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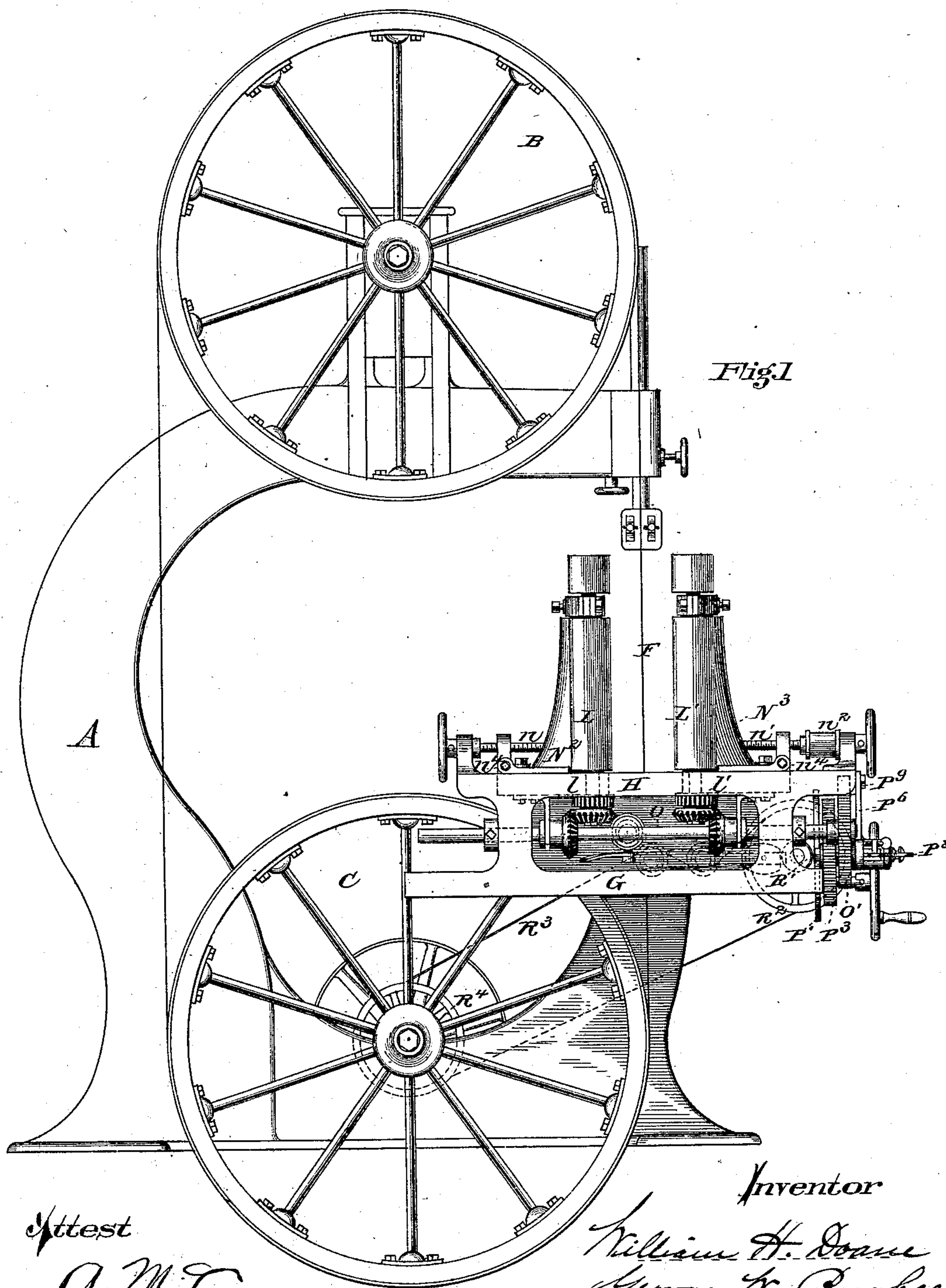
4 Sheets—Sheet 1.

W. H. DOANE & G. W. BUGBEE.

MACHINE TABLE.

No. 272,220.

Patented Feb. 13, 1883.



Attest

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4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

MACHINE TABLE.

Patented Feb. 13, 1883.



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(No Model.)

