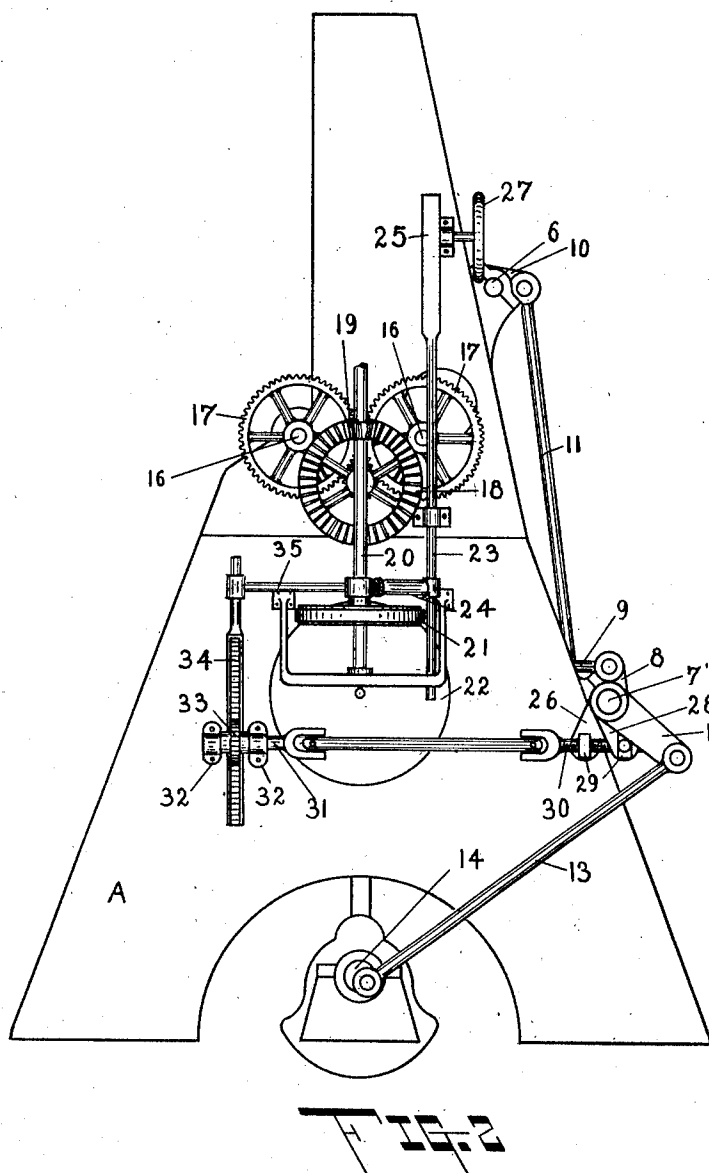


1,002,675.

3 SHEETS—SHEET 2.



WITNESSES:

