H. DEVLIN & H. W. GARLAND.

PAVING BLOCK MACHINE.

APPLICATION FILED DEC. 29, 1911.

1,044,880.

Patented Nov. 19, 1912.

3 SHEETS—SHEET 1.

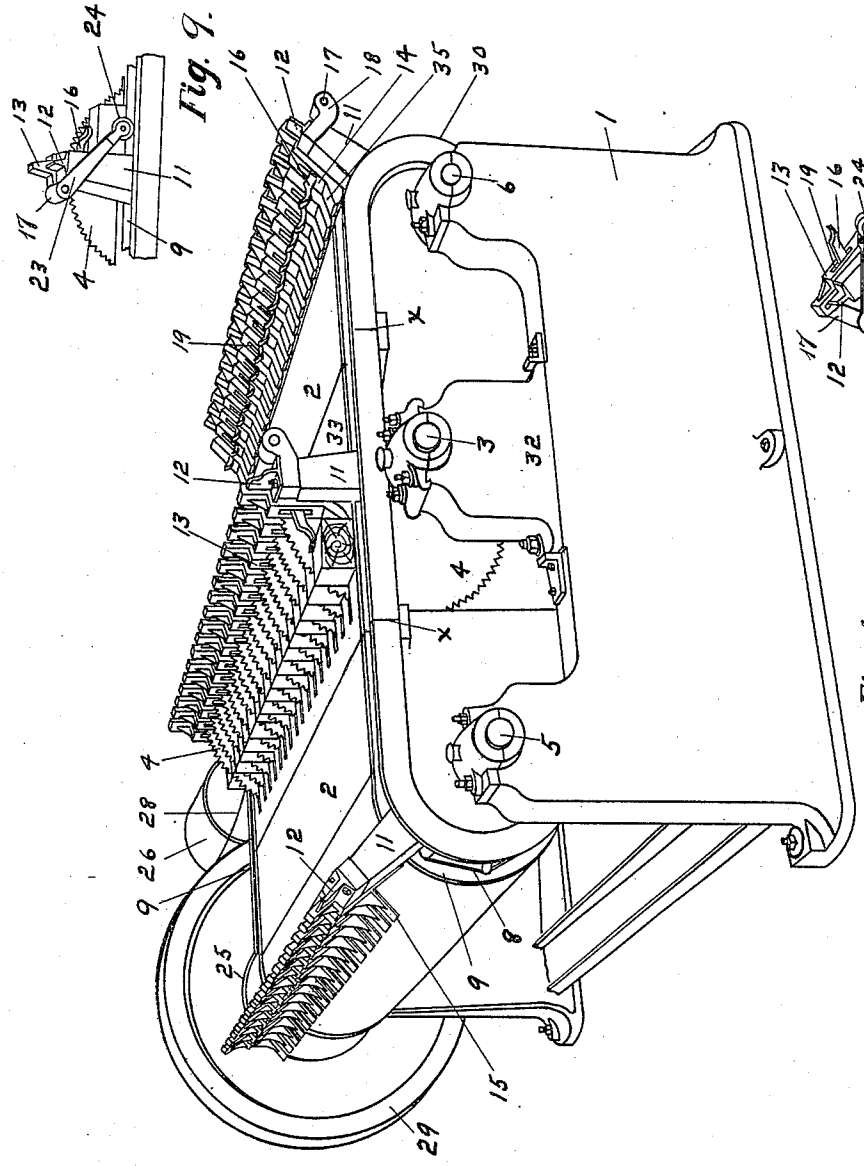

Fig. 1

Fig. 9.

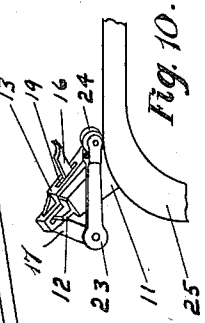

Fig. 10.