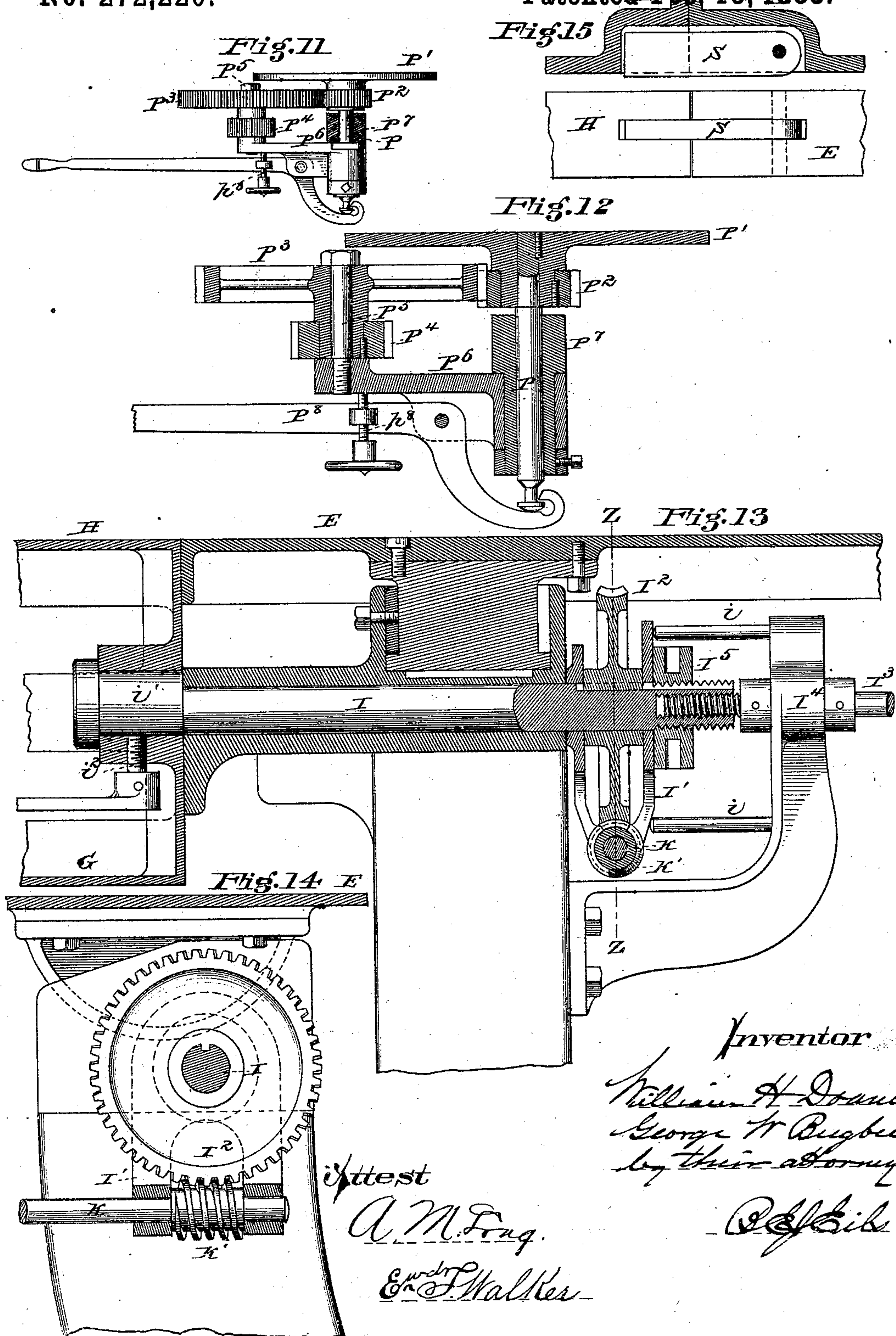
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UNITED STATES PATENT OFFICE.

WILLIAM H. DOANE AND GEORGE W. BUGBEE, OF CINCINNATI, OHIO.

MACHINE-TABLE.

SPECIFICATION forming part of Letters Patent No. 272,220, dated February 13, 1883.

Application filed June 28, 1882. (No model.)

To all whom it may concern :

Be it known that we, WILLIAM H. DOANE and GEORGE W. BUGBEE, citizens of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Band Sawing-Machines; and we 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.

This invention relates to band-saws in general, but more especially to those which are convertible from hand-feed machines into power-feed or resaw machines. Heretofore separate interchangeable tables were provided for these convertible machines, and it was necessary to remove one table and put the other one in its place in the conversion of the machines.

The principal object of this invention is to so construct these convertible machines that they may be converted without the removal and substitution of separate tables.

To this end it consists mainly in constructing the work-supporting surface of two tables divided on a line just in front of the saw-blade, constructing the table in front of the saw-blade with two faces, (one plain and the other having power-feed works erected upon it,) and so mounting this double-faced or duplex table that it may be reversed without dismounting it to bring either of its faces on a line with the single table.

