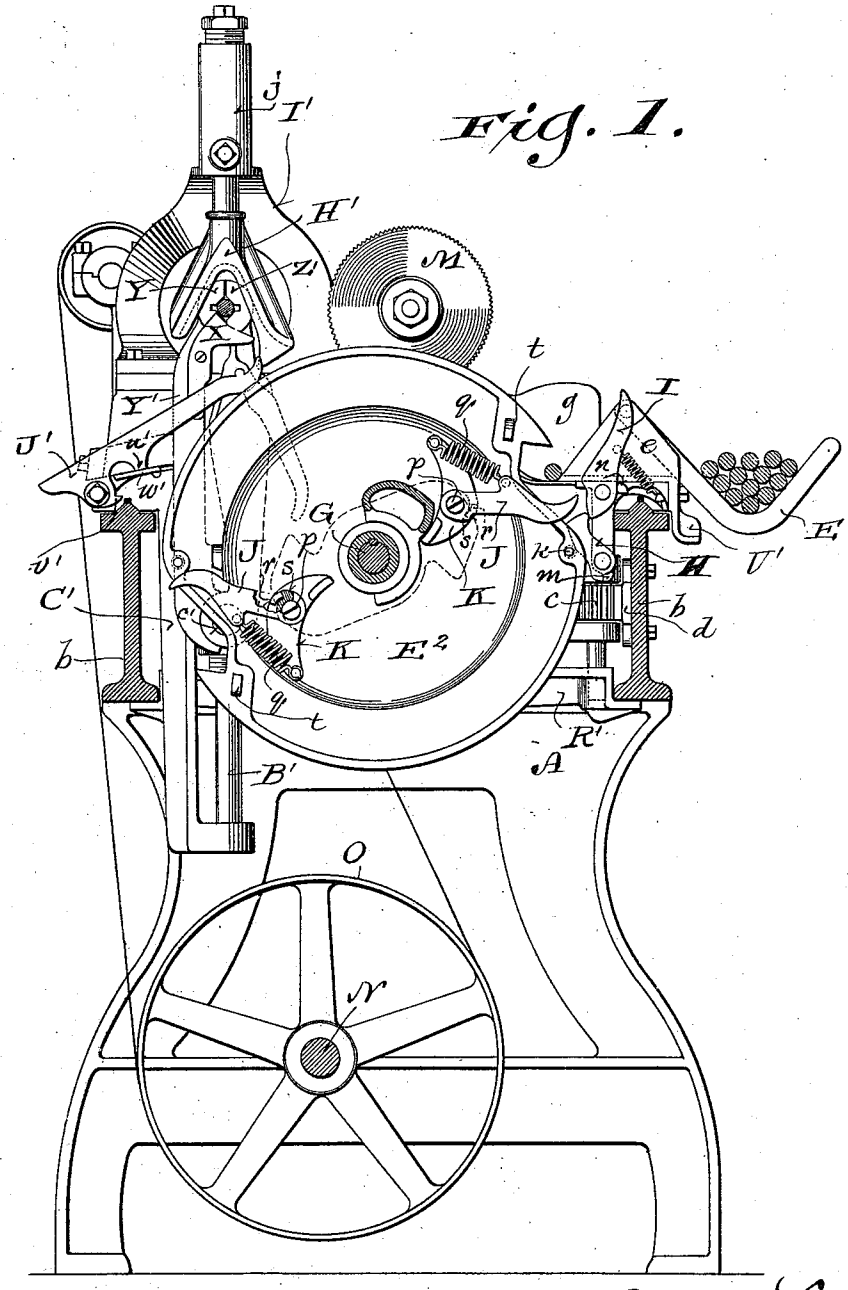
(No Model.) 5 Sheets—Sheet 1.

J. M. NASH.

WOODWORKING MACHINE.

No. 577,492. Patented Feb. 23, 1897.

Fig. 1.



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(No Model.)

