

No. 888,732.

PATENTED MAY 26, 1908.

J. R. PEIRCE.

CUT-OFF MACHINE FOR MARBLE SLABS OR THE LIKE.

APPLICATION FILED JAN. 15, 1907.

3 SHEETS—SHEET 1.

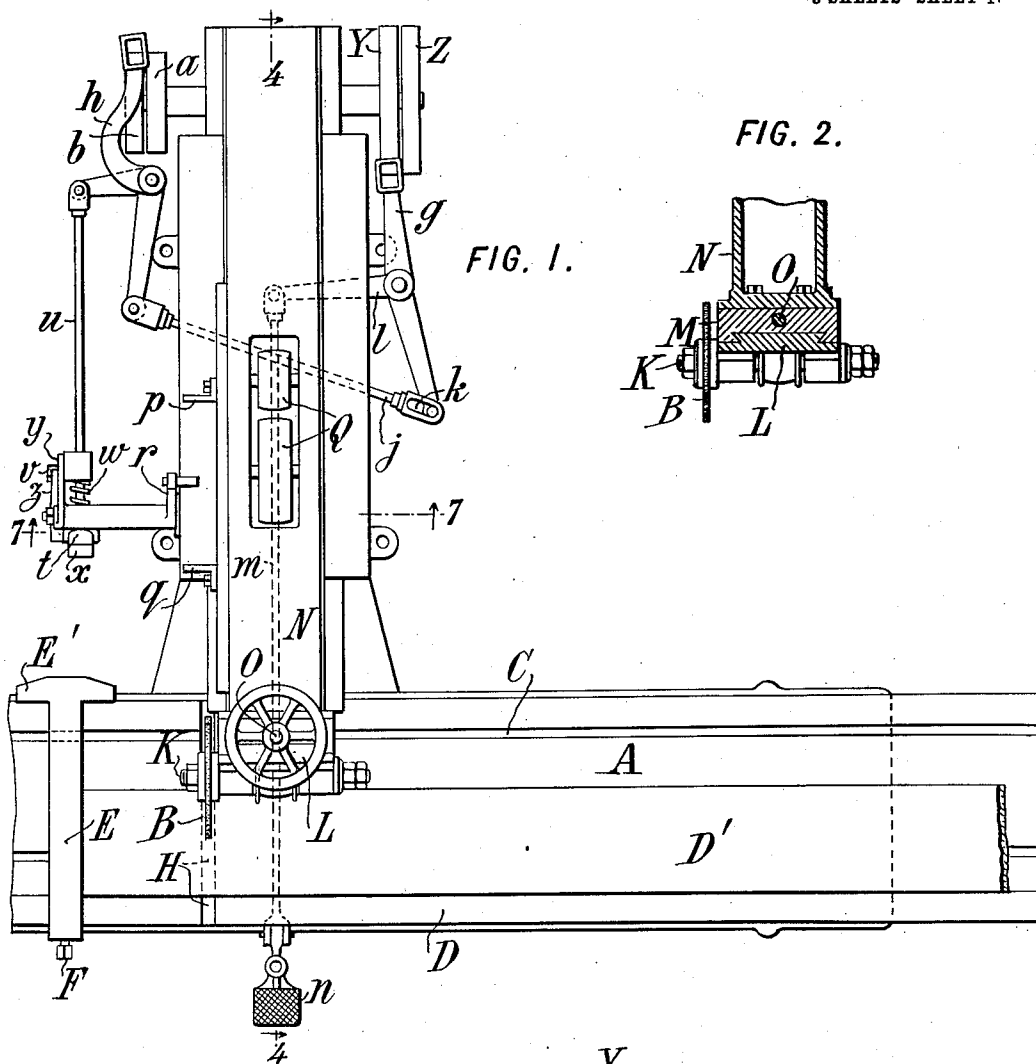


FIG. 2.