It further consists in so arranging the feed with respect to the gearing for imparting motion thereto that the feed is thrown out of gear when the power-feed face of the duplex table is turned down and thrown into position to be driven by the said driving-gearing when said power-feed face of the duplex table is turned up.

It further consists of various details of construction, which will be clearly explained in the description following and specifically stated in claims at the close of this specification.

In order that our invention may be clearly understood, we have illustrated in the annexed drawings, and will proceed to describe, the best form thereof at present known to us.

Figure 1 is a front elevation of a band resawing-machine embodying our improvements. Fig. 2 is a side elevation of the tables and feed-roll mechanism. Fig. 3 is a rear elevation of

devices shown in Fig. 2. Fig. 4 is a longitudinal section in elevation of the reversible duplex table. Fig. 5 is a transverse section on line *xx* of Fig. 4. Fig. 6 is a plan of the reversible duplex table. Fig. 7 is an elevation of feed-roll bearing-standard. Fig. 8 is a sectional elevation of the feed-gearing driving-shaft. Fig. 9 is a transverse section on the line *yy*, Fig. 8. Fig. 10 is a plan of feed-belt tightener. Fig. 11 is a plan of the driven frictional feed disk and gearing. Fig. 12 is a sectional plan of the driven frictional feed disk and gears. Fig. 13 is a sectional elevation of device for operating the reversible duplex table. Fig. 14 is a section on line *zz* of Fig. 13. Fig. 15 comprises sectional plan and elevation of means for securing the reversible duplex table in position.

We have illustrated our improvements embodied in a band-saw, the operative parts of which are mounted on a C-shaped frame, A, the upper saw-pulley, B, being mounted on the upper horn of the frame, and the lower saw-pulley, C, being keyed to the front end of the main shaft D, supported in suitable bearings on the base of the main frame, and carrying at its rear end a pulley, so that it may be driven by a belt from a counter-shaft. The single table E is mounted on the lower horn of the main frame, either immovably or in such manner that it may be tilted to the limited extent for sawing on a bevel. It is preferred to mount this table so that it can be tilted, and to that end any one of the known modes of connection providing for such tilting may be used. The front edge of this single table projects a little beyond the front face of saw-pulley C and the saw-edge of the saw-blade F, which passes through a suitable slit cut in such edge.

The duplex table consists of two rigidly-connected plates, G and H, and is secured upon the front end of the horizontal shaft I, by which it may be turned to bring either of its plates on a level with the single table, E. The shaft I passes rearwardly through a long bearing on the lower horn of the main frame, underneath the single table, its rear end carrying a forked bearing, I', on the rear side of the main frame. A worm-gear, I², is feathered on shaft I between the legs of hanger I', by which it is held in position to properly mesh into and be driven by a worm, K', on a transverse shaft, K, mounted in stirrup-bearings formed on bear-

ing I, as clearly shown in Fig. 14. The worm-shaft K is at its outer end supported in a bracket, K², fixed to table E, and may be turned by a winch or hand-wheel applied to it when the duplex table requires to be reversed. In order that the duplex table may be drawn close against the single table, and also separated therefrom a sufficient distance to admit of the removal or application of the saw-blade, the shaft I is combined with means for moving it endwise. In this instance said shaft has a hollow tapped rear end, into which is screwed the screw-threaded end of a screw, I³, swiveled to a fixed bracket, I⁴, so that it may be turned, but not moved endwise, by a winch or hand-wheel. By operating this screw I³ the shaft I may be slid endwise to move the duplex table up against or away from the single table, as may be required. In these operations the worm-gearing will prevent the turning of shaft I. The hollow end of shaft I is screw-threaded exteriorly, and a nut, I⁵, is put on it to lock it after the duplex table has been drawn up against the single table. Studs *i i* on bracket I⁴ prevent endwise movement of hanger I' and worm-gear I² at times when nut I⁵ is run back.

