Dec. 18, 1934. M. E. PEACE 1,984,492

PORTABLE SAWMILL

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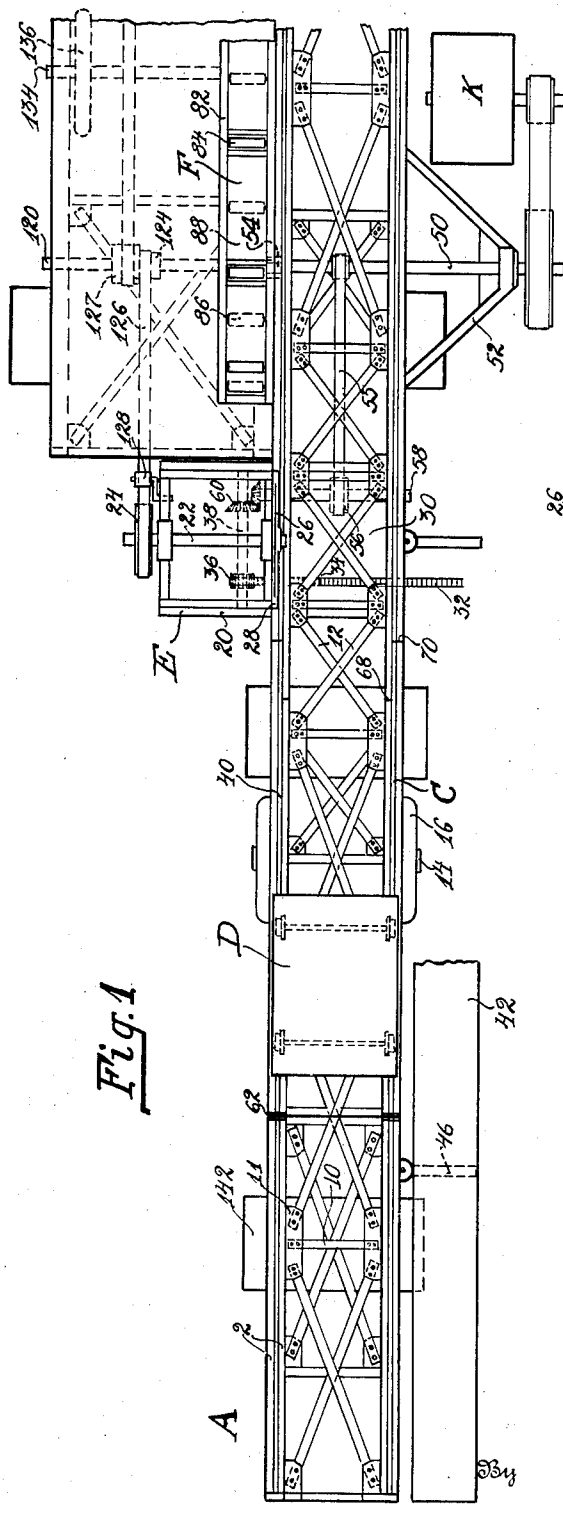


