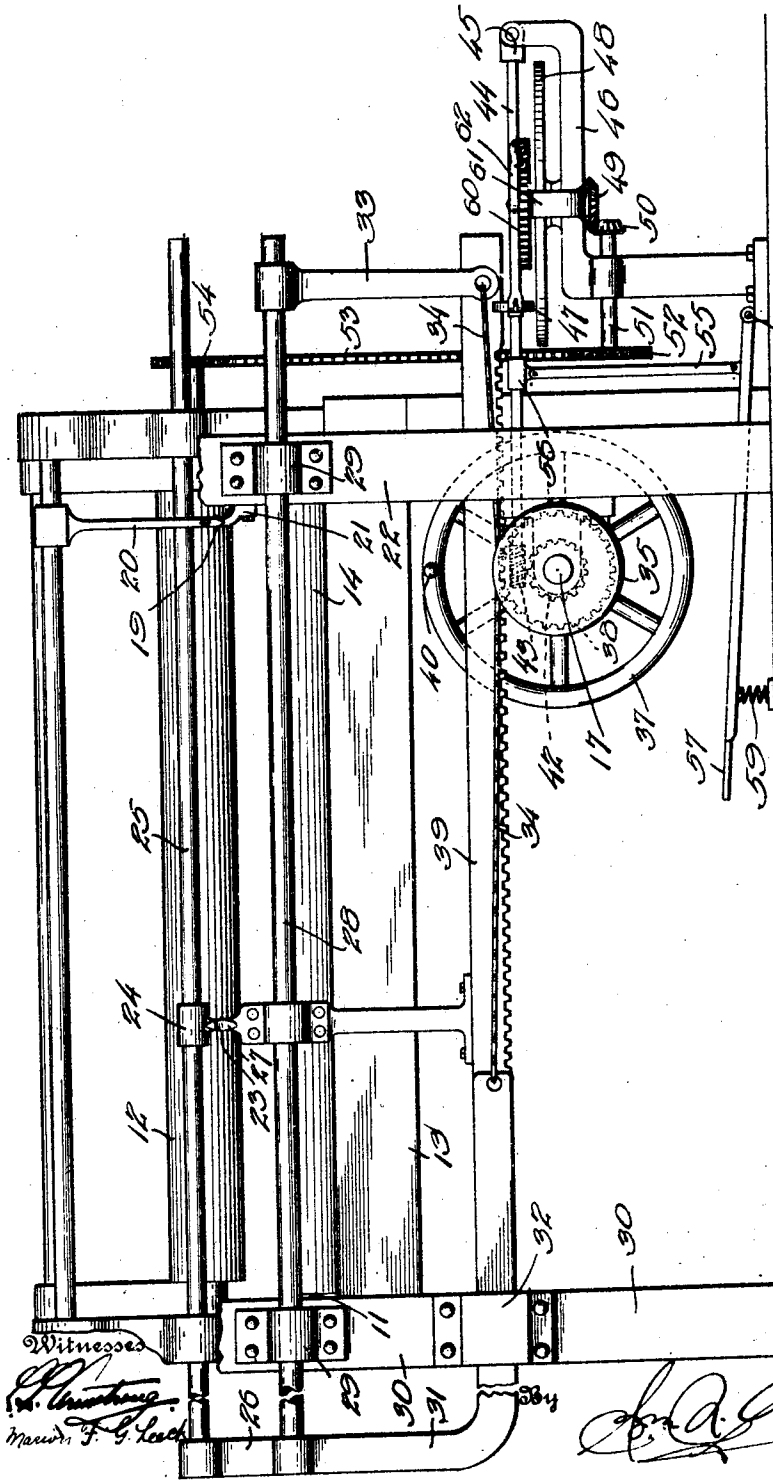


Fig. 3.

Witnesses
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Patented Oct. 9, 1928. 1,686,966

UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR SAWMILL EDGERS.

Application filed July 18, 1913, Serial No. 779,725. Renewed February 23, 1924.

This invention relates to improvements in wood-sawing machinery, and is especially concerned with saw mill edgers.