5 Sheets—Sheet 2.

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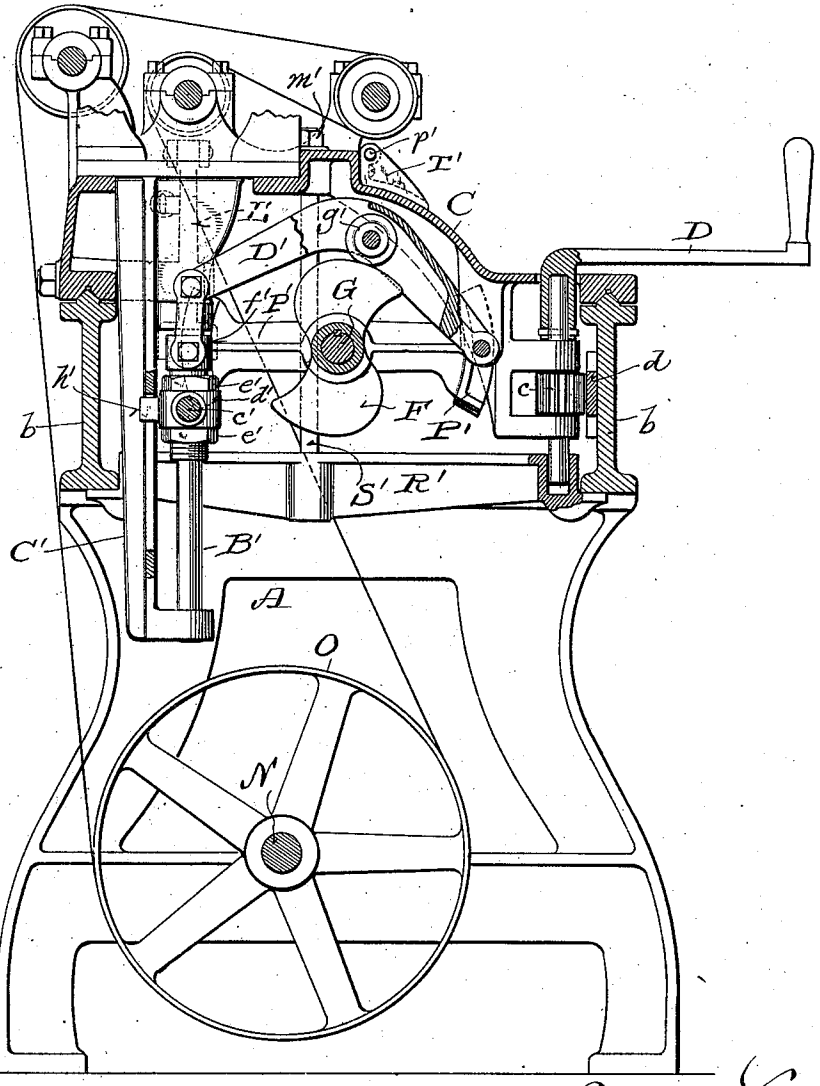
Fig. 2.



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(No Model.) 5 Sheets—Sheet 3.

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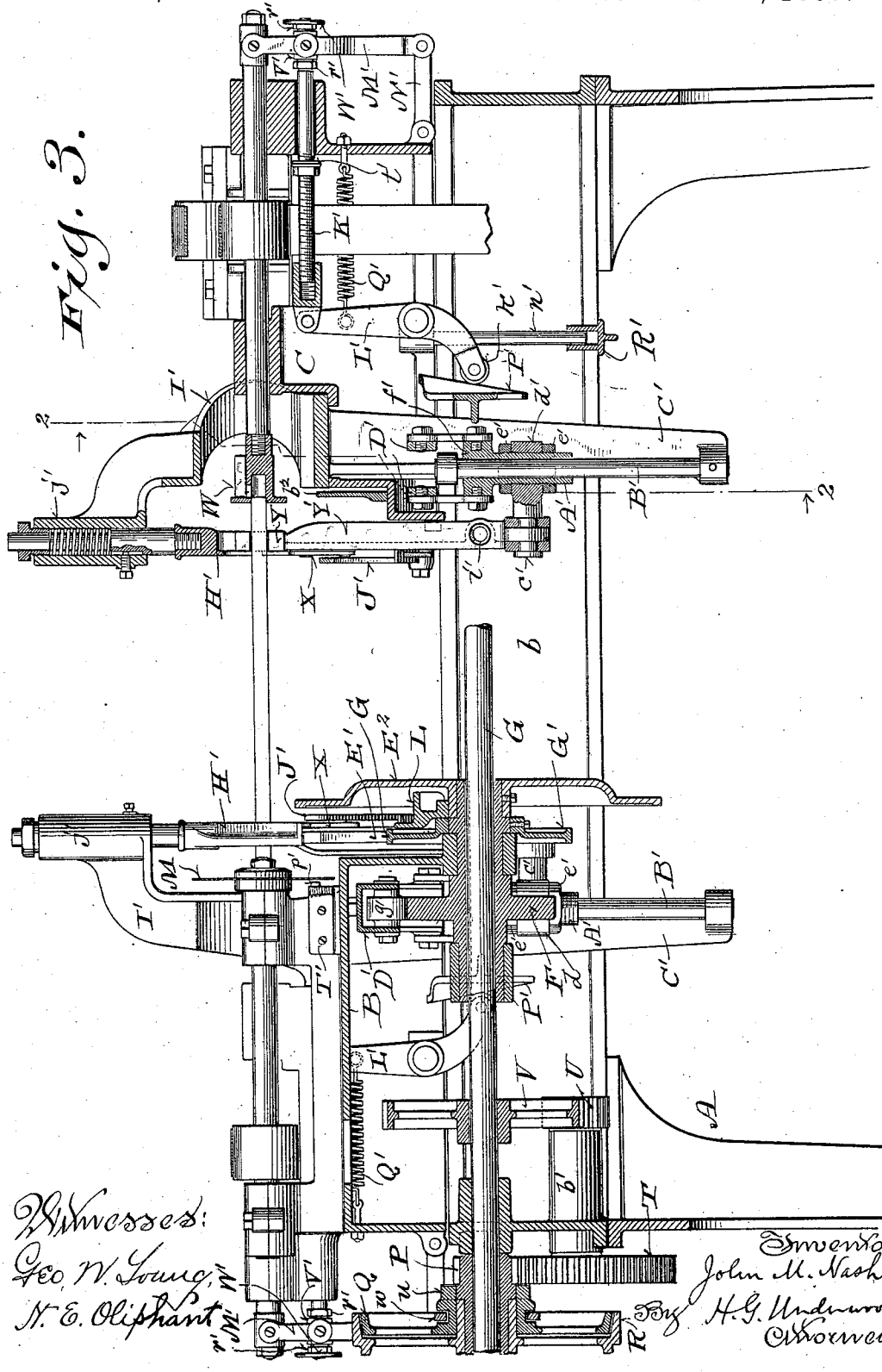
Fig. 3.



