No. 844,100. PATENTED FEB. 12, 1907.

A. COLLET.

MACHINE FOR CUTTING RAIL SEATS IN RAILWAY SLEEPERS.

APPLICATION FILED JAN. 27, 1906.

6 SHEETS—SHEET 1.

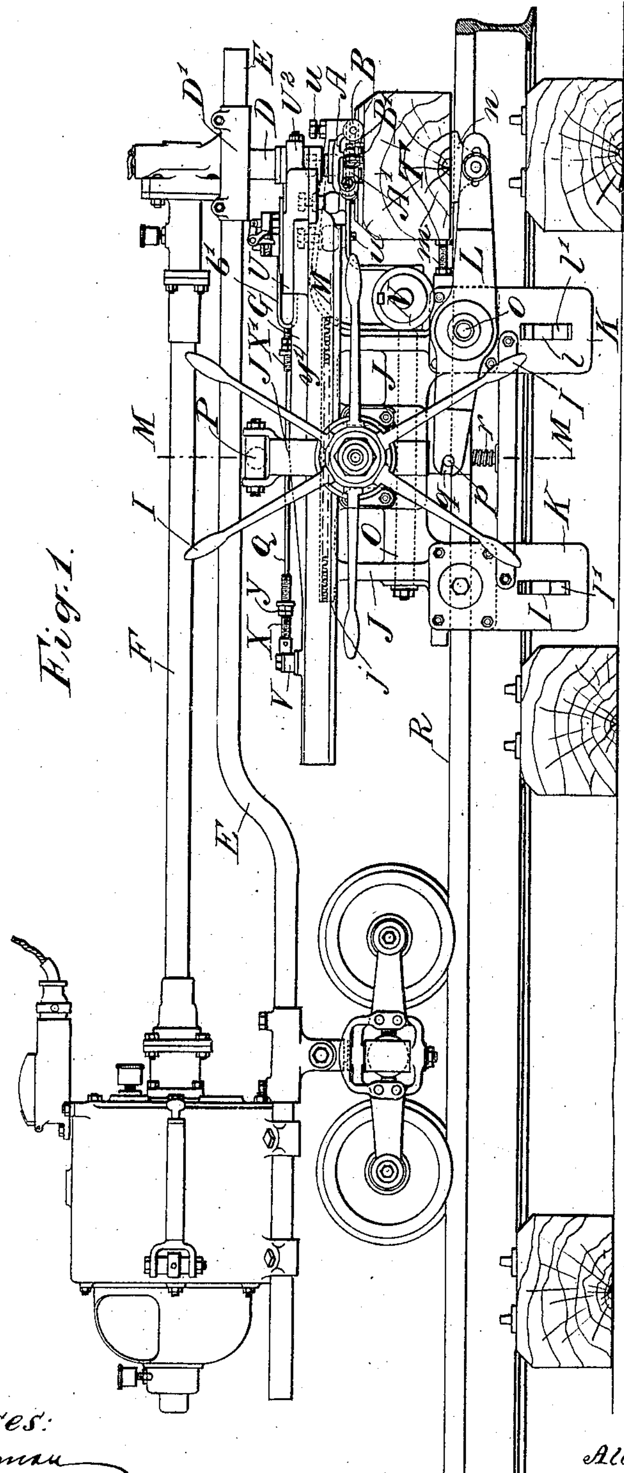


Fig. 1.

Witnesses:

Inventor:
Albert Collet
by Henry Connett
Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 844,100. PATENTED FEB. 12, 1907.

A. COLLET.

MACHINE FOR CUTTING RAIL SEATS IN RAILWAY SLEEPERS.

APPLICATION FILED JAN. 27, 1906.

6 SHEETS—SHEET 2.

Fig. 2.

