(No Model.)

4 Sheets—Sheet 1.

D. JENKINS.

MORTISING MACHINE.

No. 486,473. Patented Nov. 22, 1892.

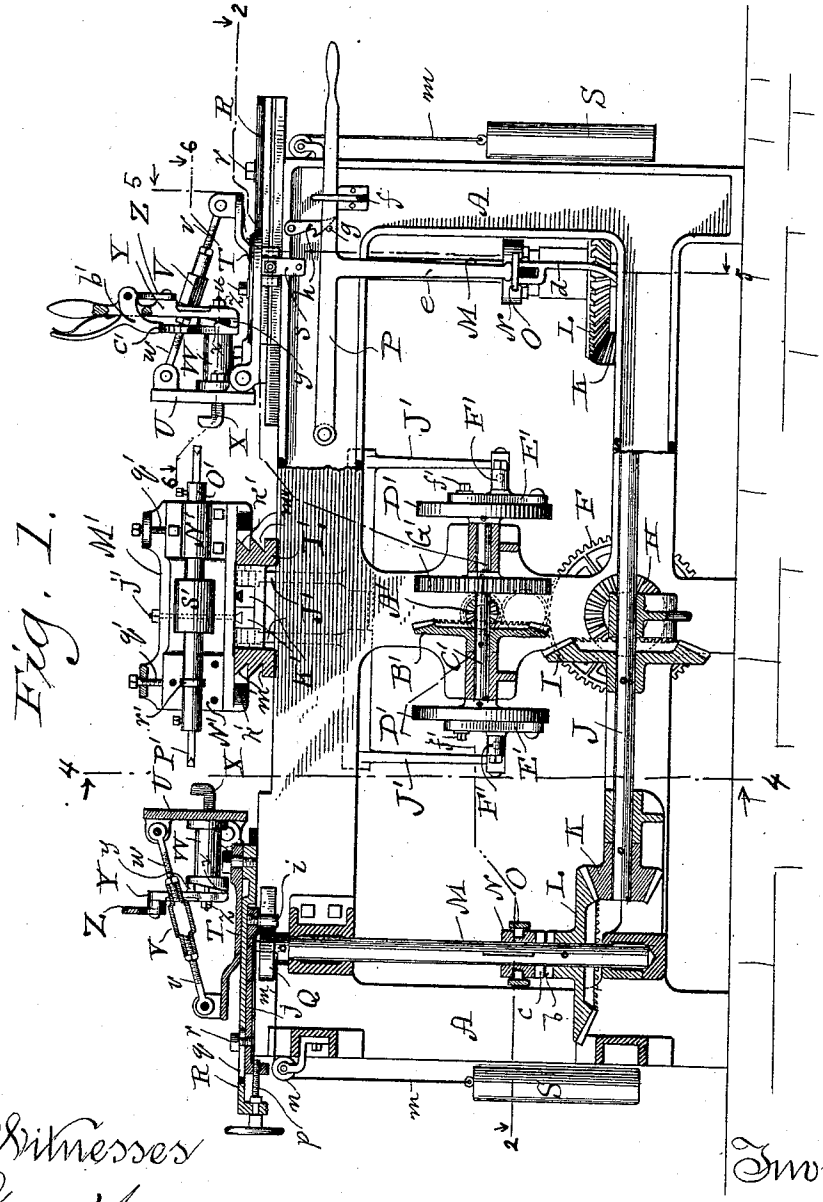

Fig. 1.

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Fig. 2.