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5 Sheets—Sheet 4.

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WOODWORKING MACHINE.

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Fig. 4.

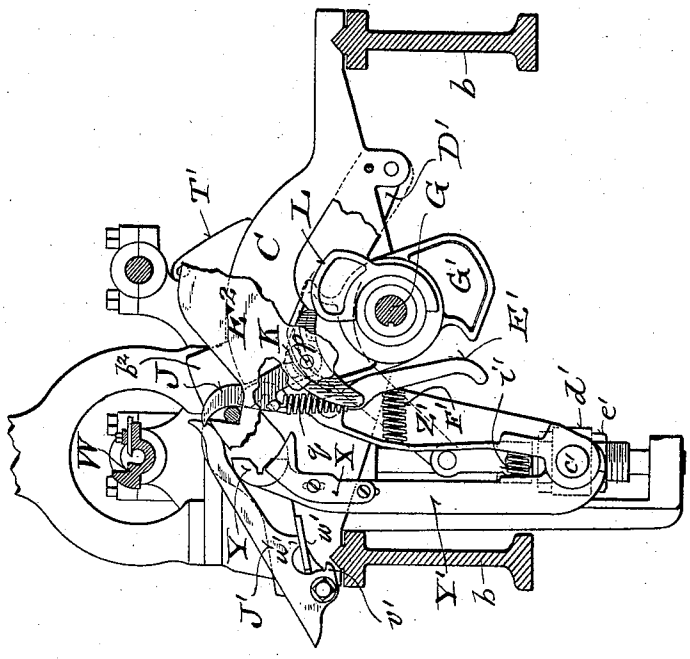
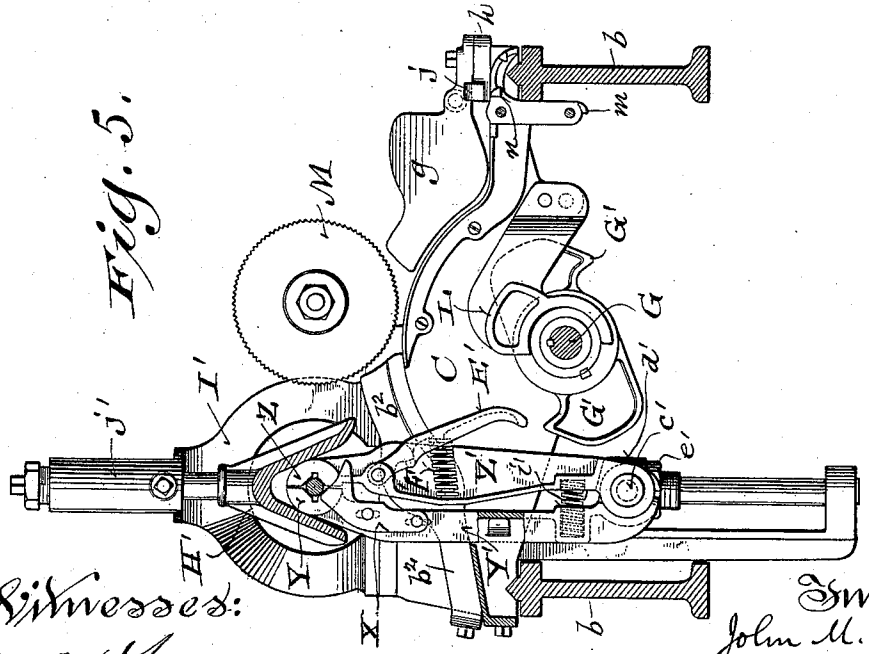


Fig. 5.



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(No Model.) 5 Sheets—Sheet 5.

