

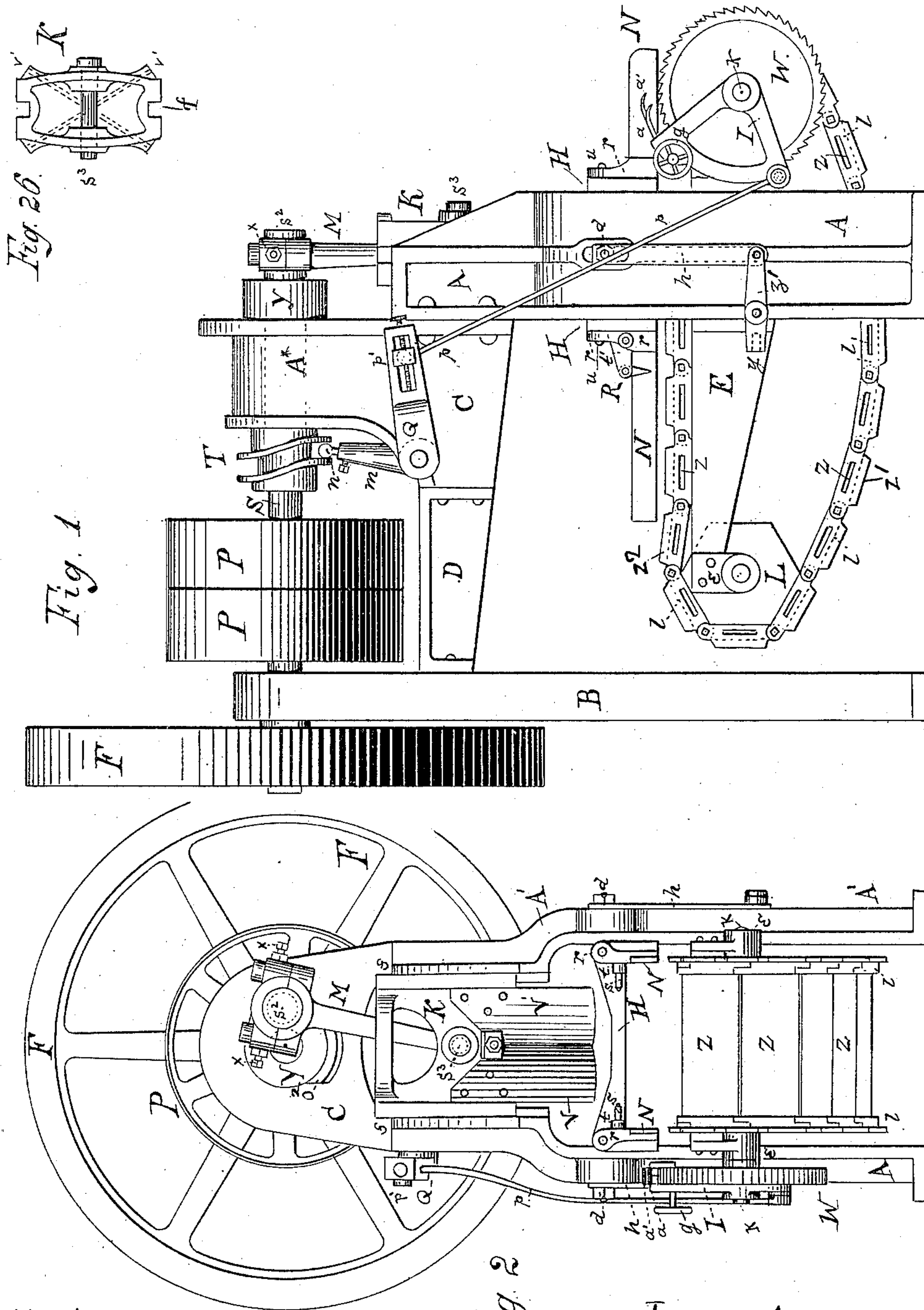
(No Model.)