In the use of edgers in saw mills it has been extremely difficult to determine the proper line of cut of the saws in the edging operation, the positioning of the boards with respect to the saws being effected by the operator sighting with his eye. No positive means, however, for indicating the exact line the saws will follow as the board is fed to the saws is employed. The position of the saws, therefore, has been determined through guesswork, resulting, in many instances, in not obtaining the full amount of available lumber which it is possible to obtain from a board, and also in failure to trim off the bark at certain portions of the edges. On the one hand, actual waste in edging the boards has occurred, while, on the other hand, the irregular edges; due to failure to trim off the bark, have impaired the commercial value of the lumber.

It is, therefore, the main and primary object of the present invention to provide an attachment designed for application to an edger, and through the medium of which, when the board has been placed upon the feed table of the machine, the sawyer will be enabled to positively position the board and the saws so that the exact line of cut will be indicated before the sawing operation is started, thus insuring the trimming of the board in such manner as to obtain all the available lumber therein, and precluding the boards emerging from the saws with ragged edges due to the presence of the untrimmed bark thereon.

A further object of the present invention is the provision, in an attachment of the character recited, of simple and efficient means for determining the line of cut not only when the edger is operating upon boards the edges of which are substantially parallel, but also when the boards are tapering in form, the invention contemplating such an organization of elements as to insure the saws following the tapering contour of the boards along the line of cut indicated by the attachment before the edging commences.

Other objects will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

It will be understood that the term "saw mill edger" as used in the specification and claims hereof is intended to define an apparatus for trimming the edges of boards, commonly forming a part of the equipment in a mill for sawing lumber, from logs, but, of course, capable of independent use.

In the drawings—

Figure 1 is a side elevation of a saw mill edger equipped with the hereindescribed invention, a sufficient portion only of the edger being illustrated as is necessary to a clear understanding of the invention.

Figure 2 is a top plan view thereof, a board being illustrated in outline on the feed table of the edger to illustrate the utility of the present invention,

Figure 3 is an end elevation of the edger and the attachment, viewing the same at the feed end.

Figure 4 is a longitudinal sectional view of the hand shafts for controlling movement of the movable gage.

Referring in detail to the accompanying drawings, the numeral 10 designates the frame of a saw mill edger upon which is journaled, in the usual manner, a saw arbor 11, and provided with the usual presser roll 12. The numeral 13 designates the front or feed table of the edger having the usual supporting roll 14 journalled at its forward end. The edger also includes in its equipment a sliding rack 15 which meshes with a pinion 16 mounted on a hand shaft 17 provided with an operating wheel 18, the latter being the usual means for rotating the hand shaft 17, whereby to shift the sliding rack 15. A fixed saw x is mounted on arbor 11 near one end and a movable saw z is spaced therefrom, being secured to rotate with the arbor 11 by a spline, 70, as shown. A shifter arm 71 carried by the sliding rack 15 engages by means of a forked end with a circumferential groove in hub 72 and furnishes the means for sliding said movable saw on said arbor.

As before stated, the hereindescribed invention is essentially an attachment for the edger above referred to being primarily intended to enable the sawyer to position the saws with facility in order to properly trim the bark from the edges of the boards. The