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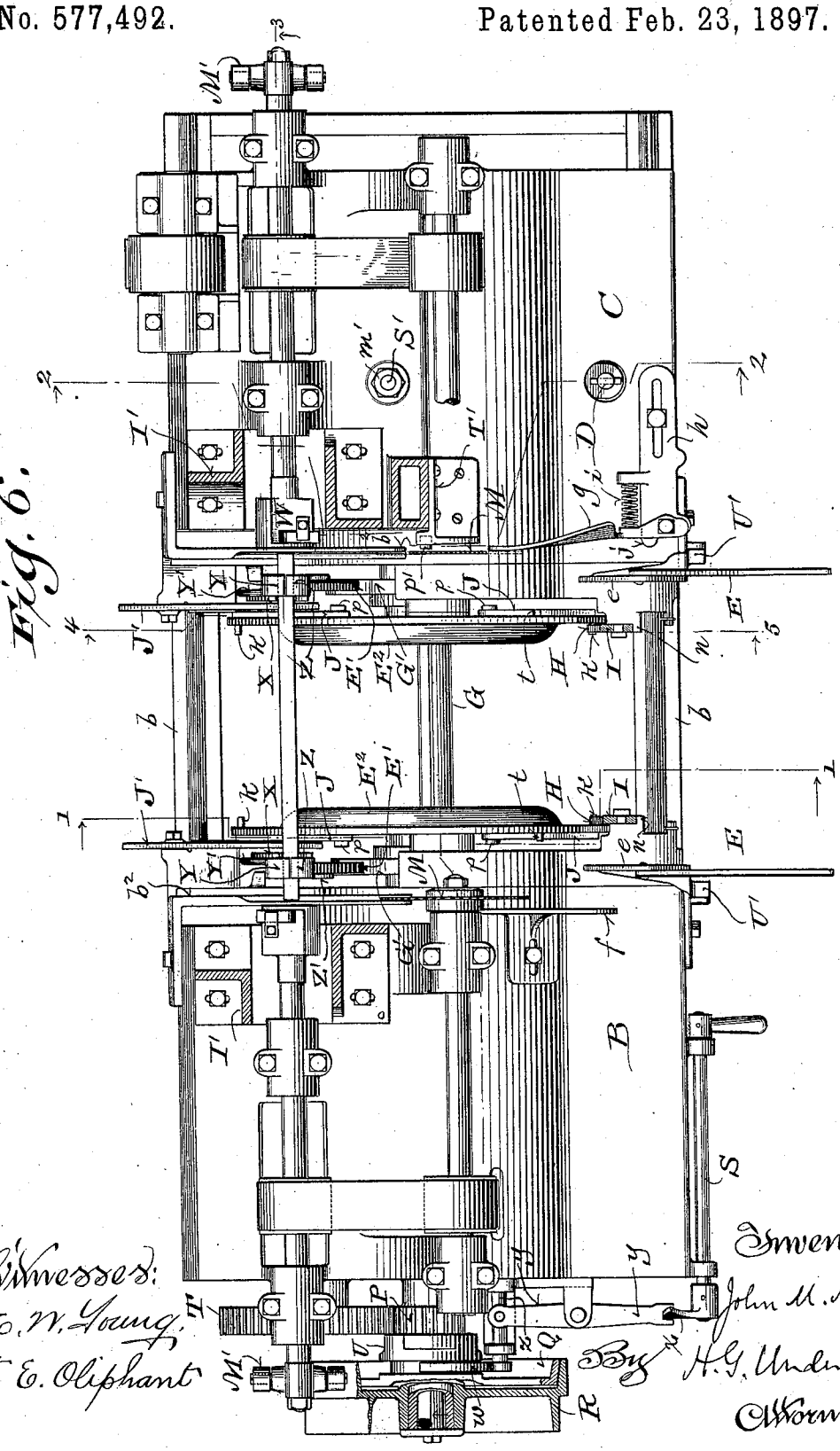
Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN M. NASH, OF MILWAUKEE, WISCONSIN.

WOODWORKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 577,492, dated February 23, 1897.

Application filed November 25, 1895. Serial No. 569,986. (No model.)

To all whom it may concern:

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

My invention has for its object to cheapen the production of chair-rounds, spindles, or analogous woodwork; and it consists in certain peculiarities of construction and combination of parts, preferably constituting a sawing and sizing machine, hereinafter set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a portion of my sawing and sizing machine as viewed on the plane indicated by line 1 1 in Fig. 6; Fig. 2, a view on the plane indicated by line 2 2 in Figs. 3 and 6; Fig. 3, a vertical longitudinal section of the machine having parts thereof broken away; Figs. 4 and 5, detail views on the plane indicated by line 4 5 in Fig. 6, showing two positions of certain movable parts in said machine; and Fig. 6, a plan view of the aforesaid machine, partly in horizontal section.