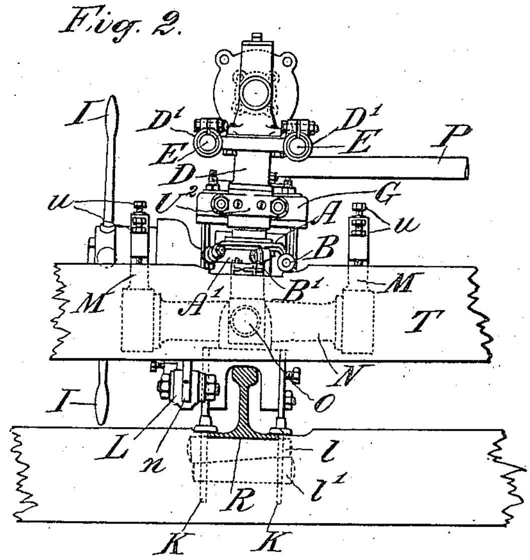
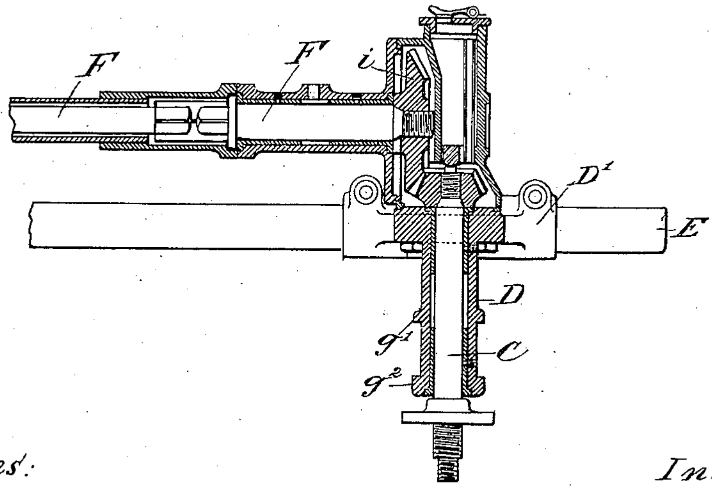


Fig. 3.



Witnesses:

[signatures]

Inventor:

Albert Collet

by Henry Connett

Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 844,100.

PATENTED FEB. 12, 1907.

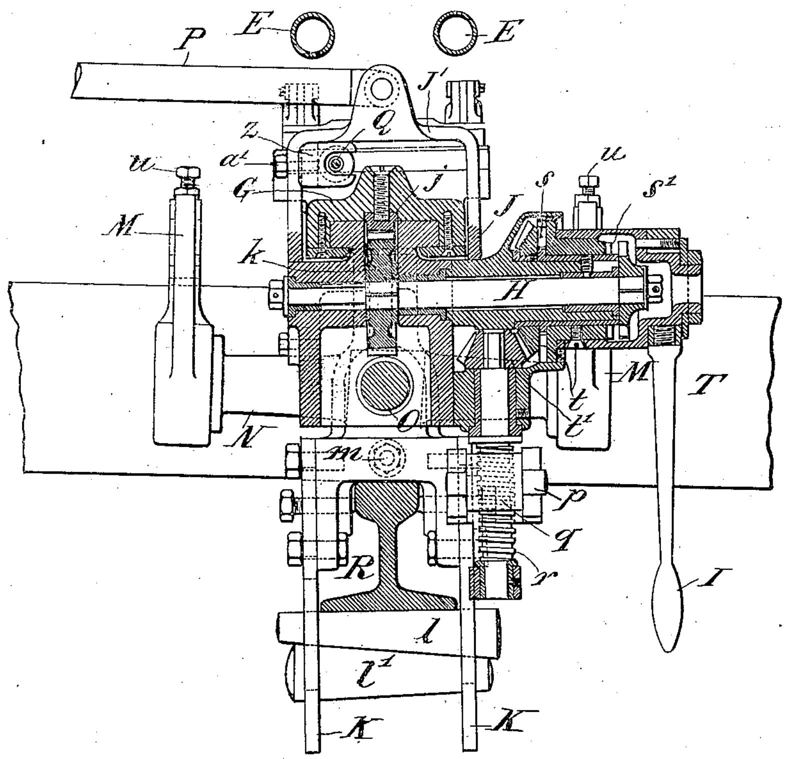
A. COLLET.