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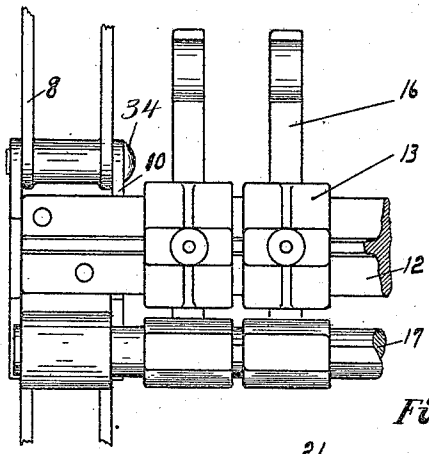


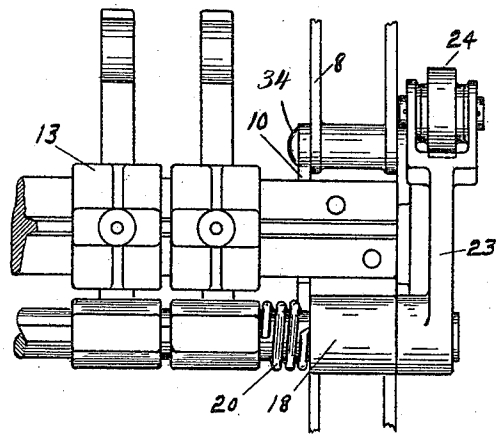
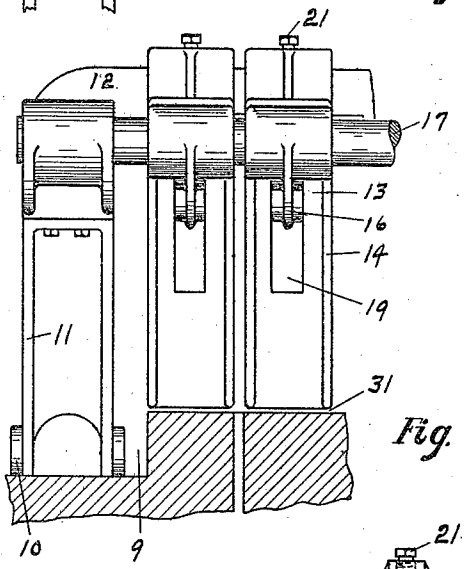


Fig. 3.



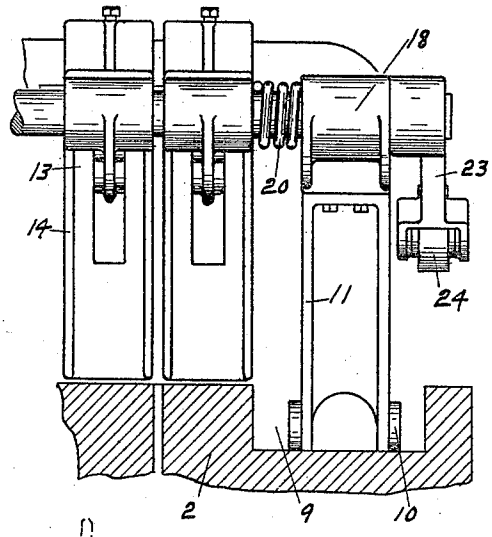


Fig. 4.

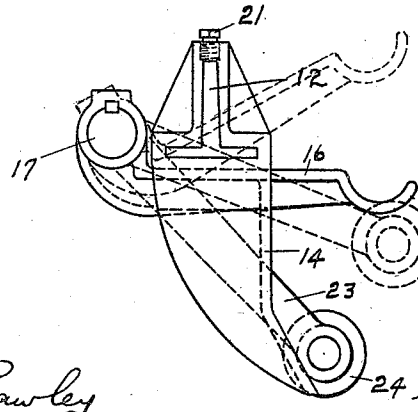


Fig. 2

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3 SHEETS—SHEET 3.

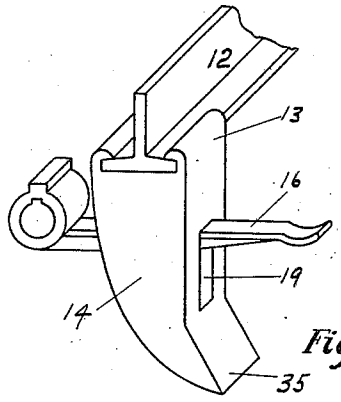

Fig. 5.

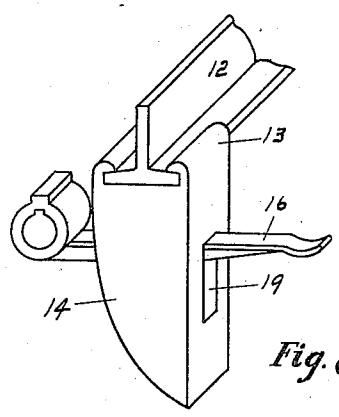

Fig. 6.