4 Sheets—Sheet 1.

D. A. GREENE.
WOOD SPLITTING MACHINE.

No. 313,586.

Patented Mar. 10, 1885.



Witnesses:
Charles C. Prentiss,
Geo. M. Brown

Fig. 2

Inventor
Darius A. Greene

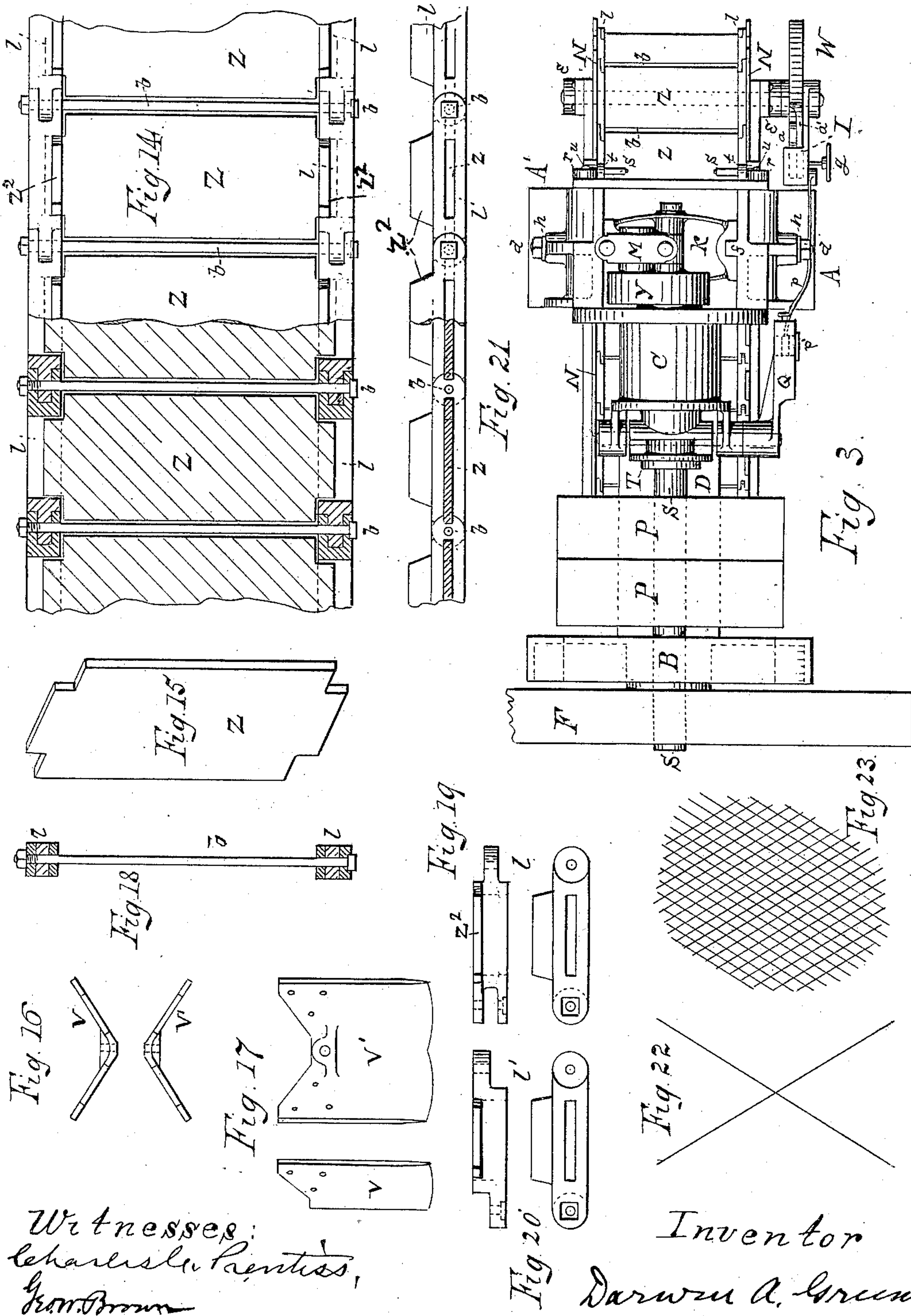
(No Model.)