MACHINE FOR CUTTING RAIL SEATS IN RAILWAY SLEEPERS.

APPLICATION FILED JAN. 27, 1906.

6 SHEETS—SHEET 3.

Fig. 4.



Witnesses:

F. W. Hinman

[signature]

Inventor:

Albert Collet

by Henry Connett

Attorney

No. 844,100. PATENTED FEB. 12, 1907.

A. COLLET.

MACHINE FOR CUTTING RAIL SEATS IN RAILWAY SLEEPERS.

APPLICATION FILED JAN. 27, 1906.

6 SHEETS—SHEET 4.

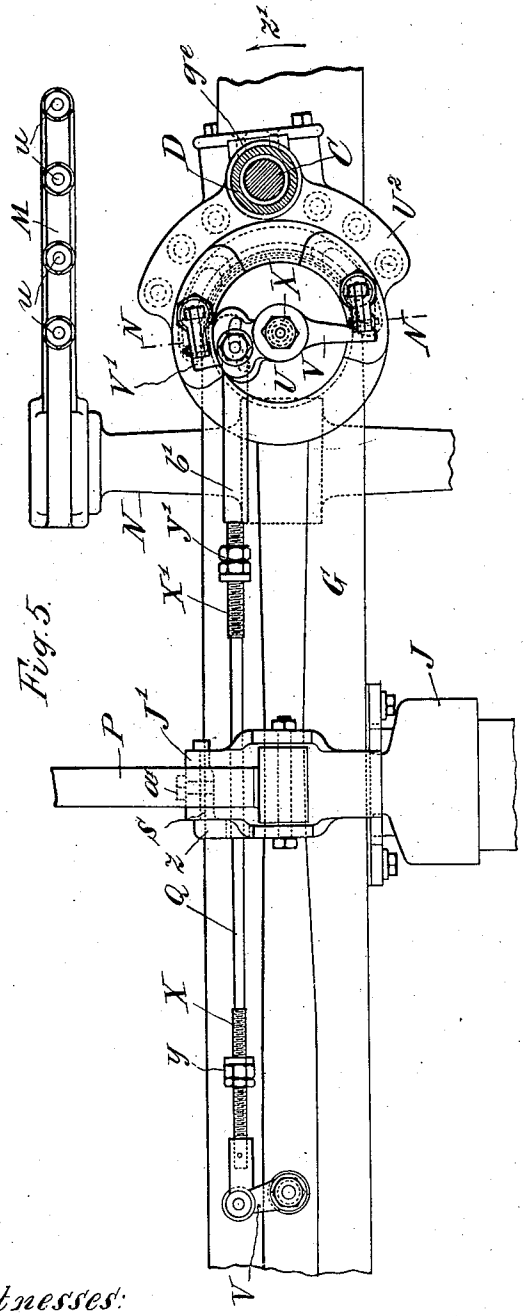


Fig. 5.

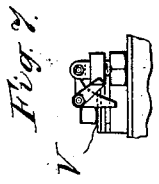


Fig. 7.

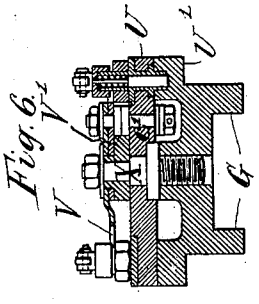


Fig. 6.

Witnesses:

Inventor:
Albert Collet

by Henry Connett
Attorney

No. 844,100. PATENTED FEB. 12, 1907.

A. COLLET.

MACHINE FOR CUTTING RAIL SEATS IN RAILWAY SLEEPERS.

APPLICATION FILED JAN. 27, 1906.

6 SHEETS—SHEET 5.

Fig. 8.