attachment includes a fixed or stationary gage 19, which is preferably in the form of a flexible strand, such as wire or rope, one end of said gage being detachably connected to a depending finger 20 which is mounted upon one of the frame elements of the edger. The other end of the gage 19 is also detachably connected to an attaching bracket 21 carried by a frame element or support 22, which may be a stanchion, placed at a point sufficiently in advance of the feed table 13 to permit the introduction of the boards to the feed table. As stated, the gage 19 is stationary or fixed, and in positioning the same upon the machine, it is placed in direct alignment with the fixed saw x on the arbor 11. Cooperating with the fixed gage 19 is a movable gage 23, which is also in the form of a flexible strand, such as wire or rope, the forward end of the movable gage 23 being detachably connected to a finger 24 carried by a shiftable rod 25 mounted in the framework of the edger. The shiftable rod 25 is connected at one end to an angle arm 26, the latter being carried by the sliding rack 15 and movable therewith; consequently, when the rack 15 is shifted by means of the hand shaft 17 and the pinion 16, it is evident that the rod 25 will likewise be shifted, thereby moving the finger 24 carried thereby, and imparting to the rear end of the gage 23 shifting movement in a direction laterally of the feed table 13. The forward end of the gage 23 is also detachably connected to a finger 27, which finger is loosely mounted on a shiftable rod 28, the purpose of this loose mounting being hereinafter fully stated. This rod 28 is slidably mounted in suitable bearings 29, one of which is carried by the framework element or support 22, and the other of which is mounted upon a similar framework element or support 30. An angle arm 31 is connected to the end of the shiftable rod 28 which corresponds to the end of the rod 25 to which the angle arm 26 is connected, thus positioning the arms 26 and 31 at the same side of the edger, and said angle arm 31 is slidably mounted in a guide 32 which is carried by the framework element or support 30. Mounted at the end of the rod 28, opposite to the end to which the angle arm 31 is connected, is a depending attaching arm 33, and connected to said arm 33 is a chain 34 which is wrapped around a winding drum 35, the other end of said chain being connected to the inner end of the angle arm 31. The drum 35 is carried by the hand shaft 17, which, for the purposes of the present invention, is elongated beyond the length commonly employed in saw mill edgers. Hence, as the hand shaft 17 is rotated, the drum 35 will rotate therewith, and through the chain 34, the angle arm 31, and the attaching arm 33, the shiftable rod 28 will be moved in a direction laterally of the edger, which movement will correspond with the movement of the rod 25 induced by the sliding rack 15 and the connections previously described. Such shifting movement of the rods 25 and 28 will, obviously, cause the ends of the gage 23 to move in unison, shifting said gage 23 in a lateral direction, but always maintaining the same in parallelism with the fixed gage 19.

While the chain 34 has been indicated as a continuous length, reaching from the arm 33 around the drum 35 and being connected to the angle arm 31, the stretches of the chain connecting the arm 33 to the drum 35, and the arm 31 to said drum, may be separate pieces, the inner ends of which should be connected to the drum 35.

It has been stated that the present invention also contemplates simple and efficient means for determining the line of cut when the edger is operating upon tapering boards, and to this end the structural elements are so organized that the finger 27, to which the forward end of the gage 23 is connected, may be moved laterally independently of the finger 24, whereby to incline the guide 23 in relation of the fixed gage 19, and thus follow the tapered contour of the boards to be edged. It is for this reason that the finger 27 is loosely or slidably mounted upon the shiftable rod 28, as hereinbefore recited, and to effect the independent movement of the finger 27, to which reference has been made, a tubular shaft 36 surrounds the elongated end of the shaft 17, the tubular shaft 36 being provided with an operating wheel 37 adjacent to the operating wheel 18. Mounted at the opposite end of the shaft 36 is a pinion 38 that meshes with a rack bar 39 the ends of which are mounted in suitable guides on the frame elements 22 and 30, the finger 27 being carried by the rack bar 39, and adapted to be moved along the shiftable rod 28 in accordance with the shifting movement of the rack bar 39. That the finger 27 may be locked for movement with the shifting bar 28, displaceable pin 40 is mounted on the operating wheel 37, said pin being adapted to engage any one of a series of openings 41 in the rim of the wheel 18 which is next adjacent to the operating wheel 37. With the pin 40 thus engaged, the wheels 37 and 18 will rotate together, thereby causing the shafts 17 and 36 to also rotate together in locked relation, and under these conditions there will be no independent movement of the finger 27 on the shiftable rod 28, but both the finger and said rod will move together. However, when the wheel 37 is released from engagement with the wheel 18, to be moved independently thereof, the wheel 37 and the pinion 38 will be rotated, causing a shifting movement of the rack bar 39, and the finger 27 will

thereby be independently moved with respect to the shiftable rod 28. Obviously, therefore, the forward end of the gage 23 will be moved relatively to the gage 19 while the opposite end of said gage 23 will remain fixed, and thus will position the gage 23 at an angle to the gage 19, permitting the gage 23 to conform to the tapered edge of the board adjacent to the same.

