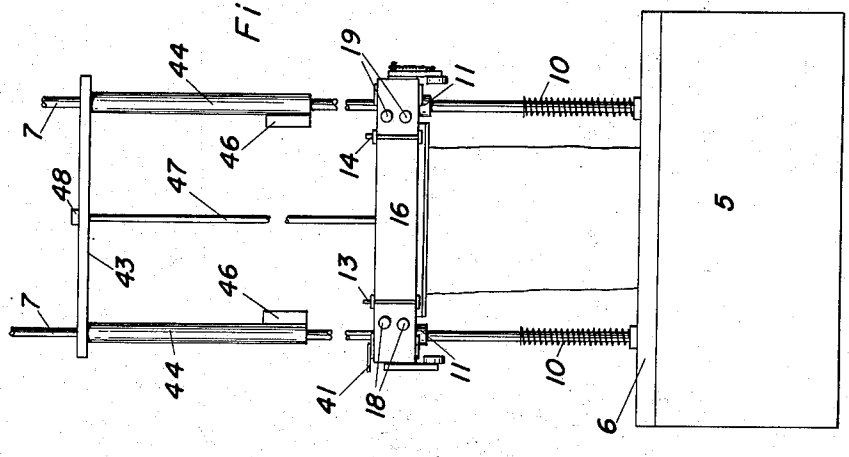
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APPARATUS FOR SPLITTING WOOD BLOCKS

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Fig 2



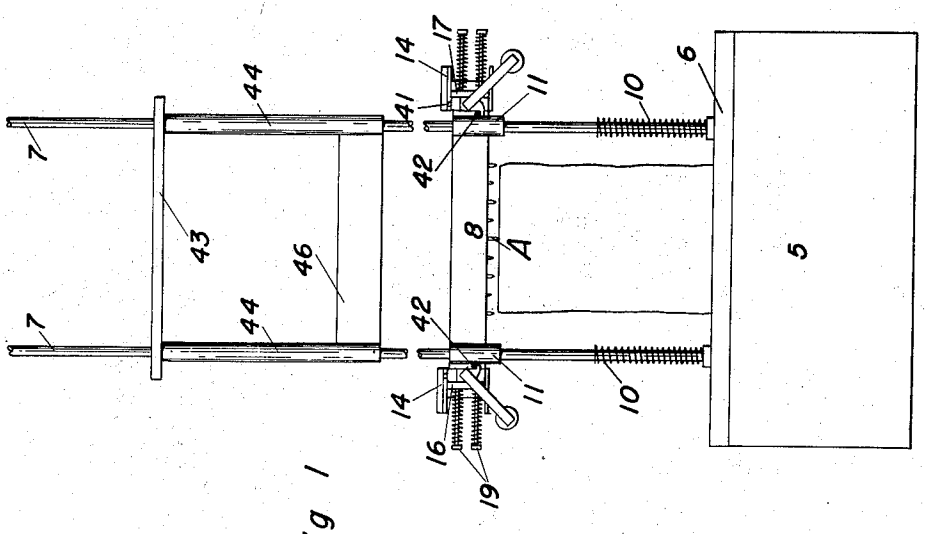


Fig 1

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APPARATUS FOR SPLITTING WOOD BLOCKS

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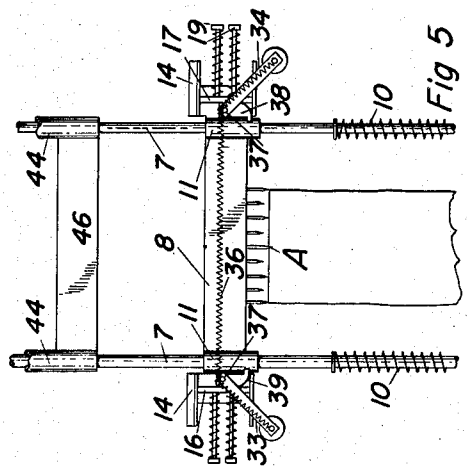


