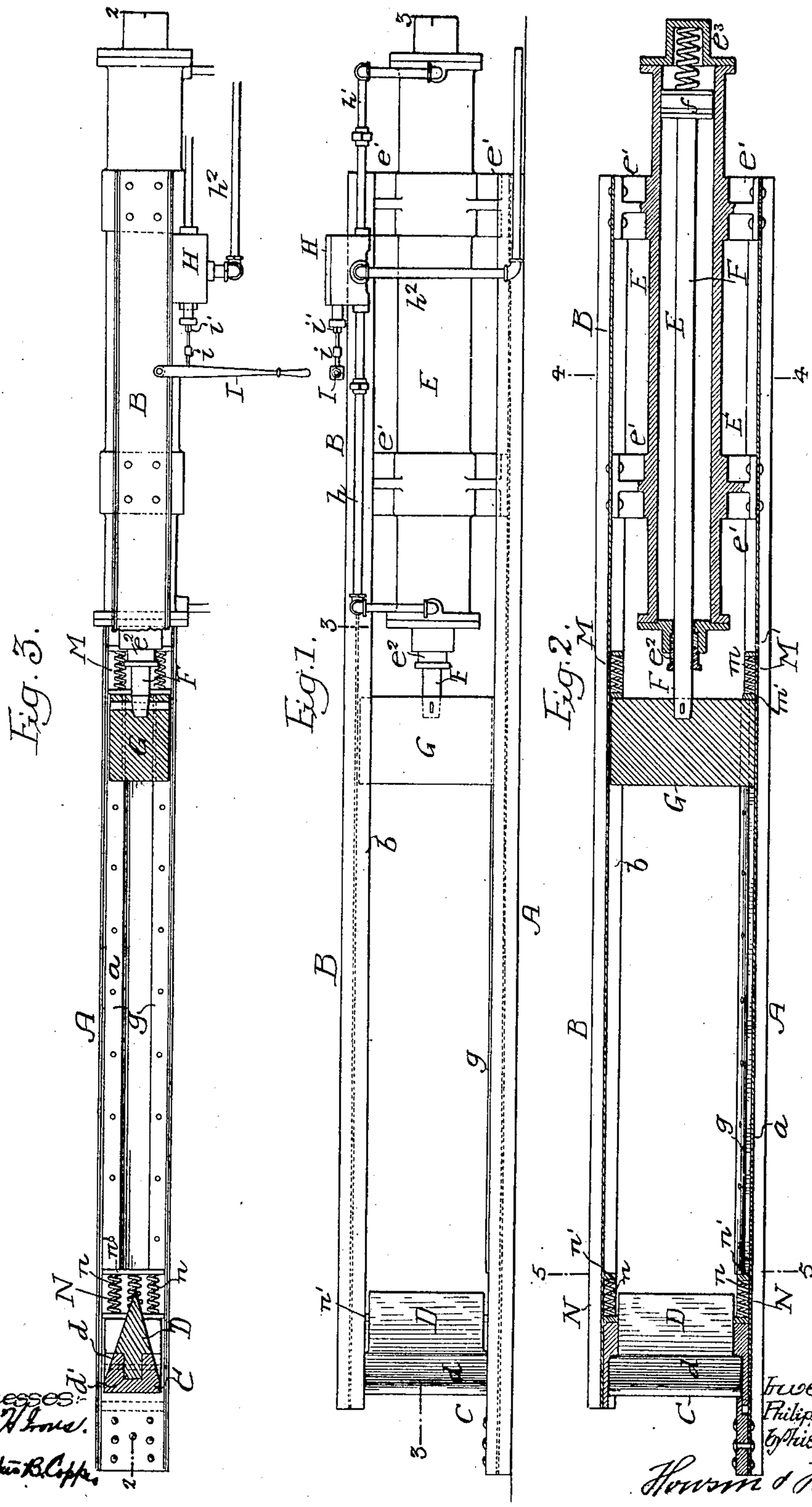
No. 885,458. PATENTED APR. 21, 1908.

P. ECKENROTH, JR.

WOOD SPLITTING MACHINE.

APPLICATION FILED APR. 12, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 8.