Referring by letter to the drawings, A represents the general framework of my machine. This framework is of any suitable construction, and supported thereon is a stationary bed B for certain elements of the machine, these elements being duplicated on a carriage C, adjustable upon longitudinal tracks *b*, constituting parts of said framework. As clearly illustrated in Fig. 2, the carriage C is provided with bearings for the arbor of a pinion *c* in mesh with a rack *d* upon the inner side of a track *b*, and projecting extremities of a pin run through the pinion-arbor serve as lugs for the engagement of notches in the arbor-engaging socket end of a crank-key D, employed to rotate the pinion for the purpose of adjusting said carriage.

Pivoted or otherwise secured to a vertical bracket *e* on the bed B is an arm E, having a right-angled bend. The bracket and arm are duplicated on the adjustable carriage C, and both arms serve as supports for chair-rounds, spindles, or other analogous woodwork that is to be fed to the machine. Both brackets *e* have inclined inner edges that facilitate feed of material to the machine, and gages *f g* prevent longitudinal play of said material on its way to a rotary carrier hereinafter specified.

The gage *f* is on the bed B, and, as shown in Fig. 6, provision is made for its longitudinal adjustment within certain limits, the shank of said gage being longitudinally slotted and the slot engaged by a clamp-bolt. The gage *g* is in pivotal connection with a plate *h*, longitudinally adjustable on the carriage C, and is made flaring at its rear end in order that the material fed to the machine may readily find its way to the rotary carrier. A spring *i* is interposed between the shank of gage *g* and a lug on the plate *h*, a stop *j* on said plate serving to limit pivotal movement of said gage in one direction.

From the foregoing it will be seen that the pivotal spring-controlled gage compensates for variations in the length (over a certain standard) of material fed to the machine.

The rotary carrier comprises notched disks E^2, fast on hub extensions of cams F, splined upon a shaft G, one of the cams being under the bed B and the other under the carriage C, movable therewith. As herein shown, there may be two notches in each disk, and the notches of one disk register with those of the other.

Lateral pins *k* on each of the disks, adjacent to the outer extremities of the notches therein, operate against pivoted dogs H, that in turn operate against pivoted spring-controlled fingers I to swing the latter down in rear of material fed by hand to the machine, these fingers serving as guards to prevent recoil of said material from the disk-notches when grippers J, subsequently specified, are actuated. Stops *m n* are arranged in position to limit reverse movement of the dogs and fingers, set forth in the foregoing.

The grippers J are loose on pivot-screws *p*, extending laterally from the disks E^2, constituting parts of the rotary carrier, and wipers K, also loose on the pivot-screws, are connected to said grippers by means of spiral springs *q*, a stop-lug *r* on each wiper being in the path of a shoulder *s* of the corresponding gripper. Cams L are rigidly secured to the bed B and carriage C of the machine in the path of the wipers K, and throw of the grippers J is limited by stop-lugs *t* on the disks

E^2, to which said wipers and grippers are pivoted. As each wiper comes into contact with a cam L it is swung on its pivot to bring the corresponding gripper into contact with a stick of material under guard-fingers I, that have in the meantime been swung down into working position. A pair of grippers clamp the material in the rotary carrier during the time corresponding wipers are in contact with the cams L, and each gripper being in yielding connection with the corresponding wiper its throw is variable in proportion to the thickness of opposing material, but the throw of each wiper is always the same, as will be best understood by reference to Fig. 1 of the drawings.

A stick of material gripped in the rotary carrier is carried on against circular saws M in order to be cut a predetermined length, the latter being determined by the set of the carriage C and the gages *f g*, above specified. The saws have their arbors mounted in bearings on the bed B and carriage C and are driven in conjunction with parallel cutter-head arbors (also mounted on said bed and carriage) by means of belt-and-pulley gear from a shaft N, that has its bearings on the framework of the machine. The belt-pulley O on the shaft under the carriage C is of such face and position on said shaft as to permit the adjustment of said carriage longitudinally of the machine-frame. Loose on the shaft G is a pinion P, having permanent tooth connection with the hub *u* of a friction-disk Q, loose on the hub of a driver in the form of a belt-pulley R, the latter hub being also loose on said pinion-hub. A flange of the belt-pulley R is in opposition to the friction-disk Q, and the working faces of said flange and friction-disk are beveled, as shown in Figs. 3 and 6, so as to clutch one another when a spanner *w*, engaging a groove in the disk-hub, is moved in the proper direction by means of a crank-rod S, supported in bearings on the machine-frame and provided at one end with a cam-wing *x*, engaging a notch in a pivotal arm *y*, shackled to the right-angled stem *z* of said spanner, this stem being loose in guides on said machine-frame.

