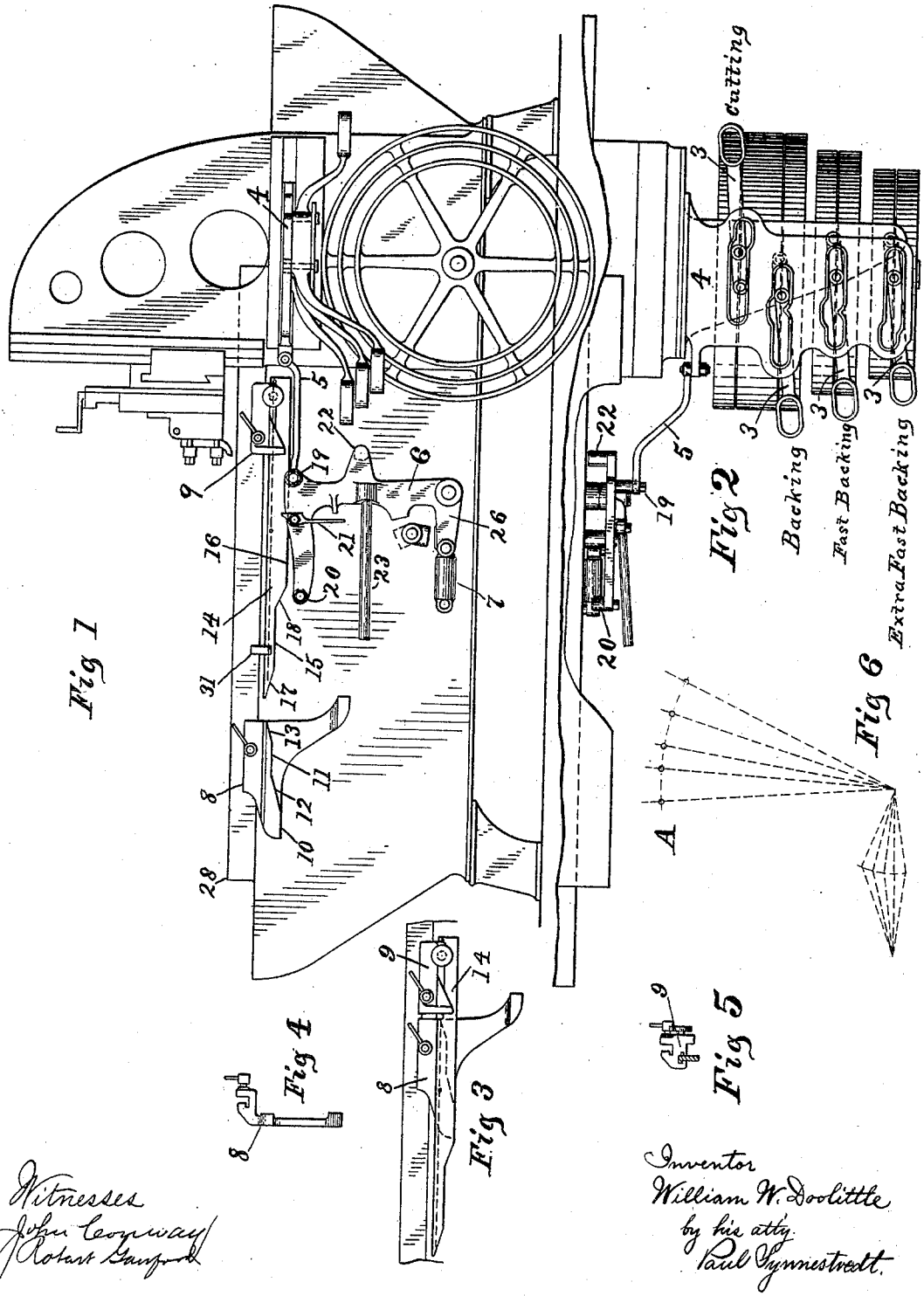
(No Model.)

2 Sheets—Sheet 1.

W. W. DOOLITTLE.

PLANING MACHINE MECHANISM.

No. 584,495. Patented June 15, 1897.



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(No Model.) 2 Sheets—Sheet 2.