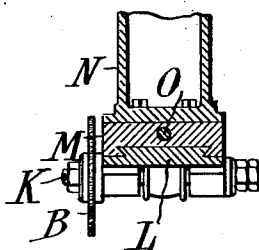


FIG. 1.

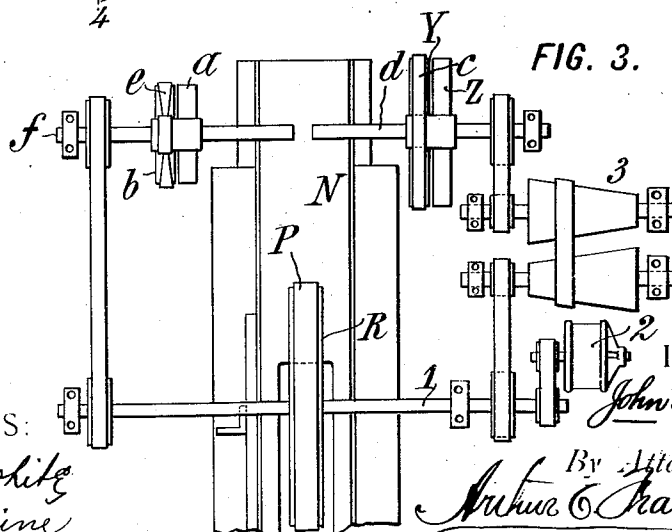


FIG. 3.

WITNESSES:

*Bred White*  
*Rene' Ruine*

INVENTOR :

*John Lloyd Peirce,*

By Attorneys

*Arthur C. Pease & Wern*

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3 SHEETS—SHEET 2.

FIG. 4.