The shaft 17 also carries a worm wheel 42 adapted to be engaged and to mesh with a worm 43 which is carried by a transversely-extending shaft 44. The end of said shaft 44, opposite to that on which the worm 43 is applied, is mounted in a pivoted bearing 45, which bearing is suitably connected to a support 46 for pivotal movement thereon, and splined to the shaft 44, so as to be slidable on said shaft, is a friction wheel 47 adapted to engage the face of a friction disk 48 rotatably mounted in the support 46. The friction disk 48 receives rotary movement, through beveled gears 49 and 50, from a shaft 51, which shaft is suitably journaled in relation to the support 46, and mounted on said shaft 51 is a sprocket gear 52 which receives rotation by means of a sprocket chain 53 from a sprocket gear 54 carried by the arbor of the presser roll 12. By reason of the construction just described, it will be evident that as the presser roll 12 rotates under the advancing movement of the board towards the saws of the edger, the shaft 51 will be rotated, thereby imparting rotary movement to the friction disk 48, and when the friction wheel 47 is engaged with the disk 48 the shaft 44 will also be rotated. During the engagement of the friction wheel 47 and disk 48, the worm 43 will be in engagement with the worm wheel 42, so that on rotation of the shaft 44 the shaft 17 will also be rotated, and as the wheels 37 and 18 are locked together through the pin 40, the shafts 17 and 36 will rotate together, which rotation causes the sliding rack 15 to gradually spread the movable saw away from the fixed saw (indicated by the dotted line *z* in Figure 2), and enable the same to follow the tapered edge of the board as the latter advances through the edger.

It will be understood, of course, that the feeding action of the shaft 17, by reason of the locked engagement of the wheels 37 and 18, is only desirable when tapered boards are being edged. Hence, it is only necessary that the worm 43 and worm wheel 42 shall be engaged under these conditions; otherwise, the worm 43 is urged upwardly and out of engagement with the worm wheel 42, the construction employed for this purpose being a link 55 which has a sleeved connection 56 at its upper end with the shaft 44, the link 55 being also connected at its lower end to a foot treadle 57 hingedly mounted at 58, and having at its underside a spring 59 which forces the treadle 57 upwardly when pressure is not applied to said treadle. The treadle 57 is actuated by the foot of the sawyer when he desires to obtain the automatic feed of the movable saw, as above recited, at which time he depresses the treadle 57 by the application of his foot thereto, and this swings the shaft 44 upon its pivotal bearing 45, and brings the worm 43 into engagement with the worm wheel 42, as stated.

The extent to which the movable saw may be automatically spread or closed with respect to the fixed saw may be varied in accordance with the position that the friction wheel 47 occupies in relation to the center of the friction plate 48. The farther that the friction wheel 47 is removed from the center of the friction plate 48, the greater will be the speed of the shaft 17, and vice versa when the wheel 47 is moved towards the center of the disk 48. Thus, in given lengths of boards, the opening movement of the saws for a given space is proportionate to the speed of the shaft 17. Hence, in order to regulate the spreading movement of the movable saw in relation to the fixed saw, a graduated segment 60 is employed, said segment being carried by an arm 61 extending from the support 46, a shifting lever 62 being pivoted on the arm 61 and engaged with the friction wheel 47 in such manner as to permit free rotation of said wheel, but also to enable it to be shifted along the shaft 44 in accordance with the shifting movement of the lever 62. The graduations of the segment 60 indicate the extent necessary for the lever 62 to be shifted to attain a necessary speed for the shaft 17, and said lever 62 is provided with the usual spring-controlled pawl for engagement with cooperating ratchet teeth on the segment 60, such as is commonly found in lever constructions.