J. Ray Abbey
Pres. S. Warfield.

INVENTOR

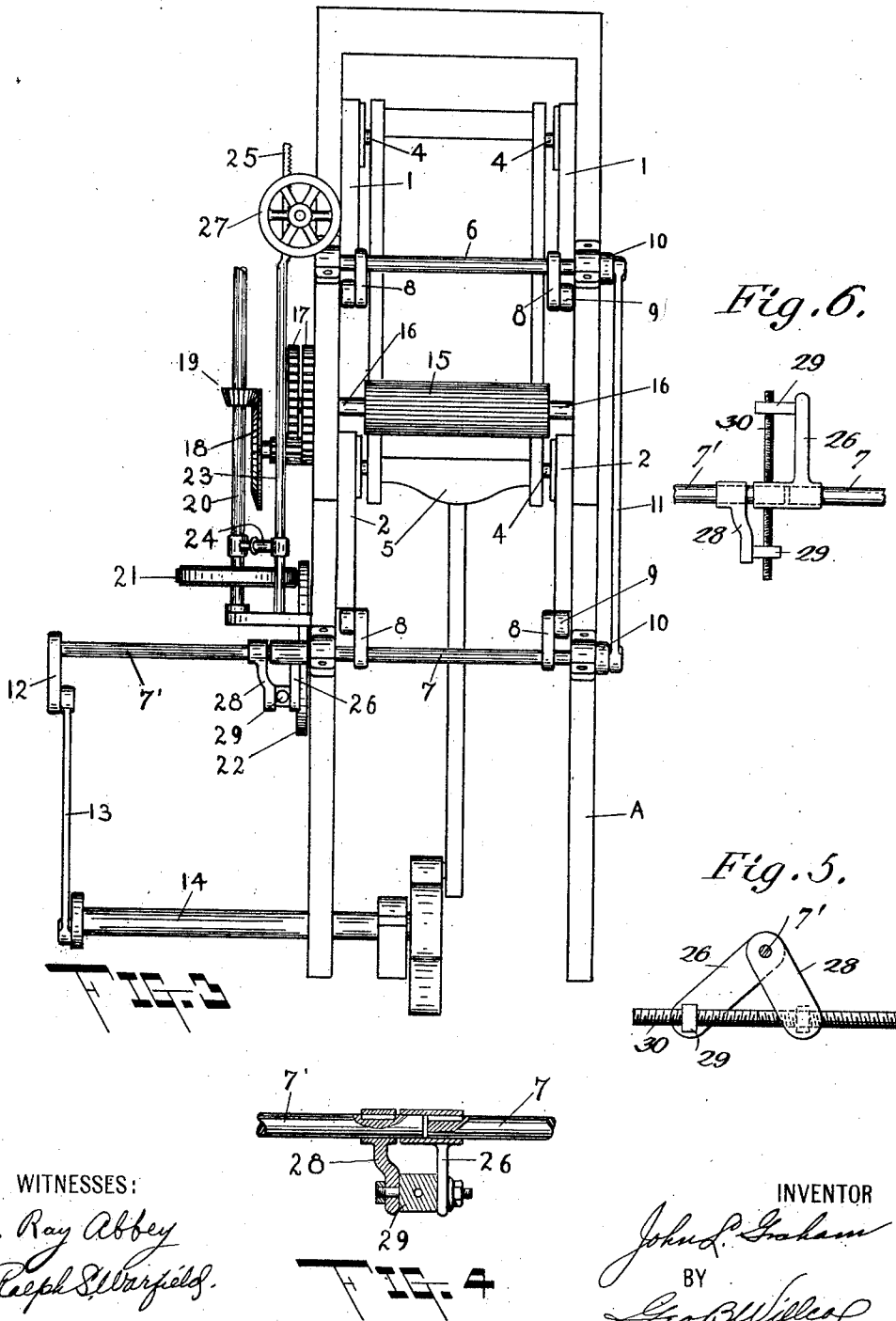
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GANG SAW MILL.
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UNITED STATES PATENT OFFICE.

JOHN L. GRAHAM, OF REYNOLDSVILLE, PENNSYLVANIA, ASSIGNOR TO WICKES BROTHERS, OF SAGINAW, MICHIGAN, A CORPORATION OF MICHIGAN.

GANG-SAW MILL.

1,002,675.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed March 26, 1908. Serial No. 423,485.

To all whom it may concern:

Be it known that I, JOHN L. GRAHAM, a citizen of the United States, residing at Reynoldsville, in the county of Jefferson and State of Pennsylvania, have invented certain new and useful Improvements in Gang-Saw Mills; and I 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.

My invention relates to oscillations for gang saws.

One object of my invention is to provide means for varying the position of the arc of oscillation of the slides in which the saw sash reciprocates, thereby changing the amount of incline of the slides.

Another object is the provision of means for varying the incline of the slides simultaneously with variations in the rate of feed of the timber to the saws.

To these ends, my invention consists in certain novel features and combinations such as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view through a gang saw, showing the pivotally-supported slides and connected parts; Fig. 2 is a side view of a gang saw equipped with my invention; Fig. 3 is a rear view of the gang saw; Fig. 4 is a detail view partly in section, showing one means for connecting the shaft members; and Figs. 5 and 6 are detail views showing the right and left threaded connection between the sections of the rock shaft.

