(No Model.) 4 Sheets—Sheet 1.

C. C. NEWTON.

MULTIPLE COLD SAWING MACHINE.

No. 533,732. Patented Feb. 5, 1895.

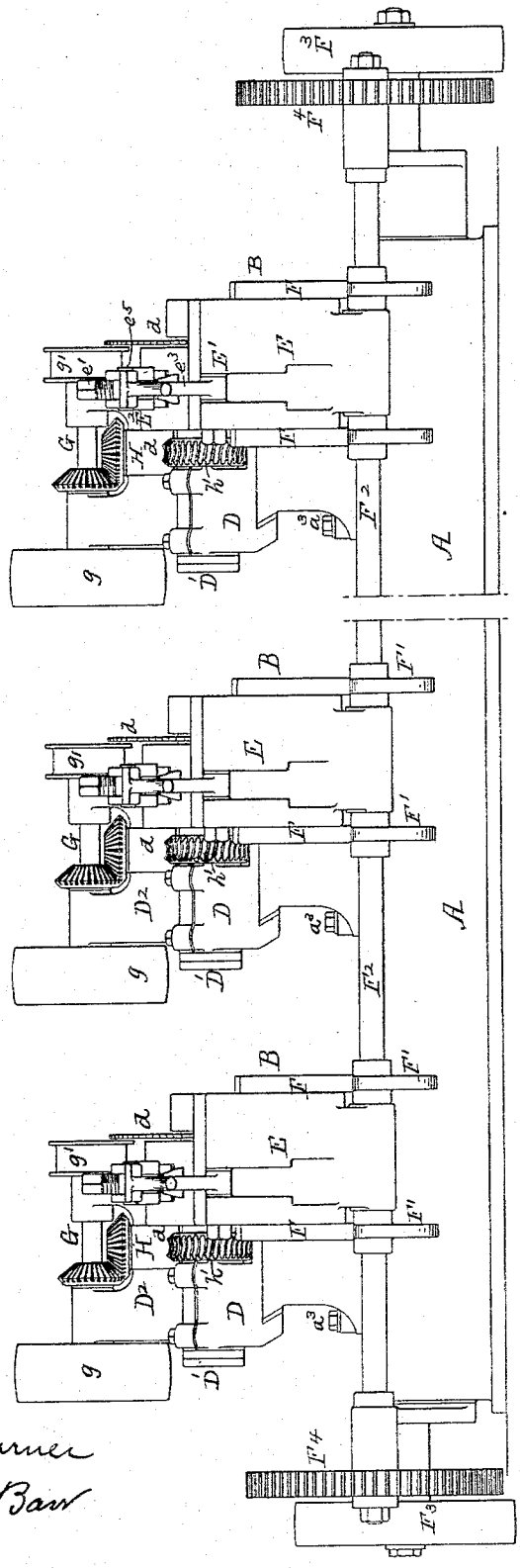

FIG. 1.

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By his Attorneys
Howson & Howson

(No Model.) 4 Sheets—Sheet 2.

C. C. NEWTON.

MULTIPLE COLD SAWING MACHINE.

No. 533,732. Patented Feb. 5, 1895.

FIG. 2.

