(No Model.)

W. J. F. LIDDELL.

CIRCULAR SAW MILL.

No. 299,233. Patented May 27, 1884.

Fig. 1

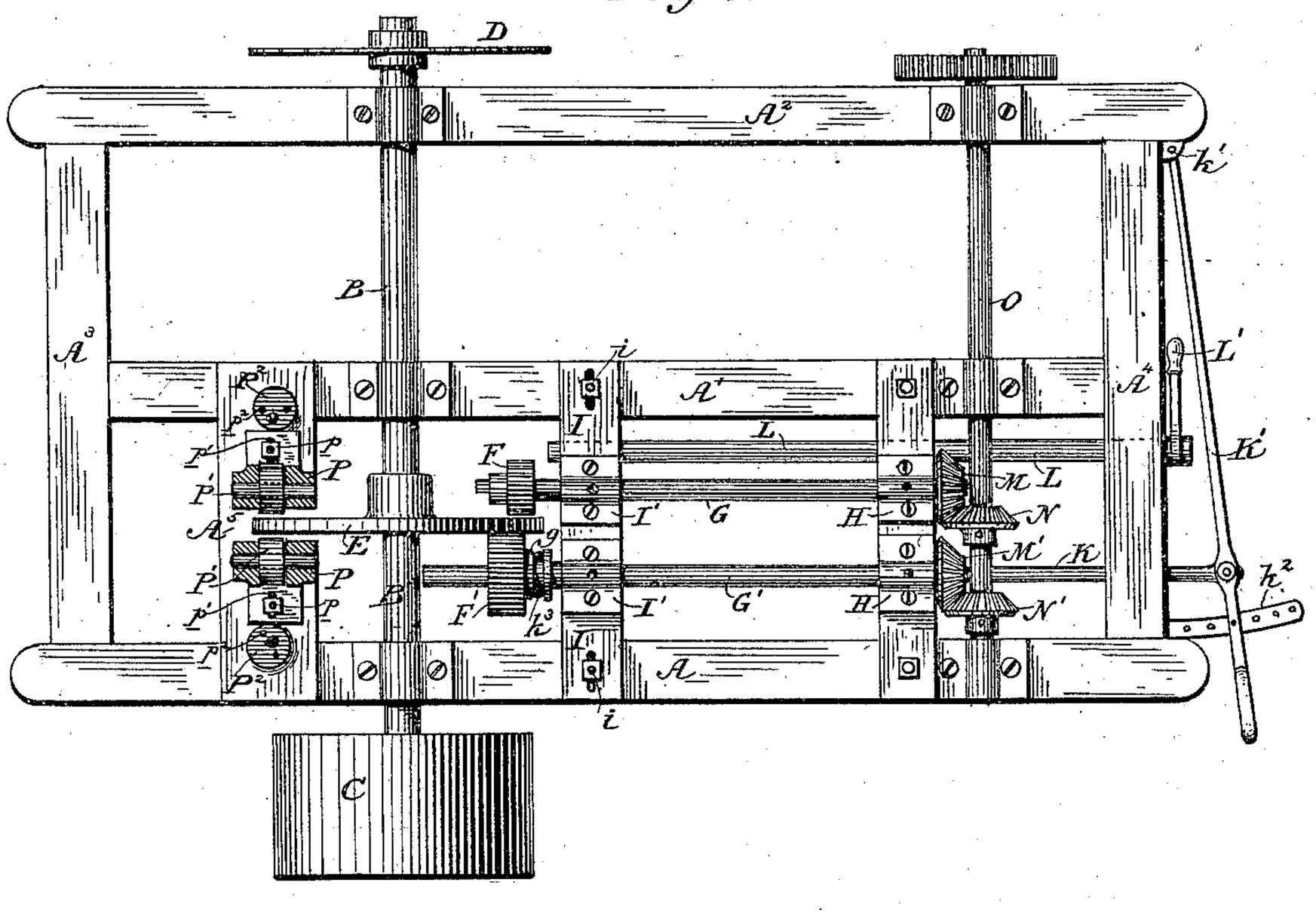


Fig. 2

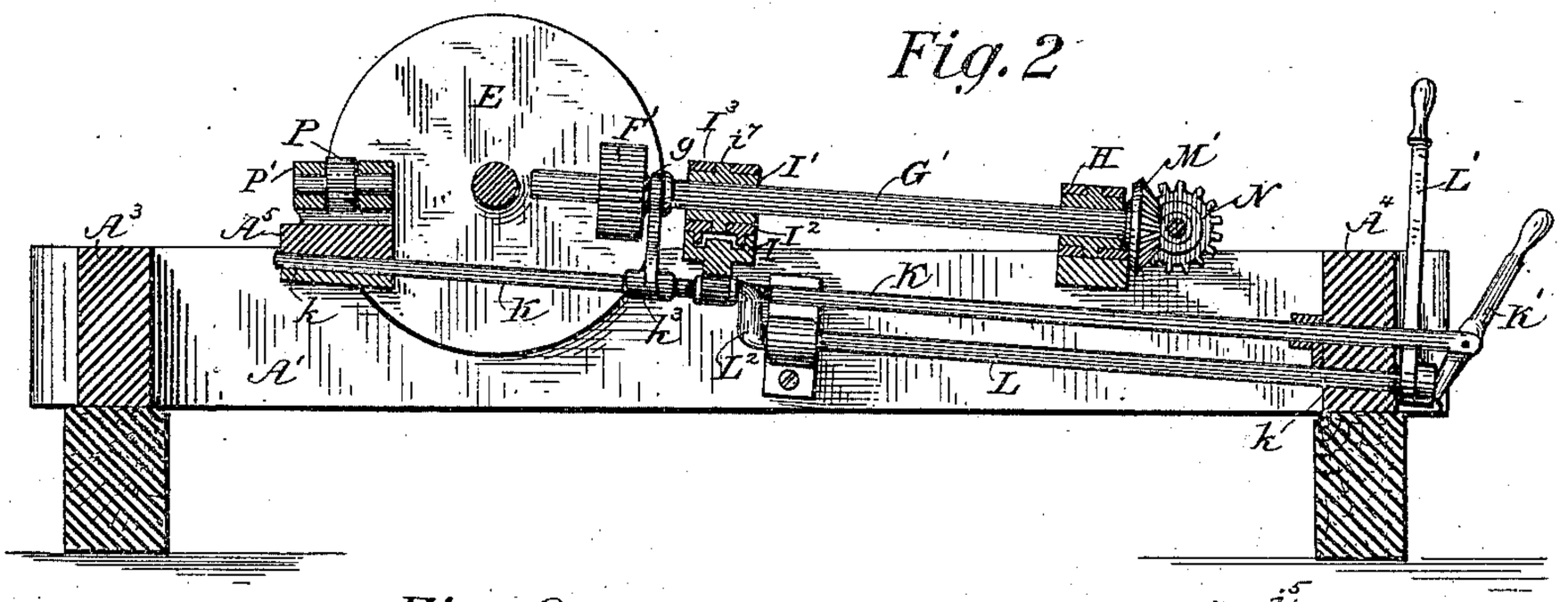


Fig. 3

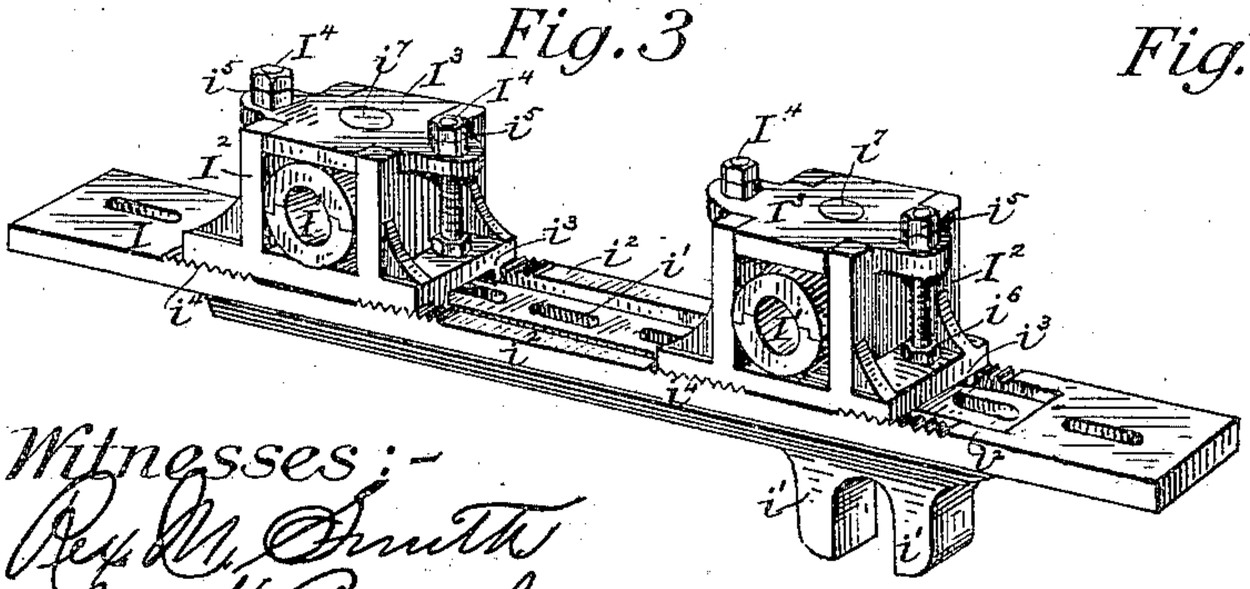
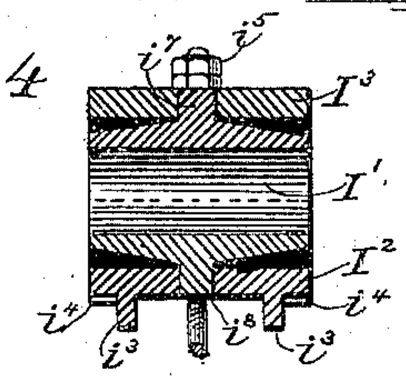


Fig. 4



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UNITED STATES PATENT OFFICE.

WALTER J. F. LIDDELL, OF CHARLOTTE, NORTH CAROLINA.

CIRCULAR-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 299,233, dated May 27, 1884.

Application filed February 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, WALTER J. F. LIDDELL, of Charlotte, county of Mecklenburg, State of North Carolina, have invented a new and useful Improvement in Saw-Mill Feed Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification.