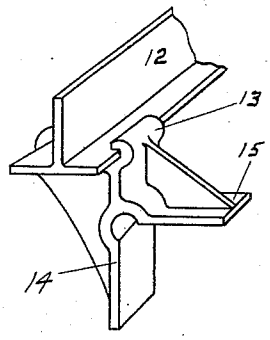

Fig. 7.

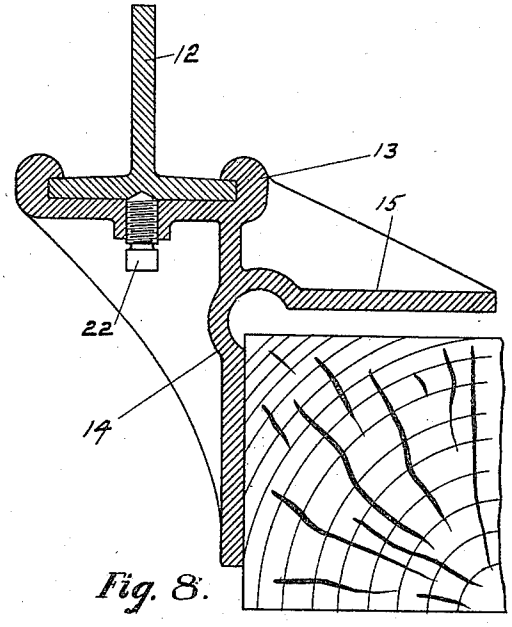

Fig. 8.

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UNITED STATES PATENT OFFICE.

HENRY DEVLIN AND HARRISON W. GARLAND, OF BAY CITY, MICHIGAN, ASSIGNORS TO THE M. GARLAND COMPANY, OF BAY CITY, MICHIGAN, A CORPORATION OF MICHIGAN.

PAVING-BLOCK MACHINE.

1,044,880. Specification of Letters Patent. Patented Nov. 19, 1912.

Application filed December 29, 1911. Serial No. 668,572.

To all whom it may concern:

Be it known that we, HENRY DEVLIN and HARRISON W. GARLAND, both citizens of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Paving-Block Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is a machine for making paving blocks and pertains more particularly to that type of machine adapted to simultaneously cut a large number of blocks from a single piece of timber, the cross-sectional shape of which is the same as the shape of the completed block.

The objects of our improvement are, first, to produce a block-cutting machine of the type in which the piece of timber is moved side-wise along a table and through a gang or circular saw, the novelty of this feature of our device residing in the construction and mode of operation of the feeding fingers by which the piece is moved along the table and through the saw.

Another object is to so construct the saw arbor and its bearings that the end bearing may be readily removed and the saws taken off the arbor, or put on without dismantling the machine.

With these and certain other objects in view, which will appear later in the specification, our invention consists in the devices described and claimed.

In the drawings, Figure 1 is a perspective view of a complete machine equipped with both types of brackets; Fig. 2 is a side view of one of the feeding brackets and its spring-pressed finger, the movement of the arm that actuates the spring-pressed finger being indicated by dotted lines; Fig. 3 is a top plan view broken away in part, showing one of the cross-bars with a number of feeding brackets mounted thereon; Fig. 4 is a rear elevation of the parts shown in Fig. 3, also showing the relative positions of the brackets and the table; Fig. 5 is a detail in perspective, of the type of bracket shown in Fig. 2; Fig. 6 is a similar detail of a preferred form of bracket; Fig. 7 is a detail of a feeding bracket adapted for feeding rectangular blocks; Fig. 8 is an enlarged vertical sectional view of the same finger with a block in place; Fig. 9 is a perspective detail of the arm by which the spring-pressed fingers are actuated; Fig. 10 is a similar view showing the position of the arm as it passes around the cam at the end of the table.

The machine consists in a frame 1 carrying a stationary table 2 having curved or semi-cylindrical ends.

3 is a saw arbor supported by the frame and carrying a plurality of saws 4 that project through slits in the table. Located at one end of the table and mounted in suitable bearings on the frame is a carrier drive shaft 5, and at the opposite end of the carrier and similarly mounted is a driven shaft 6. Each shaft carries a pair of sprockets as 7, upon which is mounted a carrier chain 8, there being one chain at each side of the table, the upper flight of the chain traveling in suitable grooves or channels 9 provided in the table for that purpose.

