

1,101,285.

W. F. HUTCHINSON.
MATCH SPLINT MACHINE.
APPLICATION FILED FEB. 24, 1913.

Patented June 23, 1914.

3 SHEETS-SHEET 1.

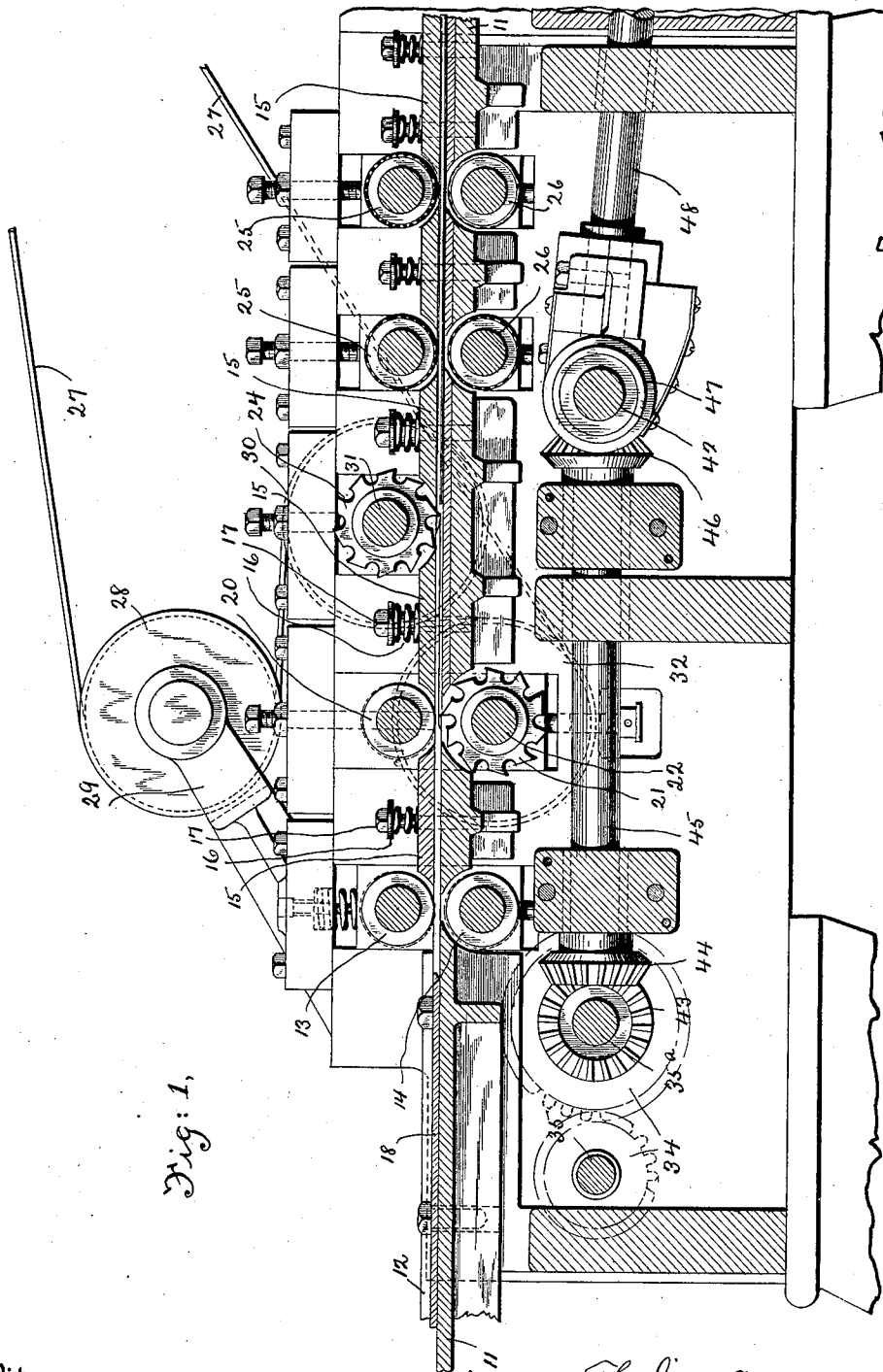


Fig. 1,

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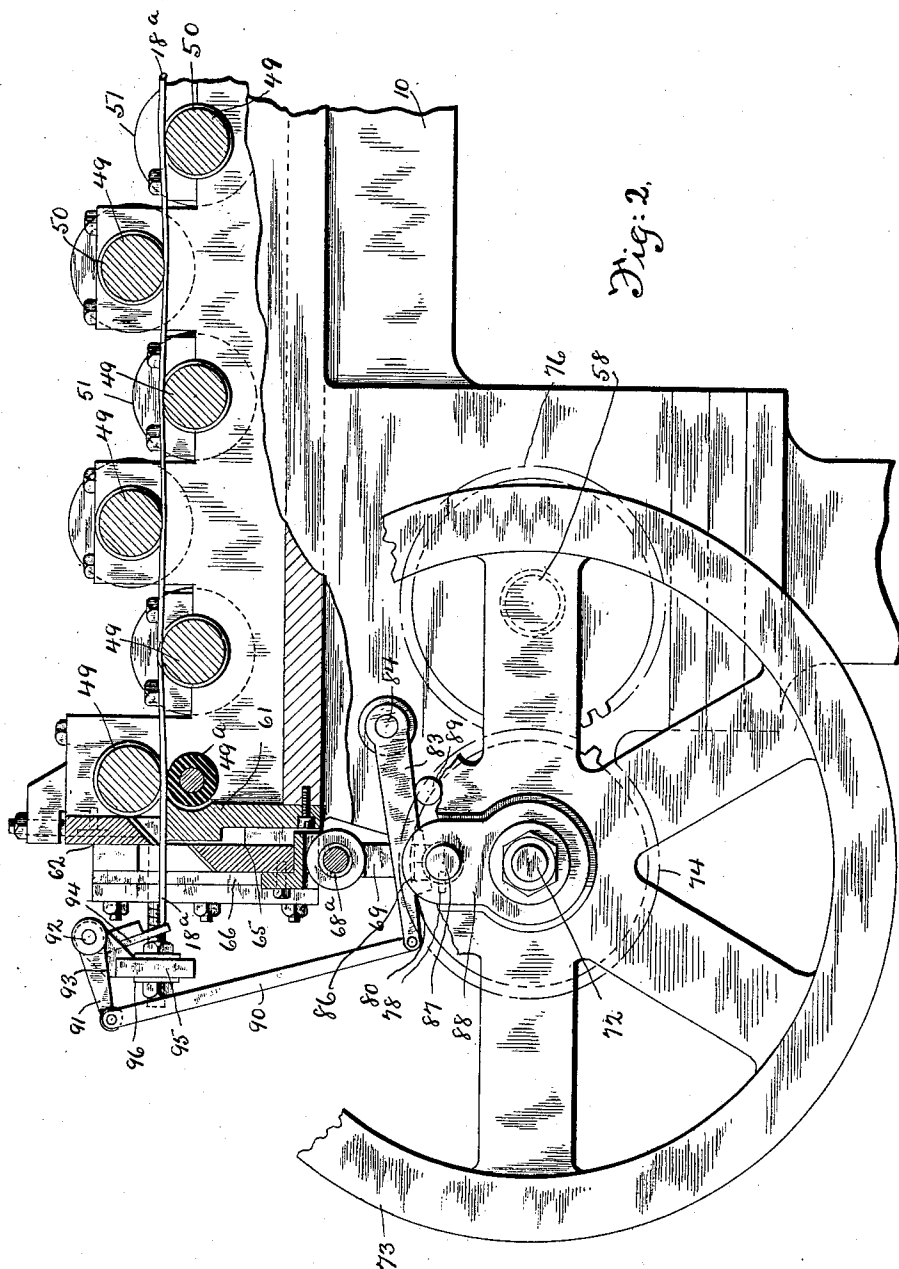


Fig. 2.