My invention relates to certain improvements in that class of feed mechanism for saw-mills wherein a friction-disk secured to or attached by the saw-mandrel is employed to drive a shaft in opposite directions and at variable speed, said shaft being geared to the saw-mill carriage for actuating, changing the direction of movement, and varying the speed of the same; and it consists, primarily, in a novel combination and arrangement of parts to secure a direct connection between the saw-mandrel and shaft for actuating the saw-mill carriage.

It also consists in providing means for supporting the disk against the pressure of the friction-rollers, to free the mandrel or disk-shaft from pressure against the collars and bearings; and it further consists in a novel construction of longitudinally-reciprocating bearing-blocks or head-piece to support the movable ends of parallel shafts, to provide means for adjusting the shaft-bearings relatively to each other, to provide means for allowing the bearings to adjust themselves in their boxes to suit the varying angles of the shafts, and to provide means for holding the boxes securely to their adjusted positions relative to each other, and admit of the removal of the bearings therefrom without affecting said adjustment, as will hereinafter appear.

In the accompanying drawings, Figure 1 is a plan view of the saw-mill frame with my improvements applied; Fig. 2, a sectional side elevation of the same in the line *x x* of Fig. 1; and Figs. 3 and 4 are detail views of the adjustable bearing-block and bearings.