Fig. 1

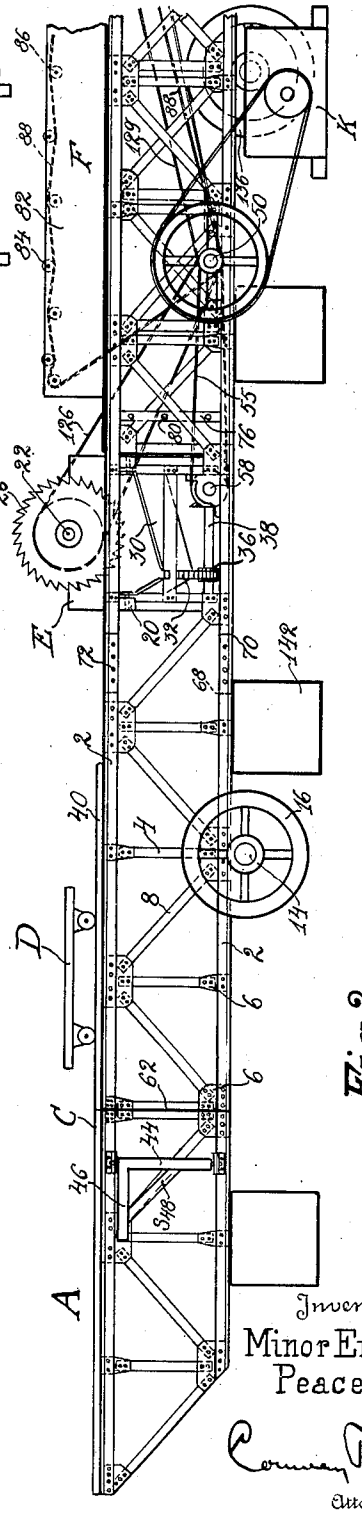


Fig. 2

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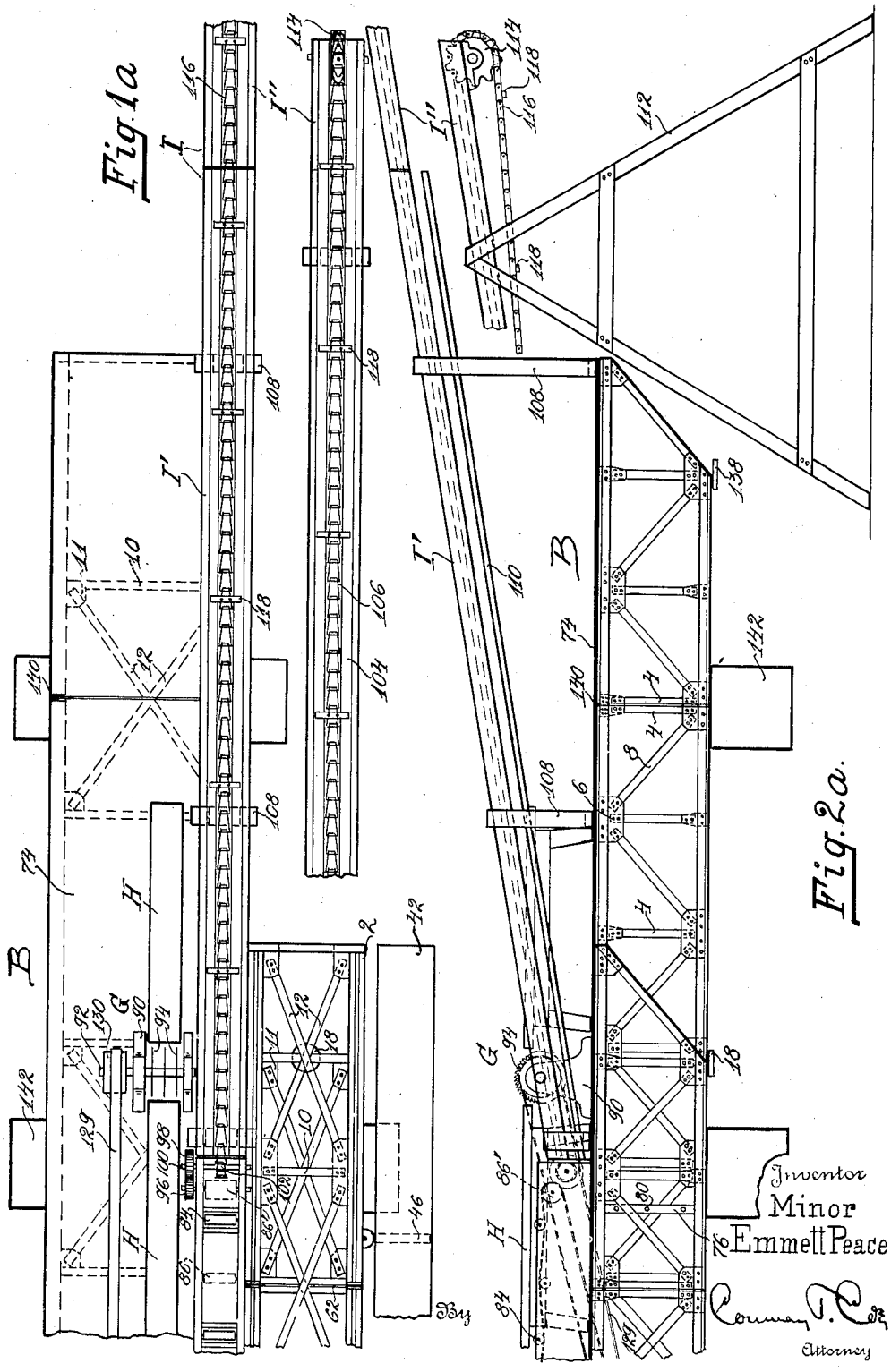


Fig. 1a

Fig. 2a.