At intervals along the chains are oppositely placed flight links 10, 10, each of which is provided with a flight consisting of an upwardly extending pedestal or standard 11. Connecting the two standards of each pair and spanning the table transversely is a cross-bar 12 arranged at sufficient height above the saws to permit the cross-bar to pass over them. Upon each cross-bar is mounted a plurality of carriers 13, spaced apart on the cross-bar so as to permit them to pass by the saws, one on each side of a saw, when the machine is in operation.

Each carrier consists of a downwardly extending bracket 14 to take against the side of the piece to be cut and to form a backing to feed the piece forward through the saws.

To hold the piece down to the table, the bracket 14 is provided with a horizontal bracket member 15. This horizontal bracket member may be either movable or stationary, that is, it may be formed integral with the downwardly extending member, as shown in Figs. 7 and 8; or it may be made in the form of a downwardly spring-pressed finger 16 adapted to bear downwardly against the top of the piece to hold it to the table as it passes through the saws.

The preferred form of the movable type of finger is shown in Figs. 2, 5 and 6. A rock shaft 17 carries the fingers 16. The

rock shaft is preferably supported at its ends by suitable bearings 18 carried by the upper ends of the standards 11 on the flight links 10, the shaft being located in the rear of and parallel with the cross-bar 12.

In practice we prefer to form this type of holder with a vertical slot 19 in the downwardly extending bracket, as shown in Figs. 1, 5 and 6, the finger projecting forwardly through the slot and having a limited up-and-down movement therein.

To yieldingly press all of the fingers simultaneously down upon the top of the piece we prefer to key or otherwise fix each finger to the rock shaft, and to provide a spring 20, one end of which is secured to the rock shaft and the other end to one of the bearings 18, so that the spring tends to turn the shaft and thereby force the ends of the fingers downwardly, as indicated in Figs. 2 and 4.

To permit blocks of different lengths to be cut from the piece, we provide means for varying the space of the carriers and fingers along the cross-bar and rock shaft. Any suitable means may be employed for this purpose, but we prefer to mount each carrier slidably on the cross-bar 12 and to mount each finger slidably on the rock shaft 17, set screws as 21, Fig. 2, or 22, Fig. 8, being provided to secure the carrier to the cross-bar.

In some classes of work where the spring-actuated finger is not necessary, we prefer to use a fixed horizontal member which is illustrated in Figs. 7 and 8. This member is adjustable laterally along its cross-bar and may be fastened thereto in the same manner as above described. In the spring-actuated type we also provide means for raising the fingers of one cross-bar simultaneously to release the severed blocks at the end of the table. For this purpose we fix to one end of the rock shaft 17 an arm 23 carrying at its extremity a roller 24 which normally rides along the edge of the table during the forward or cutting movement of the cross-bar, but at the end of the table the roller rides over a stationary cam 25, and the free end of the arm 23 is lifted, thereby raising the fingers and releasing the blocks. A similar cam is provided at the receiving end of the table and operates to allow the fingers to clamp the top of the piece to be severed and thereby hold it down to the table as it is moved forward through the saws.

To actuate the carrier chains 8 we provide the following mechanism. A pulley 26 is fixed to the saw arbor 3. This pulley may be driven from any suitable source of power. A second pulley is also fixed to the arbor 3 and by means of the belt 28 drives a drum 29 mounted on the carrier drive shaft 5.

The operation of the machine is as follows: The carriers being set in motion by means of the reducing gears and saw arbor, the piece to be severed is dropped in between the curved and 30 of the saw table and the finger of the holder, as the holder rises in its travel around the receiving end 30 of the table. The horizontal member 15 of the holder prevents the piece from rising as it passes through the saws and the downward brackets of the holder force the piece forward through the saws, the lower ends of the holders clearing the top of the table in their travel, as shown at 31 in Fig. 4. When the opposite end of the table is reached, the holders tip forward and downward on their way around the semi-cylindrical delivery end of the table, as indicated in Fig. 1, and the severed blocks drop into any suitable receptacle. The semi-cylindrical ends of the table permit easy insertion of the piece and unhampered discharge of the blocks.