In the use of the hereindescribed invention, and particularly with reference to the edging of boards the edges of which are substantially parallel, it being understood as previously explained that the fixed gage 19 is in direct alinement with the fixed saw, the positioning of the movable gage 23 will be such that it will be in direct alinement with the movable saw the sliding adjustment of which on the saw arbor 11 is effected by the sliding rack 15 in the usual way. With the movable gage 23 thus positioned, it will be apparent that any adjustment of the movable saw in relation to the fixed saw will cause a simultaneous corresponding adjustment of the movable gage 23 with respect to the fixed gage 19, so that the distance to which the movable saw is adjusted towards or from the fixed saw will establish a corresponding distance between the movable gages 23 and the fixed gage 19. In this connection, however, it will be observed that in positioning the gages 19 and 23 with respect

to the saws the same are placed so as to be in line with the inner edges of the kerfs made by these saws. Thus the minimum distance between the lines of cut of the two saws is indicated by the gages 19 and 23. With the attachment applied in the manner set forth the gages 19 and 23 are arranged a sufficient distance above the feed table 13 that when a board is placed upon the latter the same may readily fit beneath the said guides. Prior to the introduction of the board to the saws, the edge of the board which is adjacent the fixed gage 19 is moved beneath the gage 19 so that said gage will be just within the inner margin of the bark as indicated by dotted lines in Figure 2. Therefore, as the board is fed forward to the fixed saw this fixed saw penetrates the bark and cuts its thickness from the bark just outside of the wood and along the outer margin of the wood. When so positioning the board, the operating wheel 18 is operated so that through the medium of the shaft 17, and the shiftable rods 25 and 28, through the operating connections described, the movable gage 23 will be positioned over the other edge of the board, and just within the bark at the margin thereof. Inasmuch as the movable gage 23 shifts simultaneously with the movable saw, it is apparent at once to the sawyer that the line of cut of the movable saw will follow that portion of the board which is just beneath said movable gage. In the cutting of the movable saw, like the cutting of the fixed saw, the same penetrates the bark at the point immediately adjacent to the outer margin of the wood, and hence the maximum amount of lumber which is available in any board will be obtained. Regardless of the positioning of the movable saw in relation to the fixed saw, the movable gage 23 will always follow the same, and this movable gage is, therefore, adjusted in lateral relation to the fixed gage 19 to precisely the same extent that the movable saw is positioned with respect to the fixed saw, and as the distance between the fixed and movable gages 19 and 23 is the minimum width of cut, the operator is enabled to determine in a positive manner the maximum amount of lumber which can be taken from the respective boards as they are placed upon the feed table of the edger.

The operation just described is peculiarly with reference to the edging of boards having substantially parallel edges, but when it is desired to employ the attachment for use at the time that boards with tapered edges are operated on, the action is somewhat different. Under such conditions, and if the small end of the board is placed nearest the saws of the edger, one edge of the board is positioned substantially parallel with the fixed gage 19. The wheel 18 is thereupon operated to shift the end of the gage 23 which is nearest to the movable saw so that the same will be positioned at the point where it is desired the movable saw shall first penetrate the board at its small end. After this has been done, the operating wheel 37 is released from its locked engagement with the wheel 18, by properly manipulating the locking pin 40, and this permits the tubular shaft 36 to be rotated under the independent rotation of said wheel 37. The rack bar 39 will obviously be moved by the rotation of the pinion 38, thereby shifting the finger 27 so that the end of the gage 23 attached to said finger will be moved to the desired extent across the broad end of the board, and this movement is continued until the line of cut is defined by the movable gage 23. The gage 23 will, therefore, be above the bark at that edge of the board which is opposite to the edge immediately beneath the fixed gage 19. The wheel 37 is now locked into engagement with the wheel 18, and the friction wheel 47 having been positioned at the proper point on the face of the friction disk 48, the sawyer depresses the treadle 57, thereby engaging the worm 43 with the worm wheel 42. As the board is fed into the edger, the plate 48 is rotated, causing the operation of the shafts 17 and 36 as previously explained, and as the board advances through the edger the movable saw is gradually spread away from the fixed saw, following the taper of the board, and thereby trimming off the bark, as previously explained.