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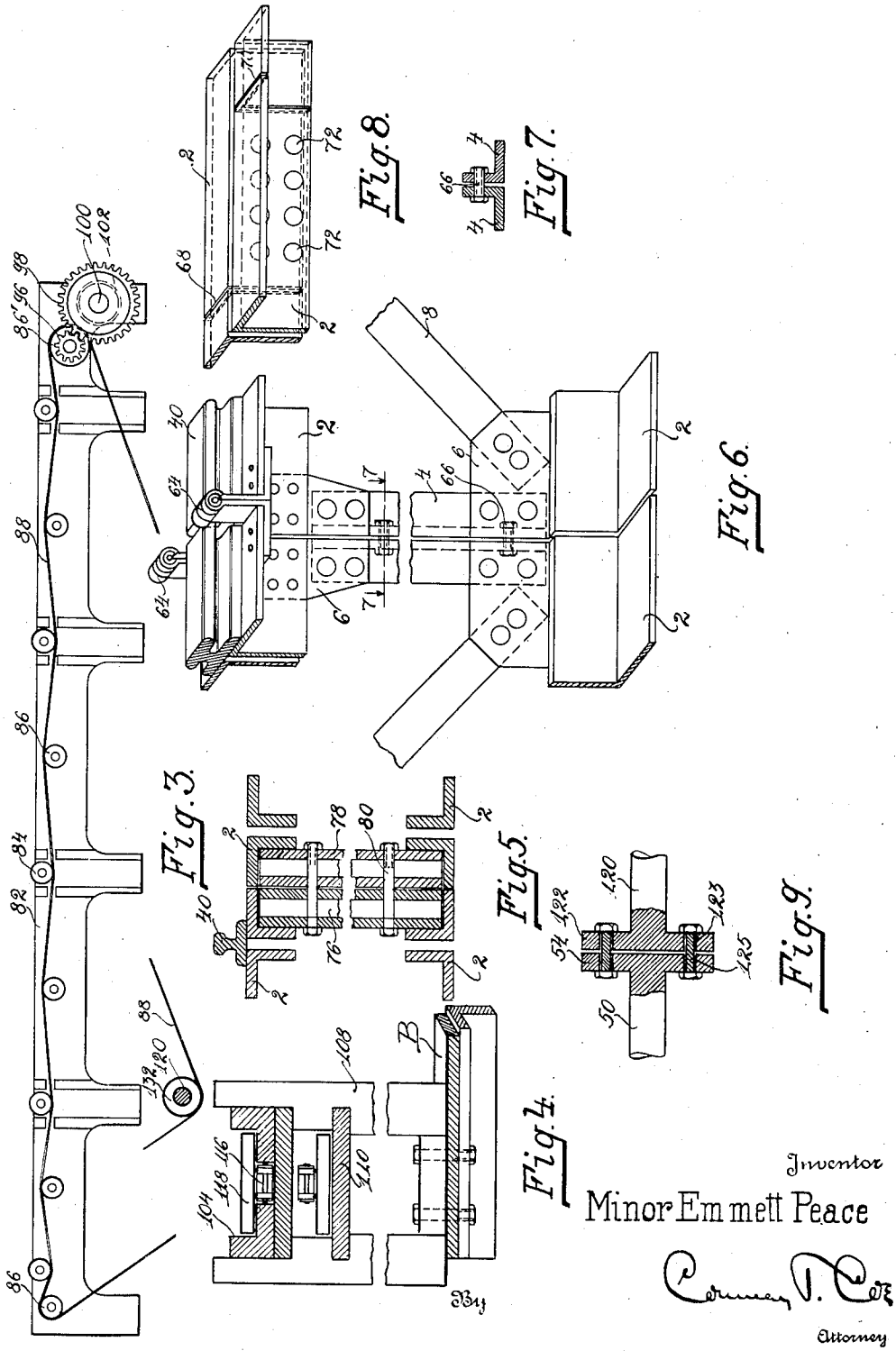


Fig. 8.

Fig. 7.

Fig. 6.

Fig. 3.

Fig. 5.

Fig. 9.

Fig. 4.

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PORTABLE SAWMILL

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Application April 17, 1933, Serial No. 666,611

13 Claims. (Cl. 143—43)

My invention relates to sawmills and particularly to such machines of the type which can be separated into several portable sections for movement from place to place.

Portable sawmills in the past have had numerous disadvantages. One of the most damaging of these is the tendency of the saw to cut crookedly and thus produce boards of the wrong thickness. Another undesirable feature is the fact that such mills, subjected as they are to the constant hazard of fire, cannot be insured except at prohibitive rates. The life of a portable mill is, as a rule, relatively short and its efficiency is usually quite low. The constant shocks and strains to which such a construction is subjected because of the movement of the heavy logs often results in its early destruction.