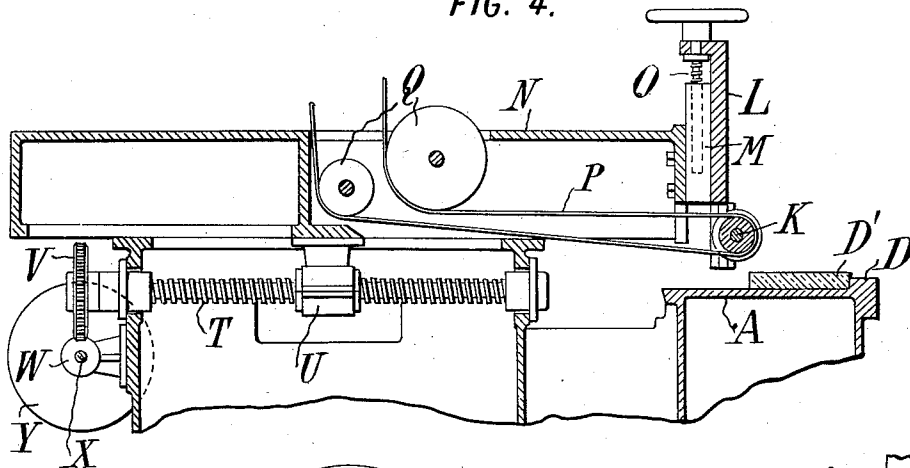


FIG. 5.<sup>a</sup>

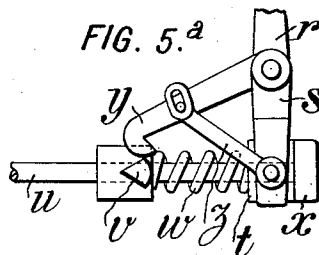
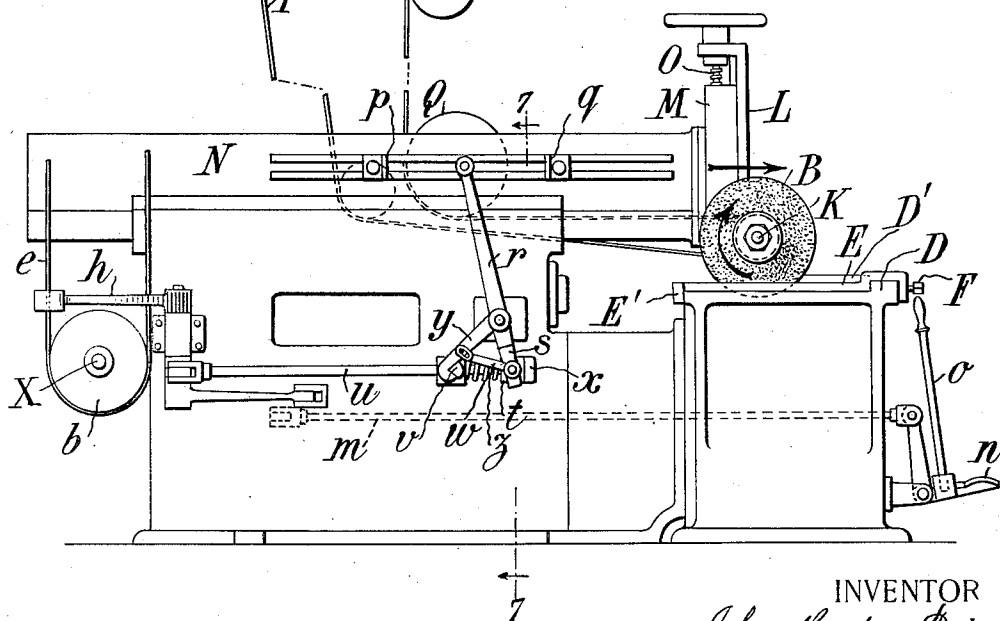


FIG. 5.



WITNESSES:

*Bred White*  
*Rene Ruine*

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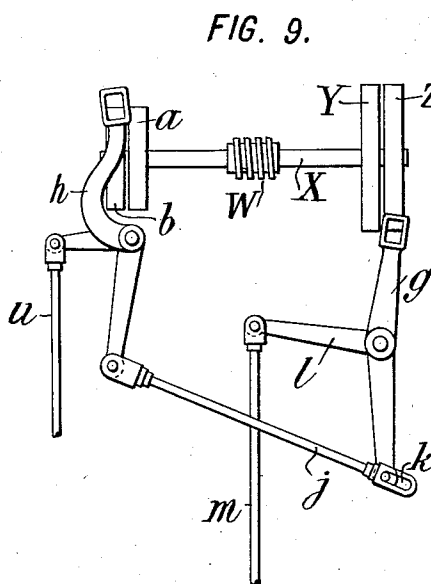
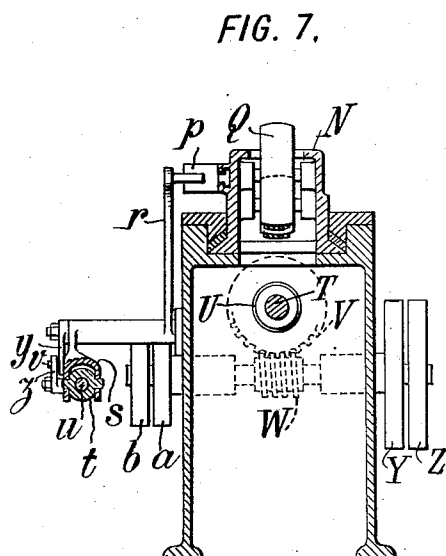
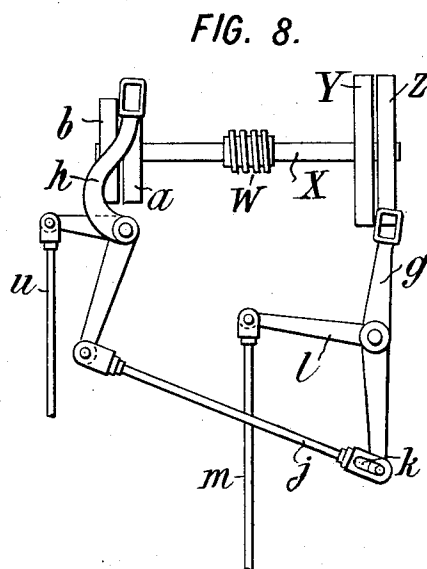
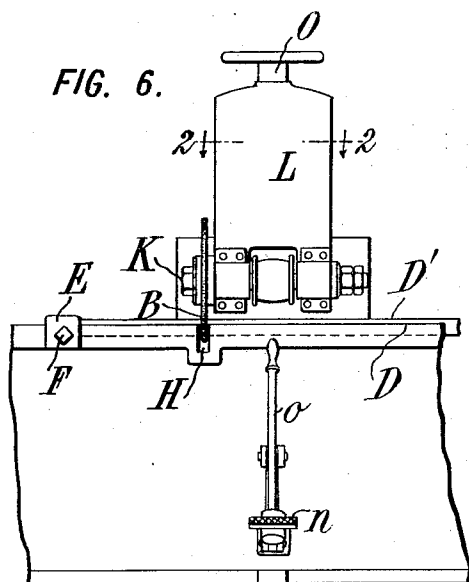
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3 SHEETS—SHEET 3.