(A) indicates the frame of the gang saw, to the inner faces of which are secured slides (1) and (2). These slides are arranged in pairs one above the other and are pivotally secured to the frame. I prefer to locate the pivotal points (3) of the slides on a plane substantially horizontal with the horn pins (4) carried by the saw sash (5), when such pins are at the upper limit of their movement.

The slides may be oscillated in any convenient manner, but as one means for effecting such movement, I provide the separate rock-shafts (6) and (7) journaled on the rear face of the frame. These shafts are each provided with arms (8) (8) connected by means of the rods (9) (9) to the free ends

of at least one of each pair of slides respectively. The rock-shafts (6) and (7) are connected by means of cranks (10) (10) and a link (11), whereby movement of one rock shaft is transmitted to the other and the pairs of slides are oscillated simultaneously and in fixed relation to each other. The rock shaft (7) may be oscillated by means of a crank arm (12) secured to a rod (13) eccentrically connected to the main drive shaft (14).

(15) (15) indicate feed rolls journaled in the frame. The shafts (16) of the feed rolls are equipped with gears (17) (17) driven from a bevel gear (18) actuated by a pinion (19) keyed on a shaft (20). A friction-wheel (21) slidably mounted on the shaft engages a friction-disk (22). In order to vary the rate of feed, the friction-wheel is movable relative to the friction-disk (22), such movement being attained through a slidable rod (23) carrying an arm (24) engaging and supporting the hub of the friction-wheel (21). The rod is provided with a rack (25) in mesh with a gear (not shown) controlled by a hand-wheel (27).

It is advisable in attaining the best results, to change the positions of the arcs of movement of the slides (1) and (2) and consequently the incline of the slides when the rate of feed of timber to the saw is adjusted. The reasons for such change are fully set forth in my co-pending application for gang saws filed co-incidental with the present application. Thus if the rate of feed is slowed down, it is desirable to so adjust the position of the arc of movement of the slides that they do not swing so far forwardly of a vertical line drawn through the pivot points (3) (3), say, and the slides therefore have less incline. On the other hand, if the rate of feed is increased, it is desirable that the slides and consequently the saws swing farther forward from a vertical line, to give the slides a greater incline. The length of the arc of movement of the slides is not altered when the inclination is changed. In other words, the speed of advance of the saws toward the timber should at all times be proportioned to the rate of feed of the timber. Such adjustment of the position of the arcs of oscillation of the slides may be effected in various ways, either by hand or automatically. As one means for effecting such change, however, I have shown the fol-

lowing mechanism. The main rock shaft (7) is made of two sections preferably journaled in alinement with each other, one section carrying the arm (8) and crank (10) and the other section (7') having the crank arm (12) secured thereto. The section (7') thus has a fixed oscillatory movement owing to its connection with the drive shaft (14). The two sections are adjustably connected as follows: Arms (26) and (28) project from the respective sections, and trunnion nuts (29) (29) are pivotally mounted in the adjacent faces of the arms and in horizontal alinement with each other. The alined heads of the nuts are apertured to receive one end of a right-and-left threaded screw shaft (30), the opposite end of which screw shaft is connected in any suitable manner to a longitudinally-slidable and rotatable shaft (31) slidably supported in bearings (32). A gear (33) is feathered on the shaft (31), such gear meshing with a rack (34) actuated in any suitable manner. In this way, the two sections of the rock shaft are adjustably connected. Rotary motion imparted to the shaft (31) will rotate the right-and-left threaded screw to move the arms (26) and (28) farther apart or nearer together, whereby to change the position of the arcs of movement of the slides. As one means for automatically effecting such change simultaneously with any adjustment of the rate of feed of the timber, I provide the sliding rod (23) with an arm (35) connected to the rack (34). Thus when the hand-wheel (27) is operated to raise or lower the rod (23) moving the friction-wheel (21) relative to the disk (22), the rack (34) is simultaneously moved to rotate the screw shaft (30) in one direction or the other to rotate shaft section (7) relative to shaft section (7'), thereby varying the positions of the arm (8) and crank (10) and hence shifting the positions of the arc of movement of both pairs of slides (1) and (2) simultaneously with any change in the rate of feed of the timber. The length of the arc traversed by the slides is constant, but the above-described adjustment suitably shifts the location of the arcs of movement of the slides relative to a vertical line, and consequently increases or decreases the incline of the slides so that the saws are caused to cut chips of uniform length throughout their full stroke and the proper relation is maintained between the forward advance of the saws and the rate of feed of the timber.