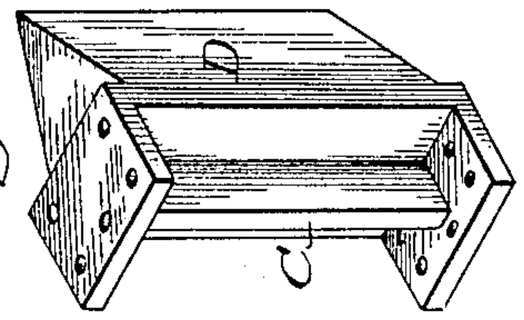


Fig. 6.

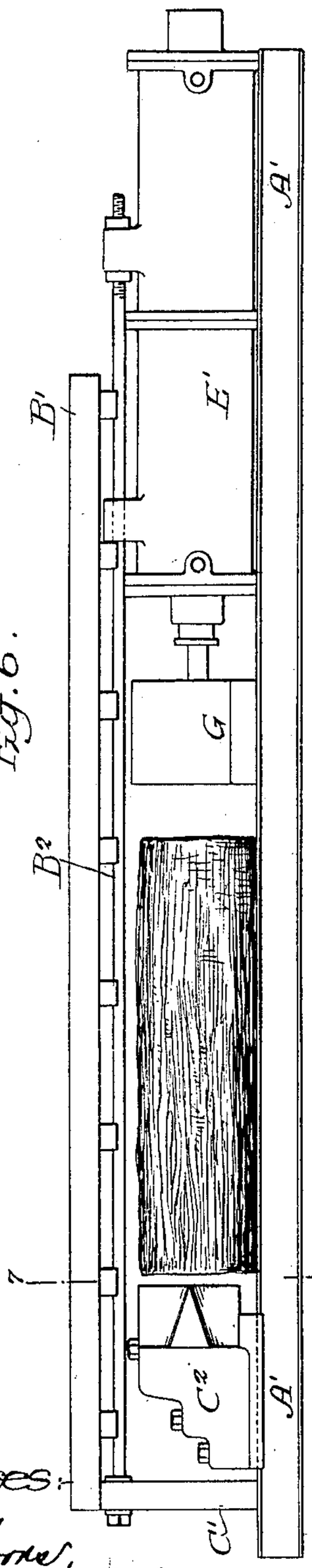


Fig. 5.

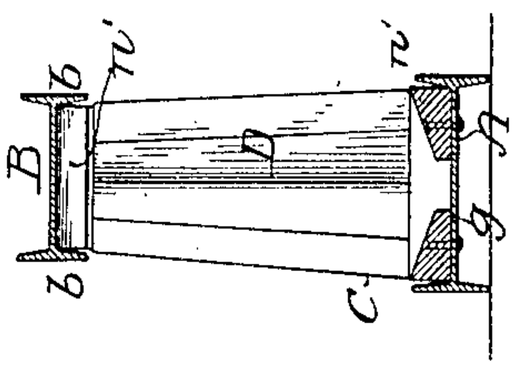


Fig. 7.

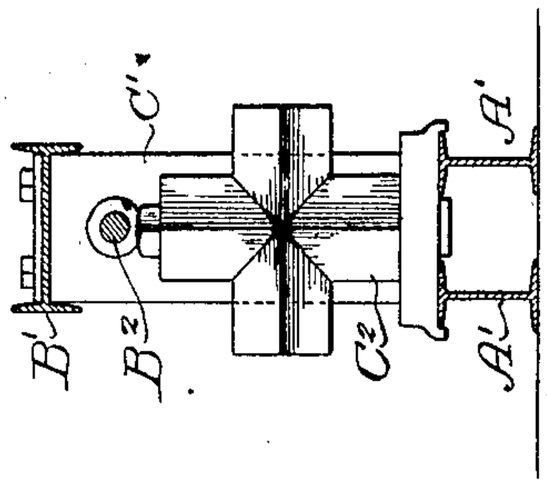
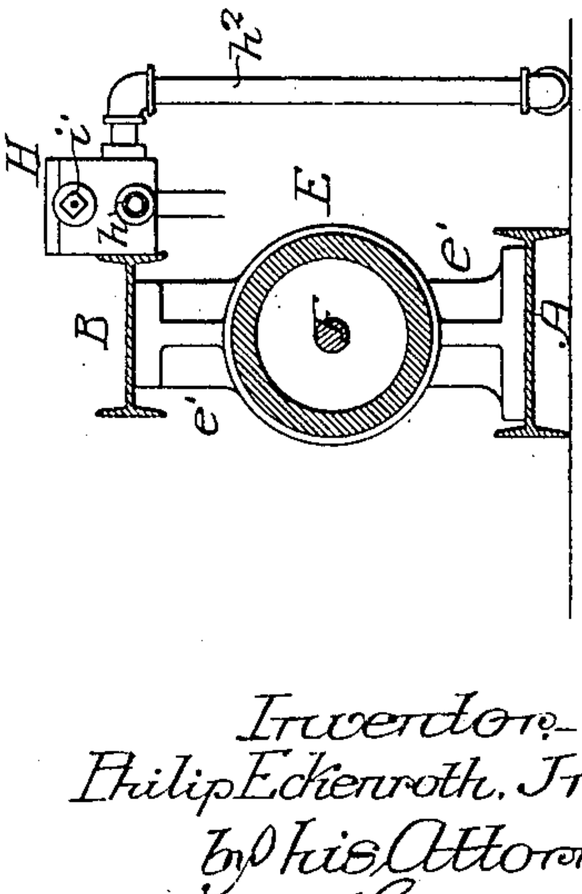