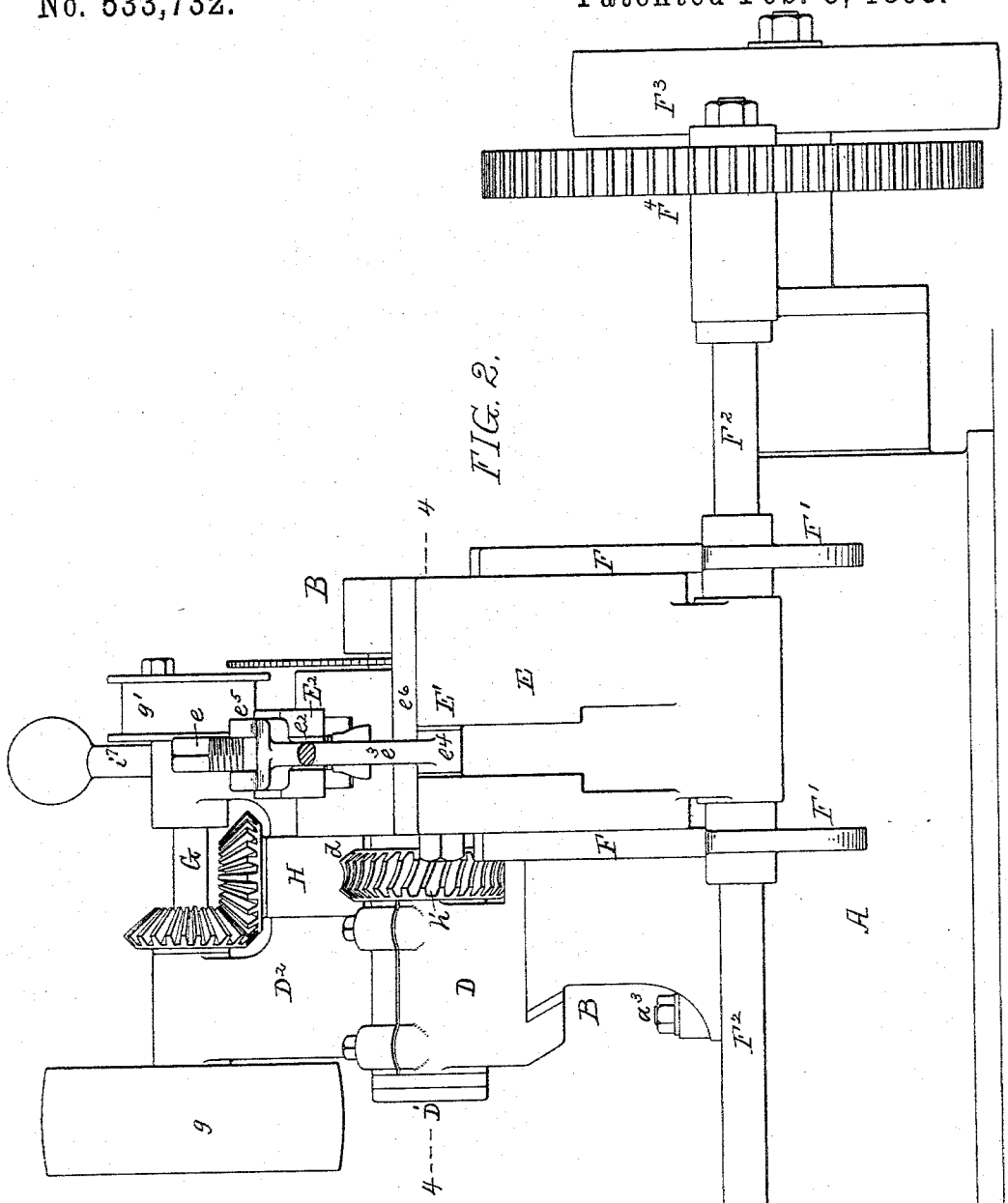
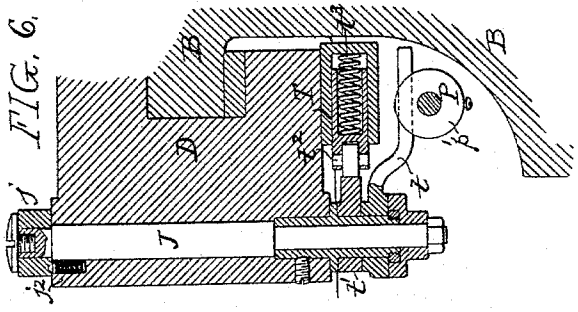


FIG. 6.



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(No Model.) 4 Sheets—Sheet 3.

C. C. NEWTON.

MULTIPLE COLD SAWING MACHINE.

No. 533,732. Patented Feb. 5, 1895.