In machines of this type it is usually a difficult and laborious task to change the spacing of the saws or to change the number of saws in order to adjust the machine to cut blocks of different lengths to operate on pieces of different lengths. We have, therefore, provided means for easily and quickly removing the saw arbor and its saws from the machine, by making the outboard saw arbor bearing 32 separate from the frame of the machine. To this end we make the middle section 33 of the table through which the saws operate, removable so that when the outboard bearing is loosened, the bearing and saw arbor, the saws and the middle section of the table, may all be removed from the machine. To do this it is only necessary to disconnect the middle section of one of the sprocket chains somewhere near the points *x*—*x* of Fig. 1. This can be done by removing the pivot pin 34 of two of the chain links.

When the saw arbor is removed, the saws can be conveniently re-arranged and the saw arbor can then be returned to position, and the spacing of the brackets 14 can be altered to suit the new arrangement of the saws. A new section 33 of the table having slots suited to the new spacing of the saws is then inserted. The chains 8 are then coupled together.

It is sometimes desired to cut blocks of other than rectangular cross-section, as for instance blocks of hexagonal shape. For this purpose we provide the bracket 14 having a forwardly inclined lower end 35 to bear against the face of the block, as shown in Figs. 1 and 5.

By the means above described we have produced a machine for cutting blocks in which the spacing of the saws may be readily changed, and in which the block is supported throughout practically its entire length by a series of rigid fingers that pro-

ject down between the saws, but do not touch either the saws or the saw table. The blocks are also held firmly down against the table while passing through the saws. By this arrangement the saws are relieved of all undue strain caused by twisting of the piece while passing through them, and only two chains are used, as distinguished from former block machines, in which as many chains and flights are employed as there are blocks to be cut from a single piece.

Our improvement moreover enables very short blocks to be cut, since the brackets 14 may be made narrow and the saws placed close together, an arrangement which is not feasible where numerous chains passing between the saws are employed.

Having described our invention, what we claim and desire to secure by Letters Patent, is:—

1. In a block-cutting machine, the combination with a frame having a stationary table, said table having a channel near each longitudinal edge thereof and having semi-cylindrical ends, a saw arbor, a plurality of saws on said arbor, a carrier drive shaft at one end of said table, a driven shaft at the other end of said table, means adapted to drive said arbor and shafts, a pair of sprockets on each of said shafts, carrier chains mounted on said sprockets and received in the channels of said table; oppositely disposed flight links carried by said chains, each of said flight links having an upwardly projecting pedestal; cross-bars secured to the upper ends of each pair of pedestals and spanning said table; a plurality of carriers adjustably mounted on each of said cross-bars, each carrier comprising a downwardly projecting bracket member, the lower end of which extends in proximity to but out of contact with said table, a horizontally projecting spring-pressed bracket member carried by said bracket, and means secured to said bracket member adapted to automatically raise said member when said member arrives at the semi-cylindrical end of said table.

2. In a block-cutting machine, the combination with a frame having a stationary table, said table having a channel near each longitudinal edge thereof and having semi-cylindrical ends, a saw arbor, a plurality of saws on said arbor, a carrier drive shaft at one end of said table, a driven shaft at the other end of said table, means adapted to drive said arbor and shafts, a pair of sprockets on each of said shafts, carrier chains mounted on said sprockets and received in the channels of said table; oppositely disposed flight links carried by said chains, each of said flight links having an upwardly projecting pedestal; cross-bars secured to the upper ends of each pair of pedestals and spanning said table; a plurality of carriers adjustably mounted on each of said cross-bars, each carrier comprising a downwardly projecting bracket member formed with a vertical slot, rock shaft bearings secured to said pedestals, a rock shaft mounted in said bearings, fingers fixed to said rock shaft and movably received in the slots of said bracket, a spring secured to said rock shaft and to one of said bearings and adapted to actuate said fingers downwardly, an arm secured to one end of said rock shaft, a roller at the extremity of said arm, and a stationary cam at each end of said table adapted to engage said roller to actuate said rock shaft.

3. In a block-cutting machine having a table and a plurality of saws projecting therethrough, a plurality of carriers, each comprising a bracket arranged to project downwardly between said saws but out of contact with said table, a cross-bar spanning said table and carrying said brackets, means for supporting said cross-bar at the sides of said table and for traversing said cross-bar along said table, and a horizontally projecting, downwardly spring-pressed finger carried by each of said brackets, together with a stationary cam, and means secured to said finger and adapted to engage said cam to release said finger.

In testimony whereof, we affix our signatures in presence of two witnesses.

HENRY DEVLIN.
H. W. GARLAND.

Witnesses:
HAROLD CATES,
FRED MITCHELL.