Fig 5

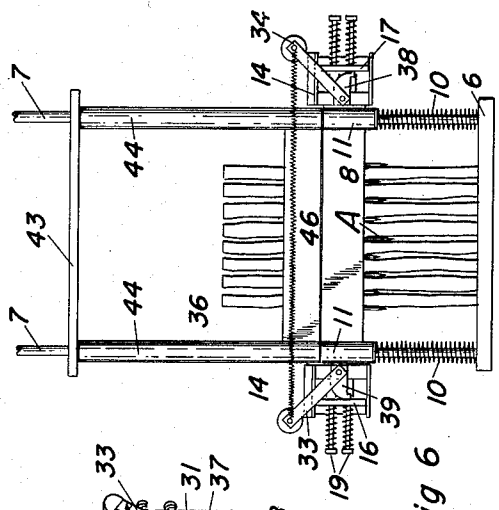


Fig 6

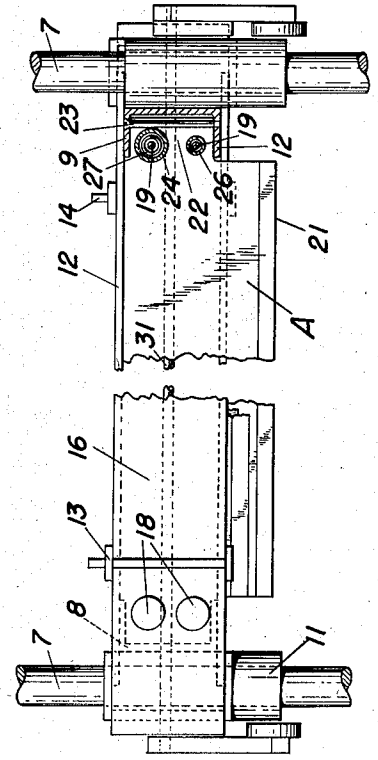


Fig 4