Fig. 4.



Witnesses:
Titus W. Howe.
Augustus B. Coppes.

Inventor:
Philip Eckenroth, Jr.
by his Attorneys,
Howson & Howson

UNITED STATES PATENT OFFICE.

PHILIP ECKENROTH, JR., OF PHILADELPHIA, PENNSYLVANIA.

WOOD-SPLITTING MACHINE.

No. 885,458. Specification of Letters Patent. Patented April 21, 1908.

Application filed April 12, 1907. Serial No. 367,815.

To all whom it may concern:

Be it known that I, PHILIP ECKENROTH, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Wood-Splitting Machines, of which the following is a specification.

My invention relates to certain improvements in machines for splitting logs to be used in the manufacture of wood pulp. The wood used in the manufacture of wood pulp must be cut into small chips, and machines have been provided for reducing sticks of wood of the proper size to chips, but only comparatively small sticks can be fed to the machines owing to the power required.

The object of my invention is to provide a machine for splitting logs to such a size that they can be readily introduced into the chipping machine.

In the accompanying drawings:—Figure 1, is a side view of my improved log splitting machine; Fig. 2, is a longitudinal sectional view on the line 2—2, Fig. 3; Fig. 3, is a sectional plan view on the line 3—3, Fig. 1; Fig. 4, is a transverse sectional view on the line 4—4, Fig. 2; Fig. 5, is a transverse sectional view on the line 5—5, Fig. 2; Fig. 6, is a side view of a modification; Fig. 7 is a sectional view on the line 7—7, Fig. 6, and Fig. 8, is a perspective view of one form of wedge.

A is the base of the machine made of a single heavy I-beam and B is another I-beam of a smaller section acting in conjunction with the base as a tension member.

C is the abutment block rigidly secured to the base A and the beam B.

D is a wedge either forming an integral part of the abutment block as in Fig. 8 or made separate as shown in Fig. 3. In Figs. 1 to 5, the wedge is arranged with its edge vertical and has shoulders *d*, which rest against the abutment C. The shank *d'* of the wedge extends into an opening in the abutment and may be held by a transverse bolt if found desirable or any other fastening may be used. Back of the abutment C is a thrust plate C which is firmly secured to the beam A and relieves the abutment of part of the strain

E is a cylinder having arms *e'* respectively bolted to the base beam A and to the top beam B. Mounted in the cylinder is a piston *f* having a rod F which extends through the stuffing box e^2 in one end of the cylinder and this rod is coupled to a head G by a key or other suitable means. This head is arranged to slide in the space between the beams A and B and in order to keep the head central I secure to the upper surface of the web *a* of the beam guide plates *g* and the head is shaped to slide on these plates. The guide plates *g* also act as chocks to center the log in respect to the wedge and head as they are slightly inclined towards each other as shown in Fig. 5.

The upper end of the head is of such a width as to freely move between the flanges *b*—*b* of the upper beam, and is of such a size that it will resist the pressure of the plunger, as it will be understood that in this particular machine I have preferably so arranged the valve mechanism that the log will be struck a blow rather than slowly pushed against the wedge as in many instances this quick blow will split the log throughout its entire length.

H is the valve and *h* is a pipe leading to the forward end of the cylinder.

h' is a pipe leading to the rear end of the cylinder and h^2 is the exhaust pipe.

I is a hand lever pivoted to the upper beam B and connected at *i* to the valve rod *i'* so that on moving this hand lever the steam or other fluid can be directed into one end or the other of the cylinder.