W. W. DOOLITTLE.

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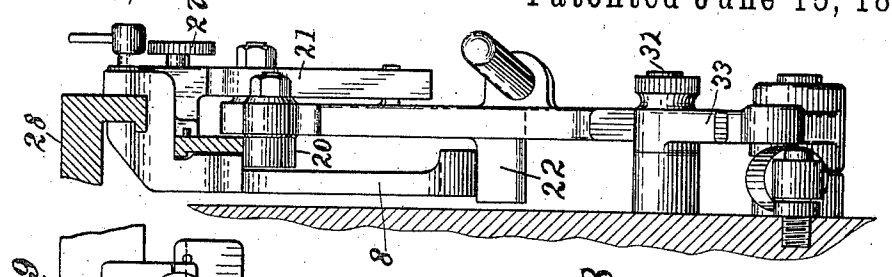

Fig 8

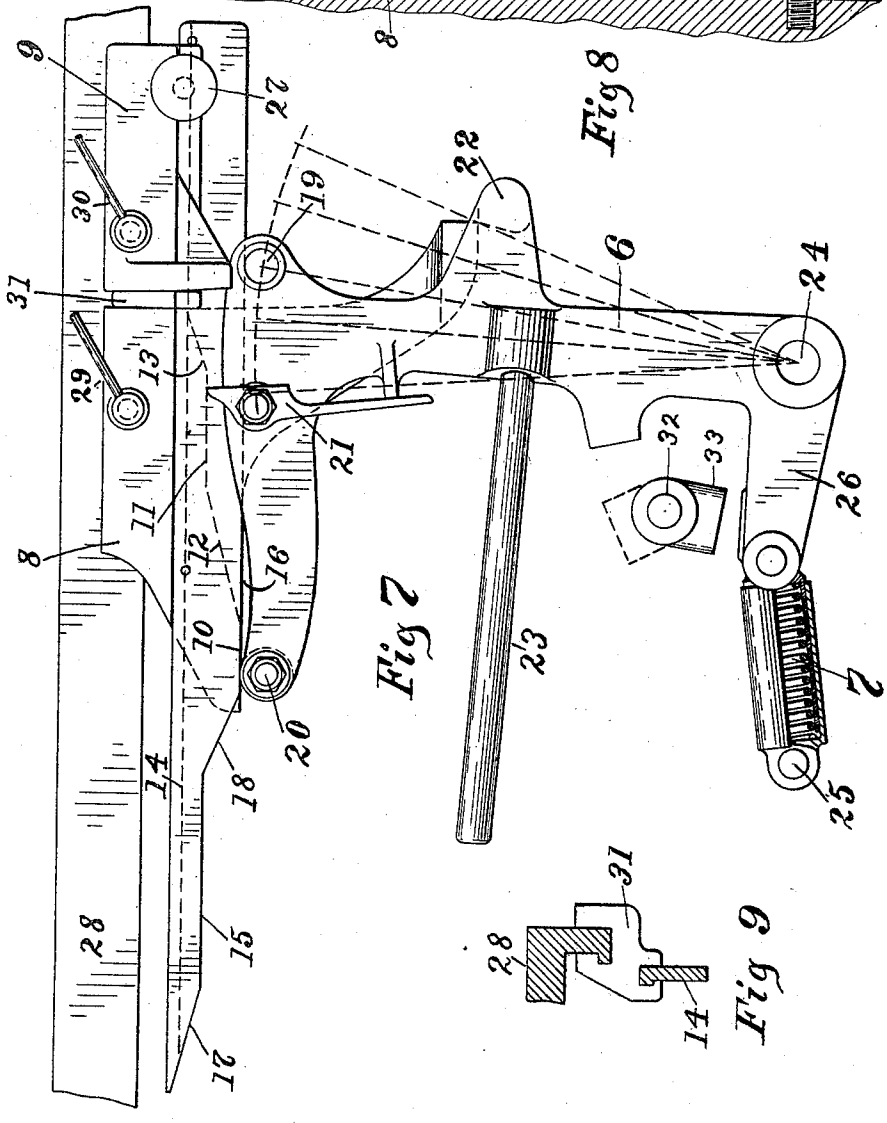

Fig 7

Fig 9

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UNITED STATES PATENT OFFICE.

WILLIAM W. DOOLITTLE, OF CHICAGO, ILLINOIS.

PLANING-MACHINE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 584,495, dated June 15, 1897.

Application filed November 20, 1896. Serial No. 612,793. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. DOOLITTLE, a citizen of the United States, residing in Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Planing-Machine Mechanism, of which the following, taken in connection with the accompanying drawings, is a specification.

My present invention is, for the most part, in the nature of an improvement over that which forms the subject-matter of an application filed March 14, 1896, Serial No. 583,178; but it includes also certain features of specific construction shown but not claimed therein.

The application referred to relates to mechanism designed for the purpose of increasing the backing speed of planing-machines and shows a construction in which a supplemental fast-backing mechanism is used to accomplish such purpose. In this improvement also I propose to use such supplemental fast-backing mechanism in combination with shifting devices similar to those heretofore shown, but adapted to effect a pause during the operation of each of the several mechanisms. In other words, the purpose of this present invention is to reduce the amount of strain incident to great changes in speed by provision of means whereby the mechanism which produces the successive changes in speed is permitted after it is thrown into operation to continue operative for a sufficient length of time to fully perform its assigned functions before it is thrown out of action.

