Jan. 1, 1952 J. H. DAGENAIS 2,580,735

WOOD-SPLITTING MACHINE

Filed April 2, 1948 3 Sheets-Sheet 1

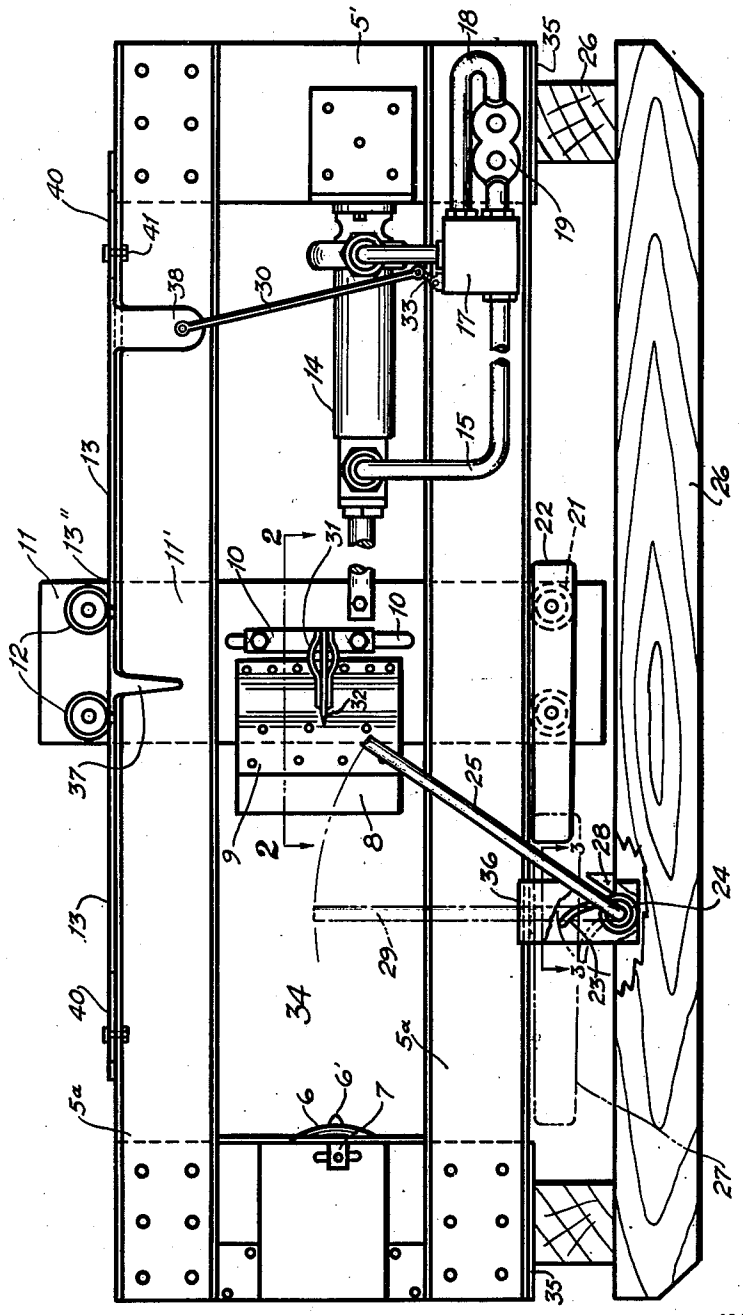

Fig. 1

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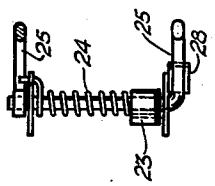

Fig. 3

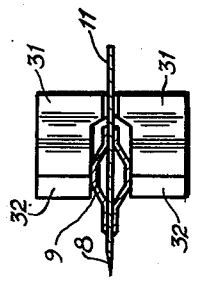

Fig. 2

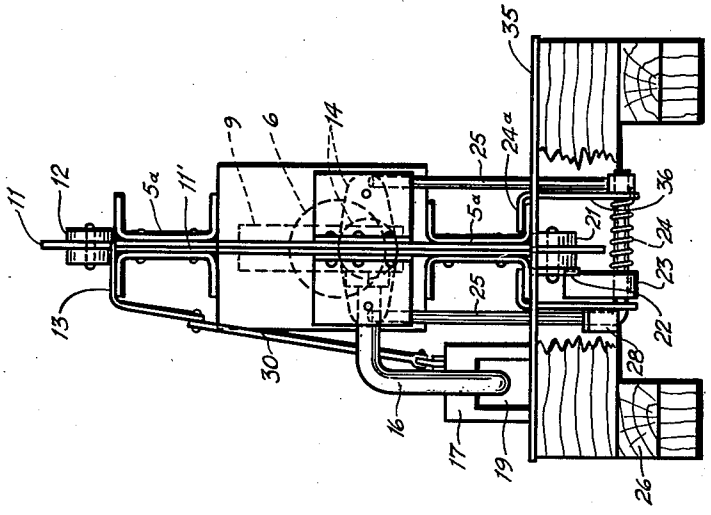

Fig. 4

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Filed April 2, 1948 3 Sheets-Sheet 3