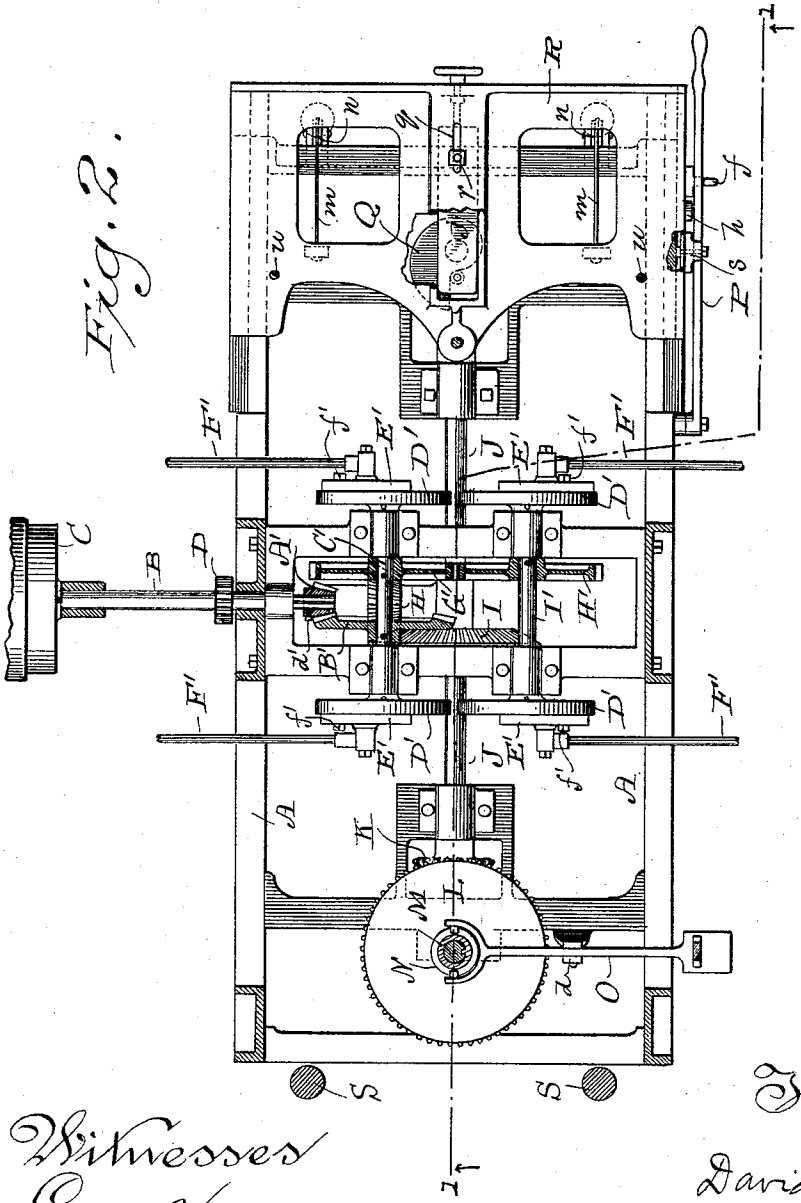

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Fig. 3.