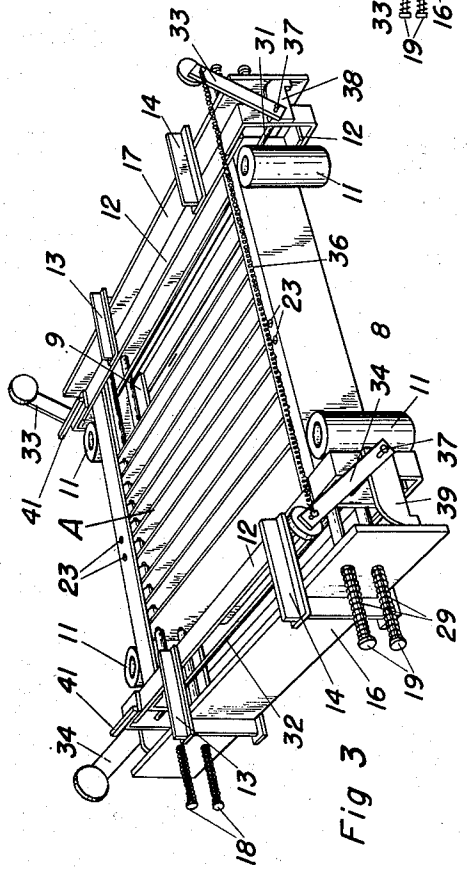


Fig 3

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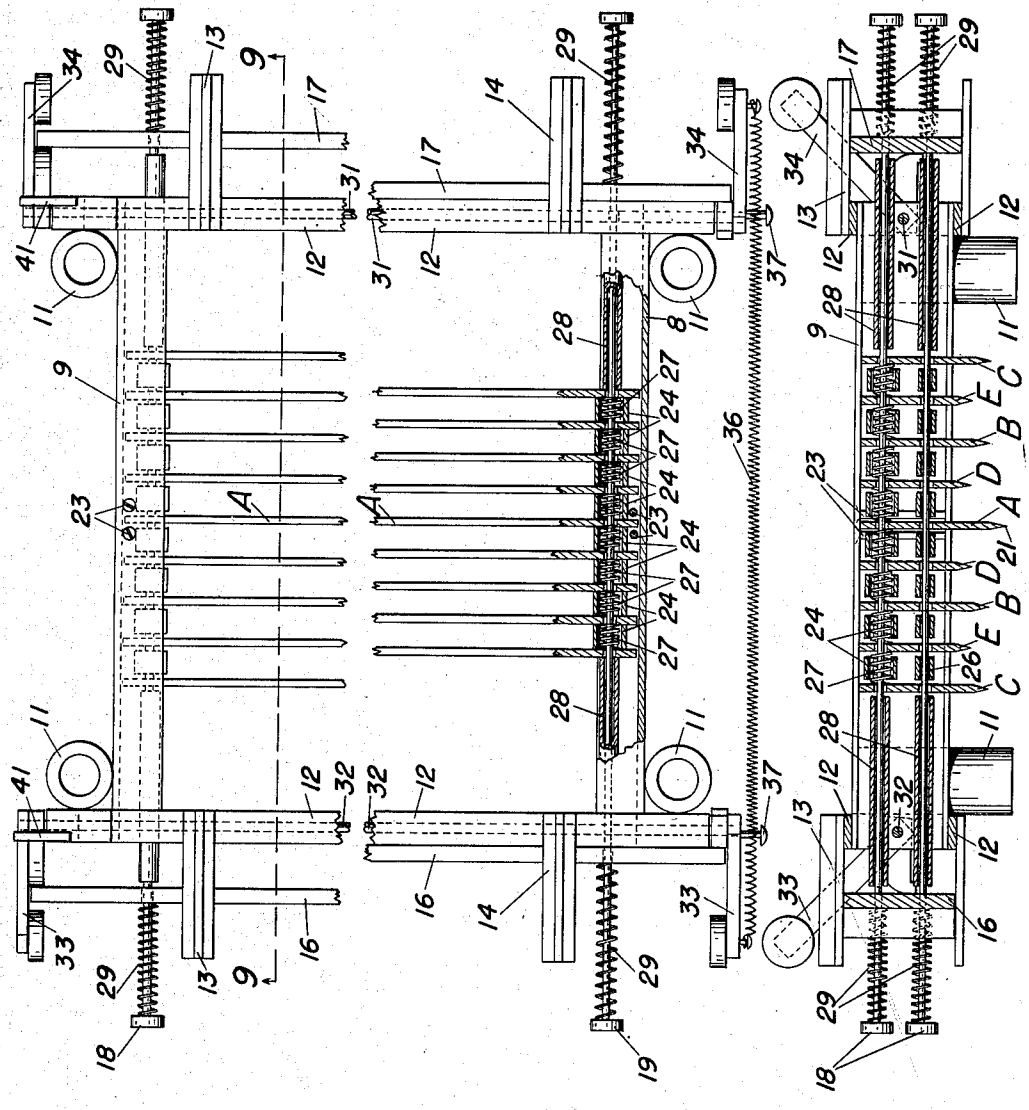