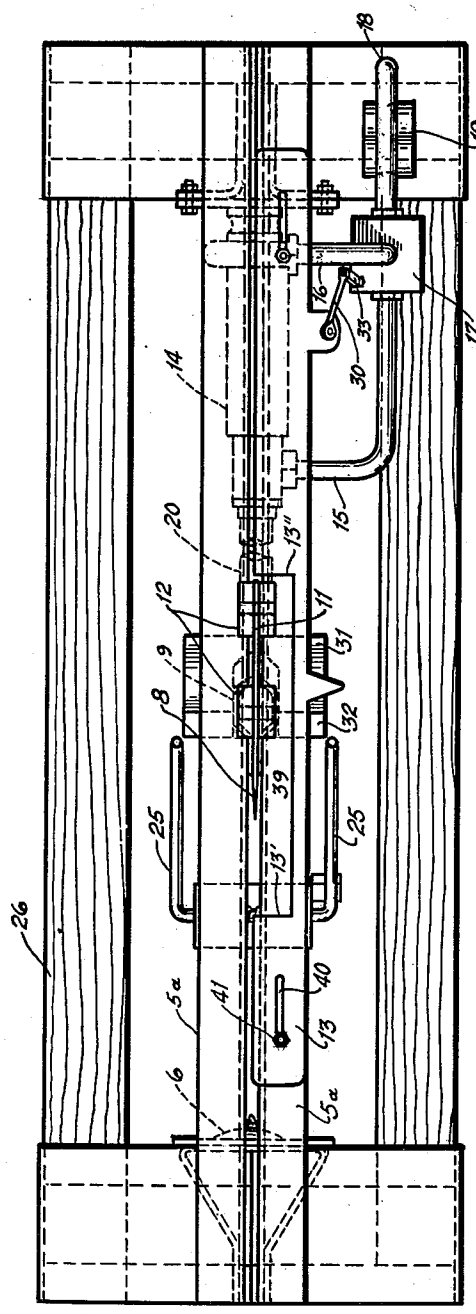

Fig. 5

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Patented Jan. 1, 1952 2,580,735

UNITED STATES PATENT OFFICE

2,580,735

WOOD-SPLITTING MACHINE

Joseph Henri Dagenais, Laval des Rapides, Quebec, Canada

Application April 2, 1948, Serial No. 20,805
In Canada October 30, 1947

1 Claim. (Cl. 144—193)

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My invention relates to improvements in wood-splitting machines in which a horizontally reciprocating traveller operates by means of reversible hydraulic pressure arranged to work in conjunction with the traveller; and the objects of my invention are, first, to provide a traveller provided with a series of knives so disposed thereon as to quickly split a piece of wood in four parts in a single operation; second, to provide means for holding a piece of wood to be split solidly on the machine during operation; and, third to provide means for preventing accidents to the operator of the machine.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows the machine in elevation; Fig. 2, a section through one of the knives; Fig. 3, a section showing part of accident preventing guards; Fig. 4, an end view of the machine; and Fig. 5, a plan view of the machine.

Similar numerals refer to similar parts throughout the several views.

The machine consists in a rectangular chassis composed of four longitudinal members 5*a* bolted in pairs and spaced apart vertically in order to leave an opening 34 between them and it is in that space 34 that the wood is placed to be split, the said members 5*a* being held apart by vertical plates 5' bolted thereon. The chassis is carried or supported on cross and longitudinal members 26 and 26'. Plates 35 are interposed between the chassis and members 26.

A traveller or carriage generally described by numeral 11, comprises a plate 11' sliding in a back and forth movement between the upper members 5*a* of the chassis and as will be observed in examining Figures 1 and 4, the traveller is provided with wheels two of which 12 are placed at its upper side and two 21 at its lower part, the four wheels being adapted to roll on members 5*a* two above the same and two under.

It should be noted that plate 11' on which the wheels are journalled slides between spaces left between the upper and lower members 5*a* of the chassis. The reason of the wheels as disposed on the traveller is to prevent the wedging of the plate in its back and forth movement and also to eliminate friction of the plate on members 5*a*.

On plate 11' of the traveller, I place a number of knives 8 and 32 knife 8 being secured in a vertical position on the plate, and knives 32 being placed one on each side thereof but at a certain distance behind the blade of knife 8 and with their cutting edge at right angles with the knife 8 that is to say, that knife 8 occupies a vertical position and knives 32 a horizontal position.

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As may be observed by referring to Figures 1 and 2 more particularly to Figure 2, it will be seen that knife 8 is placed between two bulged or convex plates 9 bolted on plate 11'. Numeral 31 designates bulged plates similar to plates 9 and the functions of those convex plates will now be explained, but before, I may state that the knives 32 are adjustable vertically by means of member 10 which slides in opening 10' in plate 11' of the traveller.

