

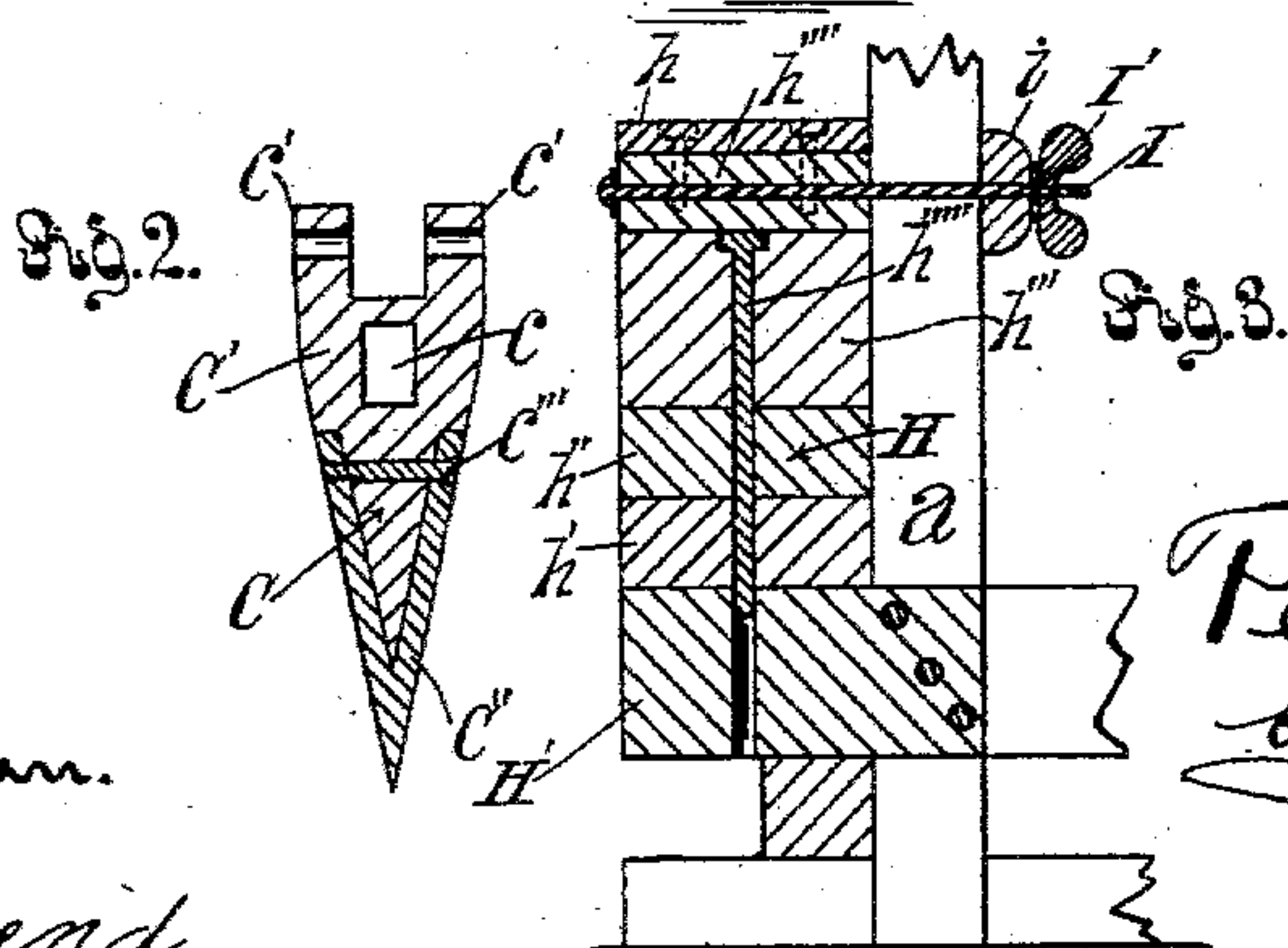
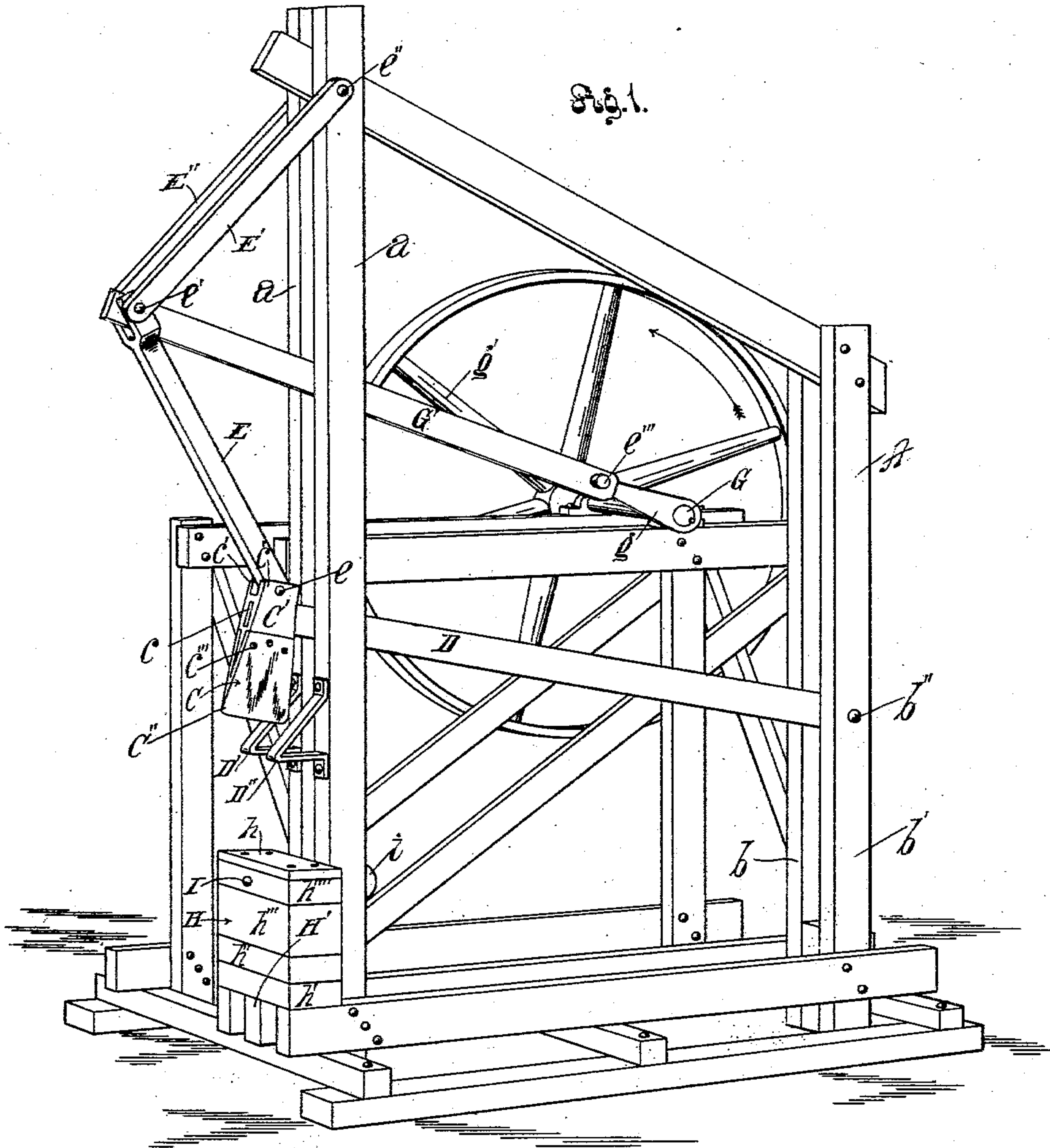
No. 629,144.