The mechanism for increasing or decreasing the incline of the slides can be operated while the machine is at work and during the oscillation of the slides.

The foregoing illustrates a modified form of the mechanism disclosed in my co-pending basic application, Serial No. 423,486, filed March 26, 1908, in which the invention

is broadly claimed. The mechanism claimed herein is also a modified form of the invention disclosed in my co-pending application, Serial No. 423,484, filed March 26, 1908, to which reference is made.

Having thus fully disclosed my invention, what I claim as new is—

1. A gang saw mill comprising a plurality of pairs of pivotally supported slides, a rock shaft for each pair of slides, means connecting at least one member of each pair of slides with its respective rock shaft, means rigidly connecting the rock shafts, an auxiliary shaft having a fixed arc of movement, the shaft arranged in alinement with and adjacent one end of one of the rock shafts, means adjustably connecting the rock and auxiliary shafts, and means for partially rotating the rock shaft relative to the auxiliary shaft.

2. In a gang saw mill, the combination with a plurality of pairs of slides, of a rock shaft for each pair of slides, one of said rock shafts composed of a plurality of alined sections, means connecting one of said sections with the remaining rock shaft, means for imparting a fixed oscillation to the remaining section of the rock shaft, and adjustable connecting means between the sections for partially rotating one section relative to the other to change the position of the swing of the slides without affecting the length of the arc of movement or imparting rake to the saw.

3. In a gang saw, a pair of pivotally-supported slides, a saw sash received and traveling in said slides, a rock shaft composed of a plurality of sections, one section of the rock shaft having a fixed arc of movement, at least one of the slides connected to the remaining section of the shaft, a right-and-left threaded screw, means for rotating the screw in opposite directions, and means carried by the respective sections of the rock shaft and engaged by the right-and-left threaded screw to permit an adjustment of one rock shaft section relative to the other.

4. A gang saw mill comprising a pair of pivotally-supported slides, an adjustable oscillatory shaft to which one of the slides at least is connected, a second oscillatory shaft having a fixed travel, an adjustable connection between the oscillatory shafts, a rotary shaft for actuating the connection between the oscillatory shafts, the rotary shaft having a reciprocating movement, a gear on the rotary shaft, and means for rotating the gear to effect an adjustment of one oscillatory shaft rotatively relative to the other.

5. A gang saw mill comprising a frame, a pair of pivotally-supported slides, a rock shaft composed of a plurality of alined sections, means for imparting a fixed oscillatory movement, to one section, at least one

of the slides being connected to the remaining section of the rock shaft, arms fast on the respective sections and means adjustably connecting the arms for changing the position rotatively of the remaining section relative to the section having a fixed oscillation to shift the position of the arc of movement of the slides and maintain the length of movement constant irrespective of the adjustment.

6. A gang saw mill comprising a frame, a pair of pivotally-supported slides, a rock shaft composed of a plurality of sections, one at least of the slides connected to one section of the rock shaft, means for imparting a fixed oscillatory movement to the remaining section of the rock shaft, a feed roll, means for rotating the roll, means for adjusting the speed of rotation of the roll, a rack controlled by said last-named means, a gear meshing with the rack, a shaft carrying the gear, a right-and-left threaded screw controlled by the shaft, arms carried by the respective sections of the rock shaft, and trunnion nuts carried by the respective arms, the heads of the trunnion nuts being correspondingly threaded to receive the right-and-left threaded screw.

7. A gang saw mill comprising a frame, a pair of pivotally-supported slides, a rock shaft composed of a plurality of sections, one of the slides at least being connected to one section of the rock shaft, an arm carried by such section, means for imparting a fixed oscillation to the remaining section of the rock shaft, an arm carried by such remaining section, trunnion nuts carried by the respective arms, the heads of the respective nuts being oppositely threaded and a right-and-left threaded screw received in and connecting the trunnion nuts.