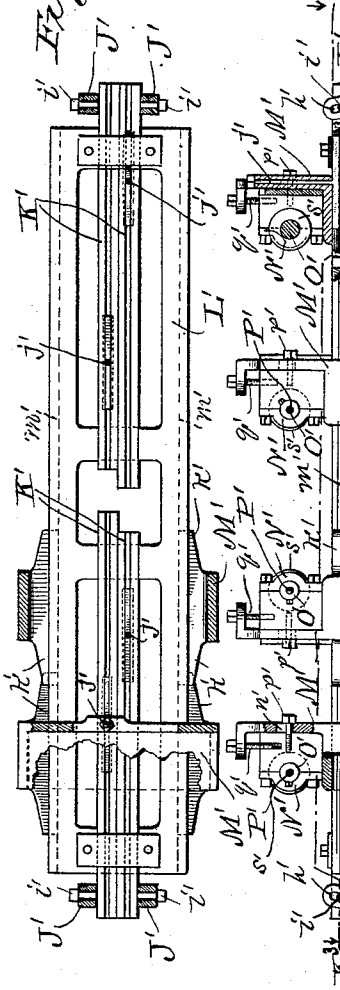
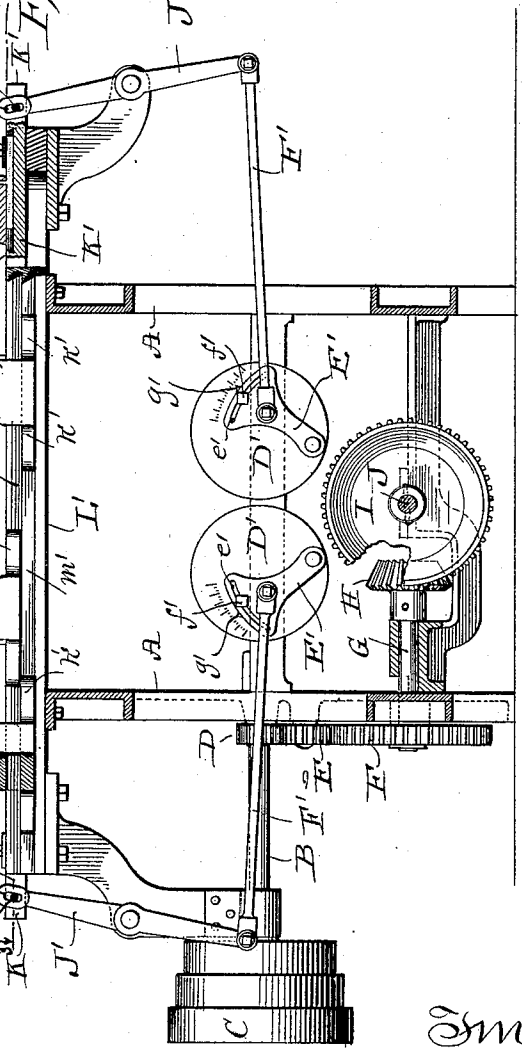


Fig. 4.



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(No Model.) 4 Sheets—Sheet 4.

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Fig. 6.

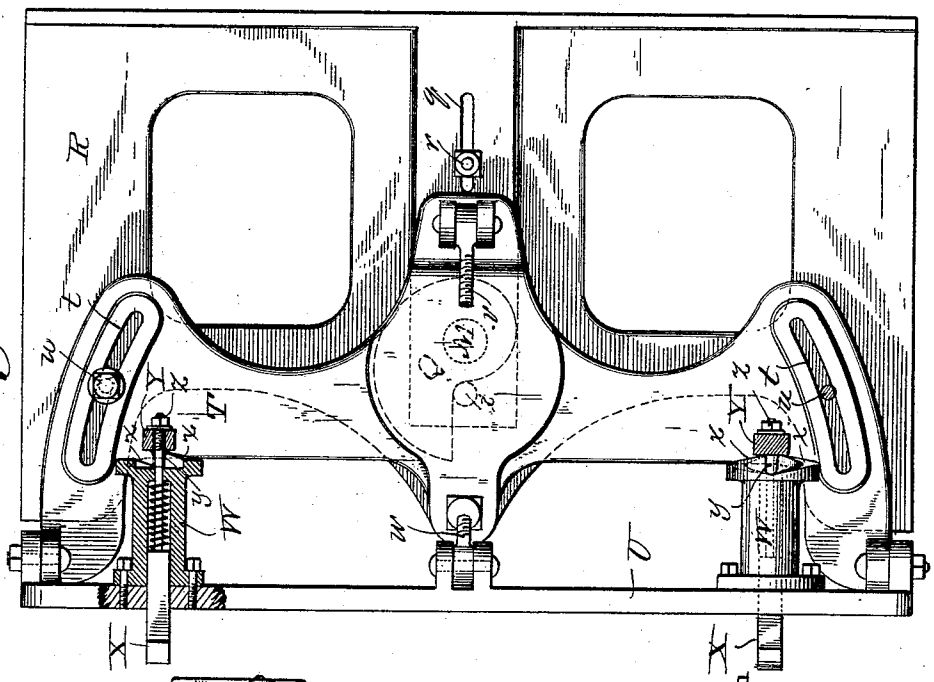
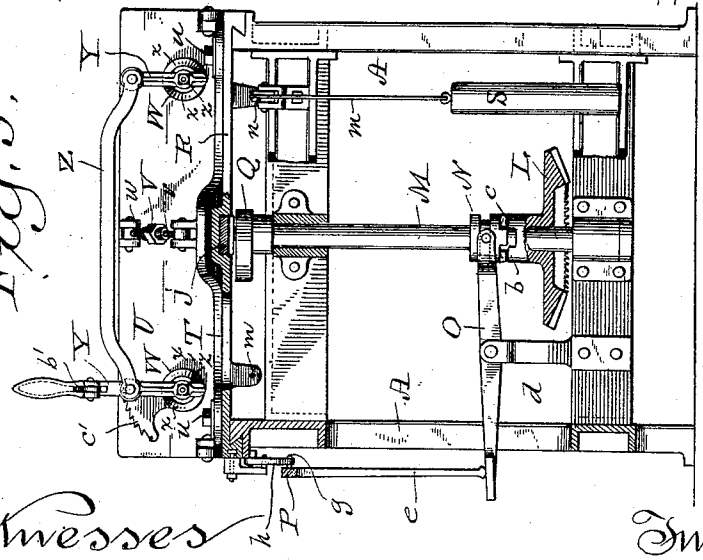