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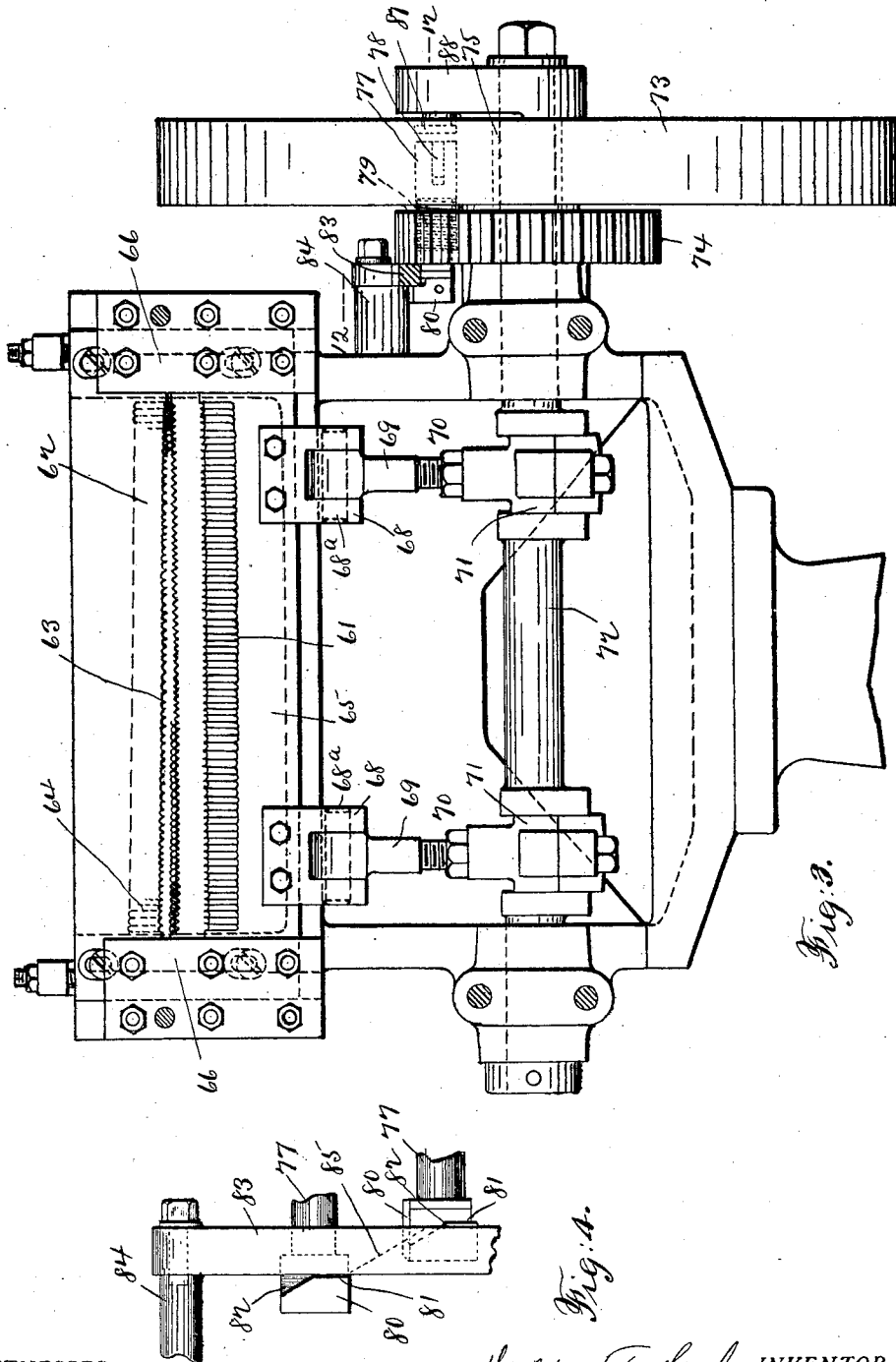
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3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

WILLIAM F. HUTCHINSON, OF VALATIE, NEW YORK, ASSIGNOR TO MATCH SUPPLY COMPANY, OF VALATIE, NEW YORK, A CORPORATION OF NEW YORK.

MATCH-SPLINT MACHINE.

1,101,285.

Specification of Letters Patent.

Patented June 23, 1914.

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To all whom it may concern:

Be it known that I, WILLIAM F. HUTCHINSON, of Valatie, Columbia county, New York, have invented a new and useful Improvement in Match-Splint Machines, of which the following is a full, clear, and exact description.

My invention relates to improvements in machines for making match splints, although the machine can be used for cutting other similar articles from sheet stock.

My present invention is intended to cut from a sheet of veneer fed into the machine lengthwise of the grain, a large series of splint forming members which will be held in parallel relation, properly shaped, and cut off into lengths suitable for matches.