The plate G of the duplex table forms a plain unobstructed surface in continuation of table E, in connection with which it is used for supporting work fed to the saw-blade by hand. The plate H, on the other hand, while its face, when turned up, is also on a level with the single table, has two sets of upright power feed-rollers mounted on the face, as shown. The rollers L and M are journaled in bearings on a standard, N², and the rollers L' and M' are similarly journaled in bearings on a standard, N³. The bases of the bearing-standards rest upon the plate H of the duplex table, and are respectively secured to slide-bars N and N' by vertical stud-pins *n*⁵, which can turn in the slide-bars. Consequently the bearing-standards may be turned horizontally on the slide-bars to effect parallelism of the rollers. This horizontal turning of the bearing-standards is effected by the adjustment of center screws, *n*⁴, screwed in lugs on the base of each standard, and bearing against opposite sides of the upturned ends of the slide-bars. When properly adjusted horizontally the bearing-standards may be secured by bolts *n*³. The slide-bars are fitted in slots in plate H to move in directions across the edge of the saw-blade, so that the rollers may be properly adjusted with respect thereto and the stuff to be resawed. A screw, *n*, swiveled to a lug on plate H, is applied to the nut in the upturned end of slide-bar N for adjusting it, and a screw, *n*', is applied to slide-bar N' for the same purpose. A spring, *n*², is placed on screw *n*', between a collar thereon and its supporting-lug, so that the bearing-standard N³, with its rollers, may yield to some extent to accommodate inequalities in the thickness of the stuff fed to the saw. The lower journals of the feed-rollers are provided beneath plate H with spur-wheels *l* and *m* and *l*' and *m*', respectively. The spur-wheels *l* and

m are driven by a spur-wheel, *o*, secured to a bevel-wheel, *o*², which turns loosely on the stud *n*⁵ of slide-bar N. The spur-wheels *l*' and *m*' are driven by a spur-wheel, *p*, secured to a bevel-wheel, *p*², which turns loosely on the stud *n*⁵ of slide-bar N'. Bevel-wheel *o*² is driven by a bevel-wheel, *o*³, on horizontal feed-shaft O, and bevel-wheel *p*² is driven by bevel-wheel *p*³ on said feed-shaft O, which turns in bearings on the duplex table. The bevel-wheels *o*³ and *p*³ are feathered to shaft O, so that they may be slid thereon. A fixed arm, *o*⁴, projecting from frame N, engages a circular groove in the hub of bevel-wheel *o*³, and a similar fixed arm, *p*⁴, projecting from frame N', engages a circular groove in the hub of bevel-wheel *p*³. Thus the bevel-wheels *o*³ and *p*³ are compelled to slide with the frame N and N', so that they will always properly mesh with the bevel-wheels *o*² and *p*². That end of the feed-shaft O which is the right-hand end when the plate H of the duplex table is turned up on a level with the single table carries on its overhung end a spur-wheel, O', adapted to be engaged and driven by a pinion, P⁴, journaled on a stud, P⁵, on the end of one arm of an elbow-lever, P⁶, which is pivoted on a horizontal shaft, P. Pinion P⁴ forms part of or is secured to spur-wheel P³, which meshes with and is driven by a pinion, P², keyed to a friction-disk, P', on shaft P. Shaft P is supported in a hanger, P⁷, suspended from the under side of the single table E, and has keyed to its inner end a friction-disk, P', adapted to be driven by a friction-driver, R', on a shaft, R, supported by hangers R⁶ and R⁷ from table E. The outer end of shaft P is clutched by the hooked end of the short arm of a lever, P⁸, fulcrumed on a bracket on elbow-lever P⁶ in such manner that such lever P⁷ may be turned horizontal, in order to slide shaft P for the purpose of forcing its friction-disk P' up against or moving it away from the friction-driver R', according as the feed-gearing is to be in motion or at rest. A screw, *p*⁸, turning in a nut on the lever P⁸, and adapted to bear with its foot against elbow-lever P⁶, may be used to hold the friction-disk P' in driving frictional contact with friction-driver R'. When elbow-lever P⁶ is turned to a position in which pinion P⁴ can properly mesh into spur-wheel O' one of its arms hooks onto a clamping-screw, P⁹, by which it may be firmly clamped to the edge of the single table E. On releasing it from the clamping-screw P⁹ the elbow-lever, together with its wheels P³ P⁴ and lever P⁸, may be turned down so as to disengage the spur-wheel O', so that the way may be cleared for the reversal of the duplex table. Shaft R carries a pulley, R², in order that it may be driven by a belt, R³, from a pulley, R⁴, on main shaft D. The slack side of belt R³ is combined with a weighted belt-tightener, R⁵, pivoted to a bracket-arm on the under side of table E. In order that the speed of the feed-gearing may be changed to suit circumstances, the shaft R is so arranged that it may be slid endwise to

move the friction-driver R' across the face of friction-disk P'. To this end the hanger R⁶ of the shaft is fitted in ways on the under side of table E, so that such hanger may be slid horizontally to move the shaft endwise. The other hanger, R⁷, is fixed, and supports the shouldered hub of pulley R², to which the shaft is feathered, so that it may slide in it. The shaft is provided with a collar on each side of hanger R⁶, so that it must move with the latter. The hanger R⁶ is connected to a lever, R⁸, fulcrumed at r on table E. The outer end of lever R⁸ is connected to a rod, R⁹, which should reach to the front of the machine, in order that it may be conveniently operated by the sawyer. We do not herein claim this particular combination of parts for shifting the movable shaft endwise, but reserve the right to claim it hereafter in a separate patent.