In order to prevent the plunger crushing the wedge, I provide buffers N—N consisting of springs *n* and buffer plates *n'* held in such a position that the head G will strike the buffer plates before coming in contact with the wedge. I also preferably provide buffers M—M at the cylinder end of the machine so as to receive the shock of the return blow to prevent the head coming in contact with the stuffing box of the cylinder. These buffers are made in substantially the same manner as the buffers N and have springs *m* and buffer plates *m'*.

I may mount a spring e^3 in the rear of the cylinder to receive the end thrust of the piston if found necessary. The spring buffers may be omitted in some instances without departing from the essential features of my invention.

In Figs. 1 to 5 inclusive, I have shown a single wedge; the wedge having a single knife edge which simply splits the log in two, but the wedge may be cruciform in shape, as shown in Figs. 6 and 7, so as to split the log in four parts.

In some instances the head G may be mounted only upon the base beam, as illus-

trated in Fig. 6, and the beam instead of being arranged on its side may be arranged on end, as shown in said figures, in which A′ A′ are two beams, E′ the cylinder, G′ the head, B′ a short beam extending from an upright C′ to the forward end of the cylinder and in this instance a strainer rod B^2 is used being connected to the upright and the cylinder. The abutment C^2 is stepped and firmly bolted to the base and the cruciform wedge may either form an integral part of the abutment or may be made detachable.

By the above construction it will be seen that the log can be rolled into place between the wedge D and the head G and by simply operating the lever I the plunger will move forward forcing the head G against the log, which in turn will be carried forward against the wedge as the head is pushed forward and the wedge enters the log splitting it, and as the movement of the head continues the log is entirely split in two, one section of the log passing on one side of the wedge and the other section passing on the opposite side of the wedge. Certain kinds of wood will split more readily than others and consequently it will not be necessary to move the plunger the full length in many instances.

In this machine the wedge is fixed and the head is movable and the log is forced against the fixed wedge by being struck by the hammer. By this method I am enabled to split a log more readily than if the wedge traveled with the head and it is impossible to stall the machine owing to the log holding the wedge. Another feature is that I can split a log of any length which will go in between the fixed wedge and the movable head.

I claim:—

1. The combination of two longitudinal beams, one mounted above the other, a fixed abutment block mounted between the two beams, a wedge mounted on said abutment block, a cylinder between the two beams at the end opposite to the wedge, a piston in the cylinder, a rod on the piston, a head on the end of the rod outside of the piston, and two plates on the lower beam arranged with their upper faces inclined towards each other, said plates being placed to center a log to be split and to guide the head, substantially as described.

2. The combination in a wood splitting machine of two beams, one mounted above the other, an abutment block secured to both beams at one end of the machine, a wedge secured to the abutment block, with its edge vertical, a cylinder secured to the two beams at the opposite end of the machine, and a piston in the cylinder, a rod projecting from the piston and extending through the end of the cylinder, with a head at the end of the rod arranged to be guided by the upper and lower beams, substantially as described.

3. The combination in a log splitting machine of two longitudinal beams, a fixed abutment secured to the two beams, a detachable wedge mounted between the two beams at the opposite end of the machine, a piston rod, a piston in the cylinder, a head mounted between the two beams outside the cylinder and attached to the rod, and yielding buffers at the wedge end of the machine placed to check the movement of the head so as to prevent its striking the wedge, substantially as described.

4. The combination in a machine for splitting logs, of a frame, an abutment at one end of the frame, a wedge carried by the abutment, a cylinder at the opposite end of the frame, a piston in the cylinder, a head connected to the piston, a yielding buffer at the wedge end of the machine placed to prevent the head from striking the wedge, and a yielding buffer at the cylinder end of the machine placed to check the movement of the plunger when it moves away from the said wedge, substantially as described.

5. The combination in a wood splitting machine of a base, guide plates inclined towards each other and fixed to said base, a beam structure mounted so as to extend horizontally over the guide plates, a wedge secured to one end of the base, a head slidable between said guide plates and the beam structure, means for forcing the head towards the wedge so that a log placed between said parts will be split.

6. The combination in a wood splitting machine of a base having a chock formed to center a log, a longitudinally extending beam parallel with and extending horizontally above the chock, a fixed wedge, a movable head slidable between said chock and the beam, and means for actuating the head to force a log against the wedge.

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

PHILIP ECKENROTH, JR.

Witnesses:
WM. A. BARR,
JOS. H. KLEIN.