The construction and arrangement of parts set forth in the foregoing paragraph constitute a clutch mechanism under control of an operator of the machine, independent of the mechanism for rotating the saw and cutter-head arbors above specified, and the motion of the belt-pulley R is communicated, by means of the friction-disk Q and pinion P, to a spur-wheel T, fast on one end of a spindle that rotates in a bearing *b'* on the machine-frame, and a pinion U, fast on the other end of the spindle, meshes with another spur-wheel V, fast on the shaft G, whereby the cams F and rotary carrier are driven at a low speed compared to that of the saws M and cutter-heads W or other woodworking-tools fast to the aforesaid arbors.

A stick of material having passed the saws it is carried on between gages b^2, that prevent endwise movement of said stick, the latter being stopped upon supports X in vertically-adjustable connection with the shanks Y' of jaws Y, while the rotary carrier continues revolution. The jaw-shanks Y' and the shanks Z' of jaws Z are in rule-joint connection with each other on studs *c'*, extending from collars *d'*, adjustably supported on exteriorly-threaded sleeves A', between upper and lower set-nuts *e'*, these sleeves being loose on guide-rods B', that are supported in brackets C', depending from the bed and carriage portions of the machine, each sleeve being provided with a cross-head *f'* in link connection with a hinged arm D', provided with an antifriction-roller *g'* in the path of one of the cams F above specified.

The vertically-adjustable collars *d'* are provided with lugs *h'*, that work in guide-slots in the brackets C', and the jaw-shanks Y' Z' in each pair are normally held apart by means of an interposed spring *i'*, adjacent to their lower ends, the former of said shanks being opposed by guide-lugs.

The supports X are made vertically adjustable, so as to coöperate with bushings that may be set in the jaws Y Z, in order to accommodate the machine to material of various diameters, and the adjustment of the collars *d'* determines the horizontal center of said material when gripped by said jaws and brought into position for action of the cutter-heads W above specified.

Pivoted to the jaw-shanks Z' are finger-bars E', and interposed springs F' are employed to hold the finger-bars outward on their pivots in the path of cams G', fast on the extended hubs of the cams F aforesaid.

The action of the cams G' on the finger-bars E' causes the jaws Z to swing in toward the ones Y and thereby clamp the stick of material caught on the supports X, this operation taking place coincident to the action of the cams F on the hinged arms D', there being a yield of the springs F' to compensate for the resistance of said material, while the former cams continue in contact with said finger-bars.

The action of the cams F on the hinged arms D' results in a lift of the jaws to thereby bring them within clamping-forks H', having vertically-yielding spring-controlled shanks centered in guides *j'*, constituting parts of brackets I', laterally adjustable on the bed B and carriage C of the machine, in order to determine the vertical center of the stick of material when brought into position for action of the aforesaid cutter-heads.

The self-centering mechanism compensates for irregularities in diameter of sticks coming from the carrier.

As the stick of material is lifted to bring it in line with the cutter-heads it swings up and passes inclined gravity-bars J', pivoted to the bed and carriage of the machine, and these bars, on their automatic return to normal po-

sition, constitute shedders for the stick of material when it is released from the centering-jaws after being sized by the cutter-heads.

The forks H′ hold the jaws in grip on the material after the cams G′ have passed out of contact with the spring-resisted pivotal finger-bars E′ above specified, and the contour of the cams F is such that said jaws remain stationary in said forks for a certain time after the lift of the hinged arms D′ takes place, in order that the cutter-heads W may operate to size the ends of said material.

The cutter-heads are cylindrical and organized to run on the ends of the stick of material, accurately centered and held by the automatic mechanism above specified, said cutter-heads being preferably in screw-thread connection with their arbors, and the latter are herein shown arranged to slide in their bearings. Parallel to the cutter-head arbors are loose rods K′, in shackle connection with levers L′, in pivotal connection with the bed and carriage of the machine, said arbors and rods being trunnioned to forks M′, that are connected by links N′ to said bed and carriage. Arranged to turn in the pivoted levers L′, at the extremities thereof farthest from their connection with the rods K, are anti-friction-rollers k', that come in the path of cams P′, fast on the hub extensions of the cams F aforesaid, said cams P′ being timed to swing said levers on their pivots against the resistance of suitably-arranged springs Q′ at the time the stick of material is centered in opposition to the cutter-heads, and thus the latter are brought on the ends of said stick to size the same. The cutter-heads having completed their operation they are returned to normal position by retraction of the springs Q′ simultaneous with the clearance of the anti-friction-rollers k' by the cams P′ above specified, and this operation is also simultaneous with the return of the jaws Y Z, the sawed and sized stick of material dropping from the machine along the shedders J′, set forth in the foregoing.

It may be found desirable in practice to employ springs arranged in position to serve as ejectors of material from the jaws Y when these jaws are on return to normal position.

In order that the carriage C may not work out of adjusted position, a transverse bar R′ is supported under the tracks b by a bolt-rod S′, extending through the top of said carriage and engaged by a clamp-nut m', said bar being guided on the arbor of pinion c and a depending rod n' opposite said arbor, this rod being in Fig. 3.