The supporting-frame is formed of longitudinal timbers A A′ A^2 and transverse end pieces, A^3 A^4. The saw-mandrel B is supported in bearings upon the longitudinal timbers transversely to the frame and at one end thereof, and projects beyond the outer longitudinal timbers. A band-pulley, C, is secured upon one of the projecting ends, by which the mandrel is driven, and a saw, D, is secured upon the outside of the frame at the other end of the mandrel. A disk, E, is keyed to the mandrel, and arranged thereon between the longitudinal timbers A A′, and between friction-wheels F F′, keyed to shafts G G′, arranged parallel to each other and at right angles to the saw-mandrel. The shafts G G′ are supported in pivotal bearings H H, fixed relatively to the frame at their ends farthest from the mandrel, and are supported at their ends nearest to the mandrel in longitudinally-adjustable bearings I I, both the fixed and adjustable bearings being arranged transversely to and supported upon the longitudinal timbers A A′ of the frame. The friction-wheel F is keyed to its shaft G in a fixed relation thereon, and the friction-wheel F′ is feathered to its shaft G′, to admit of its longitudinal movement thereon and its adjustment across the face of the disk E toward or away from its center, by which means the speed of the shaft G′ may be varied to regulate the feed of the saw-mill carriage, as will hereinafter appear. The adjustment of the friction-wheel F′ upon the end of its shaft is effected by a rod, K, suspended beneath the frame, to be moved longitudinally in its bearings *k* by means of a hand-lever, K′, pivoted at *k′* to the frame, and secured at any desired position upon an arc, k^2, also secured to the frame at the vibrating end of the lever. A forked or yoke-shaped arm, k^3, is secured to the rod K, and embraces a groove, *g*, in the hub of the friction-wheel F′, to move the said friction-wheel upon its shaft by the longitudinal movement of the rod K. The yoke k^3 and rod K have a slight oscillating movement, to admit of the lateral movement of the friction-wheel F′, with its shaft G′, when the said friction-wheel is moved into and out of contact with the disk E. The longitudinally-adjustable bearing-block I is slotted at its ends and secured to the timbers A A′ of the frame by bolts *i i*, which admit of its limited movement, such movement being effected by a longitudinal rock-shaft, L, supported in bearings upon

the frame, and provided at one end with a hand-lever, L′, and at the other end with a crank-arm, L^2, which is held between lugs i^3 i^3, cast upon the under side of the bearing-block I. The movement of the hand-lever L′ in either direction from its vertical position will move the bearing-block I in a corresponding direction, and bring either one or the other of the friction-wheels F F′ to bear with the required force upon one of the faces of the disk. The ends of the shafts G G′ nearest the fixed bearings H H have beveled pinions M M′ secured to them, which gear with corresponding beveled wheels, N N′, secured to a shaft, O, supported in bearings transversely to the frame of the machine, the said shaft O being geared to and actuating the saw-mill carriage. The movable friction-wheel F′ may be larger than the fixed wheel F, to impart a slower movement to its shaft G′, said shaft serving to feed the carriage forward with the work, and its friction-wheel being adjustable upon the face of the disk will admit of a still slower movement as the friction-wheel is moved more closely to the mandrel and the center of the disk. A very slow feed may thus be obtained for work requiring such feed, and a much more rapid movement may be imparted through the friction-wheel F and shaft G to the carriage in running it backward. It will be seen that when one of the friction-wheels is in contact with the disk the other friction-wheel, with its shaft, will be free to move idly, and that the friction-wheels F F′ will be moved in opposite directions when one or the other is brought in contact with the disk. As the friction-wheels are both arranged upon the same side of the saw-mandrel to bear upon the opposite faces of the disk, the tendency would be to loosen the disk upon its mandrel or cause the mandrel to bear with increased friction upon its journals. This tendency is obviated and the shaft is held truly in its bearings against the pressure brought upon either the disk, the band-pulley, or the saw by friction-rollers P P, journaled in bearings P′ P′, adjustably secured upon a cross-piece, A^5, of the frame, and arranged upon the opposite side of the mandrel to the friction-rollers P P, and to bear upon the opposite faces of the disk. The disk will be permitted to revolve freely between the rollers, but will be held firmly against any side pressure brought either upon it or the mandrel. The adjustment of the rollers against the faces of the disk is effected by means of eccentric plates P^2, secured to the frame A^5, which may be brought to bear against the ends of the bearing-blocks P′ P′, which are secured to the said frame-piece A^5 by bolts p, passing through slots p' in said bearings. Pin-holes p^2 in the upper face of the eccentric plates P^2 will receive a pin-lever, and admit of their movement upon their pivotal connection. The bearing-block I is peculiarly formed to admit of the adjustment of the bearings I I′ thereon relatively to each other, and also to allow a slight swiveling movement of the bearings in their boxes, to accommodate them to the varying angles of the shafts caused by the lateral displacement of their ends above described. The bearing-block is formed of a base-plate, I, formed with serrated side flanges, i^2 i^2, and a central slot, i'. Boxes I^2 I^2, formed of sides and bottom cast together, and with flanges i^3 i^3 and serrated edges i^4 i^4 to bear upon the side flanges, i^2 i^2, of the base-plate, and cap-pieces I^3 I^3, secured by bolts I^4 I^4 to the boxes, are, together therewith, adjustable upon the base-plate, and may be secured in any desired position thereon by the said bolts I^4 I^4. The bolts I^4 I^4 are screw-threaded a sufficient distance to allow separate nuts i^5 i^6 to be screwed upon them, the nuts i^5 serving to hold the boxes upon the base-plate, and the nuts i^6 serving to hold the caps upon the boxes, so that the caps may be removed without disturbing the adjustment of the boxes and bearings relatively to each other. The bearings I are swiveled by trunnion-hubs i^7 i^8, respectively, to the bottom of the boxes and to the caps, and admit of the lateral movement of the bearings and shafts, as above described.