4 Sheets—Sheet 2.

D. A. GREENE.
WOOD SPLITTING MACHINE.

No. 313,586.

Patented Mar. 10, 1885.



Witnesses:
Charles A. Kentiss,
Geo. Brown

Inventor
Darwin A. Greene

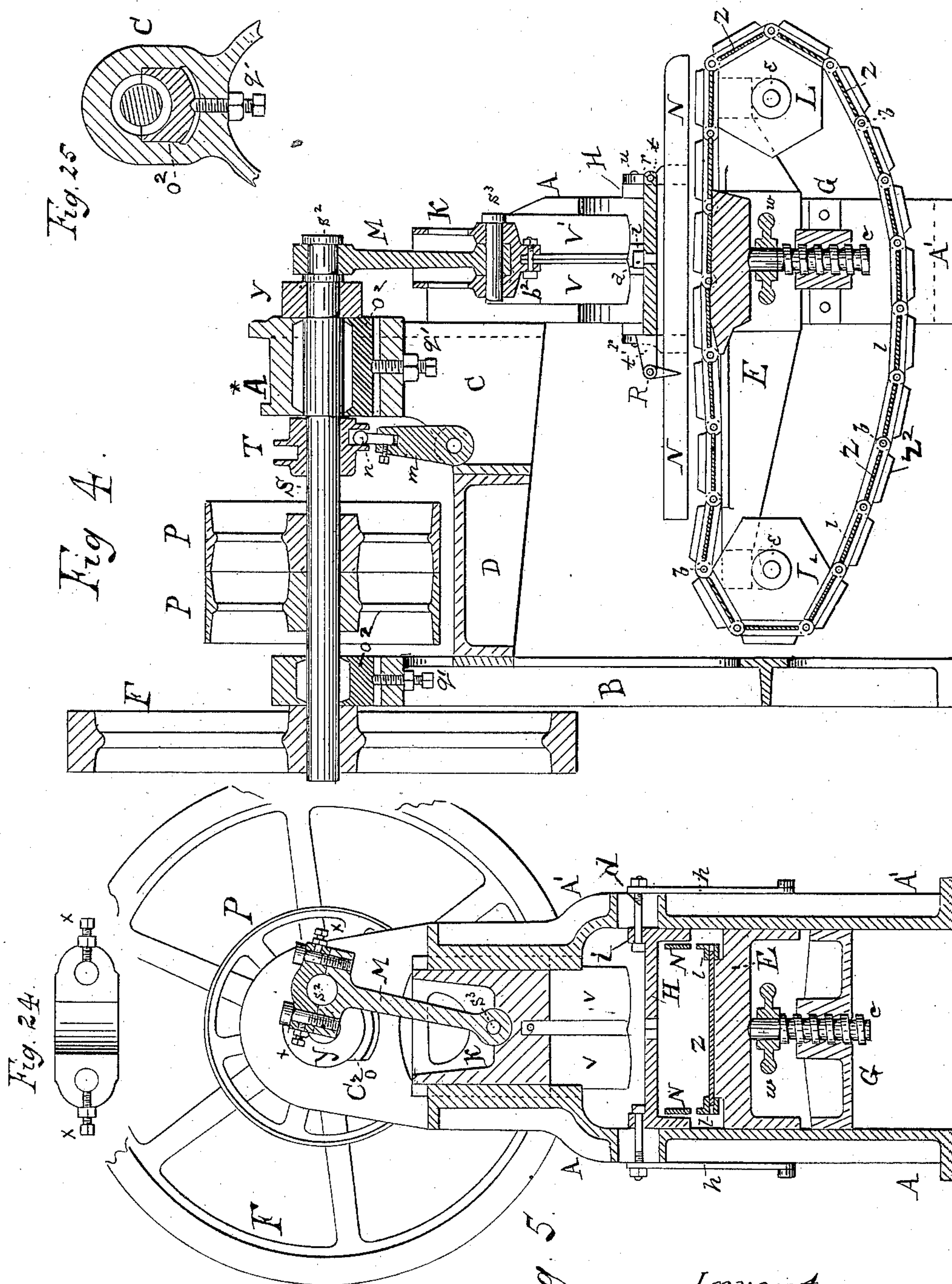
(No Model.)

