

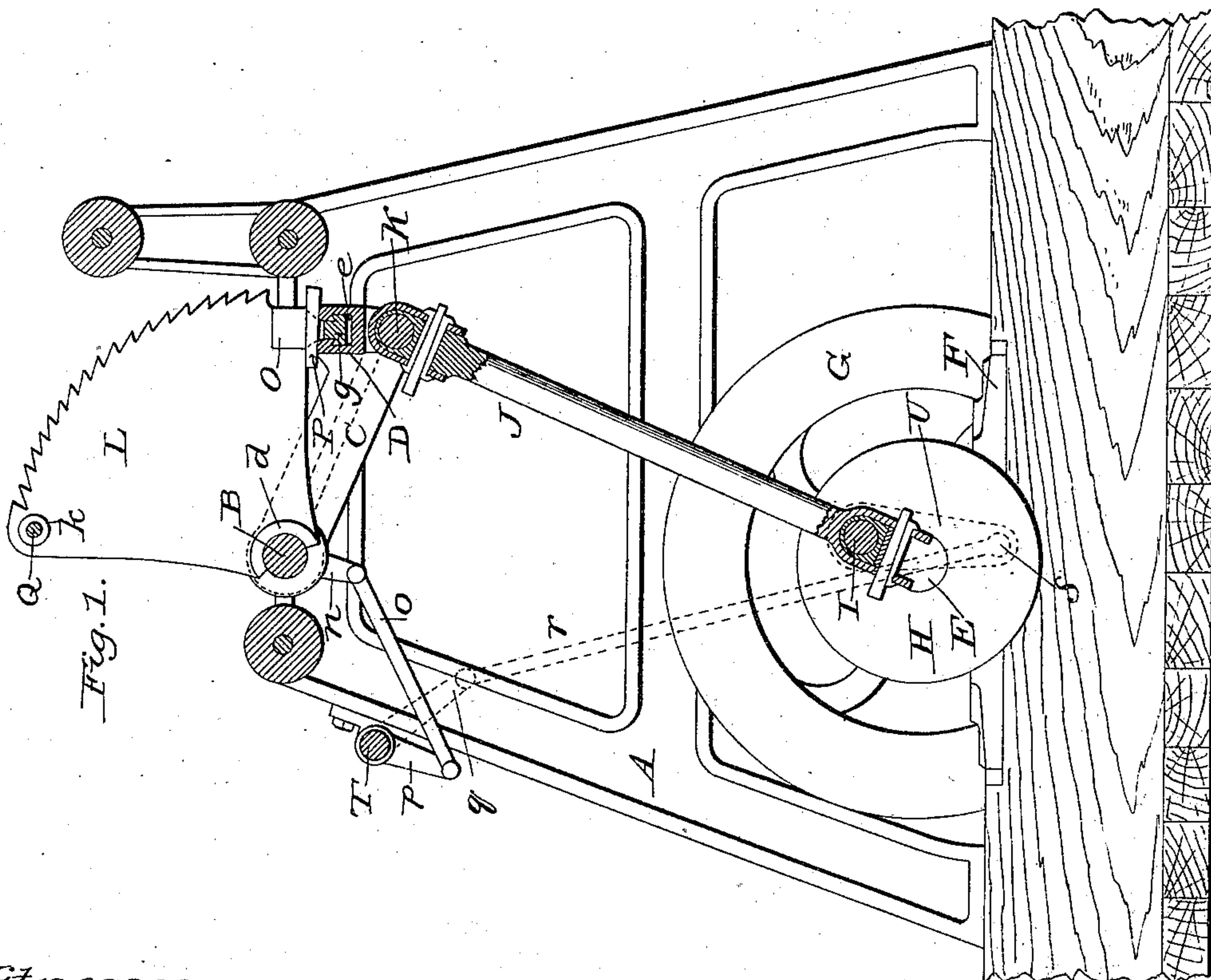