WITNESSES:

*Ired White*  
*René Bruine*

INVENTOR :

*John Royden Peirce,*

By Attorneys,

*Arthur C. Fraser & Thoma*

# UNITED STATES PATENT OFFICE.

JOHN ROYDEN PEIRCE, OF NEW YORK, N. Y., ASSIGNOR TO ROYDEN MARBLE MACHINERY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## CUT-OFF MACHINE FOR MARBLE SLABS OR THE LIKE.

No. 888,732.

Specification of Letters Patent.

Patented May 26, 1908.

Application filed January 15, 1907. Serial No. 352,372.

*To all whom it may concern:*

Be it known that I, JOHN ROYDEN PEIRCE, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Cut-Off Machines for Marble Slabs or the Like, of which the following is a specification.

In my application for patent for improvements in coping machines, filed October 31, 1904, Serial No. 230,863, Patent No. 862,933, dated August 13, 1907 and in subsequent applications, I have described apparatus for coping marble, that is to say, for sawing the large slabs into smaller and regular plates for facing walls, and for foot-boards, trim, etc., by means of a rapidly rotating disk or thin wheel of carborundum which passes through the stone in the manner of a circular saw through wood. In these machines the cuts are first made in one direction, and then the stone or wheel must be turned to make a cut in the transverse direction. In order to expedite the work in a shop, I propose to use a separate machine for effecting the second or transverse cuts, and which I call a cut-off machine by analogy with similar machines used in sawing lumber. The machine is especially designed for narrow work, such as foot-boards and marble trim, and cuts this into desired lengths with great rapidity.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1 is a plan omitting a portion of the feed table. Fig. 2 is a horizontal section of the head of the tool. Fig. 3 is a plan of the arrangement of driving shafts and gears overhead. Fig. 4 is an approximately central transverse vertical section. Fig. 5 is a transverse elevation. Fig. 5<sup>a</sup> is a detail with the parts in a different position from that of Fig. 5. Fig. 6 is a front elevation, omitting parts of the feed table. Fig. 7 is a vertical section approximately on the line 7—7 of Figs. 1 and 5. Fig. 8 is a diagram of the belt-shifting mechanism during a backward movement. Fig. 9 is a diagram of the same in the stopped position.

Referring to the embodiment illustrated, a bed A upon which the stone is supported may be of any desired proportions, according to the character of the work. A thin wheel or disk B of carborundum is rotated constantly at a high rate of speed, say a mile a

minute of circumferential velocity, or about two thousand revolutions for a wheel of twelve inches diameter, and is at the same time fed across the bed at a rate sufficiently slow to avoid burning or spalling of the marble.