Patented July 18, 1899.

P. F. WISE.
WOOD SPLITTING MACHINE.

(Application filed Dec. 27, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

PETER F. WISE, OF LOS ANGELES, CALIFORNIA.

WOOD-SPLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 629,144, dated July 18, 1899.

Application filed December 27, 1898. Serial No. 700,441. (No model.)

To all whom it may concern:

Be it known that I, PETER F. WISE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Wood-Splitting Machines, of which the following is a specification.

The particular object of my invention is to provide a wood-splitting machine which may be cheaply constructed, will be durable and efficient in operation, and will require a very small amount of power in comparison with machines of like capacity.

My invention relates to the various features of construction and combinations of parts hereinafter fully set forth and claimed, whereby I accomplish the objects above set forth.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective front elevation of a machine embodying my invention. In this view the ax is shown in its raised position. Fig. 2 is an end view of my improved splitting-ax. Fig. 3 is a sectional view of my improved splitting-anvil.

In the drawings, A represents the frame of the machine, which may be made of timbers or any suitable material.

$a a'$ represent uprights arranged at the front end of the machine, and $b b'$ represent uprights arranged at the rear of the machine.

C is my improved splitting-ax, which is formed of a cast-metal head C' , provided with a handle-socket c and projecting pivot-ears c' . The lower end of this ax-head is beveled into wedge shape and a steel shoe C'' , formed in wedge shape, is fitted upon the lower end of the ax-head and secured thereto by rivets c''' .