The single table E is provided with a horizontally-turning latch, S, in its edge, to engage a slit in one end or the other of the duplex table and lock the two tables together after they have been brought to the same level. Since the single table E turns upon a center different from the axis of the shaft I of the duplex table, it is necessary to provide some means to compensate the difference in the planes assumed by the respective tables when turned on their centers for bevel-sawing. This is provided for in this instance by mounting the duplex table upon the eccentric portion i' of shaft I by turning the duplex table on which such differences may be compensated. When properly adjusted on such eccentric the duplex table is secured to it by a set-screw, l², which is provided with a suitable handle for convenience of operation.

Primarily the invention is not limited to the particular means of supporting and reversing the duplex table. These means may be greatly varied without changing the essential character of this part of the invention. The mechanism or train for imparting motion to the feed-shaft and train for operating the feed-roller, as well as the feed mechanism proper, may also be greatly varied without departing from this general feature of the improved resaw—namely, that the power-feed of the duplex table is thrown out of gear by turning said table to bring its plain plate on a level with the single table, and is thrown into position to be driven on turning the duplex table to bring its plate carrying the feed-rollers on a level with the single table. The movement of the duplex table toward and away from the single table may be effected by sliding the duplex table on its supporting-shaft, either by hand or by mechanism, suitable changes being made in the construction. Parts of the invention may be used without other parts thereof, and some of the novel features may be incorporated in machines other than band-saws.

Having thus described our invention, what we claim is—

1. The combination, substantially as before

set forth, with a wood-working-machine frame, of the single table supported thereon and the reversible duplex table carrying a feed mechanism on one of its faces.

2. The combination, substantially as before set forth, with a wood-working-machine frame, of the single table supported thereon, the reversible duplex table carrying a feed mechanism on one of its faces, and the shaft for supporting and adapted to reverse said duplex table.

3. The combination, substantially as before set forth, with a wood-working-machine frame, of the single table supported thereon, and the duplex table, which is both reversible and movable toward and away from the single table, and also carries a feed mechanism on one of its faces.

4. The combination, substantially as before set forth, with a wood-working-machine frame, of the single table supported thereon, the reversible duplex table carrying a feed mechanism on one of its faces, the shaft for supporting and reversing said duplex table, and the screw for sliding the shaft.

5. The combination, substantially as before set forth, of the reversible duplex table, the feed-rollers mounted on the face of one of the two plates of said table, and the feed-shaft and train for driving said feed-rollers, arranged between the plates of the table.

6. The combination, substantially as before set forth, of the reversible duplex table and a power-feed mechanism mounted thereon, the driven pinion O' of which is located, as described, so that it is thrown out of gear and into position to be driven, according as one face or the other of said duplex table is turned up.

7. The combination, substantially as before set forth, of the reversible duplex table, a power-feed mechanism mounted thereon, a gearing or train for imparting motion to the feed-shaft thereof, and a lever or hinged arm for supporting part of said train, and pivoted at a point distant from the feed-shaft, so that by moving said lever or arm the train may be disengaged from or engaged with said feed-shaft.

8. The combination, substantially as before set forth, of the reversible duplex table carrying a feed mechanism on one of its faces, the shaft supporting it, and the worm-gearing for turning said shaft.

9. The combination, substantially as before set forth, with a wood-working-machine frame and the single table supported thereon, of the reversible duplex table carrying a feed mechanism on one of its faces, the endwise movable shaft I, the forked hanger thereon for supporting one end of the worm-shaft, and the worm-gear feathered to shaft I between the forks of said hanger.

10. The combination, substantially as before set forth, with a wood-working-machine frame and the single table supported thereon, of the reversible duplex table carrying a feed mechanism on one of its faces, the shaft I, the forked

hanger thereon for supporting one end of the worm-shaft and confining the worm-gear, the screw for moving shaft I endwise, and the fixed bracket supporting the screw and bearing against one side of the hanger.

5 11. The combination, substantially as before set forth, with a wood-working-machine frame and the single table supported thereon, of the reversible duplex table mounted and adjustable on an eccentric of the shaft, by which it is

turned, and carrying a feed mechanism on one of its faces.

In testimony whereof we affix our signatures in presence of two witnesses.

W. H. DOANE.

GEORGE W. BUGBEE.

Witnesses:

SIMEON HARRIS,

A. O. BLAKEMORE.