In the formation of splints it has been found a very difficult matter to shape them in long lengths and in multiples of the matches to be made, and at the same time level the splint ends and cut them off accurately so that there shall be no variation in the length of the formed splints.

The object of my present invention is to produce a machine of this kind in which a great number of splint forming members can be simultaneously shaped and cut from a strip of stock, in which the splints will be more nicely and accurately cut than is usual, and in which the several parallel splint members are projected endwise against an abutment which serves to level the ends of the splints, and then set in motion the cut-off mechanism so that when a series of individual splints are cut, they will all be of the same length. This is very important because such splints are usually fed into match dipping machines, and if the splints vary at all in length, the result will be that a great many imperfect matches will be formed. In machines of this class, heretofore, a difficulty has been experienced in cutting off as accurately as stated, and moreover the splint forming members have usually been fed and gripped by feeding devices which have not allowed for individual variations in the thickness of some of the splints, due to imperfections in wood, or otherwise, and as a result the feed has been imperfect; but in my machine, after the splint forming members are shaped, separate feeding devices grip the splint forming members and carry them quickly and at an accelerated speed, away from the forming

mechanism, and the aforesaid gripping devices are staggered and arranged so that they are sure to positively engage every splint forming member, so that the said members are carried forcibly to the cut-off mechanism, and are leveled as aforesaid at which point they set the cut-off mechanism in motion. These and other advantages will appear clearly from the description which follows.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a vertical longitudinal section through the splint forming portion of the machine. Fig. 2 is a vertical longitudinal section partly in elevation, through that part of the machine which carries and cuts off the formed stock. Fig. 3 is a rear end view partly in section, of the machine, and Fig. 4 is a detail of a part of the clutch mechanism for actuating the cut-off.

The machine is provided with a suitable frame 10 which can be of any approved design, and which is provided with a table 11 extending longitudinally through the splint forming part of the machine, the front end of the table serving as a feed table, on which the stock 18 to be cut, is placed, and this strip of stock is fed lengthwise through the machine and shaped and divided into splint forming members 18^a, which are cut off to form match splints or sticks. The table 11 has suitable guides 12 at the sides, and as the sheet stock is fed into the machine, it is grabbed by the corrugated or roughened feed rollers 13 and 14, which are arranged above and below the table, and grip the stock through an opening in the table in a manner customary with machines of this kind, and they carry the stock forward beneath the presser foot 15 to the cutters. There is a series of these presser feet 15, spaced apart over the table between the several cutters and feed rollers, and they are not claimed as novel. As arranged they are pressed downward on the stock by springs 16 arranged on bolts 17, and they serve to hold the stock flat as it progresses through the machine. The surface of the table after it passes the first cutter 21 presently referred to, is corrugated to fit the stock, and the presser feet, after the stock

passes the second cutter 24, are correspondingly corrugated or grooved on the under side, so that the stock whether shaped or only partly shaped, is accurately guided at all times. The feed rollers 13 and 14 are geared together as usual in such structures, and are held in adjustable bearings which are not referred to in detail, as this arrangement is common to machines of this type.

After leaving the feed rollers 13 and 14, the stock is, on the under side, cut partly through at intervals by the cutter 21, which I have not here claimed as new, and is carried by a shaft or mandrel 22. This cutter is shaped to give the desired cross section shape to the stock. As the stock is fed forward from the first cutter 21, it passes beneath the first of the series of presser feet 15 to the second cutter 24, which is exactly like the cutter 21, and is arranged above the table so as to cut through the stock from the other side, and complete the shaping of the splint members 18^a. As the splint members leave the second cutter, they are complete as to shape, and in every way except as to length, and they are carried along through the machine beneath a series of presser feet 15, by feed rollers 25 and 26, which are arranged one above the other so as to impinge on the splint members, and it will be noticed that the table 11 and presser feet 15, are at this point grooved or corrugated, as already described, so that there is no possibility of the splint members being displaced or their parallel arrangement changed. This is essential for the formation of perfect splints.

The driving mechanism for the above parts is not important, but I have shown it and shall refer to it in a general way so that the operation can be understood. As illustrated (see Fig. 1) the machine is driven from the belt 27 which passes over an idle pulley 28 on the bracket 29 at the top of the machine, thence over the second pulley 30 on the shaft 31 of the cutter 24, and thence around a pulley 32 on the shaft 22 of the cutter 21. Beneath the forward part of the machine are parallel shafts 35 and 35^a which are geared together as shown at 34 in dotted lines, and the shaft 35 can be driven in any suitable manner.