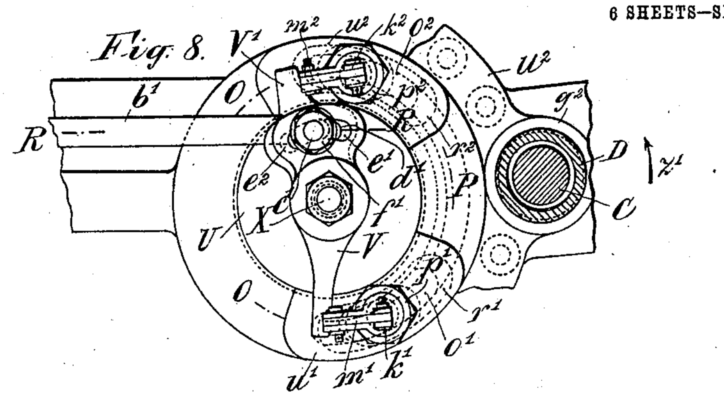


Fig. 9.

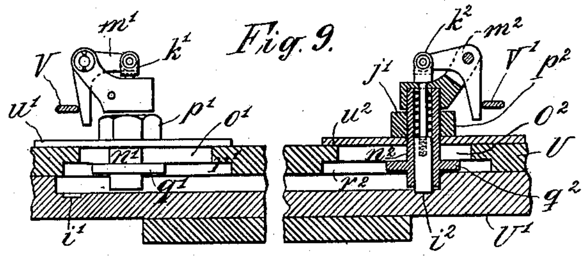


Fig. 10.

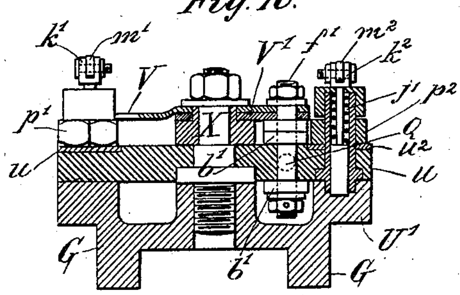
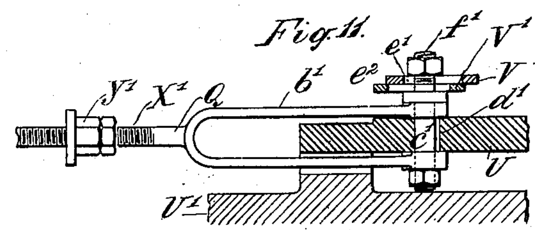


Fig. 11.



Witnesses:

Inventor:
Albert Collet

by Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 844,100. PATENTED FEB. 12, 1907.

A. COLLET.

MACHINE FOR CUTTING RAIL SEATS IN RAILWAY SLEEPERS.

APPLICATION FILED JAN. 27, 1906.

6 SHEETS—SHEET 6.

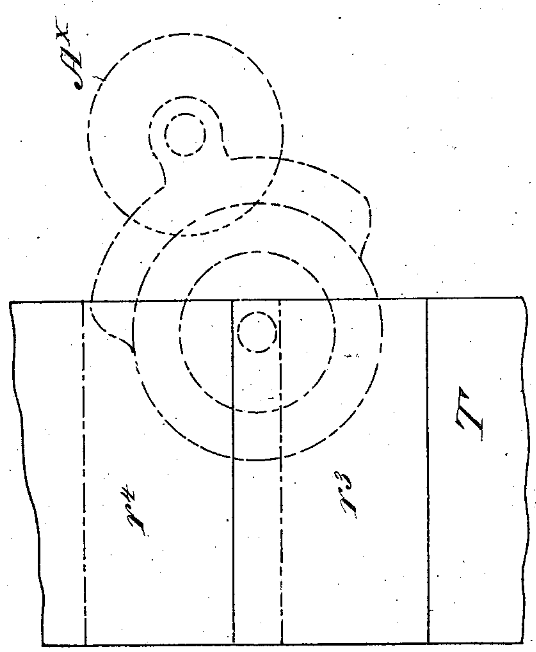


Fig. 14.