Fig. 5.



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UNITED STATES PATENT OFFICE.

DAVID JENKINS, OF SHEBOYGAN, WISCONSIN, ASSIGNOR TO THE JENKINS MACHINE COMPANY, OF SAME PLACE.

MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,473, dated November 22, 1892.

Application filed November 23, 1891. Serial No. 412,781. (No model.)

To all whom it may concern:

Be it known that I, DAVID JENKINS, a citizen of the United States, and a resident of Sheboygan, in the county of Sheboygan, and in the State of Wisconsin, have invented certain new and useful Improvements in Mortising-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide an eight-tool mortising-machine in which each tool-carrier may have an independent reciprocation and on which the work may be positioned at various angles.

To this end the invention consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a side elevation of my mortising-machine, partly broken away and in section, on line 1 1 of the succeeding figure; Fig. 2, a plan view of the same, partly broken away and in section, on line 2 2 of the preceding figure, neither of the feed-tables being shown; Fig. 3, a detail plan, partly in section, on line 3 3 of Fig. 4, illustrating the mounting of the bit-boxes; Fig. 4, a transverse section of the machine on line 4 4 of Fig. 1 with certain of the parts in elevation; Fig. 5, an end view, partly in section, on line 5 5 of Fig. 1; and Fig. 6, a detail plan view, partly in section, illustrating one of the feed-tables.

Referring by letter to the drawings, A represents the frame of my machine provided with suitable bearings at one side midway of its length for a transverse drive-shaft B, that has a cone-pulley C fast thereon. A spur-pinion D, fast on the shaft B, drives an idler E, that turns on a stud extended laterally from the machine-frame, and this idler is in mesh with a spur-wheel F, fast on another transverse shaft G, that has its bearings in said frame.

Fast on the inner end of the transverse shaft G is a bevel-pinion H in mesh with a bevel gear-wheel I, that is fast on a central longitudinal shaft J, having its bearings in the lower portion of the machine-frame. Fast on each end of the longitudinal shaft J is a bevel-pinion K, that meshes with a bevel gear-wheel L, loose on a vertical shaft M, the latter having its bearings in the machine-frame, and the hub of this bevel gear-wheel is provided with clutch-teeth *b* for engagement with similar teeth *c* on a grooved collar N, that is splined on the vertical shaft.