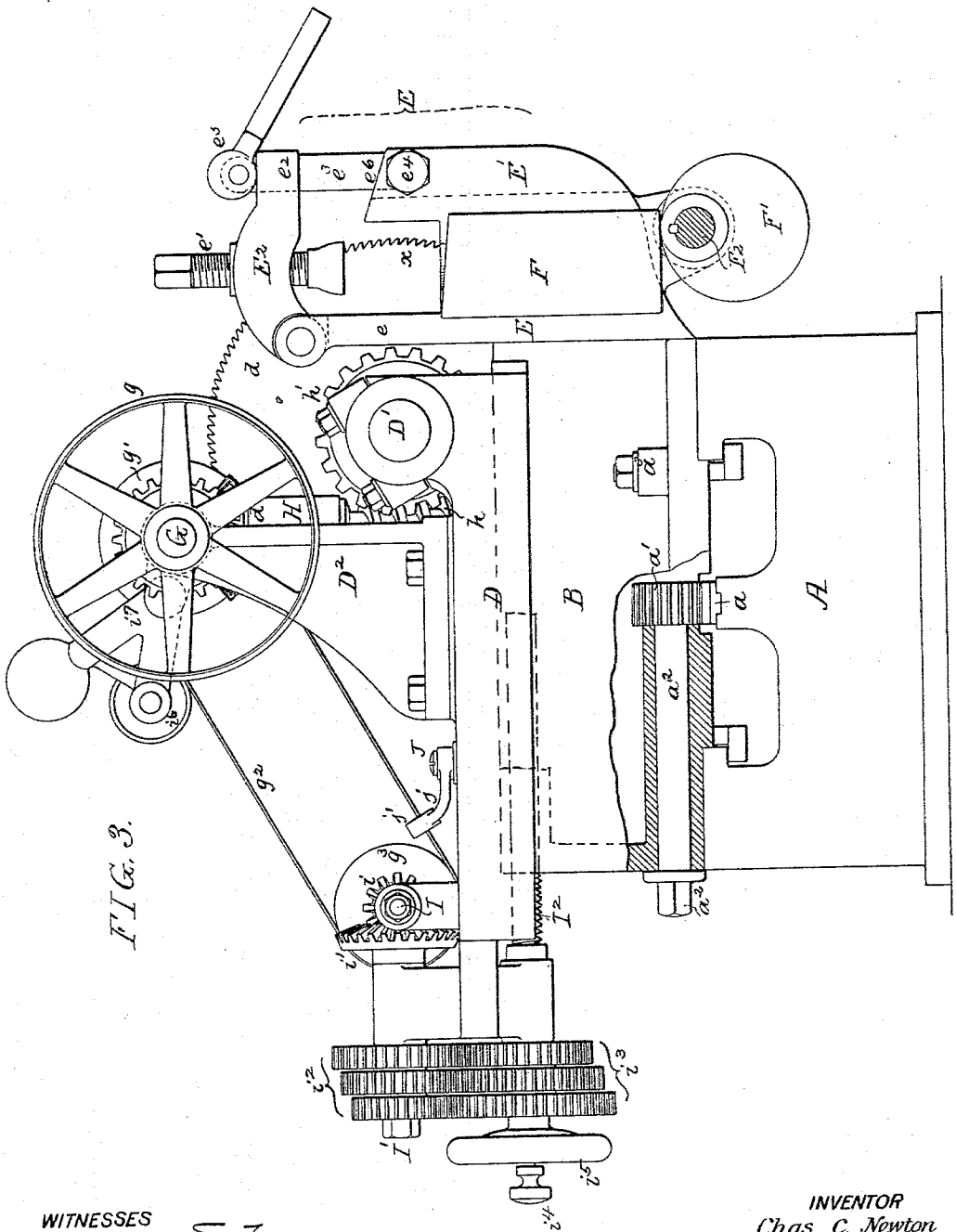

FIG. 3.

WITNESSES
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(No Model.) 4 Sheets—Sheet 4.

C. C. NEWTON.

MULTIPLE COLD SAWING MACHINE.

No. 533,732. Patented Feb. 5, 1895.

FIG. 4.