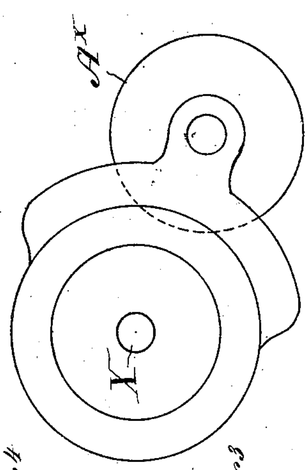


Fig. 13.

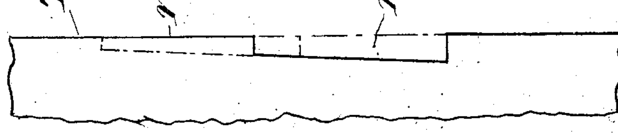


Fig. 12.

Witnesses

F. W. Ulman

H. Hose

Albert Collet
Inventor

By his Attorney Henry Connett

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT COLLET, OF PARIS, FRANCE.

MACHINE FOR CUTTING RAIL-SEATS IN RAILWAY-SLEEPERS.

No. 844,100. Specification of Letters Patent. Patented Feb. 12, 1907.

Application filed January 27, 1906. Serial No. 298,234.

To all whom it may concern:

Be it known that I, ALBERT COLLET, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Machines for Cutting Rail and Chair Seats in Railway-Ties, of which the following is a specification.

This invention relates to machines for cutting gains or recesses in wood; and its object is to provide a machine for cutting or routing out a recess or gain in the upper surface of a railway-tie to receive and form a seat for the rail or for a chair to receive and support the rail.

The machine may employ any kind of cutting tool or tools suited to the purpose; but it is preferred to use tools of the construction illustrated in my pending application, Serial No. 298,233, filed January 27, 1906.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a side elevation of the machine. Fig. 2 is a front elevation of one-half of the machine, which latter is in practice double or adapted to cut at the same time the seats for both of the rails of a track. Fig. 3 is a sectional view illustrating the driving-gear of the cutter. Fig. 4 is a cross-section taken along the axis of the shaft H in Fig. 1 at the dotted line M M, but on a larger scale than Fig. 1. Fig. 5 is a plan of a part of the machine-carriage and of the parts for effecting the lateral movement of the cutter-shaft, the recess or gain being cut by two reciprocating operations of the cutting-tool. Fig. 6 is a cross-section at N N in Fig. 5. Fig. 7 is a side view of one of the spring catches or bolts. The details of this mechanism are best illustrated in Figs 8 to 11. Fig. 8 is a plan of the plates at the front of the machine-carriage. Fig. 9 is a section along the curved line O P O in Fig. 8. Fig. 10 is a view similar to Fig. 6, but drawn to a much larger scale. Fig. 11 is a section at line R R in Fig. 8. Figs. 12, 13, and 14 are illustrative views. Fig. 12 shows the side of the sleeper or tie and the shape of the recess or gain cut in it. Fig. 13 is a plan of the cutting-tool. Fig. 14 is a plan of the sleeper or tie, the tool being shown in dotted lines as shifted over laterally.

The operation of recessing or cutting gains in the sleepers or ties will be carried out on any piece of track—as a siding, for example. In the drawings, R designates one of the track-rails of such a siding, and T designates a tie extending across said rails in position to be operated on.

It may be explained, primarily, that the recessing-machine (seen at the right in Fig. 1) consists really of two like machines connected by a transverse rod or bar P and each having a frame J and a carriage G slidable thereon. The cutters are actuated or driven from a motor W, (seen at the left in Fig. 1,) said motor being mounted on a carriage which runs on the track-rails of the siding, only one rail R of said track being herein shown. This may be an ordinary electric motor, of which F is its rotating driving-shaft. The tie T to be recessed does not rest on the track-rails R, but on supports which are adjustable, so that the tie may be raised or lowered in order that the gain cut in it shall be recessed to the proper or desired depth. The two cutting mechanisms will be so spaced or trammed that the gains or recesses cut simultaneously in the tie will be at exactly the proper distance apart. The frame J rests upon the track-rail R and has slotted cheeks or cheek-pieces K, which embrace the rail, the frame J being drawn down and held firmly in place by keys l and l' (seen clearly in Fig. 4) in the slots in the cheeks.