A foot-lever O, fulcrumed on a suitable support *d*, has a spanner connection with the grooved clutch-collar, and impinging against the outer end of this lever is a vertically-depending arm *e*, forming part of a hand-lever P, that is fulcrumed to the upper portion of said machine-frame. The hand-lever P is limited as to movement in either direction by a stop-guide *f* on the machine-frame and provided with a pin *g* for automatic engagement with a hanger *h*, that is pivoted on said machine-frame, and if said hand-lever be lifted sufficiently high to permit of the pin engaging the hanger the foot-lever O will be free to tilt on its fulcrum, and thus cause an automatic coupling of the clutch-collar N and bevel gear-wheel L, whereby motion will be imparted to the vertical shaft M through the medium of the gearing above described, this motion being automatically stopped by a lowering of said hand-lever, the depending arm *e* thereof acting to tilt said foot-lever on its fulcrum in the proper direction to disengage the clutch-teeth on said collar and bevel gear-wheel.

Fast on the upper end of each vertical shaft M is a cam Q in opposition to a projection—such, for instance, as an antifriction-roller *i*, that depends from a slide *j*, adjustable in a table R, that is dovetailed or otherwise suitably secured to the machine-frame, so as to move longitudinally thereon. There is one of the tables R at each end of the machine, and these tables are moved toward the center of said machine by the cams Q acting upon the antifriction-rollers *i*, depending from the adjustable slides *j*, each of the tables being moved independently of the other, although preferably alternate therewith. When either one of the tables has been moved toward the center of the machine and the working face of the relative cam Q passes out of contact with the antifriction-roller *i*, that depends from the slide *j* in the table, the latter will be automatically returned to its normal position

by means of weights S, flexibly connected thereto, the flexible connections *m* for these weights being preferably run over pulleys *n*, arranged in bearings at the adjacent end of said machine. The slide *j* in each table is connected to a flange on the latter by an adjusting-screw *p*, and by means of this screw said table may be positioned to regulate the normal distance between it and the tools hereinafter described. The table is provided with a longitudinal slot *q*, that engages a set-bolt *r* on the slide, and by means of this set-bolt said slide and table are held together against movement on each other after an adjustment by the screw *p* has been effected.

As best illustrated in Figs. 1 and 5, a striker *s* may be adjustably secured to each table and positioned so as to automatically disengage the hanger *h* from the pin *g* on the relative hand-lever P, when said table is returned to its normal position by the weights above described.

Pivotally connected at its center to each of the tables is a plate T, having segmental slots *t*, that engage set-bolts *u* on said table, and by means of this construction and arrangement of parts said plate may be adjusted to certain angles. Hinged at its ends to each of the plates T is a transverse bar U, and by means of a turnbuckle V, working on screw-threaded rods *v w*, respectively pivoted to the said plate and bar, the latter may be adjusted to stand at more or less of a right angle to the former.

Bolted to each bar adjacent to its ends are sleeves W, having cam-surfaces *x* at their free ends. Arranged to work in each sleeve W is a spring-controlled dog X, between which and the adjacent bar U the material to be operated upon is positioned and clamped. That end of each dog X that extends through the cam end of its relative sleeve is engaged by a lever Y, having lugs *y* thereon for impingement against the cam-surfaces on said sleeve. By means of a set-nut *z* on the shank of each clamping-dog in opposition to the relative lever the tension of the spring controlling said dog may be readily regulated to lengthen or shorten the distance between the working end of this dog and the bar to which the sleeve containing said spring is bolted. As shown, there are two clamping-dogs to each of the bars U, and the levers Y belonging to these bars are connected by means of a link Z, one of the levers being extended a sufficient distance beyond the link to serve as a handle to which I pivot a spring-controlled latch *b'* for engagement with the teeth of a segment-rack *c'* on the adjacent one of the sleeves W, and by the adjustment of this handle-lever both clamping-dogs are simultaneously operated.

To clamp the material in position on the machine, the levers Y are swung in the proper direction to cause their lugs *y* to travel against the rise of the cam-surfaces *x* on the adjacent sleeves W, and thus the clamping-dogs are drawn back against the power of their controlling-springs, said levers being locked in their adjusted position by the automatic engagement of the latch *b'* with the teeth on the opposing segment-rack, and the material is unclamped by a reverse movement of the aforesaid levers permitting the dog-controlling springs to expand.