I claim as my invention and desire to secure by Letters Patent—

1. In a saw-mill feed mechanism, a friction-disk secured to the saw-mandrel, in combination with friction-wheels arranged to bear upon the opposite faces of said disk in such manner that one only of said wheels shall bear upon the friction-disk at a time, said friction-wheels being secured to parallel shafts geared to and actuating the saw-mill carriage, and mounted in movable bearings and connected by bevel-gears with the shaft actuating the saw-mill carriage, substantially as described.

2. In a saw-mill feed mechanism, a friction-disk secured to the saw-mandrel, in combination with parallel shafts carrying friction-wheels arranged upon opposite sides of said disk, but at such a distance apart as will adapt them to be brought one only at a time into operative contact with said friction-disk, movable bearings for adjusting said friction-wheels relatively to the friction-disk, and beveled pinions mounted upon said parallel shafts, and meshing with corresponding pinions on a shaft substantially at right angles thereto, for actuating the saw-mill carriage, substantially as described.

3. The combination, in a saw-mill feed mechanism, of a friction-disk secured to or actuated by the saw-mandrel, friction-wheels arranged to bear upon the opposite faces of said disk, and secured to shafts geared to and actuating the saw-mill carriage, and friction-rollers secured to the frame and arranged diametrically opposite the friction-wheels, to bear against the opposite faces of the friction-disk, substantially as and for the purpose described.

4. The combination, in a saw-mill feed mechanism, of a friction-disk secured to or actuated by the saw-mandrel, the shafts provided with friction-wheels arranged to bear upon

the opposite faces of said disk, the friction-rollers arranged diametrically opposite the friction-wheels, to bear against the opposite faces of the friction-disk and supported in adjustable bearings secured to the frame.

5. In a saw-carriage feed mechanism, the combination, with the movable ends of the parallel friction-wheel shafts, of the adjustable bearings consisting of the longitudinally-adjustable bed-plate I, formed with elevated side flanges, and a longitudinally-slotted bottom, bearing-boxes formed with serrations to engage with the corresponding serrations of the bed-plate, and clamping-bolts for securing the boxes adjustably to the bed-plate, substantially as described.

6. In a saw-mill feed mechanism, a longitudinally-adjustable bearing-block, in combination with a bearing-box adjustable longitudinally upon said bearing-block, and a sleeve-bearing pivoted within said box by means of trunnion-hubs journaled therein, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 16th day of February, A. D. 1884.

WALTER J. F. LIDDELL.

Witnesses:
J. L. CHAMBERS,
I. S. FRANKLIN.