The upright cutter-shaft C, Fig. 3, rotates in an upright bearing D, integral with sleeves D′, which embrace and clamp on rods E, which connect with the motor W. On the upper end of the shaft C is a bevel-pinion which gears with a bevel pinion or wheel i on the forward end of the motor-shaft F. This mechanism provides the means for driving the cutter or cutters B in the head A on the shaft C. The upright bearing D is secured to the forward end of the carriage G by means of a sector U^2, on and integral with a movable plate U, said sector having a collar which embraces and clamps the bearing D between two shoulders g' g^2 on the latter. The plate U turns about an upright pin X, set firmly, Fig. 10, in a bed or plate U′, on and integral with the carriage G. On the under side of this carrige G, Fig. 4, is a rack j, with which gears a pinion k on a cross-shaft H, rotatively mounted in the frame J, and the said shaft may be rotated through the medium of a hand-wheel I, for moving the cutters forward and back across the tie to be recessed. It may be here noted that when the cutter-head is moved forward and back the engine W and the carriage G move with it,

as they are all connected together. In the front of the frame J is an adjustable screw-buffer *m*, Fig. 1, up against which the rear face of the tie T is brought to be operated upon.

The means for raising the tie T and supporting it at the proper level comprises two like devices, one at each end of the tie and each forming a part of the respective machines, only one of which is herein shown. The device shown consists of a lever L, fulcrumed at *o* on the frame and carrying at its ends a shoe *n*, upon which that end of the tie T is supported. At its rear end the lever L is forked and slotted to engage pins *p* on a nut *q*, through which extends a screw *r*. This screw *r* is rotated in turning the lever about its fulcrum, by means of the device heretofore called the "hand-wheel" I. The boss of this wheel is fixed to a sliding sleeve, which incloses the bearing of the shaft H, and on this sleeve are two sets of teeth *s* and *s'*. When the sleeve is pushed in to the position seen in Fig. 4, the teeth *s* engage with similar teeth on a bevel-pinion *t*, rotatable on the bearing of the shaft H and gearing with a pinion *t'* on the upper end of the before-mentioned screw *r*, Fig. 4.

It will be obvious how the tie T may be elevated to the desired height by the means described, and also lowered to the rails after the cutting or recessing operation. By sliding the sleeve back or outward until the teeth *s* are disengaged and the teeth *s'* are caused to engage teeth carried by the shaft H the latter may be rotated, and through the medium of the pinion *k* and rack *j* the cutter-carriage G be moved to and fro. When the tie T is raised, its upper surface bears on screw-stops *u*, the tips of which may be regulated as to height by screwing the screws up or down. These stops are carried by bent arms M on a transverse part N in the frame. This transverse part forms an integral part or cross-head on a longitudinally-extending bar O in the frame J. This bar is seen in dotted lines in Fig. 1. The bridge-piece J' of the frame J, Fig. 4, together with the bar P, serves to connect the two machines rigidly together, abreast on the track.

The cutting devices and the means for operating them will now be described, premising that the cutters or cutting-tools B are mounted in a head A, screwed onto the lower end of the upright shaft C, and that means are provided whereby the cutter is made to cut a wide gain by first advancing it across the tie T, then shifting it laterally, and then drawing it back again across the tie.