Referring again to the drive-shaft B, I show a bevel-pinion A', splined on the inner end thereof and held fast by means of a set-screw *d'*, as best illustrated in Fig. 2. When properly set, the pinion A' engages with a bevel gear-wheel B' on a shaft C', that has its bearings in the machine-frame, and carries disks D' D', each of the latter having an arm E' eccentrally pivoted thereto and provided with a segmental slot *e'* for engagement with a set-nut *f'*, whereby this arm is held in the position which it may be adjusted to regulate the throw of a pitman F', connected thereto. The disk relative to each arm is preferably provided with a scale opposed to an indicator *g'* on said arm, whereby the throw of the pitman F' may be accurately determined. The shaft C' is provided with a spur-wheel G', that engages a similar wheel H' on another shaft I', and this latter shaft also carries disks D' D', provided with pivotally-adjustable eccentric arms E', connected to pitmen F', as best illustrated in Fig. 2. Each of the pitmen F' connects the relative arm E' with one arm of a bell-crank J', pivoted to a bracket on the machine-frame, and the other arm of this lever is provided with an elongated eye *h'*, that engages a lug *i'* on a slotted bar K', arranged to slide in guides on a central transverse base L', that forms part of said machine-frame. A suitable bolt *j'* serves to adjustably secure a standard M' on each of the bars K', and this standard is provided with feet *k'*, that engage guide-grooves *m'* in the sides of the base L', above described. As readily seen in the drawings, the bars K' are arranged in pairs on opposite sides of the center of the machine, and as there is a standard M' on each of the bars it is desirable, in order to obtain the greatest amount of adjustment and permit of a variable travel, that the feet of one standard engage a separate groove in the base L' from that engaged by the feet on the other standard in the pair, this arrangement of parts being best illustrated in Figs. 3 and 4. Each of the standards M' is provided with vertical slots *n'* for engagement with lateral set-screws *p'*, by means of which twin boxes N' are retained on said standard, vertical screws *q'*, having their bearings in the standard, being employed to adjust the boxes to various elevations. The boxes N' serve as bearings for tool-spindles O', held against longitudinal movement by suitable collars *r'*, and arranged on each spindle midway of its length is a pulley *s'* for connection with a driving-belt. There being four standards and an equal number of the spindles designed to carry a tool P' at each end, I provide for eight tools that

may do their work simultaneously or in gangs of four, accordingly as the sliding tables R may be operated together or alternately to bring the material up to said tools, and it is obvious that any one or more of the standards M′ may be disconnected from its reciprocating mechanism and the tools detached from the spindle carried with said standard to lessen the number of cuts in said material.

By the foregoing description of the construction and arrangement of parts constituting my machine it will be seen that when the bevel-pinion A′ is positioned to mesh with the bevel gear-wheel B′ the bars K′ and the tool-carrying standards thereon will be reciprocated on the base L′ and the material being fed up by the cam and weight controlled sliding tables R mortises, corresponding in number to that of the reciprocating tools, will be cut in said material, each of these mortises being of a position, depth, length and angle as the various possible adjustments above described may determine.

In case it is desirable to convert the mortising-machine into a boring-machine the bevel-pinion A′ is set back on the shaft B far enough to not engage with the bevel gear-wheel B′, and consequently there will be no reciprocation of the tools when in contact with the material fed up by the cam and weight controlled sliding tables.

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

1. The combination of a frame provided with a stationary transverse base, supports arranged on the base, tools extended from the supports, a positively-adjustable carrier loose on the base in opposition to the tools, a projection on the carrier, a rotative cam opposed to the projection, and a retractive mechanism for said carrier independent of the cam, substantially as set forth.

2. The combination of a frame provided with a stationary transverse base, supports reciprocative on the base, tools extended from the supports, a positively-adjustable carrier loose on the base in opposition to the tools, a projection on the carrier, a rotative cam opposed to the projection, and a retractive mechanism for said carrier independent of the cam, substantially as set forth.