Fig 7

Fig 8

Fig 9

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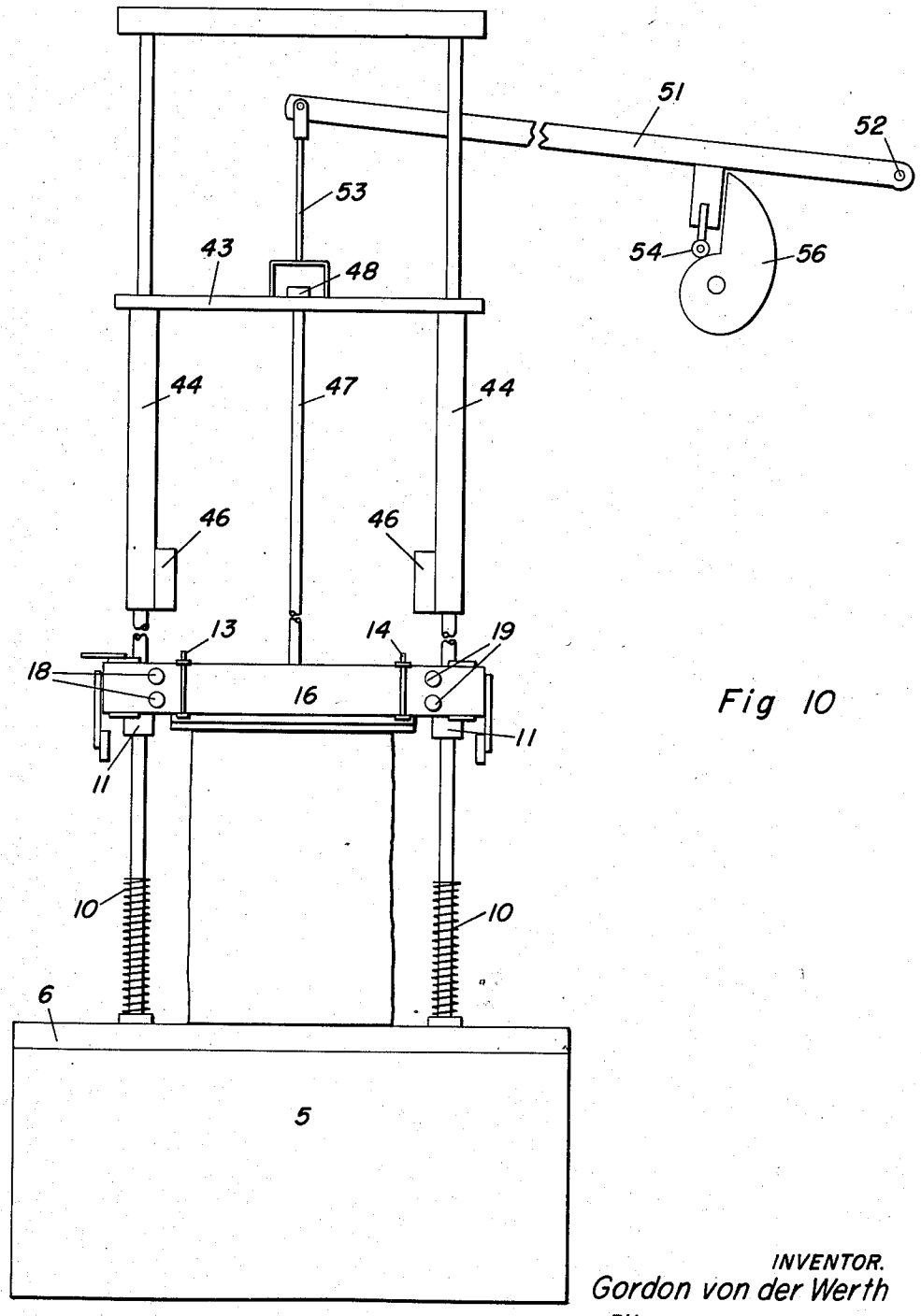


Fig 10

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APPARATUS FOR SPLITTING WOOD BLOCKS

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Application October 2, 1946, Serial No. 700,622

6 Claims. (Cl. 144—193)

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This invention relates to a method and apparatus for splitting wood blocks.

The principal object of this invention is to produce a machine wherein wooden blocks may be split for the purpose of forming wooden shakes.

A further object is to produce a machine wherein a plurality of slabs are simultaneously split from a single block which results in mass production in contradistinction to the former method of producing one slab at a time from which slabs the shakes are cut.

A further object is to produce a machine whereby the splitting blade will be automatically released from a fixed position so as to freely follow the grain of the wood during the splitting operation.

A further object is to provide means whereby all of the blades engaging the block previous to any splitting operation are at an equal distance one from the other.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Fig. 1 is a front elevation of my machine.

Fig. 2 is a side elevation looking from the right of Fig. 1.

Fig. 3 is a perspective view on an enlarged scale showing the blade carrier.

Fig. 4 is a side elevation of the blade carrier as viewed from the left hand side of Fig. 1 and showing a portion thereof in cross section.

Fig. 5 is a fragmentary rear elevation of Fig. 1 at the moment of initial contact of the blades with the block to be split.

Fig. 6 is a view similar to Fig. 5 showing the blades imbedded in the block during the final splitting operation.

Fig. 7 is an enlarged fragmentary top plan view of the blade carrier with the blade in splitting position as shown in Fig. 6.

Fig. 8 is a view similar to Fig. 7 showing the blades in the initial contacting position of Fig. 5 and partly in cross section, and

Fig. 9 is a cross sectional view taken on the line 9—9 of Fig. 7 and showing the spacers in cross section.

Fig. 10 is a side elevation, similar to Fig. 2, and showing the means for raising and lowering the weight for driving the blades into the block.

In the making of shakes it is common practice to saw into predetermined lengths, substantially rectangular logs. The resulting blocks thus

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formed by the sawing operation are then split lengthwise of the grain so that wooden slabs are formed. These slabs are later sawed diagonally of their length to form tapered shakes.