4 Sheets—Sheet 3.

D. A. GREENE.
WOOD SPLITTING MACHINE.

No. 313,586.

Patented Mar. 10, 1885.



Witnesses:
Charles B. Prentiss
Geo. W. Brown

Fig. 5.

Inventor
Darwin A. Greene

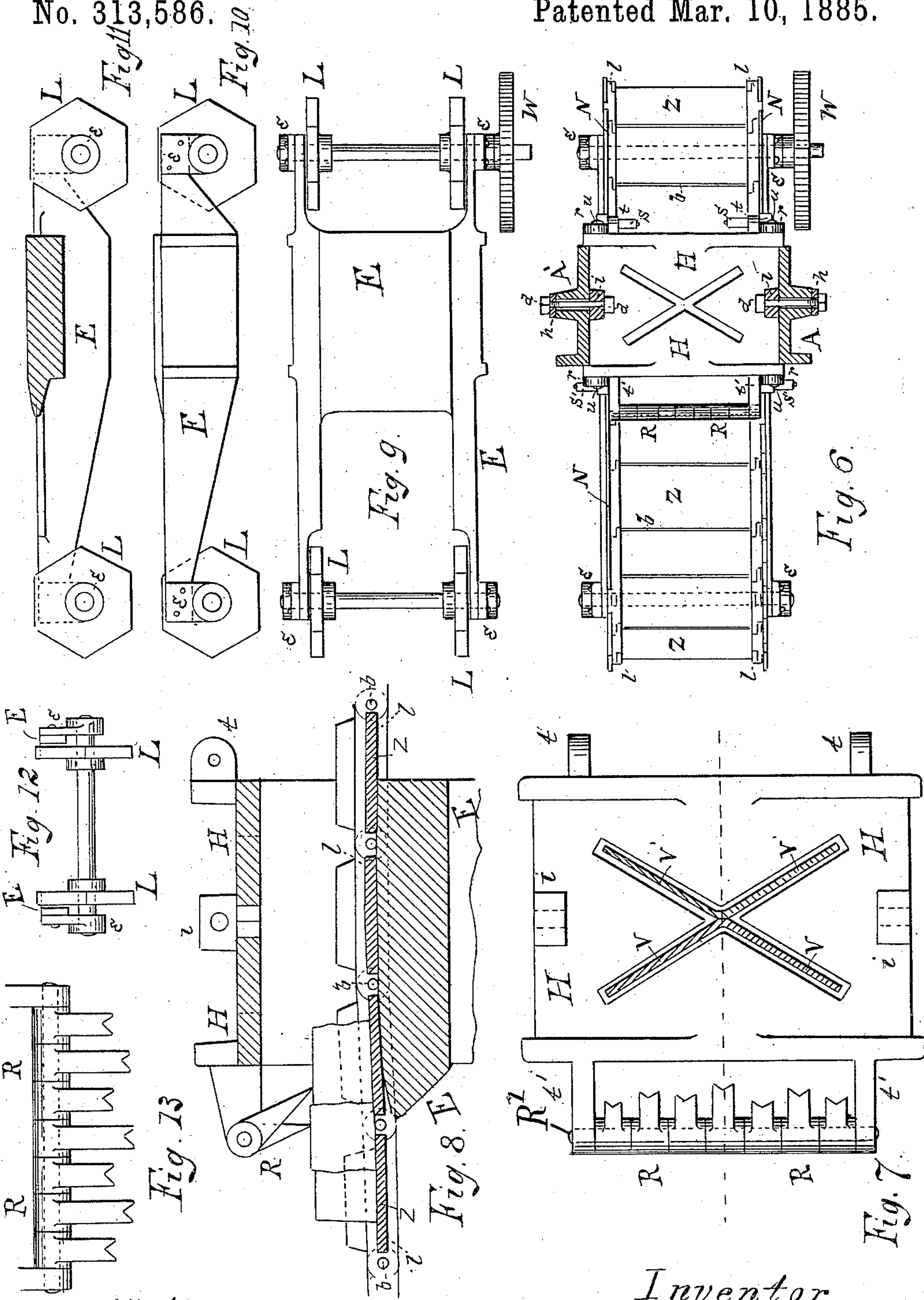
(No Model.)