The several feed rollers 25 and 26 above referred to should be geared together so that the stock will be fed progressively through the machine. The shaft 35^a above referred to, connects by gears 43 and 44 with a longitudinal shaft 45 which is mounted in suitable bearings on the machine frame, and connected by gears 46 and 47 with the shaft 42, and thus drives this shaft. The shaft 42 is geared to a longitudinal shaft 48 which extends rearward through the machine, and serves to drive the delivery and cut-off mechanism which will now be described.

When the formed splint members 18^a leave the mechanism shown in Fig. 1 which shapes them, they are gripped by a series of gripping rollers 49 (see Fig. 2) and carried rapidly away from the forming mechanism so that there will not be the slightest danger of the stock becoming clogged or the splint members becoming broken through any clogging. These gripping rollers 49 are driven at a higher rate of speed than the rollers 25 and 26, so that clearance is thus provided, and an important difference from the usual arrangement of feed rollers lies in the fact that the rollers 49 are staggered as shown in Fig. 2, the top surface of one roller being a little higher than the lower surface of the next adjacent roller, so that each individual splint member 18^a is sure to be independently and positively gripped. This arrangement is suitable for stock having any degree of flexibility, because the stock will buckle slightly as the drawing shows in an exaggerated way, and as it is straightened out when cut off, it will not interfere with the formation of good splints.

It will be noticed by reference to Fig. 2 that the rollers 49 are grooved circumferentially as shown at 50 to fit the splint forming members. This grooving of the rollers is not novel, however. The rollers 49 can be driven in any suitable manner, and are shown provided with driving pulleys 51.

I will now describe the cut-off mechanism which cuts the splint members into individual splint lengths. As the splint members 18^a leave the gripping rollers 49, they are discharged finally beneath the roller 49 (see Fig. 2) and between it and the bearing roller 49^a which is preferably yielding, and can be made of rubber. The splint members 18^a pass out at the rear of the machine over the guide bar 61, the upper edge of which is grooved or corrugated as shown in Fig. 3, to fit the splint members. At this point the several splint members pass beneath a stationary knife 62 which is suitably supported on the machine frame, and which should have a suitable means of adjustment, as is customary to such knives, the knife having its edge corrugated to fit the splints, and with the corrugations extending along the bevel of the knife as shown at 63 and 64 in Fig. 3. A second knife 65 is arranged below and a little in the rear of the knife 62, and is correspondingly shaped and arranged to shear through the several splint members 18^a, and across the stationary knife 62. By having these knife edges arranged so that they shear by each other, and by having them shaped to fit the splint members 18^a, I get a perfect cut, and the ends of the splint members are left smooth and in good condition for insertion in the carrier of a match machine, and also in good condition to receive the firing composition

which is applied to the end of the splints. The knife 65 can be actuated in any convenient way, but I have shown the preferred means. The knife slides in suitable guideways 66, and has at the lower edge pairs of ears 68 between which are pivoted as shown at 68^a the pitmen or connecting rods 69 which connect with the eccentrics 71 on the shaft 72 which is mounted transversely in the machine frame, and is provided with a fly-wheel 73. This fly-wheel is turned by a gear wheel 74, and both fly-wheel and gear-wheel are mounted on a bushing 75 which is shown by dotted lines in Fig. 3 and which turns on the shaft 72. The gear-wheel 74 can be driven by any suitable gear wheel, as for instance the gear 76 on the shaft 58, and it will be seen that the cog-wheel 74 and fly-wheel 73 are in constant rotation.