In order to accomplish this splitting operation it has been standard practice to employ a splitting knife which is forced downwardly through the block in any desired manner, to then split off and remove a portion of the block, to then again engage the knife with the top of the block and split off another portion. In this manner a block is finally split into a number of slabs which can then be resawed to form shakes. Such a method does not lend itself to mass production.

It is, of course, obvious that by splitting shake-slabs in this manner the resulting slabs are far from uniform as to thickness; consequently, the shakes sawed therefrom will vary with the varying thickness of the slabs from which they are cut. Also, the process is slow which results in a high cost of production for slabs of very inferior quality.

Applicant has devised a method and a machine for splitting blocks of a predetermined length, which blocks are placed upon a suitable support after which a blade carrier is moved downwardly thereagainst with sufficient force to initially set a plurality of different length blades in the end grain of the block, all of which blades at this time being held at a predetermined distance one from the other, and to then release the blades so that they are capable of movement sidewise with respect to each other and also so that they may cant in following the grain of the wood.

Further movement of the blades through the block is effected by downward pressure upon the carrier preferably exerted through a blow struck on the carrier a short interval of time after the blades have first engaged the block, the result being that as the blades travel downwardly through the block the physical width dimension of the block will increase due to the splitting action plus the thickness of the blades passing between the various slabs into which the block is being split; consequently, both the slabs being split and the blades causing the splitting must move sidewise in order to maintain a uniform width of slab from top to bottom.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates a support upon which is mounted a base block 6 which serves to position a plurality of spaced guide rods 7, the same being preferably arranged in a rectangular formation so as to slid-

ably support a blade carrier comprising a pair of parallel channels 8 and 9, each having collars as shown at 11, which slide upon the guide rods 7, engaging springs 10 on the rods 7 when at the bottom of their travel as will be later seen.

These channels are connected together by spaced bars 12 which serve to support the spaced guides 13 and 14, between which is slidably mounted pressure plates, as shown at 16 and 17, the pressure plates 16 and 17 being spaced on opposite sides of the blade carrier. These plates 16 and 17 in turn serve to support adjacent each end theerof a pair of vertically disposed blade carrying rods as shown at 18 and 19.

The rods 18 are parallel and adjacent to the channel 9 while the rods 19 are parallel and adjacent to the channel 8 and form supports for a plurality of blades, the configuration of which is best shown in Fig. 4, i. e., the blade A has a cutting edge 21 and tongues 22 which rest in the channels 8 and 9 and are loosely and slidably mounted on the rods 18 and 19.

Referring now to Fig. 9, it will be noted that the blade A is the center blade and while loosely mounted on the rods 18 is prevented from moving sidewise to any extent by pins 23, the purpose of which will be later seen. Also, in this figure it will be noted that positioned on opposite sides of the blade A are long blades B and C and short blades D and E and that all of these blades are spaced an equal distance apart through the medium of spacers 24 and 26 positioned on the rods 18.

The length of the blades, that is from cutting edge to back, is of utmost importance for two reasons, in that in using staggered lengths it spreads the sidewise movement of the wood over a longer period of time for a given downward movement of the blades, and secondly, the shortest blades enter the block after the longer blades on either side have already been well set in the block; hence these shorter blades cannot become misaligned while the longer blades are in the process of sidewise movement.

Taper is also important inasmuch as it is desirable that the wood be compressed to some degree before splitting takes place. The taper is designed so that the block will not actually be split until all of the longest blades have entered the block. Then the splitting by all blades takes place in rapid succession with regard to their individual lengths.

The spacers 24 have housed therein springs 27, and also elongated spacers 28 extend from the blades C and abut either the plate 16 or 17, as the case may be, when the blades are in the held position as shown in Fig. 8.

Springs 29 are carried on the outer ends of the rods 18 and 19 and tend to move the plates 16 and 17 against the spacers 28; therefore, at the moment when the blades start to enter the block no difficulty is experienced from the sidewise movement of the leading edge by the very fact that this sidewise movement is taking place and causing a twisting action on a very small portion of the blades concerned (the cutting edge). The springs, therefore, have been placed only on the rods near the top portion of the blades to counteract this action. The springs aid in the sidewise movement of the upper portion of the blades under friction developed by pressure of the blade against the carrier as well as aiding in the actual sidewise movement of the block being split. Pressure is relieved from these springs 27 automatically by the controlled action of the guided plates 16 and 17 compressing the tension springs 29.