4 Sheets—Sheet 4.

D. A. GREENE.
WOOD SPLITTING MACHINE.

No. 313,586.

Patented Mar. 10, 1885.



Witnesses:
Charles C. Prentiss,
Geo. Brown

Inventor
Darius A. Greene

UNITED STATES PATENT OFFICE.

DARWIN A. GREENE, OF NEW YORK, N. Y.

WOOD-SPLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 313,586, dated March 10, 1885.

Application filed October 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, DARWIN A. GREENE, of the city, county, and State of New York, have invented certain new and useful Improvements in Wood-Splitting Machines, of which the following is a specification.

The invention is a machine for splitting wood for kindling, the wood having previously been sawed into the proper lengths. The equal lengths of wood stand upright on a chain-carrier, and are moved under a vertically-reciprocating knife or splitter, the construction of which is hereinafter described. Such machines have usually been constructed with a longitudinal frame, and with the main shaft set transversely to the central longitudinal line of the chain-carrier. This general construction has the serious fault of limiting the arrangement of the machine to one position with reference to the saw-benches in connection with which it is ordinarily desired to use it.

Some of the advantages of the present invention are as follows: The parts are arranged more compactly, are more durable, and more easily accessible. The clearing-plate is so constructed as to be vertically adjustable above the chain-carrier, so that different lengths of wood can be accommodated. The mode of formation of the chain-carrier enables it to perform its function more perfect than in the usual construction.

In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation of the machine. Fig. 2 is an end view of the same. Fig. 3 is a plan of the invention. Fig. 4 is a central vertical longitudinal section of the machine. Fig. 5 is a transverse vertical section in the plane of the connecting-rod which operates the knife. Fig. 6 is a plan of the clearing-plate and the endless feed-chain and its connections, a part of the fixed framing being shown in section. Fig. 7 is a plan on a larger scale of some of the parts illustrated in Fig. 6. Fig. 8 is a vertical longitudinal section of the parts illustrated in Fig. 6. Fig. 9 is a plan of the support for the feed-chain and some of its attachments. Fig. 10 is a side elevation of Fig. 9. Fig. 11 is a central vertical section of Fig. 9. Fig. 12 is an end view of Fig. 11. Fig. 13 is an end view of the retaining-fingers illustrated in Fig.

8. Fig. 14 is a plan of part of the feed-chain, partly in section. Fig. 15 is a perspective view of one of the members or links of the feed-chain. Fig. 16 is a plan of the knives detached. Fig. 17 shows a front and a side view of one of the knives. Fig. 18 is a transverse section through the feed-chain on center line of the hinge-bolts. Fig. 19 shows a plan and a side view of one of the links of the feed-chain detached. Fig. 20 shows a modification of the links. Fig. 21 is a side view, partly in section, of a part of the feed-chain. Fig. 22 shows the relative positions of the edges of the two knives. Fig. 23 is a diagram showing on which lines the wood is cut or split. Fig. 24 is a reversed plan of the binding-piece which unites the connecting-rod that operates the knives. Fig. 25 is a vertical transverse section showing one of the bearings of the main shaft. Fig. 26 is a plan of the cross-head which carries the knives.