While the operation just described has reference to the conditions which prevail when a tapered board is fed with its narrow end introduced first to the saws, it will be understood that the broad end of a tapered board may also be first introduced to the saws, under which condition the adjustment of the parts will be just the reverse of what has been described when the narrow end is first presented; also that the friction wheel 47 will be positioned at the opposite side of the center of the disk 48 to that which it occupies when operating first upon the narrow end, in order to reverse the direction of movement of the shaft 44 and its connections with the shaft 17, and thus close the movable saw towards the fixed saw during the feeding of the board instead of spreading it from the fixed saw, as is the case when operating upon the board with its narrow end first presented to the saws. The saw used in such an operation is comparatively small and has a heavy swage, which permits, in practice, of a crowding of as much as eight inches in sixteen feet of cut.

That the operator may determine the position of the lever 62 on the graduated segment 60, the rod 28 is also provided with graduations indicating the amount of taper in a given length.

From the foregoing description it will be apparent that in the use of the hereindescribed attachment a positive means of indicating the exact lines of cut of the saws is provided; that as the gages 19 and 23 indicate these exact lines of cut in advance of the actual cutting of the saws, it is possible to so position the saws with respect to the edges of the boards that there shall be no waste of the lumber, and that these gages also provide means by which it is possible to always insure boards free from irregular edges, due to portions of the bark remaining thereon, and thus prevent imparting the commercial value of the lumber by reason of such irregular edges.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. An attachment for saw mill edgers, comprising a fixed gage arranged in alignment with the fixed saw of the edger, a movable gage associated with the fixed gage, one end of said movable gage being arranged in alignment with the movable saw of the edger and adjustable in relation to the fixed gage simultaneously with the adjustment of the movable saw in relation to the fixed saw, and means for effecting adjustment of the other end of the movable gage independently of the adjustment of the first-mentioned end thereof, whereby to incline the movable gage in angular relation to the fixed gage.

2. An attachment for saw mill edgers, comprising a fixed gage arranged in alignment with the fixed saw of the edger, a movable gage associated with the fixed gage, one end of said movable gage being arranged in alignment with the movable saw of the edger and adjustable relatively to the fixed gage simultaneously with the adjustment of the movable saw in relation to the fixed saw, means for effecting the adjustment of the movable gage in parallel relation to the fixed gage, and means for also effecting an independent adjustment of the other end of the movable gage, whereby to incline the movable gage in angular relation to the fixed gage.

3. An attachment for saw mill edgers, comprising a fixed gage arranged in alignment with the fixed saw of the edger, a movable gage one end of which is arranged in alignment with the movable saw of the edger and adjustable relatively to the fixed gage simultaneously with the adjustment of the movable saw in relation to the fixed saw, means for effecting said adjustment of the end of the movable gage, a mounting for the other end of the movable gage capable of adjustment independently of the adjustment of the first-mentioned end, whereby to incline the movable gage in angular relation to the fixed gage, means for effecting the independent adjustment of said mounting, and means for locking together the adjusting means for the two ends of the movable gage, whereby to effect adjustment of the movable gage in preserved parallel relation to the fixed gage.

4. An attachment for saw mill edgers comprising a fixed gage arranged in alignment with the fixed saw of the edger, a movable gage associated with said fixed gage, one end of said movable gage being arranged in alignment with the movable saw of the edger and adjustable relatively to the fixed gage simultaneously with the adjustment of the movable saw in relation to the fixed saw, an operating shaft, connections between said operating shaft and said end of the movable gage for adjusting the position of said end by the operation of said shaft, a mounting for the other end of the movable gage adjustable independently of the adjustment of the first-mentioned end of said movable gage, a second shaft, and connections between said second shaft and said mounting, whereby to actuate the latter when said second shaft is operated to effect the independent adjustment of the mounting for positioning the movable gage in inclined relation to the fixed gage.