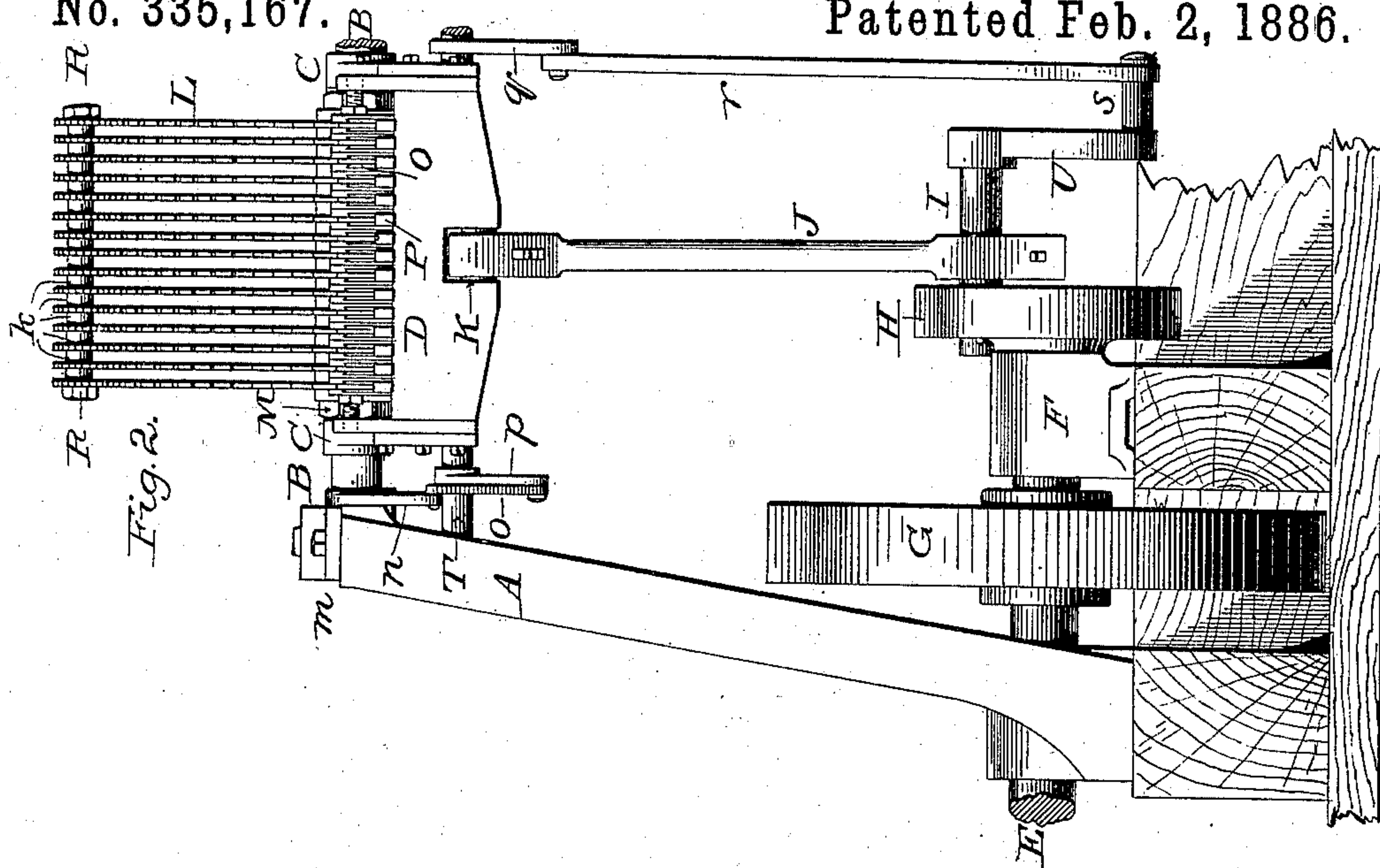
(No Model.)