In the accompanying drawings, A A' are standards secured to the head-block A*, and the latter secured to the standard B by the stay D, the parts thus combined forming the frame of the machine. The chain support or bed E between the standards A A' is upheld by a screw, c, the nut of which forms a brace, G, to the standards A A'. A hand-wheel, w, is fastened to the screw c, to turn the latter and raise or lower the whole of the chain-support E. To the two ends of the chain-support E bearings e are bolted, in which rotate shafts, each carrying two hexagonal wheels, L, which impart motion to the endless chain. The chain moves upon and over the said wheels, which are actuated by the ratchet-wheel W, fixed on the shaft k.

I is a segment, the hub of which turns on the shaft k, and the upper arm of which has the inner ends of the pawls a and a' rigidly secured to a shaft turning in said arm, and provided with the hand-wheel g, by means of which the pawls can be raised or lowered, so as to release or engage the ratchet-wheel W to start or stop the feed. The segment I is moved by a rod, p, attached by one end to the lower arm of said segment, and having its other end connected with and moved by an arm, Q, of a bell-crank lever pivoted upon the frame of the machine. The upper arm, m, of said lever is

vibrated by the cam T, fixed on the main shaft S.

n is the case-hardened ball on the end of the arm *m*, which ball fits in and is moved by the groove in the cam.

The endless chain consists of links *l* and wrought-iron plates *z*. Each link is provided with a slot to receive the narrower end of the wrought-iron plate *z*, as shown in Figs. 14, 19, and 21. The links are held by bolts *b*, the heads of which are angular, and fit in proper and similar sockets in the links *l*, so as to turn with one of said links. The links of the chain are thus connected by hinges, as shown in Figs. 14, 15, and 18. The meeting end of one link has on each corner a single hinge-plate, which enters between two hinge-plates on the edge of the adjacent link, and the said hinge-plates are pivoted together by the transverse bolts *b*, the angular head of which fits into a similar socket in the outer plate of the link. Each bolt *b* is held in place by a nut on its end opposite its head, and each bolt turns with the link provided with the socket, and is thereby prevented from working loose. The plates *z* work on the hexagonal wheels L, while the links *l* have the proper length to lie on the sides of said wheels, which thus carry the chain and keep it in proper position.

Fig. 19 shows a side and top view of one link. Fig. 20 shows similar views of a modified form of the same. The former is the one shown in the drawings and preferably used. Each link has on its edge the flange *z*² *z*², which keeps the wood in proper position on the carrier.

H is the clearing-plate situated above the carrier, and provided with a cross-slot to allow the knives *v v'* to pass through the plate, as seen in Fig. 7. The said plate prevents the wood from being lifted when the knives rise. The clearing-plate H is formed to fit and slide upon the standards A and A', as shown in Fig. 7. The clearing-plate is adjusted to different heights by means of the bolt *d*, the pivoted lever *z'*, and link *h*. The pivoted lever *z'* is pivoted in the frame of the machine, and is provided with a recess, *y*, into which a bar fits to hold up and change the position of the clearing-plate when the nuts on the bolt *d* are not tightened. The chain-support E fits and slides upon the standards A A', so that the chain and its supports can be raised and lowered.

On the clearing-plate H two lugs, *t'*, are cast, in which holes are drilled to receive a shaft, R', Fig. 7, on which a number of fingers, R R, with chisel-edges and of unequal lengths, are loosely hung or pivoted, and lie at various inclinations, meeting the surface of the wood at different points and affording sufficient resistance to prevent the wood from being forced backward by each blow of the knife. The chain-plates *z* rest on the horizontal bed-plate E, which consequently supports the wood when the blow is struck.