The bed may be provided or not with under-cut grooves C by which the stone may be clamped thereon. The rapidity of work, however, is greatly facilitated by the provision of a fixed longitudinally-extending stop or rail D against which the slab D' is pressed by the transverse movement of the cutting wheel, so that the work is held in place without any necessity for clamping. I provide also an end stop E which is preferably adjustable. For example, as shown in Figs. 1 and 5, it may be fastened at any desired point on the bed by means of a set-screw F engaging the outer edge of the table. The end stop E is provided also with a longitudinally-extending end portion E' serving to hold it at a correct right-angle to the longitudinal rail D, so that when one end of the stop is adjusted to a correct distance from the wheel, the entire forward edge of the stop will be in correct position.

With this machine the slabs of marble can be very quickly and by a single movement brought up against the longitudinal stop D and the end stop E, whereupon, by pressing on a suitable foot-lever, the wheel saws across the slab at the desired line. This is a very much simpler and more rapid operation than would be involved in the use of the previous type of machines above referred to, in which the stone or the wheel would have to be turned, the stone clamped, and a proper adjustment of the stone effected relatively to the wheel, before the actual cutting operation could commence.

The wheel preferably cuts entirely through the slab, so that the piece which is cut off may be immediately removed, and so that the ends shall be left with a good finish. To secure this effect the bed A is formed with a slot H which may extend entirely through the bed, and the wheel B extends slightly into such slot. As shown by the arrows in Fig. 5, not only is the direction of traverse of the wheel such as to hold the slab J against the longitudinal stop D, but also the direction of rotation of the wheel is such as to hold the slab down upon the bed A.

The bearings for the shaft K of the wheel are substantially identical with those shown in my application of October 31, 1904, and are carried in a block L which is arranged to slide vertically upon the end plate M of a carriage N which is adapted to reciprocate in a direction transverse to the bed A. The block L at its upper end overhangs the end plate M of the carriage, and is fixed against longitudinal movement upon a threaded shaft O screwing into the end plate M and thereby effecting a vertical adjustment of the cutting wheel, so that the latter may be made to penetrate exactly to a desired depth in a slab of marble; or, assuming that the wheel is to pass entirely through the marble, the adjustment provides for the lowering of the wheel as its edge wears away and its diameter becomes smaller, or for the use of wheels of different diameters.

The rotation of the wheel B is effected by means of a belt P running over a small pulley on the wheel shaft K and over a pair of guide pulleys Q carried within the carriage N, and thence upward through a suitable opening in the top of the carriage over a fixed guide pulley R and a tension pulley S.

The traverse of the carriage N is effected by means of a threaded shaft T fixed against longitudinal movement and engaging a nut U on the under side of the carriage. The feeding shaft T is provided with a worm gear V on its rear end driven by a worm W on a cross-shaft X. The cross-shaft X is provided with a forward driving pulley Y and an adjacent loose pulley Z, and with a smaller reverse driving pulley a and an adjacent loose pulley b. A straight belt c runs from a pulley on the overhead shaft d to the forward driving pulley Y or its idle companion Z, and a cross-belt e from the overhead shaft f to the reverse driving pulley a or its idle companion. By suitably shifting the belts the wheels is fed in one direction or the other at will, or held stationary.

Preferably the mechanism is so arranged as to automatically feed forward, reverse and stop in its original position each time that the operator presses a starting lever, thus making a complete cycle of operations and returning to the starting position without attention from the operator. In the machine illustrated this automatic operation is effected by the following mechanism: The belt-shifting levers *g h* are connected to each other by means of a link *j* having a slot *k*. In Fig. 1 the belts are in position to execute a forward driving movement. At the end of the forward movement the shifting lever *h* is forced to the right and acts through the link *j* to move the shifting lever *g* to the right also (Fig. 8). The carriage then moves backward. At the end of the backward movement the shifting lever *h* is again swung to the left. The