2 Sheets—Sheet 1.

T. S. WILKIN.
GANG SAW MILL.

No. 335,167.

Patented Feb. 2, 1886.



Witnesses:
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 Walter S. Dodge.
 mms.

Inventor:
Theodore S. Wilkin,
by Rodger Lorr,
his Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

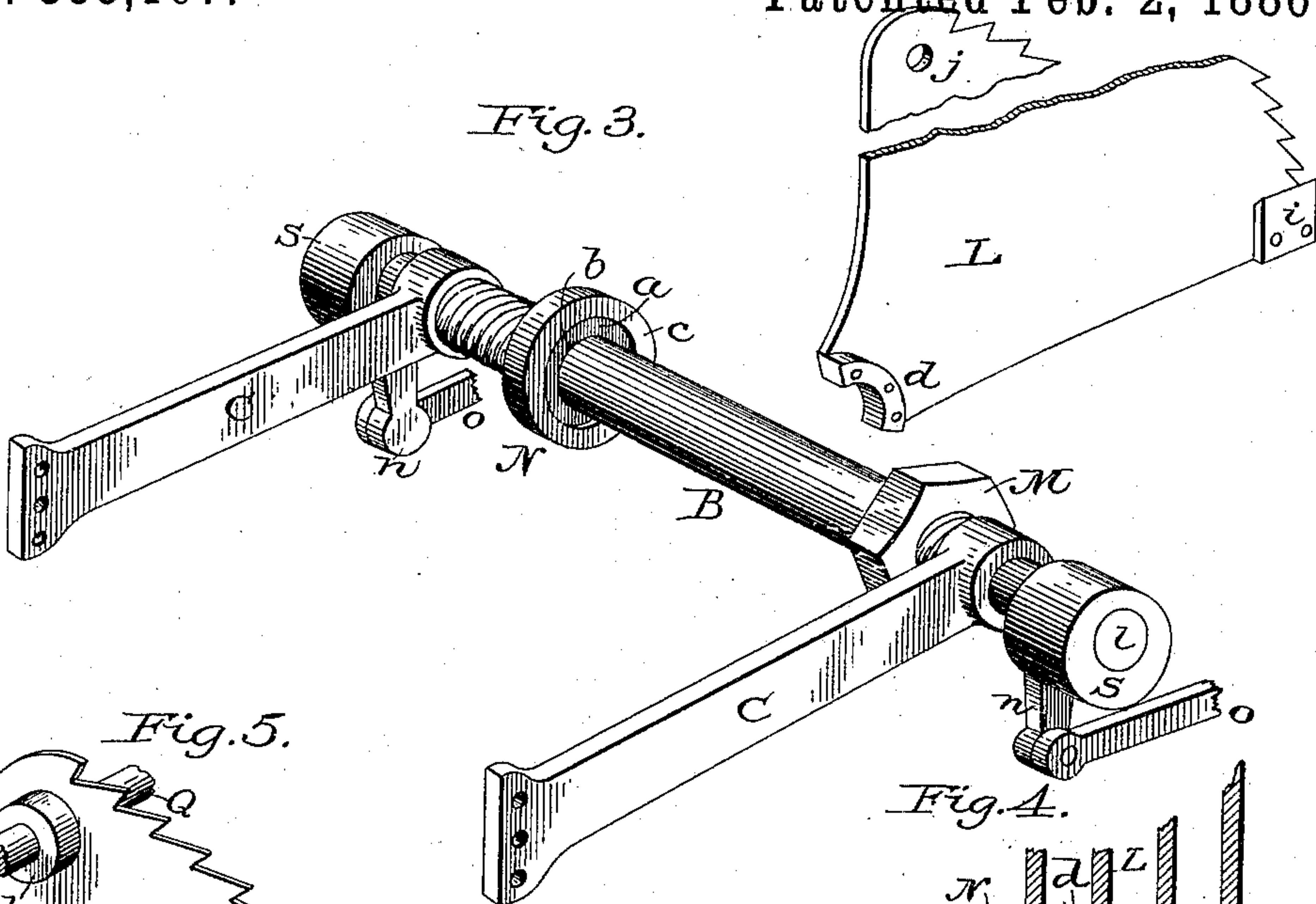


Fig. 5.