A piece of wood to be split is placed in space 34 of the chassis. The traveller is then put in action knife 8 contacting the centre of the piece of wood which is pressed against plate 6 provided with a point 6'' which enters into the wood to hold it steady in place. This plate 6 is adjustable vertically as shown at 7. The traveller moves ahead under pressure from cylinder 14 with the result that knife 8 is sunk into the piece of wood which is partially split in two, and as the traveller advances farther, the two partially split pieces arrive in contact with the edge 9' of convex plates 9 the reason of which being to spread the split wood to a certain extent in order to prevent jamming of the knife. The two partially split pieces of wood now come in contact with the lateral knives 32 the object of which being to split in two parts the already split piece of wood in two. It will be noticed that knives 32 are also provided with bulged plates 31 the functions of which are the same as plates 9 of knife 8.

The initial piece of wood is now split in four parts and the traveller has attained its limit of forward movement. Before explaining the return of the traveller to its initial position, I will describe the functions of safety guards 25.

Secured to plate 11' and under the lower longitudinal members 5*a*, is a reciprocating member 22; also secured to members 5*a*, is a double support 36 at the base of which safety arms 25 are adapted to revolve the arms 25 being fixed on an axle journalled in the support 36. Numeral 23 designates a cam also secured on the safety arms axle and which is also adapted to revolve simultaneously therewith. The traveller being started in its forward drive, member 22 is carried away thereby and upon coming in contact with the cam 23 will cause the arms 25 to revolve to a point indicated at 29. Numeral 27 indicates the extreme forward position of member 22.

The reasons of arms 25 are twofold: one reason is to prevent accidents to the operator of the machine, and the other object of the arms is to retain the piece of wood in place on the machine until it is finally split and the traveller returned to its initial position.

I will now describe the return drive of the traveller and of the safety arms to their initial positions as shown in Figure 1. I may state first that on the axle with which revolve guards **25** and cam **23**, I place a spring **24** which is compressed by the forward movement of the traveller and it is due to the effect of that spring that the arms **25** are brought back to their initial position against rest **28** when the machine is idle.

The mechanism which puts the traveller and safety guards in motion, consists of a motor **17** and a hydraulic pump comprising a cylinder **14** into which slides a piston connected to a rod **20** secured to plate **11'** of the traveller. The cylinder **14** which receives its water from expansion pump **19** is provided with inlet **16** and outlet **15** with by-pass **18**. The system of pump is the same as that used in dump-truck for example, and it is no part of this invention with the exception however of the control mechanism causing the back and forth movement of the traveller and which I will now describe.

On the upper face of the upper pair of members **5***a*, is a rod **13** adapted to slide thereon. The rod **13** is provided with depending handle **37** and tongue **38** and also slots **40** and guiding bolts **41**, one at each end thereof. This rod is adapted to slide back and forth and here is how it works. On approximately the centre of the rod, I cut a fairly long notch forming two shoulders **13'** and **13''** against which the upper wheels of the traveller come in contact during its drive forward and backward. When the machine is put into motion, the traveller and rod **13** occupy the position shown in Figure 1 of the drawings and when the machine is started, the traveller will move ahead until its wheels come in contact with shoulder **13'** pushing rod **13** ahead with it until it reaches the end of its course when at the same time tongue **38** and rod **30** having been drawn with it have caused the valve **33** to reverse the pressure in the cylinder **14** with the result that the traveller is now withdrawn backwards until wheels **12** of the traveller come in contact with shoulder **13''** pushing rod **13** back to its initial position when valve **33** is brought to occupy a neutral position, the machine being then brought to a standstill until it is started again by slightly pulling forward rod **13** by the operator of the machine using handle **37** opening valve **13**, the pressure behind the piston in cylinder **14** will push the traveller ahead for a new cycle.

It will be easily seen that the safety arms **25** are revolved ahead by the forward movement of the traveller, and that they are brought back under the effect of the pressure exerted by spring **24** which has been compressed by the traveller in its forward movement.

I claim:

In a wood splitting machine, the combination of a vertical rectangular frame made of longitudinal members spaced apart by means of plates, the said frame being supported on cross members provided with skates for transportation, a horizontally travelling unit adapted to move back and forth on rails secured on upper and lower members of the frame, a head on said travelling unit provided with three knives so disposed one on the other for splitting a piece of wood in four sections, means for forcing said head towards the piece of wood to be split comprising a cylinder having a reciprocating piston connected to the travelling unit, a hydraulic pump for actuating said piston, controlling means for reversing the action of the piston comprising a depending tongue secured to said travelling unit and moving therewith and a rod pivoted on said tongue at one end and connected to said pump at its other end, said knives comprising a main vertical knife permanently secured to said head, and two knives adjustably secured perpendicularly on said head and to said vertical knife, means on said knives for spreading the piece of wood as it is being split consisting of convex plates secured thereon, an arm pivoting on one of the frame members and held in tension by a spring and disposed to be actuated by said travelling unit and said spring for preventing the split wood from falling outside of the frame while being split, and a plate at the forward end of the frame and adjustable thereon and provided with a point for holding the piece of wood steady in place during the cutting operation.

JOSEPH HENRI DAGENAIS.

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