movement, however, is taken up in the slot *k* of the link *j*, and the shifting lever *g* does not move, but holds the belt upon the loose pulley Z (Fig. 9). Both belts now run upon loose pulleys, and the traversing movement ceases until the lever *g* is swung back to the position of Fig. 1 by means of an arm *l* connected to a rod *m* extending to the front of the machine and operated by a pedal *n* or lever *o*, or both. The forward movement is commenced by the operation of the pedal as described. The shifting of the belts to obtain the backward movement and to obtain the cessation of movement is effected automatically by means of a reversing striker or stop *p* and a stopping striker *q* projecting from the side of the carriage N and in line with the upper end of an arm *r* which is operatively connected to the belt shifter *h*; the strikers *p* and *q* being adjustable as shown.

A special type of connection between the arm *r* and the shifting lever *h* is illustrated, by means of which a quick and complete throw of the belt from the idle to the backward driving pulley is effected. The arm *r* is integrally or otherwise connected with a forked arm *s*, the lower end of which is pivotally connected with a block *t* mounted slidably upon a rod *u* connected to the shifting lever *h*. A block *v* with a V-shaped projection at one side is fixed upon the rod *u*, and a spring *w* surrounds the rod between the slide *t* and the fixed block *v*. The rod has also a head *x* engaging the rear end of the slide *t*. Supposing the carriage to be moving forward, the parts of this mechanism will be in the position of Fig. 5, the block *v* being engaged by a pivoted hook *y*. As the carriage reaches the end of its forward movement the reversing striker *p* strikes the arm *r*, forcing the arm *s* and the slide *t* backward and compressing the spring *w*. A connecting link *z* has a slotted end engaging a pin on the hook *y* which allows a certain movement of the slide *t* without interfering with the hook *y*. After a sufficient compression of the spring *w*, the link *z* pushes up the hook *y*, releasing the block *v* and the rod *u*, so that the latter springs backward the full distance necessary to throw the belt from one pulley entirely on to the other. This position of the parts is indicated in Fig. 5<sup>a</sup>. The carriage then commences its backward movement at the end of which the stopping striker *q* engages the arm *r* and pulls back the slide *t*. The slide *t* engages the head *x* and pulls back the rod, and with it the block *v*, the latter lifting the hook *y* to slide under its free end, and the hook being engaged by the upper end of the slot in the link *z* and thus pulled down only after the block *v* has passed under the hook. The carriage will now remain stationary until the driving belt is

shifted on to the forward driving pulley, which movement, however, will be taken up in the slot *k* and will not affect the rod *u* and connected mechanism. The latter therefore  
5 will remain in the position of Fig. 5 until the completion of the forward movement.

A suitable arrangement of overhead shafting is shown in Fig. 3. The pulley R which drives the cutting-wheel belt P is mounted  
10 upon a main shaft 1 driven from a motor 2. The main shaft 1 is directly connected to the rearwardly driving jack-shaft *f* and to a variable-speed gearing, indicated as a whole by the numeral 3, from which the forwardly  
15 driving jack-shaft *d* is operated at any desired rate of speed.

Though I have described with great particularity of detail a certain specific embodiment of my invention, yet it is not to be  
20 understood therefrom that the invention is limited to the specific embodiment disclosed. Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art  
25 without departure from the invention.

What I claim is:—

A cut-off apparatus for marble slabs, comprising a carborundum wheel B rotating in a vertical plane, a carriage N for said wheel, means for traversing said carriage, said carriage having an opening at its front end and an opening in its top near the center, pulleys Q arranged near the center of the carriage, a driving belt P for said carborundum wheel guided around said pulleys Q and passing  
35 through said openings in the carriage, an overhead driving pulley R for said belt, a tension pulley S for taking up the slack thereof, and a block L carrying said wheel and adapted to be adjusted vertically relatively to the carriage, so as to compensate  
40 for wear of the wheel.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN ROYDEN PEIRCE.

Witnesses:

DOMINGO A. USINA,  
THEODORE T. SNELL.