The construction will be best understood by reference to Figs. 5 to 14. The carriage G is provided at its upper part with a rod Q, coupled at one end to an arm V, which swings about an upright stud on the carriage G. This rod Q carries on its screw-threaded parts *x x'*, respectively, nuts *y y'*, adapted to abut against a fork Z, in which the rod Q rests, Figs. 4 and 5, said fork forming a part of a block S, mounted on the bridge-piece J' at one side and held in position by means of a screw *a'*. The front end of the rod Q terminates in a fork *b'*, Fig. 11, which is coupled to a pin *c'*, that plays in a slot *d'* in the plate U. The pin *c'* engages at its upper end two superposed arms V V', provided, respectively, with slots *e'* and *e²* to allow of the position of the arms V V' being regulated relatively to the pin *c'*. On the upper end of the pin is a nut *f'*. The plate U is adapted to turn about an upright pin X over the fixed plate U'. The plate U is rendered immovable with respect to the fixed plate U' in each of its respective extreme positions by spring detents or bolts *k'* and *k²*, adapted to engage, respectively, bolt sockets or recesses *i'* and *i²* in the plate U', the bolts acting under the influence of springs, as *j'* in Figs. 9 and 10. At the upper part of the respective bolts are elbow-levers *m'* and *m²*, one arm of the lever being coupled to said bolt, the other being free and pendent. The respective arms V and V' bear on these pendent arms of the levers *m' m²*. The bolts *k'* and *k²*, respectively, play in cylindrical guides *n'* and *n²*, mounted, respectively, in slots *o'* and *o²* in the plate U, wherein they may be adjusted and clamped fast by nuts *p'* and *p²*. On the respective guides are integral flanges *q'* and *q²*, Fig. 9, situated in a recess formed in the under side of the plate U under the slots *o' o²*, and covering-plates *u'* and *u²* under the respective nuts *p'* and *p²* cover the slots *o'* and *o²*.

The operation of the mechanism is as follows: In Figs. 1, 5, 8, 9, 10, and 11 the cutter-shaft C is supposed to be in the position it occupies after the cutter-head, moving from rear to front, has made the first cut of the recess and has swung over about the pin X) in the direction of the arrow *z'* in Fig 5 and the carriage G is moving back (to the left) to effect the second cut of the recess. In this position the bolt *k²* at the upper part of Fig. 5 has entered the socket *i²*, and the bolt *k'* has been raised by the arm V impinging on the pendent arm of the lever *m'*. The movement of the carriage G back or toward the left carries back also the plate U', the pin X, the plate U, and the whole of the cutter mechanism. When the cutters shall have traversed the width of the tie T and completed the recess or gain therein, the stop *y'* on the rod Q impinges on the fork Z, and the movement of the rod Q with the carriage is arrested. The carriage continuing its movement, the plate U also continues to move; but the rod Q being unable to move the said plate U can only move bodily the slight distance allowed by the space *d'*, Fig. 11, between the pin *c'* and the end of its slot. During this slight movement of the plate U all of

the parts carried by it move, and the pendent arm of the bell-crank m^2 at the bolt k^2 impinges on the arm V′, the pin c' of which is arrested because the rod Q, connected thereto, is immovable for the time, the rod Q is being arrested, while the pin X continues to move with the carriage. By reason of this stoppage of the arm V′ the bolt k^2 is disengaged from its socket and the plate U is released, so that the movement of the carriage toward the left causes the said plate to turn about the pin X and swing back the cutter-shaft C into position at the next advance to make the first cut of the gain in the succeeding tie to be recessed. In the movement just described the arm V, which was before, Fig. 9, pressed against the pendent arm of the bell-crank m', will have been withdrawn and the bolt k' put in condition to engage its socket i' when the plate U shall have turned far enough, and this again locks the plates together.

Figs. 12, 13, and 14 are illustrative views showing how the recess in the sleeper is made at two cuts, the cutter being shifted after the first cut. Fig. 12 is a side view of a sleeper T, showing a recess partly cut in it at r^3, the other part r^4 being designated by dotted lines. Fig. 13 is a plan view showing the cutter $A^\times$ in position to cut that portion of the recess seen in Fig. 12, and Fig. 14 is a plan view showing the sleeper in full lines and the cutting mechanism shifted laterally, so as to cut the remaining part r^4 of the recess. It will be understood that by varying the positions of the bolts k' and k^2 in their respective slots o' and o^2 the extent af angular displacement of the plate U about its center may be modified or varied, and consequently also the extent of lateral swing of the cutter-shaft C. Hence the width of the gain or recess cut in the tie T may be varied within limits—that is to say, the gain cut may be only equal in width to the diameter of the cutter-head, or it may be nearly double that in width. It may be explained here that the motor W is capable of turning about an upright axis on its carriage at its mounting to freely permit of the lateral swing of the cutter-shaft, and that the cutter-head employed turns about the axis of the upright shaft C, moving forward and back in a horizontal plane over and across the tie. As it is usually required that the bottom of the gain or recess (see Fig. 12) shall be slightly inclined laterally, the cutter-shaft will be or may be inclined from the perpendicular to effect this object.