8. The combination in a gang saw mill, of a saw sash arranged to travel plumb at all times, a pair of movable slides in which the sash is slidably received, a sectional rock shaft, one of the sections adapted to actuate the slides and being adjustable relative to the remaining section, means for imparting a fixed oscillation to said remaining section, arms secured to the respective sections, adjustable means connecting the arms to vary the position of one relative to the other, and means for mechanically operating such adjustable means at any time.

9. A gang saw mill comprising a sash, a plurality of pairs of slides, rock shafts, one of the rock shafts composed of a plurality of aligned sections, the respective pairs of slides connected to the remaining rock shaft and to one section of the sectional rock shaft, means adjustably connecting the sections, a feed mechanism, and means controlling the feed mechanism and the adjustable means for changing the feed and

varying the adjustment simultaneously during the operation of the machine.

10. A gang saw comprising a plurality of pairs of pivotally supported slides, a rock shaft and a sectional oscillatory shaft, the pairs of slides connected to the rock shaft and to one section of the oscillatory shaft respectively, the remaining section having a fixed arc of travel, means adjustably connecting the sections, a feed mechanism, and means for controlling the rate of feed, a rack actuated simultaneously with the feed controlling means, a gear meshing with the rack and adapted to operate the adjustable connecting means for varying the position of the arc of movement of the slides without affecting the length of such arc or imparting rake to the sash.

11. As a means for adjusting the amount of advance of a gang saw relative to a cant, the combination with a sliding saw-carrying sash, horn pins carried by the sash and pairs of slides in which the horn pins are received, of means for pivotally supporting the slides on a plane approximately horizontally in line with the horn pins when the latter are at their upper limits of movement, a rock shaft, a sectional oscillatory shaft, means connecting the rock shaft with one section of the oscillatory shaft, a linkage connecting the slides to the rock shaft and to one section of the oscillatory shaft, the remaining section of the oscillatory shaft being independent of the linkage and lying substantially in alinement with the first named section, means for imparting a fixed oscillation to the said remaining section, and adjustable mechanically actuated means connecting the two sections of the oscillatory shaft for varying the position of the arc of movement of the respective slides without altering the length of such arc.

12. As a means for adjusting the amount of advance of a gang saw relative to a cant, the combination with a sliding saw carrying a sash, horn pins carried by the sash and pairs of slides in which the horn pins are received, of means for pivotally supporting the slides on a plane approximately horizontally in line with the horn pins when the latter are at their upper limits of movement, a rock shaft, a sectional oscillatory shaft, means connecting the rock shaft with one section of the oscillatory shaft, a linkage connecting the slides to the rock shaft and to one section of the oscillatory shaft, the remaining section of the oscillatory shaft being independent of the linkage and lying substantially in alinement with the first named section, means for imparting a fixed oscillation to the said remaining section, an adjustable connection between the sections of the oscillatory shaft for varying the positions only of the arcs of movement

imparted to the slides, a feed mechanism, means for changing the rate of feed, and means connecting the means controlling the rate of feed and the adjustable connection to cause the adjustment of the rate of feed to simultaneously adjust the position of the arc of movement imparted to the slides.

13. In a gang saw, the combination with a plurality of pairs of slides, of a rock shaft and a sectional oscillatory shaft, one section of which is connected to the rock shaft, a linkage connecting the slides with the rock shaft and the first named section of the oscillatory shaft, a power shaft connected with the remaining section of the oscillatory shaft to impart a fixed rotation thereto, and an adjustable connection between the sections of the oscillatory shaft to shift the position of the arc of move-

ment of the slides, the length of such arc remaining constant.

14. In a gang saw, the combination with a plurality of slides, of a sectional oscillatory shaft, a linkage connecting the slides with one section of the oscillatory shaft, a power shaft connected with the remaining section of the oscillatory shaft to impart a fixed oscillation thereto, and an adjustable connection between the sections of the oscillatory shaft to shift the position of the arc of movement of the slides, the length of such arc remaining constant.

In testimony whereof, I affix my signature in presence of two witnesses.

JOHN L. GRAHAM.

Witnesses:

RALPH S. WARFIELD,
NELLIE M. ANGUS.

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