Extending transversely through a part of the fly-wheel 73 and gear wheel 74, is a slide pin 77 which is keyed to the fly-wheel 73 as shown at 78, so that it will not turn over but will always be in the right position for operation, as presently described. This pin is normally pressed out by a spring 79 which is coiled around a reduced part of the pin as shown in Fig. 3, and the inner end of the pin is provided with a head 80, the inner portion of which is cut away so as to produce a shoulder 81 and an inclined wall 82 which merges into the shoulder. The object of this head is to provide for pulling the pin 77 inward and for releasing it to the pressure of the spring 79 to control the cut-off mechanism. This is done by means of a setting arm 83 which is pivoted on the machine frame as shown at 84, and which has an inclined under-cut portion on the under side as shown at 85, this inclined part merging into the shoulder 86. The pin 77 when pushed out by the spring 79 is adapted to strike an abutment in the form of a pin 87, which is carried by the arm 88, the latter being fast to the shaft 72 above referred to. Obviously this abutment can be in any other form, without affecting its operation. When the pin 77 is pressed out so as to strike the abutment 87, it will be seen that the arm 88 will be carried along with the fly-wheel 73 and gear-wheel 74, and consequently the shaft 72 will be rotated and the knife 65 started so as to move up across the knife 62 and sever the splint members 18^a. The object of having this controlling mechanism for the cut-off is to enable the splints to be all cut of a length, and this is done by having the splints act to first level themselves and then actuate the setting arm 83 to start the cut-off in operation.

Referring again to the setting arm, and especially to Fig. 4 which is partly diagrammatic, it will be seen that when the arm is

raised, the spring 79 will be free to push the pin 77 into engagement with the abutment 87; but when the arm is lowered, the inclined or cam surface 85 of the arm 83 will strike the incline 82 of the pin 77 as shown at the lower part of Fig. 4, and pull the pin inward as shown in the second position in Fig. 4. The parts are arranged so that this inward movement will occur just before the pin 77 comes opposite the abutment 87, and so the pin 77 will pass the abutment without striking it and there will be no movement of the cut-off mechanism. The pin 89 (see Fig. 2) is arranged in the machine frame so as to prevent the arm 83 from dropping too far. At its free end the arm 83 is pivoted to a link 90 which is also pivoted to a crank 91 on the shaft 92 (see Fig. 2) which is supported in a bracket 93, and which has a depending leveling plate 94 extending across the rear end of the machine and in the path of the splint forming members 18^a, this leveling plate 94 having also a crank connection with the shaft 92 and adapted to swing back against a plate 95 at the limit of its movement.

From the description just given it will be seen that when the splint members 18^a are forced through the rear end of the machine they will come into contact at their ends with the plate 94. It will further be seen that the bracket 93 is carried by the plate 95, and that this is adjustable in the frame by means of the screws 96, so that by setting the screws properly, the length of the splints to be cut can be nicely regulated. When the splint forming members 18^a strike the leveling plate 94, any irregularities in length will be overcome, because the resistance is sufficient to cause the most advanced splint members to slip slightly in the gripping rollers 49, and at the time the plate 94 is swung back by pressure from all the splints, their ends will be level, and at this moment the crank 91, link 90 and arm 83 will be lifted sufficiently to free the pin 77 which will strike the abutment 87 and turn the shaft 72 so as to quickly move the knife 65 through the stock, thus cutting the splint members into individual splints.

From the foregoing description it will be seen that I have disclosed means for cutting a sheet of stock into relatively long individual members, that these are gripped and carried quickly away from the cutting and forming mechanism so as to obviate any clogging, and that means is provided for securing absolute uniformity in the lengths which are cut off. This last is a very important matter, as with rotary cutting machines of the general kind disclosed, that is where the stock is first shaped in long parallel members, it has heretofore been found almost impossible to secure uniformity of length in the splints.

I claim:

1. In a machine of the kind described, means for shaping stock into relatively long slender members, means for feeding the
5 shaped members in parallel relation, a quick cut-off device to sever the stock transversely and without interrupting the feed of the stock, a movable leveling plate in the path
10 of the stock members, said leveling plate acting first to level the ends of the stock members and then start the cut-off device, and means for adjusting the movement of the leveling plate.
2. A machine of the kind described comprising means for shaping stock into relatively long slender parallel members, an un-
15 interrupted feed for carrying the stock forward with the members in parallel relation, a quick acting cut-off device to sever the
20 members without interrupting the feed, a clutch for operating the cut-off device, and

a plate or abutment in the path of the formed stock members, said abutment acting first to level the ends of said stock members and then start the clutch and cut-off. 25

3. A machine of the kind described comprising means for shaping stock into relatively long parallel members, means for feeding the members in parallel relation, a cut-off device, a clutch for operating the
30 cut-off device, a leveling plate or abutment in the path of the formed stock members, said abutment having a movement in the direction of the stock and acting first to level the ends of said stock members, and
35 then start the clutch and cut-off, and a limiting plate adjustably supported behind the leveling or abutment plate.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."