To hold the wood in proper upright posi-

tion, long wrought-iron bars N are attached to the arms *r*, swinging on bolts *u*, fastened to the clearing-plate H.

t t are lugs cast on and projecting from the clearing-plate. The said lugs are drilled through and receive headed pins or bolts slightly smaller in diameter than the openings. The pins carry the springs *s s*, and are screwed or otherwise secured to the arms *r*. The springs *s* exert a pushing force between the lugs *t* and the heads of the pins, thus forcing the arms *r* and bars N inward to keep the wood close together while being split. This binding of the wood makes the same feed evenly, and saves unnecessary splitting and waste. The bars N are longer than the clearing-plates, as shown in Fig. 4. They hold the wood in position while it is coming under the knives *v v'*. The bolt *b*² holds the two knives *v v'* close together, and other proper bolts secure them to the cast-iron knife head-block K. The said block is provided with grooves *f f*, fitting over and sliding upon corresponding bars which form parts of the standards A A'. The head-block A* forms the main bearing for the crank-shaft S, which is held in position by the adjustable box *o*², resting on the point of the adjusting-screw *q'*, as seen in Fig. 25. The shaft S has a similar bearing in the standard B, as shown in Fig. 4.

Every part of the machine is within sight and reach of the operator, and can be easily adjusted to different lengths of wood or to cut coarse or fine, as desired.

The set-screws *x x*, Figs. 5 and 24, prevent the crank from jarring on the main shaft.

I attach much importance to the fact that the adjustable bed E, which supports the feed-chain, is mounted on a cross-girder or bridge, G, extending across the framing within the endless feed-chain. The adjustment is effected by turning a single stout screw.

The employment of two obtuse-angled knives having but one joint at their intersection forms a very strong splitter. This construction permits also longer knives to be easily substituted when desired.

The use of the chisel-edged fingers R in connection with the yielding guides on the clearing-plate, and adjustable with the latter, makes a very strong hold and guide for the wood as it passes under the knives.

The described construction of the feed-chain gives the latter very close joints, and also gives an even upper surface to receive and sustain the wood. The wood is held laterally by the flanges on the links.

The brace G, while acting as a nut to the screw, by which the bed-plate E and carrier are adjusted vertically, also forms a strong stay to the frame of the machine.

By means of the heavy head-block A* above the main shaft the strain upward when the splitting takes place is resisted with more than usual firmness.

In practice the machine would rest on a heavy and strong iron bed-plate.

I claim as my invention—

1. The combination, with the main shaft S, having cam T, the bell-crank lever, and the segment I, connected to said lever by the rod *p* and to the cam by said rod and lever, of the ratchet W, operated by pawls carried on the segment, the chain-carrier, and the vertically-adjustable bed-plate E, as set forth.

2. The adjustable clearing-plate with its chisel-pointed pawls, and the yielding side guides carried thereon, in combination with each other and with the knives and feed-chain, as and for the purpose specified.

3. In a machine for splitting wood, the combination, with the bed-plate E, of the endless carrier *l z*, composed of the iron plate *z* and links *l*, the former being held in place by the latter, which are provided with the lateral flanges *z'*, and are held together by the angular-headed bolts *b*, substantially as specified.

4. The combination of the carrier, as described, and the vertically-adjustable bed-

plate E, with the main shaft S, having cam T, the bell-crank lever *m Q*, and rod *p*, connecting said cam with the segment I, the said segment carrying pawls which engage the ratchet W, to impart intermittent motion to the carrier, and the clearing-plate H, as set forth.

5. In a machine to split wood, the combination of the knives *v v*, actuated by proper mechanism from the main shaft, the clearing-table H, the adjustable bed-plate E, the chain-carrier *l z*, and the bearing-block A*, provided with the journal-boxes *o' o'*, controlled by the set-screws *q' q'*, substantially as specified.

In testimony whereof I have hereunto set my hand, at New York city, New York, this 20th day of June, 1883, in the presence of two subscribing witnesses.

DARWIN A. GREENE.

Witnesses:

WM. C. DEY,
M. F. BOYLE.