5. An attachment for saw mill edgers, comprising a fixed gage arranged in alignment with the fixed saw of the edger, a movable gage associated with said fixed gage, one end of said movable gage being arranged in alignment with the movable saw of the edger and adjustable relatively to the fixed gage simultaneously with the adjustment of the movable saw in relation to the fixed saw, an operating shaft, connections between said operating shaft and said end of the movable gage for adjusting the position of said end by the operation of said shaft, a mounting for the other end of the movable gage adjustable independently of the adjustment of the first-mentioned end of said movable gage, a second shaft, connections between said second shaft and said mounting, whereby to actuate the latter when said second shaft is operated to effect the independent adjustment of the mounting for positioning the movable gage in inclined relation to the fixed gage, and means for locking said shafts together, whereby to adjust both ends of the movable gage in unison, and thereby permit adjustment of the movable gage relatively to the fixed gage in preserved parallel relation.

6. The combination with a saw mill edger including fixed and movable saws, an operating shaft, and connections between said operating shaft, and the movable saw of the edger, whereby said shaft is adapted to adjust the movable saw with respect to the fixed saw, of means for automatically actuating said shaft for operating the movable

saw with respect to the fixed saw during the advancing movement of a board through the edger, and manually-operated means for controlling the automatic feeding of the movable saw.

7. The combination with a saw mill edger including fixed and movable saws, an operating shaft, and connections between said operating shaft and the movable saw of the edger, whereby said shaft is adapted to adjust the movable saw with respect to the fixed saw, of driving connections interposed between one of the rotating shafts of the edger and said operating shaft for automatically operating the movable saw with respect to the fixed saw during the advance of a board through the edger, and a variable-speed controlling device included in said driving connections.

8. The combination with a saw mill edger including fixed and movable saws, an operating shaft, and connections between said operating shaft and the movable saw of the edger, whereby said shaft is adapted to adjust the movable saw with respect to the fixed saw, of a pair of gages associated with the edger, one of said gages being fixed and arranged in alignment with the fixed saw, one end of the other gage being arranged in alignment with the movable saw and adjustable simultaneously therewith, a mounting for the other end of the movable gage and independently adjustable with respect to the first-mentioned end of said gage, a tubular shaft surrounding the operating shaft of the edger, connections between said tubular shaft and said mounting for effecting adjustment of the mounting, whereby to position the movable gage in inclined relation to the fixed gage, and means for automatically operating the movable saw in relation to the fixed saw during the advancing movement of a board through the edger.

9. The combination with a saw mill edger including fixed and movable saws, an operating shaft, and connections between said operating shaft and the movable saw of the edger, whereby said shaft is adapted to adjust the movable saw with respect to the fixed saw, a pair of gages associated with the edger, one of said gages being fixed and arranged in alignment with the fixed saw, one end of the other gage being in alignment with the movable saw and adjustable simultaneously therewith when the movable saw is adjusted in relation to the fixed saw, a mounting for the other end of the movable gage, said mounting being adjustable independently of the first-mentioned end of the movable gage, a tubular shaft surrounding said operating shaft, connections between said tubular shaft and said mounting for adjusting the latter, releasable means for locking the operating and tubular shafts together, and driving connections for automatically operating the movable saw with respect to the fixed saw during the advancing movement of the board through the edger.

10. The combination with a saw mill edger including fixed and movable saws, an operating shaft, and connections between said operating shaft and the movable saw of the edger, whereby said shaft is adapted to adjust the movable saw with respect to the fixed saw, of a pair of gages associated with the edger, one of said gages being fixed and arranged in alignment with the fixed saw, one end of the other gage being in alignment with the movable saw and adjustable simultaneously therewith when the movable saw is adjusted in relation to the fixed saw, a mounting for the other end of the movable gage, said mounting being adjustable independently of the first-mentioned end of the movable gage, a tubular shaft surrounding said operating shaft, connections between said tubular shaft and said mounting for adjusting the latter, releasable means for locking the operating and tubular shafts together, driving connections for automatically operating the movable saw with respect to the fixed saw during the advancing movement of the board through the edger, and a variable-speed controlling device included in said driving connections.

In testimony whereof I affix my signature.

L. R. FOREMAN.