Mounted between and parallel to the spaced bars 12 are rotatable shafts as shown at 31 and 32 and secured to the ends of these shafts are weighted arms 33 and 34 respectively which form a blade releasing device.

A spring 36 extends between two of the arms (see Fig. 3), and is adapted to engage pins 37 on each of the arms when the arms are in down position (see Fig. 5).

Also, secured to the shafts 31 and 32 are cam members, as shown at 38 and 39 respectively, which cam members, when in the position of Fig. 3, push against the plates 16 and 17 respectively, holding them against tension of the springs 29, thus releasing the blades and permitting the springs 27 to function as illustrated in Fig. 9. Tension springs 29 are of sufficient strength to overcome resistance of springs 27 and insure sufficient rigidity of the blades in cutting position as well as being flexible enough to allow for maximum sidewise movement without offering too much resistance to cams 38 and 39. Further, when the arms 33 and 34 are in the position of Fig. 3 they will engage stops 41 to prevent further upward movement of the arms 33 and 34 through the action of the spring 36.

When the cams 38 and 39 are in their lowered position so as to move the plates 16 and 17 inwardly the cams will engage the pins 42 (see Fig. 1), thus limiting the downward movement of the arms 33 and 34. It will thus be apparent that when the arms 33 and 34 are in the lowered position of Fig. 5 the blades will all be held in uniform spaced relation and when the arms are moved to the position of Fig. 6, that the blades will be free to move upon the rods 18 and 19 and to follow the grain of the block being split.

In review, the blade releasing device is inertia operated, controlled by the downward movement of the blade carrier. It consists of guided pressure plates 16 and 17 and a weighted cam arm device. At this point cognizance should be taken of the fact that the cam action and that of plates 16 and 17, though interrelated are completely independent of each other in action.

To further explain this, it should be pointed out that the sidewise movement of these plates is initially controlled by the blades themselves inasmuch as the blades, due to taper and number, move sidewise two to three times faster than the downward movement of the carrier or upward movement of the cam arms 33 and 34. This action is highly significant and desirable as it allows the blades to enter the block under the guided action of the tension springs 29, thus assuring alignment before the cam action takes over and releases the blades completely.

The plates 16 and 17 are guided so that they are unable to tilt when pressure is applied by the lower blade spacers only and insures that pressure will be relieved from the top blade spacers automatically.

As a safety factor and to insure against damage to the mechanism, due to the exceptionally uneven grain of the block being split, the plates 16 and 17 can exceed their normal traverse as insured by the cam because of its independence, and allowance is made for this in compression of the tension springs 29.

The cam spring 36 is so arranged as to only exert pressure when the arms 33 and 34 are past the horizontal position. This aids in the outward movement of the plates 16 and 17 and keeps the arms in an upright position when the blade carrier compresses bumper spring 10.

In order to force the blades through the block I provide a driving element which may be of any desired form, but here I have shown a weighted frame slidable on the guide rods 7 and consisting of a plate 43 from which is suspended by the guides 44 parallel weight bars 46 which are adapted to engage the blade carrier and to deliver a blow thereto when brought forcibly in engagement therewith.

A pair of lifting rods 47 slidably connect the plate 43 with the blade carrier, the result being that as the weighted frame moves upwardly it will engage a stop 48 mounted upon the upper ends of the rods 47 and will raise the blade carrier to a point above the normal top of a block to be split.

The result of this construction is that assuming the parts have all been assembled in operative position the weight is lifted together with the blade carrier through the action of the lifting rods 47.

The weight and the carrier move upwardly as one unit until the blade carrier is high enough to permit the insertion of a block on the plate 6 with its end grain directed toward the blades in the carrier.

In order to lift and drop the weight, I provide an arm 51, pivoted as at 52, and having a connecting rod 53, connected to the plate 43. A roller 54, carried by the arm 51, engages a cam 56, the rotation of which raises and drops the arm 51 and, consequently, the blades and driving weight.

After the block is in position the blade carrier and weight start down as a unit, the blade carrier falling approximately six inches before coming to rest with the blades partially imbedded in the upper end grain of the block. This allows the longer of the blades to set their cutting edges and thus insure that the blades are in perfectly spaced alignment, the blades at this time being held by the tension springs 29 against the spacers 24 and 26.