A further object is to provide certain novel details and combinations of mechanism to be hereinafter particularly pointed out in the claims, and which I will now proceed to describe more fully, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a planing-machine embodying my invention. Fig. 2 is a partial plan view of the same. Figs. 3, 4, and 5 illustrate detail parts of the moving stops. Fig. 6 represents diagrammatically the different positions of the stud 19. Fig. 7 is an enlarged side view of the moving stops and shifting-lever. Fig. 8 is an end view of the same, partly in section. Fig. 9 is an end view of the block 31.

Referring now more particularly to Figs. 1 and 2, it will be seen that I have shown a planing-machine 1, employing a series of belts for its cutting, backing, fast-backing, and extra-fast-backing mechanism, shifting-arms (numbered 3) for moving the same, and a cam-plate 4 for operating such shifting-arms, substantially the same as shown in the application hereinbefore referred to. Connected with the cam-plate by means of a link 5 and the stud 19 I have provided a reversing-lever 6, pivoted to the body of the planer and having connected with it a spring 7. Attached to the planer-table are the moving stops 8 and 9. On the stop 8 I have arranged two approximately parallel faces 10 and 11 and two inclined faces 12 and 13, and on the stop 9, or, more accurately speaking, on the adjustable extension 14 of the stop 9, I have arranged approximately parallel faces 15 and 16 and inclined faces 17 and 18. These parts are best shown in Figs. 7 and 8. Projecting from or attached to the reversing-lever 6 I have arranged a roller 20 and a swinging pawl 21. From the back side of the lever 6 projects a lug 22. A handle 23 is also provided in connection with the lever 6 for the purpose of moving the latter by hand.

The pivot or fulcrum 24 of the lever 6 and the pivot or fulcrum 25 of the spring 7 are so arranged in relation to each other that the horizontal arm 26 of the lever 6 and the spring 7 will together form a kind of toggle-joint. The blade 14 is adjustably arranged with relation to the stop 9 by the provision of a thumb-screw 27 to permit the regulation of the parts with the greatest degree of nicety. Both the stops 8 and 9 are adjustable relative to the table 28 by means of their respective handles 29 and 30, which provision is of course substantially identical with that in common use. As an additional guide for the projecting end of the blade 14 I have arranged a block 31, (clearly shown in Fig. 9,) which may be, when desired, slid out near to the projecting end of the blade 14 for the purpose of supporting the same more rigidly in place.

In the position of the parts shown in Figs. 1 and 2 the planing-machine is at rest, all of the belts being on loose pulleys and the toggle formed between the spring and the arm 26 of the lever 6 forming a straight line. If now

it be desired to start the machine on the cutting stroke, the lever is pushed downward, throwing the stud 19 over to the position A in Fig. 6. This moves the cam-plate 4 to the limit of its travel toward the left and, as may be readily seen by examination of the plan view in Fig. 2, will shift the cutting-belt onto its tight pulley and so start the machine. When the table has traveled to the end of the stroke for which it is adjusted, the stop 8 will strike against the lug 22 and move the reversing-lever 6 to the right, bringing the roller 20 up to the parallel face 10 of the stop 8, in which position the stop 8 will pass over the lug 22 and the cam-plate 4 will have been shifted sufficiently far to throw the cutting-belt out of action and to throw the ordinary backing-belt into action, reversing the machine; and in this position the reversing-lever 6 and the connected shifting devices will pause until the backward movement of the table 28 and the stop 8 permits the roller 20 to travel up the incline 12 by the aid of the spring 7, which pause, by properly proportioning the length of the parallel face 10, can be made of just sufficient duration to permit the speed of the table to be increased to that of the mechanism then in gear. As now the roller 20 travels up the incline 12 (the moving force or effect of the spring 7 being continuous) the cam-plate will be still farther moved to the right, the backing-belt will be thrown out of action, and the fast-backing belt will be thrown into action, the speed with which this change takes place being readily regulated by proper design of the incline 12. After the fast-backing belt has come fully into action the lever 6 and cam-plate 4 will again pause to permit such fast-backing belt to completely perform its assigned functions before it is again thrown out of action, because the roller 20 will continue to travel along the parallel face 11 and the lever 6 cannot move farther until the roller 20 begins to travel up the incline 13. It is apparent that here again, simply by a proper proportioning of the length of the parallel face 11, the period during which the fast-backing mechanism is allowed to remain in action can be regulated. As the roller 20 travels up the incline 13 the fast-backing belt is thrown out of action and the extra-fast-backing belt is thrown into action by the last or final movement of the reversing-lever 6 and the cam-plate 4, and the machine continues on the backing stroke at the highest rate of speed until it nears the point of reversal, where now the cycle of movements of the lever 6 and the cam-plate 4 is reversed. The incline 17 first contacts with the roller 20, cutting the extra-fast-backing mechanism out of gear and cutting in the fast-backing mechanism, and the latter is continued in operation during a proper length of time to completely perform its assigned functions (in this case to reduce speed) by the movement of the roller 20 along the parallel face 15. As soon as the roller 20 begins to travel down the incline 18 the lever 6 and the cam-plate 4 are moved a further step, throwing the fast-backing mechanism out of action and the ordinary backing mechanism into action, and then another pause in the movement of the shifting devices is permitted by the travel of the roller 20 along the parallel face 16 until the stop 9 proper strikes the swinging pawl 21, when the ordinary backing mechanism is thrown out of action and the cutting mechanism is again thrown into action, whereby the machine is finally reversed and begins another cutting stroke.