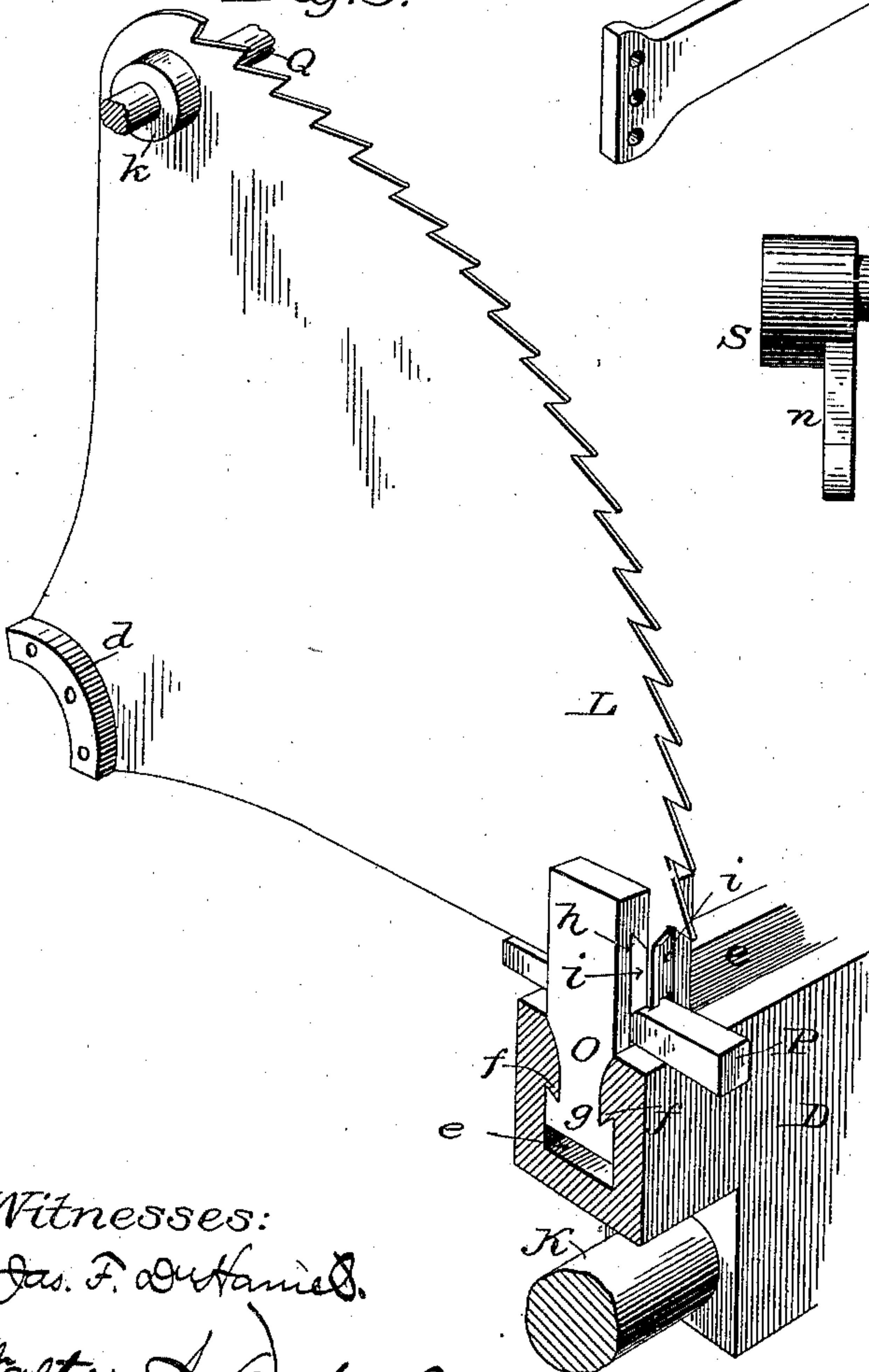


Fig. 4.