The blocks or ends sawed from the sticks of material are held back by means of suitably-arranged stops T′, and extending from these stops are plugs p', of wood or other suitable material, that face the saws and prevent said stops from being set too near the same.

In order to readily determine the proper adjustment of the machine for work on sticks of different lengths, pattern-gages U′ may be extended from the bed B and carriage C of the machine parallel to each other.

The trunnions of the rods K′ project from sleeves V′, loose on said rods between set-nuts r', one nut in each pair of the latter being the hub of a hand-wheel W′, as clearly illustrated in Fig. 3, and each rod is in screw connection with socket-shackles on the upper ends of the levers L′, whereby the throw of the cutter-heads W or other woodworking-tools substituted therefor may be regulated. The rods K′ may be provided with cushioned buffers t', as shown in Fig. 3.

It is to be observed that the shedders J′ have their pivot ends provided with lugs u' v' in opposition to the upper and lower faces of a fixed stop-plate W′, and thus movement of said shedders in either direction is automatically limited.

I have shown and described a practical machine constructed according to my invention, but it is to be understood that in the matter of detail and relative arrangement of parts the machine may be varied in some particulars without departure from said invention.

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

1. In a woodworking-machine, the combination of a continuously-rotary carrier provided at each end with projecting pivots, a gripper and a wiper loose on each pivot but in flexible connection with each other, and stationary cams arranged in the paths of the wipers.

2. In a woodworking-machine, the combination of a continuously-rotary longitudinally-extensible carrier provided at each end with projecting pivots, a gripper and a wiper loose on each pivot but in flexible connection with each other, and stationary cams arranged in the paths of the wipers.

3. In a woodworking-machine, the combination with a continuously-rotary carrier, of pivotal guard-fingers for material fed to the carrier, and suitable means for automatically actuating the guard-fingers to bring the same in and out of working position with respect to said material.

4. In a woodworking-machine, the combination with a carrier, of pivotal spring-controlled guard-fingers for material fed to the carrier, pivotal dogs operative to swing said fingers into working position, and projections on the carrier arranged to actuate the dogs.

5. In a woodworking-machine, the combination of a carrier, provided with pivotal grippers and wipers, cams arranged in the paths of the wipers, guard-fingers for material fed to the carrier, and an automatic finger-actuating mechanism embodying projections on said carrier.

6. In a woodworking-machine, the combination of a continuously-rotary carrier comprising notched end disks, suitable means for automatically clutching and releasing material fed into the disk-notches, saws operative

in the path of said material, and stops arranged to hold back the blocks cut from the aforesaid material.

7. In a woodworking-machine, the combination of a continuously-rotary carrier comprising notched end disks, suitable means for automatically clutching and releasing material fed into the disk-notches, saws operative in the path of said material, stops arranged to hold back the blocks cut from the aforesaid material, and saw-opposing plugs extending from the stops.

8. In a woodworking-machine, the combination with saws and a continuously-rotary carrier, of gages arranged to prevent longitudinal movement of material in the carrier after passing the saws, reciprocative jaws, suitable means for effecting an automatic yielding grip of the jaws on material coming from the carrier, clamp-forks for the closed jaws, and reciprocative tools operative upon the centered material.

9. In a woodworking-machine, the combination with saws and a continuously-rotary carrier, of gages arranged to prevent longitudinal movement of material in the carrier after passing the saws, reciprocative jaws, suitable means for effecting an automatic yielding grip of the jaws on material coming from the carrier, clamp-forks for the closed jaws, and automatic sizing mechanism operative on ends of the centered material.

10. In a woodworking-machine, the combination with saws and a continuously-rotary carrier, of a self-centering clamp mechanism for material coming from the carrier, automatically-reciprocative tools operative upon centered material, and pivotal gravity-bars arranged to be swung up and passed by said material on its way to line with the tools but which on return to normal position constitute shedders for the aforesaid material when the latter is released from the clamp mechanism subsequent to an operation of said tools.

11. In a woodworking-machine, the combination with a carrier, of a self-centering mechanism comprising reciprocative normally open jaws having longitudinally-adjustable shanks, suitable means for closing the jaws on material brought thereto by the carrier, laterally-adjustable longitudinally-yielding clamp-forks for said jaws, and automatic reciprocative tools operative on the centered material.

12. In a woodworking-machine, a carrier comprising a pair of peripherally-notched disks provided with lateral pivots adjacent to the notches, a gripper and a wiper loose on each pivot but in flexible connection with each other, suitable means for imparting continuously-rotary motion to the disks, and stationary cams arranged in the paths of the wipers.

13. In a woodworking-machine, the combination with a carrier, of a self-centering mechanism comprising reciprocative normally open jaws arranged in pairs and having longitudinally-adjustable shanks, a support on the shank of a jaw in each pair for material delivered from the carrier, suitable mechanism for closing the jaws on the material, laterally-adjustable longitudinally-yielding clamp-forks for said jaws, and automatically-reciprocative tools operative on centered material.