Having thus described my invention, I claim—

1. A machine for the purpose specified, having a frame to be supported on the rails of a railway-track and provided with two pairs of slotted jaws K depending below the frame, the jaws of the pairs being spaced to embrace the track-rail, keys in the slots in said jaws, said keys adapted to take under and bear on the foot of the rail to secure the frame firmly thereto, a carriage displaceable on the frame, a rack and pinion for moving the carriage on the frame, a horizontally-rotating cutting means on the carriage for forming the recess in the tie, and mechanism for driving said cutting means.

2. In a machine for cutting a cross recess or gain in a railway-tie, a fixed frame, a carriage which reciprocates horizontally on said frame, a rotating cutting mechanism carried by said carriage, and means for supporting and adjusting said tie vertically to regulate the depth of the gain cut in the tie, said means consisting of a lever, a shoe n on one arm of the lever and supporting the tie, and mechanism for depressing the other arm of the lever.

3. In a machine for cutting a cross recess or gain in a railway-tie, means for supporting and elevating the tie, means for limiting the extent to which the tie may be raised, said means comprising the arms M and a plurality of screws u driven through said arms and adapted to bear on the upper surface of the tie, and reciprocating cutting means for recessing the tie.

4. The combination with a railway-track, of a means for cutting gains in railway-ties, said means comprising a frame secured firmly to the rails of said track, a carriage G slidable on said frame, a rotative cutting mechanism on said carriage G, a motor and wheeled carriage therefor on said railway-track, means connecting the motor with the carriage G, mechanism through which said motor drives the cutting mechanism, and means for holding the tie in position to be recessed.

5. In a machine for the purpose specified, the combination with a motor, a cutter, the upright cutter-shaft C, and the lateral rods E of the motor, said rods being so disposed that a plane passing through their axes will be slightly inclined laterally from the horizontal, of the upright bearing D of the cutter-shaft, and sleeves D′ on and rigid with said bearing and fixed on the respective rods E, the axis of the cutter-shaft being disposed perpendicular to said inclined plane, for the purpose specified.

6. In a machine for the purpose specified, the combination with the carriage G, provided with a fixed bearing-plate U′, of the plate U pivotally mounted on plate U′ at X, and the cutting-tool and its shaft, the means for carrying the cutting-tool, said means carried by the plate U and movable about the axis X, whereby the tool may be swung about the axis X as a center.

7. In a machine for the purpose specified, the combination with the plate U′ and the plate U mounted movably thereon, of the means for securing together said plates in a

temporary manner, said means comprising the spring-bolts k' and k^2 on the plate U adapted to engage recesses or openings i' and i^2 in the plate U^2, the elbow-levers m' and m^2 coupled by one arm to the respective bolts, and the lugs V and V′ which engage the other arms, respectively, of the said elbow-levers.

8. In a machine for the purpose specified, the combination with the fixed plate U′, and the movable plate U mounted thereon at X, the former being provided with a recess i', and the latter with slots o' and r', of the tubular, screw-threaded socket n', provided with a flange-like holder q' and a nut p', the holder adapted to play in the wider slot r' in effecting adjustments, the covering-plate u' between the plate U and the nut p', the bolt k' movable in the socket n', and adapted to engage at its lower end a bolting-recess i', and the spring j' behind the bolt k', substantially as set forth.

In witness whereof I have hereunto signed my name, this 10th day of January, 1906, in the presence of two subscribing witnesses.

ALBERT COLLET.

Witnesses:

JULES ARMENGAUD, Jeune,

HANSON C. COXE.