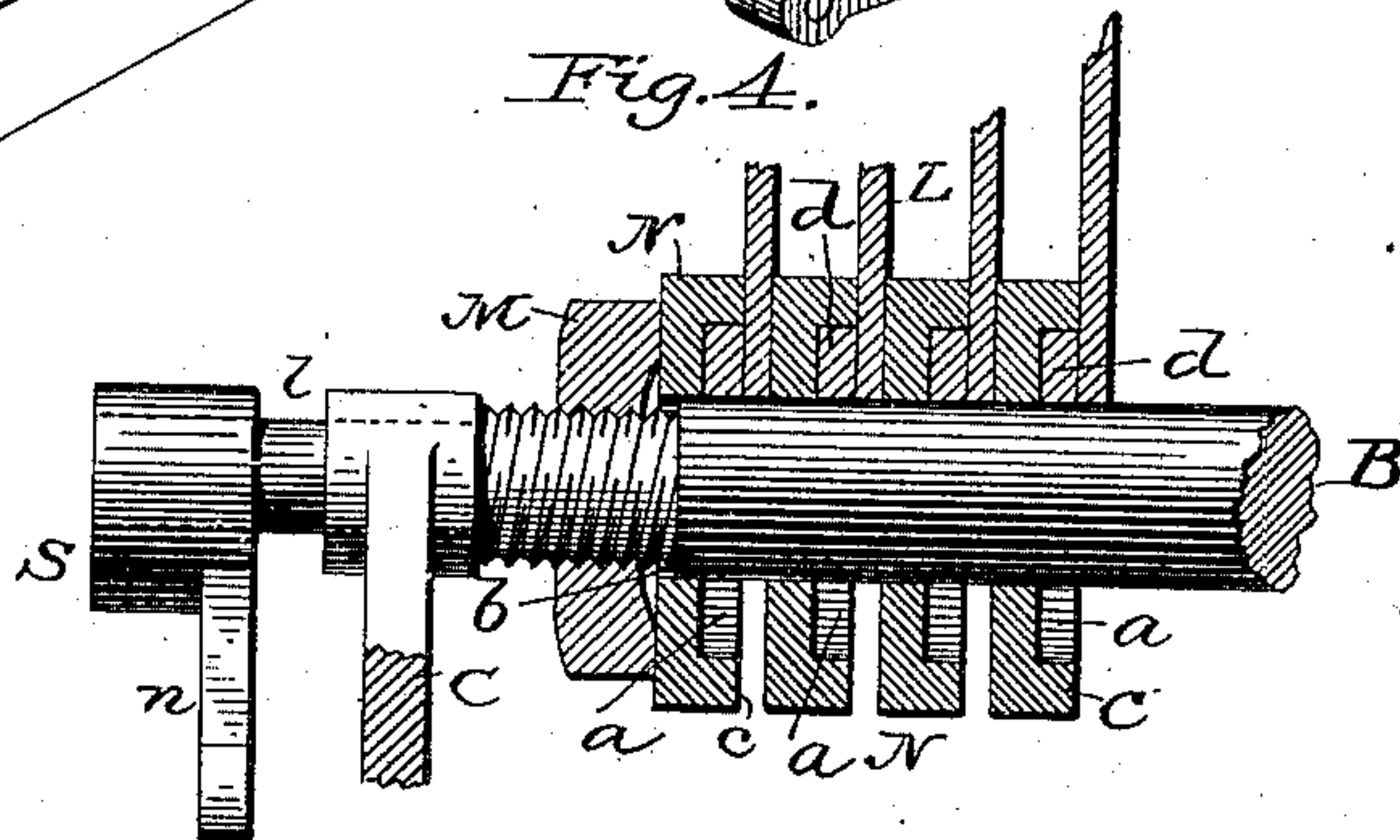
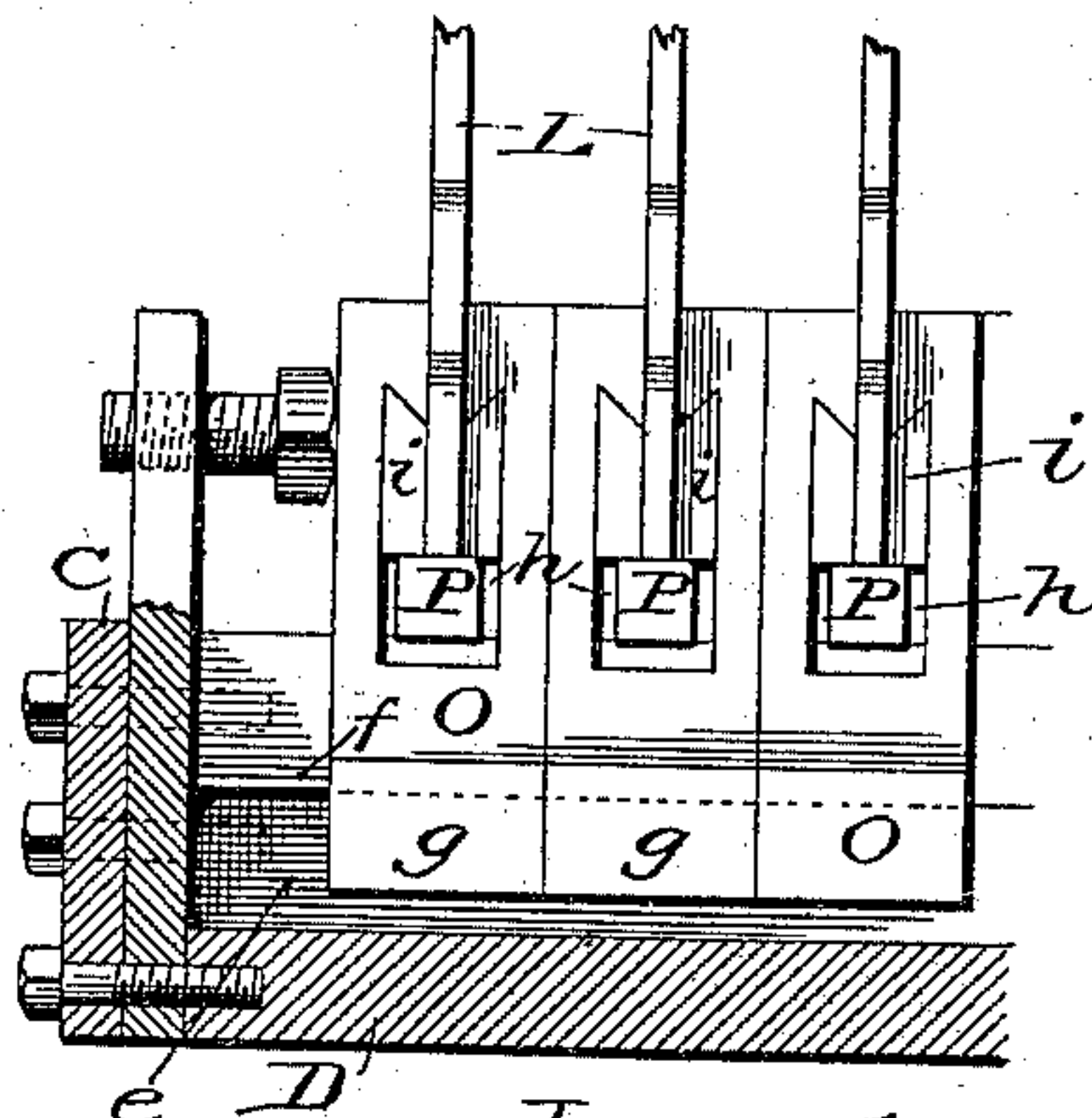


Fig. 6.