D is an ax-handle, which is rigidly secured in the handle-socket at one end and has its other end pivoted between the uprights $b b'$ by means of a pivot b'' . The ax is arranged in front of the uprights $a a'$ and the ax-handle reciprocates up and down therebetween.

$D' D''$ are stops arranged to dislodge the wood from the ax in case it should grasp the same.

E is a toggle-arm, which has its lower end pivoted between the pivot-ears of the ax-head by means of a pintle or pivot e . The up-

per end of this arm is bifurcated and is by means of a pintle e' pivoted to the lower end of the upper members $E' E''$ of the toggle-arm. The upper ends of the toggle-arms $E' E''$ are pivoted to the uprights $a a'$ by the pivot e'' .

G is a crank-shaft, which is journaled in the rear portion of the machine and is provided at one end with a crank g and at the other end with a belt-wheel g' . A connecting or pitman rod G' is journaled at one end upon the crank on the crank-shaft by means of the crank-pin e''' , and at its other end it is journaled upon the pivot-pin e' and between the members of the bifurcated toggle-arm E.

H is my improved anvil-block, which is formed of the upper or top member h''' , which is provided with a metal protecting-plate h . This upper member is provided with a transverse bolt I, which extends through from the front to the rear and is provided upon its outer end with a cross-bar i , adapted to engage with the uprights $a a'$ when the bolt is tightened by means of the butterfly-nut I' .

H' is the base-block, which is provided through its center with a perforation, and $h' h''$, respectively, represent adjusting-blocks which are each provided with a perforation. To the upper block h''' is secured a bolt or shaft h'''' , which passes through the perforations in all the other blocks and through the foundation or base block, thereby holding the blocks rigidly in relation with each other.

Different lengths of wood can be split by altering the height of the anvil-plate h . This is done in the following manner: The butterfly-nut I' on the bolt I is loosened, allowing the cross-bar i and top plate h''' to be removed. Then the section h''' is raised, carrying with it the bolt h'''' , thereby allowing the lower section h' to be removed. By raising the bolt h'''' clear out of the openings in all of the different sections $h' h''$, &c., all of them can be removed. When the blocks are removed or placed so that the top plate h''' is at the desired elevation, the cross-bar i and anvil-top h are replaced and drawn toward each other by means of the bolt and nut to clamp the uprights $a a'$ to thereby be held in position.

In practical operation, the device being arranged as shown in Fig. 1, the crank-shaft is rotated in the direction indicated by arrows, thus to swing the crank, and by means of the
 5 connecting-rod to alternately straighten and flex the toggle-joint, thus to raise and lower the ax, the ax moving in the arc of a circle of which the pivot b'' is the center. The wood is placed beneath the ax in the usual manner
 10 when the ax is elevated, and upon the downstroke the wood is split. If the wood should cling to the ax, it is freed therefrom by coming against the stops $D' D''$ when the ax is raised.

15 I have found that I secure better results by arranging the crank-shaft below the horizontal plane passing through the pivotal point of the toggle-arm and with such relation thereto that when the toggle is flexed to its fullest
 20 extent the upper member of the toggle and the pitman-rod will stand substantially at right angles with each other.

By stationing the driving-shaft below the horizontal plane of the toggle-joint and causing
 25 the crank to be rotated, as indicated by the arrow, the pull of the pitman G upon the toggle E will be downward to a greater or less extent, depending upon the distance below the line the shaft is placed, thereby adding
 30 that much power to the force of the downward blow of the ax upon the wood. Since the head of the ax is pivoted to the end of the toggle and the end of the ax-handle is pivoted to the frame at a point below the horizontal
 35 plane of the lower end of the toggle, the downward movement of the ax from its highest point when the toggle is flexed to its greatest extent will cause the lower end of the lower toggle to move outward and downward as the
 40 central part of the toggle moves inward and downward. This movement of the parts will bring the toggle into a straight line quicker than would otherwise be done, and the downward movement of the ax will be increased
 45 over that which would otherwise be given. Furthermore, the same increase of speed is gained in flexing the toggle when the ax moves upward. This gives a sharp penetrating blow to cause the ax to enter the wood easily on
 50 the stroke and assists in clearing the ax from the wood on the upstroke in case the wood clings on the blade on account of the fibers not being all separated.