It will be noticed from the position of the parts shown in Fig. 3 particularly that the blade 14 is arranged to slide past the stop 8 in such manner that the parallel faces 10 and 16 may form practically one continuous surface. This is provided to the end that on very short strokes the fast-backing mechanism and the extra-fast-backing mechanism may both be prevented from coming into operation. If it be desired to permit the fast-backing mechanism to operate, but to prevent the extra-fast-backing mechanism from operating, the stops are arranged so that the parallel faces 10 and 15 will form practically a continuous plane.

In some cases it may be desirable absolutely to prevent the cutting in of the extra-fast-backing mechanism, and for that purpose I have provided an eccentric block 33, pivoted on a stud 32, which when turned to the position shown accomplishes this result. When turned to the position indicated in dotted lines, this eccentric block does not interfere with the action of the mechanism at all.

While I have confined this description to a planing-machine in which a backing, fast-backing, and extra-fast-backing mechanism only are employed, it is perfectly obvious that another and still another backing mechanism or belt could be provided, if it were desirable, by reason of the machine having an exceptionally long stroke.

While I have secured by the specific arrangements shown a means whereby the duration of time occupied in throwing any particular mechanism into or out of action and the duration of time which such particular mechanism may continue in action can be regulated with great nicety, it is perfectly obvious that a similar result could be obtained in something of a similar manner by a proper arrangement of the inclines or grooves in the cam-plate 4, although one objection to such an arrangement would be the great increase in the travel of the cam-plate. Such modification, however, not departing in any material respect from the spirit of my invention, I would include as fully within the scope of my claims.

Approximately the same results as are secured by the specific method I have illustrated could also be obtained by the use of a series of steps or any other means whereby an intermittent action of the shifting mechanism is

secured in place of the several inclines and parallel faces which I have shown.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a planing-machine, the combination with a cutting, backing, and fast-backing mechanism, and shifting devices controlling the same, of mechanism coacting with said shifting devices to effect pauses between the intervals of movement of the latter, substantially as shown and described.

2. In a planing-machine the combination with a cutting, backing, and fast-backing mechanism, and shifting devices controlling the same, of stops provided with parallel faces located in different planes coacting with said shifting devices to effect pauses between the intervals of movement of the shifting devices, substantially as shown and described.

3. In a planing-machine, the combination with a cutting, backing, and fast-backing mechanism, and shifting devices controlling the same, of stops provided with inclines and parallel faces coacting with said shifting devices to effect pauses between the intervals of movement of the shifting devices, substantially as shown and described.

4. In reversing mechanism for planing-machines, the combination with the reversing-lever, of a spring connected therewith and moving stops provided with inclines adapted to coact with said spring in the movement of said lever, substantially as described.

5. In a planing-machine the combination with its cutting, backing, and fast-backing mechanism, and shifting devices controlling the same, of stops provided with parallel faces located in different planes and means whereby said shifting devices are held in operative contact with said parallel faces, substantially as shown and described.

6. In a planing-machine, the combination with its cutting, backing, and fast-backing mechanism and shifting-arms for moving the same, of a cam-plate controlling the movement of said shifting-arms and devices for actuating said cam-plate constructed to secure an intermittent movement of said shifting-arms, substantially as shown and described.

7. In a planing-machine the combination with a cutting, backing, and fast-backing mechanism, and shifting devices controlling the same of stops provided with inclines 12, 13, 17, and 18, and parallel faces 10, 11, 15, and 16 and means whereby said shifting devices are held in position to coact with said inclines and parallel faces in the operation of said various mechanisms, substantially as shown and described.

8. In a planing-machine the combination with a cutting, backing, and fast-backing mechanism and shifting devices controlling the same, of stops for actuating said shifting devices, one of said stops being provided with a blade or extension constructed to pass the other stop and thereby prevent the operation of the fast-backing mechanism, when on short strokes, the two stops are brought sufficiently close together, substantially as shown and described.

WILLIAM W. DOOLITTLE.

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PAUL SYNNESTVEDT.