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UNITED STATES PATENT OFFICE.

THEODORE S. WILKIN, OF MILWAUKEE, WISCONSIN.

GANG-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 335,167, dated February 2, 1886.

Application filed June 4, 1885. Serial No. 167,644. (No model.)

To all whom it may concern:

Be it known that I, THEODORE S. WILKIN, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Gang-Saw Mills, of which the following is a specification.

My invention relates to gang-saw mills; and it consists in constructing the gang of a series of sector-shaped saws mounted upon an arbor or rock-shaft, and so connected or bound together as to afford the necessary stiffness and rigidity without a straining-frame.

The invention further consists in various details of construction relating to the manner of mounting and securing the saws, preventing twisting or binding, securing the advance and recession of the saws on the down and up strokes, respectively, and other matters hereinafter set forth.

In the accompanying drawings, Figure 1 is a vertical sectional view of my improved gang; Fig. 2, a face view of the same; Figs. 3 to 6, detail views of parts hereinafter described.

Prior to this invention saw-gangs have almost invariably been made with straight saws stretched in a reciprocating sash or frame. Attempts have been made to substitute circular for reciprocating saws; but, owing to the necessarily greater thickness of such circular saws and consequent waste of timber, and to the fact that the rear sides of the saws act upon and cut or mar the faces of the boards or planks, the use of circular-saw gangs is confined almost entirely to light work.

My invention is designed to combine the advantages of reciprocating and circular saws, while avoiding the disadvantages of each. The manner in which I attain these ends is illustrated in the annexed drawings, in which—

A indicates a rigid frame extending from the lower or ground floor of the mill up to the log-floor, the frame shown being simply the lower section of the ordinary gang-frame, which requires little or no change to adapt it to the new gang.

B indicates a substantial shaft or arbor, journaled in boxes at the top of frame A, and having two radial arms, C, keyed or otherwise firmly secured to it near its ends, the arms projecting from the shaft or arbor at the same angle, and being connected by a girt or

cross-beam, D, to the end of which they are firmly bolted. These arms D are advisably made of steel, and are of such form and dimensions as to avoid all liability of springing or twisting when the machine is in operation. At the base of frame A is a driving-shaft, E, mounted in pillow-blocks F, and carrying a fly-wheel, G, and a crank wheel or disk, H, as for the ordinary saw-gang. From the crank-pin I of the disk H a pitman, J, extends to and connects with the noddle-pin K or girt D, so that as the disk rotates, the girt and the arm C, to which it is bolted, are carried up and down, swinging through an arc of a circle of which the axis of shaft or arbor B is the center.

L indicates the saws, of which I use a number about equal to that of an ordinary reciprocating gang, each saw, under the present plan, being made in the form of a sector, the center of which may be coincident with or slightly eccentric to the axis of the arbor or shaft B, upon which the saws are mounted. If made eccentric, the center should be placed slightly above the axis of the arbor, in order that the periphery of the saw may constantly advance on the downstroke and recede on the upstroke. This form is illustrated in the drawings, and is believed to be the better form for general use.

As shown in Figs. 3 and 4, the shaft or arbor B is threaded near each end and just within the arms C, and provided with heavy nuts M. Between these nuts washers or disks N are placed upon the shaft or arbor, each washer having a recess, *a*, in one side face, extending partially or entirely around the central opening, *b*, and producing a flange or lip, *c*. These washers N and the nuts M are placed upon the arbor before the arms C are keyed fast, and are removed only in case it becomes necessary to change the saws or to vary their adjustment, the washers serving as spacing-blocks or gages to regulate the width of space between the saws, and consequently the thickness of the boards or planks produced.

Each saw is cut out to conform to the shaft or arbor, as shown in Fig. 3, and has a tab, *d*, of metal riveted to one side, and conforming to the curvature of that edge which is cut away to fit the arbor, as shown in Figs. 3 and 4. This tab *d* is of a thickness just equal to the depth

of recess *a* or flange *c*, and of a form and size to accurately fit and fill the space between the arbor B and the flange *c*, the recess *a* and tab *b* being arranged face to face.