The top toggle-pivot is rearward of a vertical line drawn from the lower toggle-pivot, and the parts are so arranged that before the ax is at its lowest point of its stroke the lower arm E of the toggle passes its right angle with the ax-handle D , thus to apply the power
 60 most effectively.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

65 1. In a wood-splitting machine, the combination set forth of the frame; the ax pivoted by means of a rearwardly-projecting handle to the frame; the toggle-arm pivoted at one

end to the ax and at the other end to the frame; a crank-shaft journaled in the frame; and a connecting-rod journaled at one end on
 70 the crank-shaft and pivotally secured at its other end to the joint of the toggle-arm.

2. In a wood-splitting machine, the combination set forth of the main frame; the splitting-ax pivoted to the frame by means of the
 75 rearwardly-projecting handle; the toggle-arm pivoted at one end to the ax and at the other end to the frame of the machine; the crank-shaft journaled in the rear of the frame and arranged below the joint of the toggle-arm; and the pitman-rod connecting the crank-shaft with the joint of the toggle-arm. 80

3. In a wood-splitting machine, the combination set forth of the frame; the ax pivoted by means of a rearwardly-projecting handle
 85 to the frame; the toggle-arm pivoted at one end to the ax and at the other end to the frame; the pivotal point between the ax and toggle being above the pivotal point of the handle when the toggle is flexed to its greatest extent; a crank-shaft journaled in the
 90 frame; and a connecting-rod journaled at one end on the crank-shaft and pivotally secured at its other end to the joint of the toggle-arm.

4. In a wood-splitting machine, the combination set forth of the main frame provided with an adjustable anvil and a rigid stop above
 95 the anvil; the splitting-ax pivoted to the frame by means of the rearwardly-projecting handle; the toggle-arm pivoted at one end to the ax and at the other end to the frame of the machine; the crank-shaft journaled in the rear of the frame and arranged below the joint of the toggle-arm; and the pitman-rod connecting the crank-shaft with the joint of
 100 the toggle-arm. 105

5. In a wood-splitting machine, the combination set forth of the ax-head provided with the handle-socket and with the pivot-ears projecting upwardly above such socket; the V-
 110 shaped steel shoe fitted upon the lower end of the cast head; the handle firmly secured in the handle-socket at one end and having its other end pivoted to the frame of the machine; the toggle-arm having one end pivoted between the pivot-ears of the cast head and its other end pivoted to the frame of the machine; the crank-shaft journaled in the frame; and the connecting-rod journaled at one end upon the crank-shaft and pivoted at
 115 its other end to the joint of the toggle. 120

6. In a wood-splitting machine, the combination set forth of the splitting-ax; a suitable guide for the ax; a toggle-arm having one end pivoted to the ax and having its other end
 125 bifurcated and pivoted to a second bifurcated toggle-arm; such second toggle-arm pivoted by its other end to the frame of the machine; the crank-shaft journaled in the machine; and a connecting-rod journaled at one end to
 130 the crank and having its other end journaled between the members of the bifurcated toggle-arms.

7. In a wood-splitting machine, the combi-

nation set forth of the frame; the ax pivoted to the frame by means of a rearwardly-extending handle; the toggle-arm pivoted at one end to the ax and pivoted at its other end to the frame; the crank-shaft journaled in the frame; the connecting-arm journaled at one end upon the crank-shaft and pivoted at its other end to the joint of the toggle-arm, the crank-arm being arranged with such relation to the upper member of the toggle that when the toggle is flexed to its fullest extent the connecting-arm and the upper member of the toggle will form substantially a right angle with relation to each other.

8. In a wood-splitting machine, the combination set forth of the anvil provided with the horizontal bolt and the tightener; the foundation-block rigidly secured to the frame of the machine; and the regulating-blocks, the top one being provided with a downwardly-projecting bolt adapted to pass through perforations in the other regulating-blocks and in the foundation-block.

9. In a wood-splitting machine, the anvil set forth consisting of the top plate; the cross-bar; the bolt and nut to draw the top plate and cross-bar toward each other; the regu-

lating-blocks, each provided with the opening through its body to admit the bolt, and the bolt to pass through such blocks.

10. In a wood-splitting machine, the combination set forth of the frame; the ax pivoted to the frame by means of a rearwardly-extending handle; the toggle-arm pivoted at one end to the ax and pivoted at its other end to the frame; the crank-shaft journaled in the frame; the connecting-arm journaled at one end upon the crank-shaft and pivoted at its other end to the joint of the toggle-arm, the crank-arm being arranged with such relation to the upper member of the toggle that when the toggle is flexed to its fullest extent the connecting-arm and the upper member of the toggle will form substantially a right angle with relation to each other; the top toggle-pivot being rearward of a vertical line drawn from the lower toggle-pivot, and the parts so arranged to cause the lower toggle-arm to pass the right angle with the ax-handle before the ax reaches its lowest point of stroke.

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