3. The combination of a frame provided with a stationary transverse base, a series of supports arranged on the base, tools extended from the supports, a positively-adjustable carrier loose on the base in opposition to the tools, a pivotally-adjustable clamp mechanism forming part of the carrier, a projection on said carrier, a rotative cam opposed to the projection, and a retractive mechanism for the aforesaid carrier independent of the cam, substantially as set forth.

4. The combination of a frame provided with a stationary transverse base, a series of supports arranged on the base, tools extended from the support, a positively-adjustable carrier loose on the frame in opposition to the tools, a clamping mechanism forming part of the carrier and adjustable to various angles, a projection on said carrier, a rotative cam opposed to the projection, and a retractive mechanism for the aforesaid carrier independent of the cam, substantially as set forth.

5. The combination of a frame provided with a stationary transverse base, a series of supports arranged on the base, tools extended from the supports, a positively-adjustable carrier loose on the frame in opposition to the tools, a clamping mechanism that forms part of the carrier and has a pivotal and angular adjustment, a projection on said carrier, a rotative cam opposed to the projection, and a retractive mechanism for the aforesaid carrier independent of the cam, substantially as set forth.

6. The combination of a frame provided with a stationary transverse base midway of its length, supports arranged on the base, tools extended from the supports toward both ends of the frame, carriers loose on said frame in opposition to the tools, a slide forming part of each carrier, suitable means for adjusting the latter on its slide, a projection depending from the slide, a rotative cam opposed to said projection, and suitable means for returning the relative carrier to its normal position after being actuated by the cam, substantially as set forth.

7. The combination of a frame provided with a stationary base having tool-supporting devices mounted thereon, carriers loose on the frame at right angles to said base, a depending projection forming part of each carrier, a shaft carrying a cam opposed to said projection, a clutch-hub gear-wheel loose on the shaft, a lever-controlled clutch-collar splined on said shaft in opposition to the hub of the gear-wheel, a driving-pinion for this wheel, and suitable means for returning the relative carrier to its normal position after being actuated by the cam, substantially as set forth.

8. The combination of a frame provided with a stationary base having tool-supporting devices mounted thereon, carriers loose on the frame at right angles to said base, a depending projection forming part of each carrier, a shaft carrying a cam opposed to said projection, a clutch-hub gear-wheel loose on the shaft, a clutch-collar splined on said shaft in opposition to the hub of the gear-wheel, a foot-lever connected to the clutch-collar, a hand-lever having a depending arm impinged against the foot-lever, a driving-pinion for said gear-wheel, and suitable means for returning the relative carrier to its normal position after being actuated by the cam, substantially as set forth.

9. The combination of a frame provided with a stationary base having tool-supporting devices mounted thereon, carriers loose on the frame at right angles to said base, a depending projection forming part of each

carrier, a shaft carrying a cam opposed to said projection, a clutch-hub gear-wheel loose on the shaft, a clutch-collar splined on said shaft in opposition to the hub of the gear-wheel, a foot-lever connected to the clutch-collar, a hand-lever having a depending arm impinged against the foot-lever, a pivotal hanger for the hand-lever, a driving-pinion for said gear-wheel, and suitable means for returning the relative carrier to its normal position after being actuated by the cam, substantially as set forth.

10. The combination of a frame provided with a stationary base having tool-supporting devices mounted thereon, carriers loose on the frame at right angles to said base, a depending projection forming part of each carrier, a shaft carrying a cam opposed to said projection, a clutch-hub gear-wheel loose on the shaft, a clutch-collar splined on said shaft in opposition to the hub of the gear-wheel, a foot-lever connected to the clutch-collar, a hand-lever having a depending arm impinged against the foot-lever, a pivotal hanger for the hand-lever, a striker on the relative carrier for automatically detaching said hanger and hand-lever, a driving-pinion for said gear-wheel, and suitable means for returning said carrier to its normal position after being actuated by the cam, substantially as set forth.

11. The combination of the reciprocative tables having plates mounted thereon, a bar connected to each plate, sleeves fast on the bar and having cam-surfaces at their free ends, spring-controlled dogs arranged to work in the sleeves, levers loose on the dog-shanks and provided with lugs opposed to the cam-surfaces of said sleeves, a link connecting the levers, a latch carried by one of these levers, and a segment-rack for engagement with the latch, substantially as set forth.