5 The saws and washers are alternated, and the tab *d* of each saw is seated in the recess *a* of the adjoining washer, and when the required space is filled the nuts M are turned up and made to press the whole series firmly together,
10 but not until the lower edge of each saw is attached near its periphery to the girt D. To effect this attachment conveniently and easily, and permit the ready displacement of the saws, the girt D is formed with a longitudinal
15 slot or groove, *e*, having overhanging ribs *f*, which are undercut, as shown in Fig. 5, to receive hooks or connecting-blocks O. These blocks are of the form shown in Fig. 5—that is to say, they are of approximately rectangular
20 shape, but cut out on their front and rear sides or edges to form a T-head, *g*, the arms of which are undercut to correspond to the form of ribs *f* of the slot *e* in the girt. The upper end of each block has a slot, *h*, of the same form as
25 the slot *e* of the girt D, running from its front to its rear edge, or at right angles to the groove *e* of girt D. Each block is of the same thickness as the washers or collars N.

Each saw is furnished at or near its periphery
30 and at its lower edge with metal tabs *i* on both sides of the blade, as shown in Fig. 3, of a form and size to fit the slots or openings *h* of the blocks O. The slots or openings *h* are each of such depth as to receive beneath the tabs *i* a
35 wedge or taper key, P, which rests upon the top of the girt D, and, being driven firmly to place, serves both to force the tabs *i* snugly up to the overhanging lips of the slot *h* and to draw the T-head *g* of the block O firmly to its
40 place against the lips or ribs *f* of groove *e*, thereby making both rigid and secure.

Each saw is formed with a hole or perforation, *j*, at or near its upper outer corner, and when the saws of the entire series are secured
45 to the girt and to the arbor B said holes are thereby aligned with each other. When thus aligned, a rod or bolt, Q, is passed through the series of holes, and a washer or spacing-collar, *k*, is placed upon said rod between each
50 two saws, said washers or collars being of the same width exactly as the collars N and blocks O, from which it follows that the saws are accurately spaced at the center and at the two outer corners. The rod or bolt Q may be headed
55 at one end, threaded and provided with a nut, R, at the other end, or nuts may be applied to both ends. In either case the saws are clamped firmly by turning up a nut. By thus connecting and firmly binding the saws together
60 at the three points mentioned I cause each saw to brace and support the others, and as a consequence no frame or structure is required, notwithstanding the fact that the saws are made nearly or quite as thin as the straight
65 saws now commonly used in gang-mills.

If desired, the saws may be made with eyes to encircle the arbor, with tangs to enter

sockets, or a continuous groove in the arbor; or they may be attached thereto in any equivalent manner. The connection with the girt 70 and the binding together of the saws at the upper corners may also be modified, though the construction and arrangement set forth are deemed best.

Instead of tabs separately made and attached 75 to the saws, they may be formed integral therewith.

It will of course be understood that the radius of the saws must be considerably greater than the diameter of the log to be sawed, in 80 order to allow a rise and fall of the saws without bringing the girt or girt-connections or the tie-rod at the top into contact with the log.

For the purpose of advancing and receding 85 the saw on the cutting and return strokes instead of or in addition to making the periphery of the saw eccentric to the axis of the arbor, the journals *l* of the arbor are or may be mounted in sleeves S, which are in turn
90 mounted in the boxes or bearings *m* of the frame A, the holes or bearings formed in the sleeves for the reception of the journals *l* being made eccentric to the axis of the sleeves S, so that by merely turning or rocking the
95 sleeves in their bearings the arbor B and its saws shall be advanced or receded as required.

The sleeves S are provided with radial arms *n*, which are connected by rods or links *o* to similar arms, *p*, projecting from a rock-shaft, T, journaled in frame A, and furnished with a 100 longer arm, *q*, which is connected by a pitman, *r*, to the crank-pin *s* of a crank-arm, U, secured to the crank-pin I of wheel H.

In some cases the rock-shaft T and its connections may be omitted, the pitman *r* in such 105 case connecting directly with one or both arms *n* of the sleeves S; but ordinarily sufficient room cannot be secured for such arrangement.

It is obvious that the mechanism for advancing and receding the saws may be varied; 110 hence I do not restrict myself to the use of the particular construction shown.

Good results may be secured by making the journals *l* of arbor B eccentric to the axis of 115 the arbor.

The rock-shaft or arbor B may be threaded at one end only, or at both ends, as preferred.

Having thus described my invention, what I claim is—

1. In a gang-saw mill, a series of sector- 120 shaped blades, toothed on their peripheries, secured to a rock-shaft or arbor, and bound together at their outer corners, substantially as shown and described.