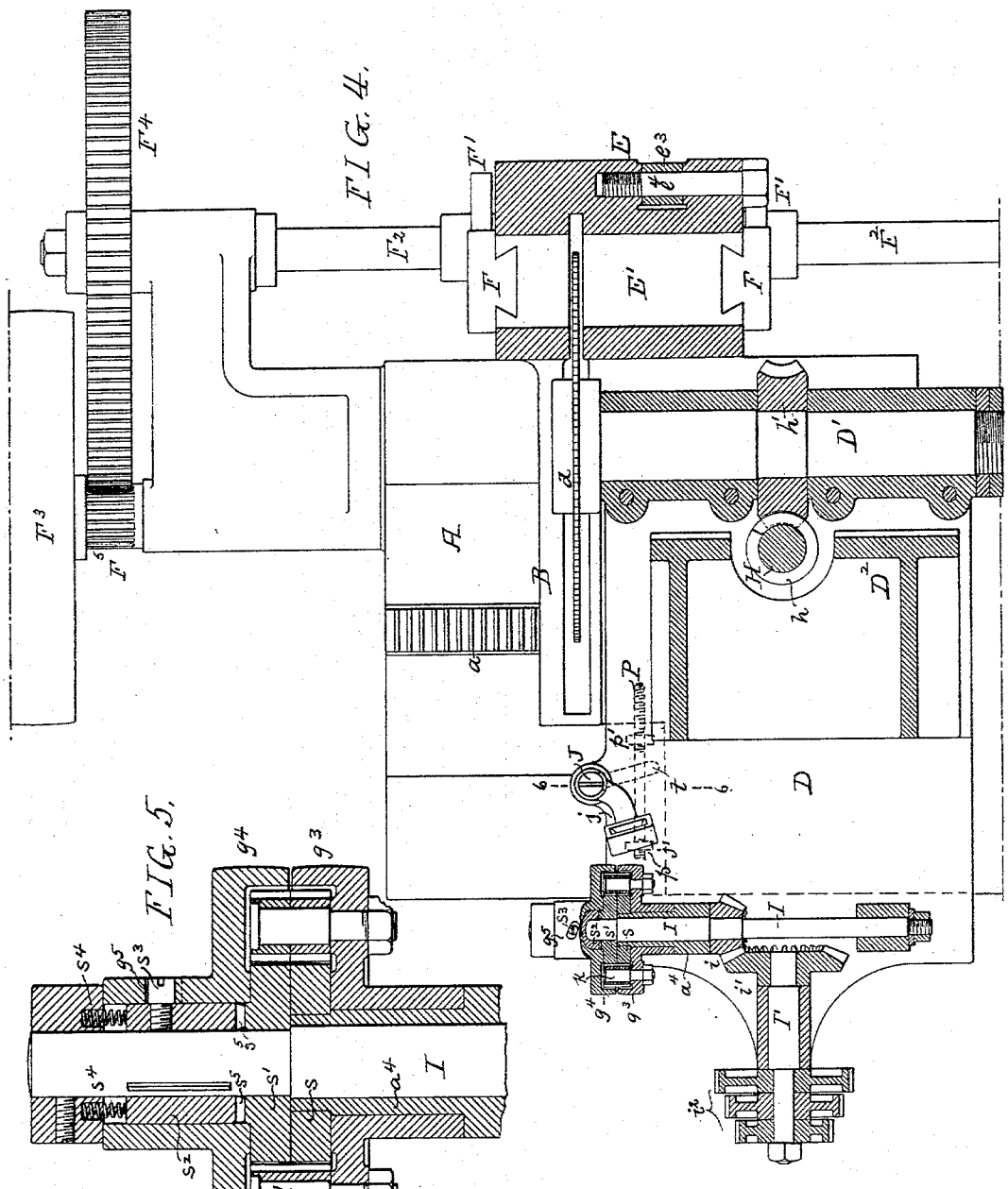

FIG. 5.

WITNESSES

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William A. Barr

INVENTOR

Chas C. Newton

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UNITED STATES PATENT OFFICE.

CHARLES C. NEWTON, OF PHILADELPHIA, PENNSYLVANIA.

MULTIPLE COLD-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 533,732, dated February 5, 1895.

Application filed February 9, 1894. Serial No. 499,627. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. NEWTON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Multiple Cold-Sawing Machines, of which the following is a specification.

The object of my invention is to construct a multiple sawing machine for cutting metal shafts, bars and rods in given lengths.

The machine is so constructed that a single shaft, for instance, can be placed in the machine after the several cutting heads are adjusted to cut the shaft into short lengths and after the shaft is cut the sections can be released and removed simultaneously from the machine.

In the accompanying drawings:—Figure 1, is a face view of my improved multiple sawing machine. Fig. 2, is an enlarged face view of one of the heads. Fig. 3, is an end view. Fig. 4, is a sectional plan view on the line 4—4, Fig. 2. Fig. 5, is an enlarged sectional view of the fast and slow speed mechanism; and Fig. 6, is an enlarged section on the line 6—6, Fig. 4.

A is the base of the machine, on which are adjustably secured the cutting heads B and on the base is a rack a. On each head B is a shaft a^2 having a pinion a' meshing with the rack so that on releasing the clasp bolts a^3 on a head the said head can be moved longitudinally on the bed, and again secured in position by the clamp bolt a^3. On each head B is the carriage D and on the carriage is mounted the saw spindle D′, carrying the saw d. On the front of each head is work clamp E, constructed as follows:

E′ is the lower jaw of the clamp, secured to, or forming part of the head B, and having a socket x for the work. Pivoted to an upright portion e of the lower jaw is a cross bar E^2 forming with the clamp screw e' the upper jaw. Adapted to a slot e^2 in the bar E^2 is a link e^3 pivoted at e^4 to the lower jaw E′ and mounted on the upper end of this link is an eccentric lever e^5 which locks the jaw to the work. By throwing this lever down and moving the link out of the slot, the upper jaw can be readily detached and thrown back. In order to lift the work out of the lower jaw, I provide said lower jaw with a sliding plunger F, which is acted upon, in the present instance, by cams F′ on the shaft F^2, running the entire length of the machine. This shaft is mounted in bearings on the base and bearings depending from lower jaws E′. When said shaft is turned, the cams will raise the plungers F, and as the top of each plunger is inclined, as shown in Fig. 3, as well as the surface e^6 of the lower jaw the work will roll or slide out of the clamp as soon as the face of the plunger is in line with the surface e^6 of the lower jaw. The shaft or bar cut in lengths may be conveyed from the machine, by trucks or by an endless belt, or may be allowed to fall onto the floor or into a receptacle. The shaft F^2 is geared to a belt pulley F^3 by a gear wheel F^4 and pinion F^5 mounted in the present instance, on the hub of the belt wheel; but other means of driving this shaft may be used, without departing from my invention.

I have shown in the drawings, two cams and two plungers for elevating cut work, but a single cam and plunger may be used, without departing from my invention.

On the carriage D is a standard D^2, having the bearings for the driving shaft G, which drives the saw and feeds the carriage. This driving shaft has a belt pulley g and is geared to a vertical shaft H, adapted to bearings d in the standard D^2, and the shaft H has a worm h, meshing with a worm wheel h' on the spindle D′, and through this gearing the saw is driven from the shaft G. The carriage is reciprocated through the medium of a screw shaft I^2 mounted in bearings on the carriage and adapted to a nut on the head B. The screw shaft is driven from the driving shaft G through the gearing which I will now proceed to describe, by which the carriage is fed slowly toward the work and quickly returned.

On the driving shaft G is a belt pulley g' around which passes a belt g^2 to the quick and slow speed pulleys g^3, g^4 on a shaft I, which is geared to the shaft I′ by bevel gear wheels i, i'. An idler pulley i^6 rests upon the belt g^2 and is hung to the bracket B^2 by a weighted arm i^7. The belt passes through an eye j' of a shifter lever j on a vertical shaft J, which shifts the belt from the slow forward feed pulley to the quick return feed pulley. The internal construction of these pulleys is clearly shown in Fig. 4, and in the detail Fig. 5. The pulleys g^3 and g^4 inclose the slow speed

gearing and on an extension of the bearing a^4 for the shaft I is fixed a stationary gear wheel s and on the shaft I is loosely mounted a gear wheel s'. The wheel s' has one tooth more than the wheel s so that the amount of feed forward on each revolution will be the difference between the teeth, or one tooth forward at each revolulition. Meshing with the gear wheels s, s' is a long pinion k mounted on the stud k' projecting from the wheel g^3. A sleeve s^2 adapted to slide upon but turn with the shaft I has teeth s^5 which engage with teeth on the the loose gear wheels s' when the belt is on the slow feed pulley g^3, but when the belt is on the opposite speed pulley g^4 the sleeve is drawn away from the gear wheel s' by the movement of the pulley g^4. A pin s^3 on the sleeve rests in an inclined slot g^5 in the hub of the pulley g^4, as clearly shown in Figs. 4 and 5, but as soon as the belt is shifted onto the slow speed pulley the springs s^4 throw the teeth s^5 of the sleeve into engagement with the teeth of the gear wheels s'. Thus I am enabled to automatically feed very slowly forward but make a quick return. On the shaft I' are a series of gear wheels i^2 meshing with a series of gear wheels i^3 on the screw shaft I^2. These wheels are loose on the shaft but any one of the wheels can be locked thereto by an adjustable key i^4. The screw shaft I^2 has a handle i^5 by which it can be turned by hand.

In order to automatically shift the belt, I mount the shifter j on a vertical shaft J on the carriage D, (Fig. 6) and secured to the lower end of this shaft is an arm t, which plays between adjustable collars p, p' on the stud P screwed into the base of the machine so that when the carriage is fed forward the arm t will strike the collar p' when near the limit of its stroke and shift the belt onto the quick return pulley, and when the carriage has nearly reached the limit of its movement in the opposite direction the lever strikes the collar p and shifts the belt from the fast to the slow pulley.