12. The combination of the reciprocative tables having plates mounted thereon, a bar connected to each plate, sleeves fast on the bar and having cam-surfaces at their free ends, spring-controlled dogs arranged to work in the sleeves, levers loose on the dog-shanks and provided with lugs in opposition to the cam-surfaces of said sleeves, a set-nut adjustable on each dog-shank in opposition to the lever thereon, a link connecting the levers, a latch carried by one of these levers, and a segment-rack for engagement with the latch, substantially as set forth.

13. The combination of a frame provided with a stationary transverse base midway of its length, supports arranged on the base, tools extended from the supports toward both ends of the frame, tables reciprocative on said frame in opposition to the tools, a slide positively adjustable in each table and provided with a depending projection, a rotative cam opposed to the projection, suitable means for returning the table to its normal position after action of the cam on said projection, and an independently-adjustable clamping mechanism on each of said tables, substantially as set forth.

14. The combination of the reciprocative tables, plates mounted on the tables, a bar hinged to each plate, clamping-dogs carried with the bar in opposition thereto, screw-threaded rods pivotally connected to said plate and bar, and a turnbuckle uniting the rods, substantially as set forth.

15. The combination of the reciprocative tables having segmentally-slotted plates pivoted thereon, set-bolts on the table engaging the plate-slots, a bar hinged to each plate, clamping-dogs carried with the bar in opposition thereto, screw-threaded rods pivotally connected to said plate and bar, and a turnbuckle uniting the rods, substantially as set forth.

16. The combination of a frame having a stationary transverse base midway of its length provided with horizontal side grooves, a series of bars reciprocating in the base lengthwise of the same, a series of standards, each of which is connected to one of the bars and has feet engaging a single one of the base-grooves, supports independently adjustable on the standards, tools extended from the supports toward both ends of the frame, and a carrier reciprocative on said frame in opposition to the tools, substantially as set forth.

17. The combination of a frame provided with a stationary base having side grooves in the direction of its length, a series of bars reciprocative in the base lengthwise of the same and adjustable as to throw, a series of standards, each of which is connected to one of the bars and has feet engaging a single one of the base-grooves, tool-supports mounted on the standards, and a carrier reciprocative on said frame at right angles to the said base, substantially as set forth.

18. The combination of a frame provided with a stationary transverse base midway of its length, a series of bars loosely arranged in the base lengthwise of the same, a corresponding series of bell-cranks pivoted to the frame and joined to the bars, a series of rotative disks having eccentric arms adjustable thereon, a pitman connecting each eccentric arm with one of the bell-cranks, tool-supporting devices secured to said bars, and carriers reciprocative on said frame at right angles to said base, substantially as set forth.

19. The combination of the herein-described frame, the transverse drive-shaft provided with a spur-pinion, an idler driven by said pinion, a counter-shaft carrying a spur-wheel in mesh with the idler, a bevel-pinion on the latter shaft, a longitudinal shaft carrying a bevel gear-wheel in mesh with the bevel-pinion, vertical shafts geared to the longitudinal one, a clutch mechanism controlling the rotation of each vertical shaft, cams carried by these latter shafts, sliding tables having projections in the paths of the cams, suitable

means for returning the tables to their normal position after being actuated by said cams, a clamping mechanism carried by each table, a stationary base arranged on the frame midway of the tables, a series of bars loosely arranged in said base lengthwise of the same, tool-supporting devices connected to each bar, a series of bell-cranks pivoted to said frame and corresponding in number to that of the bars to which they are joined, disk-carrying shafts having gear connection with said driveshaft, and a pitman connecting each of the disks with one of the bell-cranks, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Sheboygan, in the county of Sheboygan and State of Wisconsin, in the presence of two witnesses.

DAVID JENKINS.

Witnesses:
M. A. LONG,
W. W. WOLFF.