2. A blade for gang-saw mills, made in the 125 form of a sector and provided with teeth on its periphery, substantially as shown and described.

3. A blade for gang-saw mills, made substantially in the form of a sector, but having 130 its toothed circumference made slightly eccentric, to cause the blade to advance in cutting.

4. The herein-described saw for gang-saw

mills, consisting of a sector-shaped blade, as L, having teeth on its periphery, a curved tab, as *d*, near the meeting-point of its upper and lower edges, and tabs, as *i i*, at its outer 5 lower corner.

5. In a gang-saw mill, the combination of a supporting-frame, an arbor journaled in said frame, a series of saws of sector shape mounted upon said arbor, a girt connecting said saws 10 near their peripheries, a crank-shaft, and a pitman connecting the crank-pin and the girt, all substantially as described and shown.

6. In combination with a rock-shaft, a saw-blade secured thereto in a radial plane at right 15 angles to the axis of the arbor, a crank, and a pitman connecting the saw-blade and the crank, substantially as set forth and shown, whereby rotation of the crank is caused to impart a reciprocatory movement to the saw about the 20 axis of the arbor.

7. The combination of a frame, as A, an arbor, as B, journaled in said frame and threaded near its end, collars, as N, mounted upon said arbor and formed with a cavity, as *a*, in 25 one face, sector-shaped saws, as L, each provided with a tab, as *d*, to enter the cavity of one of the collars, and with tabs, as *i*, near the periphery, a girt, as D, provided with a longitudinal groove, as *e*, blocks, as O, connecting the saws and girt, wedges, as P, passing 30 through the blocks between the saws and girt, a crank-shaft, as E, and a pitman, as J, connecting the girt and the pin of the crank of said crank-shaft.

8. The combination, substantially as shown and described, of a frame, A, a rock-shaft, B, journaled therein and provided with radial arms, as C C, a girt, D, secured to the outer 35 ends of said arms, saws L, secured upon the arbor and connected with the girt, a shaft, E, journaled in frame A and provided with a crank-wheel, H, and a pitman connecting the crank-pin and the girt. 40

9. The combination of a supporting-frame, 45 A, rock-shaft B, journaled therein and provided with arms C C, girt D, connecting said arms, saws L, secured to the rock-shaft and girt, the rod Q, extending through the upper corners of the saws, spacing blocks or collars 50 between the saws, a crank-shaft, E, and a pitman connecting the crank-pin and the girt.

10. A saw-gang consisting of arbor B, journaled in a suitable supporting-frame and provided with a threaded portion at one end, a

series of collars, N, mounted upon said arbor 55 and formed with recesses *a* in their side faces, saws L, having tabs *d*, seated in the recess *a*, nut M, secured upon the threaded portion of the arbor and pressing the saws and collars firmly together, tie-bolt Q, passing through 60 the upper extremities of the saws, spacing-collars encircling said bolt and serving to separate the saws, arms C C, secured upon the arbor B, girt D, connecting said arms, and blocks O, connecting the saws and girt and 65 serving to space the saws, all substantially as described and shown.

11. In combination with rock-shaft B and a supporting-frame, saws L, secured to said rock-shaft and provided with tabs *i* near the outer 70 lower extremities, arms C C, keyed to the rock-shaft, girt D, secured to said arms and provided with groove or slot *e*, block O, having T-heads *g*, seated in groove *e* and slotted at their upper ends to receive the tabs *i* of the saws, and 75 wedges P, extending through the blocks O between the saws and the girt.

12. In combination with a frame, a rock-shaft or arbor mounted therein, sector-shaped saws secured to said arbor, eccentric sleeves 80 encircling the journals of said arbor, to advance the same as the saws reciprocate about the axis of the arbor, and mechanism for reciprocating the saws.

13. In combination with frame A and arbor 85 B, having journals *l*, sleeves S, encircling the journals *l*, journaled in frame A, and provided with arms *n*, saws L, secured upon arbor B and connected by girt D, shaft E, provided with crank H, pitman J, connecting crank- 90 pin I and girt D, rock-shaft T, provided with arms *p* and *q*, links *o*, connecting the arms *n* and *p* of the sleeves and rock-shaft, an eccentric crank-arm, U, secured upon the shaft E, and a pitman, *r*, connecting the arm *q* of the 95 rock-shaft and the eccentric crank-arm.

14. In combination with a frame, a rock-shaft or arbor mounted therein, a gang of sector-shaped saws secured to said arbor, mechanism for reciprocating said saws about the 100 axis of the arbor, and a device, substantially such as shown and described, for advancing the gang and arbor on the cutting stroke and receding them on the return stroke.

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