14. In a woodworking-machine, a self-centering clamp mechanism comprising sleeves reciprocative on guides, collars adjustable longitudinally of the sleeves, paired jaws having spring-separated shanks in rule-joint connection with the collars, a guide opposing one jaw-shank of each pair, a finger-bar in pivotal connection with the other of these shanks, a spring interposed between the finger-bar and adjacent jaw-shank, rotary cams operative against the finger-bars, and laterally-adjustable longitudinally-yielding clamp-forks arranged to receive the closed jaws.

15. In a woodworking-machine, a self-centering clamp mechanism comprising sleeves reciprocative on guides, collars adjustable longitudinally of the sleeves, paired jaws having spring-separated shanks in rule-joint connection with the collars, a guide opposing one jaw-shank of each pair, a finger-bar in pivotal connection with the other of these shanks, a spring interposed between the finger-bar and adjacent jaw-shank, rotary cams operative against the finger-bars, and laterally-adjustable longitudinally-yielding forks arranged to receive the closed jaws.

16. In a woodworking-machine, a self-centering clamp mechanism comprising sleeves loose on guides, collars adjustable longitudinally of the sleeve, paired jaws having spring-separated shanks in rule-joint connection with the collars and the outer shank of each pair in opposition to a guide, hinged bars linked to the collars, rotary cams operative against the hinged bars, a finger-bar in pivotal connection with the inner jaw of each pair, other rotary cams operative against the finger-bars, and laterally-adjustable longitudinally-yielding clamp-forks arranged to receive the closed jaws.

17. In a woodworking-machine, the combination of a frame, a shaft in bearings on the frame, a pinion loose on the shaft, a driver loose on the pinion-hub and constituting one section of a clutch, a friction-disk that constitutes another clutch-section and is in loose sliding engagement with the driver-hub, as well as in sliding-tooth connection with said pinion-hub; suitable means for adjusting the friction-disk, and a gear-train that transmits motion of the pinion to said shaft.

18. In a woodworking-machine, the combination of a frame, a shaft in bearings on the frame, a clutch-controlled start-and-stop speed-reducing gear for the shaft, independently-driven reciprocative tools, reciprocative jaws, suitable means for effecting an automatic yielding grip of the jaws, clamp-forks for the closed jaws, and cams carried by said

shaft to constitute parts of the tool and jaw mechanisms.

19. In a woodworking-machine, the combination of a frame, in bearings on the frame, a clutch-controlled start-and-stop speed-reducing gear for the shaft, saws and reciprocative tools, an independent drive mechanism for the saws and tools, a carrier having rotation with said shaft, reciprocative jaws having yielding grip on material coming from the carrier subsequent to action of the saws, clamp-forks for the closed jaws, and cams carried by said shaft to constitute parts of the tool and jaw mechanisms.

20. In a woodworking-machine, the combination of a carrier, reciprocative jaws, suitable means for effecting a yielding grip of the jaws on material coming from the carrier, yielding clamp-forks for the closed jaws, and reciprocative tools operative on said material in said fork-held jaws.

21. In a woodworking-machine, the combination of a carrier, saws in the path of material on the carrier, reciprocative jaws, suitable means for effecting a yielding grip of the jaws on material coming from the carrier, yielding clamp-forks for the closed jaws, and reciprocative tools operative on said material in the fork-held jaws.

22. In a woodworking-machine, the combination of a frame having a stationary bed, a saw and a reciprocative tool having their arbors mounted on the bed, a carriage longitudinally adjustable on the frame, another saw and tool having their arbors mounted on the carriage, a continuously-rotary carrier having a portion thereof adjustable with said carriage, reciprocative jaws for gripping material coming from the carrier, clamp-forks for the closed jaws, and suitable means for reciprocating the arbors of the tools other than said saws.

23. In a woodworking-machine, the combination of a frame having a stationary bed, a saw and a reciprocative tool having their arbors mounted on the bed, a carriage longitudinally adjustable on said frame, suitable means for clamping the carriage in adjusted position, another saw and tool having their arbors mounted on the carriage, a continuously-rotary carrier having a portion thereof adjustable with said carriage, reciprocative jaws for gripping material coming from the carrier, clamp-forks for the closed jaws, and suitable means for reciprocating the arbors of the tools other than said saws.

24. In a woodworking-machine, the combination of a tool-carrying arbor, a loose screw-threaded rod parallel to the arbor, a link mechanism in connection with said arbor, a sleeve on the rod also connected to the link mechanism, a hand-wheel nut adjustable on said rod in opposition to the sleeve, a rotative cam, a pivotal spring-controlled lever arranged to be actuated by the cam, and a lever-connecting shackle provided with a screw-threaded socket engaged by the aforesaid rod.

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

J. M. NASH.

Witnesses:
N. E. OLIPHANT,
B. C. ROLOFF.