In order that the belt shifter may operate quickly I mount a cam t' on the shifter, and bearing against this cam is a spring plunger T having a roller t^2, which, when the point of the cam is moved past the roller, the spring t^3 will force the plunger forward and quickly move the belt shifter its full throw. The belt shifter is locked in either position by a spring stud j^2 adapted to a recess in the under side of the shifter, as shown in Fig. 6. Thus it will be seen that the feeding mechanism of the saw is entirely automatic and that a shaft can be readily set in position and cut to the lengths required and the cut sections can be simultaneously released from the machine by suitable mechanism.

I claim as my invention—

1. The combination in a multiple sawing machine, of the bed, a series of cutter heads mounted thereon, mechanism for adjusting said cutter heads on the bed, a work clamp carried by each head and a carriage adapted to slide upon said head, a saw mounted on said carriage, with mechanism for feeding the carriage, substantially as described.

2. The combination in a multiple sawing machine, the bed, a series of heads adjustably mounted on said bed, work clamps carried by each head, means for cutting off the work clamped thereto, a work discharging device acting simultaneously on each head so as to discharge the work from said heads at one operation, substantially as described.

3. The combination of the bed, the cutter head, the stationary work clamp, the reciprocating carriage, the saw carried thereby and a sliding plunger F adapted to lift the work after it is cut and disengaged by the clamp, substantially as described.

4. The combination of the bed, a series of cutting heads, stationary work clamps on each head, a work discharging plunger adapted to the clamps, a shaft and a cam or cams acting on the plunger so that on the turning of the shaft the plungers will be raised and will lift the cut work and allow it to pass away from the machine, substantially as described.

5. The combination of the cutting head, a work clamp fixed thereto and having an upper and lower jaw, the lower jaw being provided with a socket and the upper jaw being movable with a plunger adapted to slide on the lower jaw and discharge the work from the work socket, substantially as described.

6. The combination of the cutter heads, the reciprocating carriage, the circular saw geared thereto, the work clamp consisting of the upper and lower jaws, said lower jaw having a socket for the work, the upper jaw consisting of a pivoted bar, and a clamp screw with a lock for locking the upper jaw to the lower jaw, a discharging plunger for the work, means for raising said plunger, the upper face of the plunger being inclined so that when the plunger is raised the work will slide or roll out of the clamp, substantially as described.

7. The combination of the cutting head, the reciprocating carriage the circular saw carried thereby, a clamp having an upper and lower jaw, a work socket in the lower jaw, the upper face of the outer portion of the lower jaw being inclined, with a plunger, the upper face of said plunger also being inclined, a cam for raising the plunger whereby the work is elevated clear of the socket so that it will roll or slide away from the clamp, substantially as described.

8. The combination of the cutting heads, the reciprocating carriage, a circular saw mounted thereon, a clamp having upper and lower jaws, the upper jaw being pivoted to an extension of the lower jaw, a clamp screw in said upper jaw, the outer portion of the jaw being slotted, a link pivoted to the lower jaw and adapted to a slot in the upper jaw, an eccentric lever on said link adapted to lock the jaw in position and to the work, with a

plunger for lifting the work and releasing it after it is cut, substantially as described.

9. The combination of the cutter head, the work clamp, the reciprocating carriage, a feed screw therefor, a spindle mounted on said carriage, a saw mounted on said spindle, a driving shaft, a vertical shaft geared to said driving shaft and having a worm meshing with a worm wheel on the saw spindle, with automatic means for reversing the feed screw, substantially as described.

10. The combination of the bed, the series of cutter heads, a rack on the bed and pinions on each cutter head adapted to the rack, a work clamp and a circular saw mounted on each cutter head, and clamps for securing the heads in position after adjustment, substantially as described.

11. The combination of the bed, a series of cutter heads mounted thereon, a work clamp on each cutter head, a reciprocating carriage also mounted on the cutter head, and carrying the circular saw, an independent driving shaft for each head, said driving shaft being geared to the saw spindle and to the feed screw of the carriage, substantially as described.

12. The combination of the cutting head, the carriage, a saw spindle and a driving shaft mounted on said carriage, a shaft I also mounted on the slide, fast and slow speed pulleys mounted on said shaft, slow speed gearing between the said slow speed pulley and the shaft, a belt, belt shifter and automatic means for shifting the belt when the carriage reaches its two extreme positions and feeding mechanism for the carriage geared to the shaft I, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES C. NEWTON.

Witnesses:
H. W. CHAMPION,
E. J. HAMMIN.