Further dropping of the weight drives the blades into the block but the time delay between the initial setting of the blades in the block and the time the weight delivers a blow to the carrier insures against cocking of the blades, which are movable, being only under spring tension, and during this interval the blades have a chance to recover from their first shock through the action of the springs 29. The interval between the setting of the blades and the striking of the blow is only a fraction of a second.

As the weight drives the blade carrier downwardly through the block the cam arms 33 and 34 will move into upward position due to the inertia of the weights, inasmuch as the rapid downward movement of the blade carrier will pivot the arms 33 and 34 from the position shown in Fig. 5 to that shown in Fig. 6, thus forcing the plates 16 and 17 to move outwardly, thereby releasing the spacers 28 and springs 27 which were previously holding the blades in relatively fixed position.

The blades may now follow the grain of the block free of any friction which would be caused by springs 29 and may also move sidewise on their respective rods to take care of the increased width of the block, plus the thickness of the blades imbedded therein.

The carrier will finally come to rest against the springs 10 and this completes one cycle of operation.

After the block has been split, upward movement of the blade carrier will withdraw the blades from the split slabs, and also the upward movement will reset the arms 33 and 34 to the position of Fig. 5 ready for the next descent of the blade carrier, the resetting mechanism.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention within the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a device of the character described, a blade carrier comprising a substantially rectangular frame, parallel rods mounted in said frame, vertically disposed blades slidably mounted on said rods, spring means positioned between said blades, spacers positioned between said blades, elongated spacers positioned on said rods and engaging the outer ones of said blades, guided pressure plates supporting said rods and tension springs engaging said plates and tending to overcome the action of said springs between said plates, and inertia operated means for relieving the action of said tension springs toward said blades.

2. In a shake forming machine, a frame, means to guide said frame for vertical movement, two pairs of horizontally disposed vertically spaced rods on opposite sides of said frame, a series of spaced splitting blades having their end portions mounted on said rods, spring spacers mounted on one rod of each pair between said blades, spring means on the ends of the spring carrying rods urging said blades toward each other, said blades having a loose sliding connection with the other rod of each pair, and loose spacers interposed between the blades on the last mentioned rods.

3. In a shake forming machine, a frame, means to guide said frame for vertical movement, two pairs of horizontally disposed vertically spaced rods on opposite sides of said frame, a series of spaced splitting blades having their end portions mounted on said rods, spring spacers mounted on one rod of each pair between said blades, spring means on the ends of the spring carrying rods urging said blades toward each other, said blades having a loose sliding connection with the other rod of each pair, loose spacers interposed between the blades on the last mentioned rods, and spring means on the last mentioned rods urging said blades against the spacers thereon.

4. In a shake forming machine, a frame, opposite sides of said frame constituting confronting channels, means to guide said frame for vertical movement, two pairs of horizontally disposed vertically spaced rods on opposite sides of said frame, a series of spaced splitting blades having their end portions mounted on said rods, and their ends supported in said channels, spring spacers mounted on one rod of each pair between said blades, and spring means on the ends of the spring carrying rods urging said blades toward each other.

5. In a shake forming machine, a frame, opposite sides of said frame constituting confronting channels, means to guide said frame for vertical movement, two pairs of horizontally disposed vertically spaced rods on opposite sides of said frame, a series of spaced splitting blades having their end portions mounted on said rods, and their ends supported in said channels, spring spacers mounted on one rod of each pair

between said blades, spring means on the ends of the spring carrying rods urging said blades toward each other, said blades having a loose sliding connection with the other rod of each pair, and loose spacers interposed between the blades on the last mentioned rods.

6. In a shake forming machine, a frame, opposite sides of said frame constituting confronting channels, means to guide said frame for vertical movement, two pairs of horizontally disposed vertically spaced rods on opposite sides of said frame, a series of spaced splitting blades having their end portions mounted on said rods, and their ends supported in said channels, spring spacers mounted on one rod of each pair between said blades, spring means on the ends of the spring carrying rods urging said blades toward each other, said blades having a loose sliding connection with the other rod of each pair, loose spacers interposed between the blades on the last mentioned rods, and spring means on the last mentioned rods urging said blades against the spacers thereon.

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