Further disadvantages are often present in mills of this type. In the first place, the waste and sawdust from the mill is not taken care of and is likely to pile up to such an extent that it becomes necessary to move the whole mill even before the timber in its vicinity is exhausted. In addition, these materials greatly increase the fire hazard. In locating the usual mill, a pit must be dug under the saw for the dust and this pit will often be filled with water during rainy weather. It is practically impossible to get beneath the mill to make any necessary repairs thereunder. The foundations used for such mills are usually unsteady and unsatisfactory and do not permit of easy use.

The primary object of the present invention is the construction of a mill which will not be subject to any of the above disadvantages or drawbacks. The mill is constructed in two units each of which consists of a steel framework. I have discovered that one of the reasons for the crooked or improper cutting action of the saw in most portable mills is that the saw frame is not rigidly held in proper alignment with the carriage tracks. This is often caused by yielding of the wood, by warping or shrinking, or by wear on the bolt holes of the bolts which hold the saw frame in place. In addition, I have found that the carriage track itself is often thrown out of proper alignment for one of these reasons. Finally, the carriage track is likely to sag between its supports when formed of wood and this in itself will reduce the efficiency of the machine to a considerable extent.

On the other hand, a construction formed throughout of steel is of course indestructable by fire. Such an apparatus can be insured at a low rate and can therefore be sold on a time basis which is practically impossible with the present type of portable mill. The saw frame is rigidly mounted on the unit which carries the track and is riveted in place so that neither the saw nor the track can possibly be thrown out of alignment. Since the parts are made of steel braced so as to rigidify the whole framework, no sagging can occur and proper alignment of the log is insured. The bearings of the whole arrangement will be properly supported so that there will be no strain on the various driving shafts. The device, while strong enough to stand almost any amount of abuse and hard usage, is still light enough to be transported easily. The nature of the framework for some reason appears to make the device capable of standing the impacts and stresses due to the movement of heavy logs better than a wooden support. In addition, the manufacture of such a device out of a metal framework makes it easier to form it in a plurality of separate sections which can be secured together in accurate and exact position when the mill is in use.

A second object of the invention is the manufacture of a portable mill in two units which can be secured together to form a single, complete sawmill even by unskilled persons. More specifically, I contemplate the use of two units, one of which carries a track for the carriage and a saw frame rigidly mounted with respect to the track for holding the saw. A second unit carrying a roll conveyor for receiving slabs and planks from the saw and an edger mechanism can be secured side by side with the first unit. This edger unit is adapted to support at least the first unit of a strip and slab conveyor. The two units are secured together by a few bolts and when so secured are accurately positioned for proper operation of the mill as a single unitary device. Each section is provided with wheels so that it can be transported easily.

A further object of the invention relates to the arrangement of the driving mechanisms in a mill of this type. One principal feature of my construction is that the power plant may be located on the opposite side of the saw unit from the edger where it is completely out of the way. This is accomplished preferably by the use of transverse shafts running through the two frames, and coupled together in any suitable manner. The end of the shaft extending beyond the side of the saw unit is driven by the power plant. All the various mechanisms of the mill are driven from this single shaft and its extension through the edger unit. The device is so arranged that

when it is desired to move the mill from place to place only one belt need be removed and one shaft uncoupled.

Another purpose of the invention lies in the provision of a sawdust conveyor which will remove the sawdust from the vicinity of the saw and drop it at a distance from the mill. Another feature is the provision of the live roll carrier for conveying slabs or planks from the saw to the edger. Finally, a removable slab and strip conveyor is provided which takes any material from the end of the live roll bed or from the edger tables and removes it to a distance from the machine where it can be burned. This last conveyor is preferably aligned with the end of the live roll bed and lies in substantially the same horizontal plane. At least one unit of the slab and strip conveyor is removably mounted on the edger unit so that it can be taken down if necessary to reduce the height of the edger unit during transportation.

In setting my mill up for use, a steady and firm base can be made without digging any deep holes. All that is necessary is to level off a few spots on the ground, on which large beams can then be placed upon which the mill units are supported. I have found that such a construction is easy to use and gives entirely satisfactory results since no strains exerted on the mill during any sort of use will result in damage. In addition, this arrangement raises the mill high enough to permit entry to the under side for the purpose of making repairs, a matter which is facilitated by the metallic framework structure.

A further object is to make the end sections of the units in such a manner that they can be hinged to the body portions and folded over thereon during transportation to shorten the lengths of the units.

The mill according to this invention may be used with any kind of machinery and any type of carriage. Any suitable source of power may be used for driving it. The shafts are so arranged that additional drives for adding other machinery such as a trimmer can be put in easily. The arrangement is easily assembled and operated and yet is extremely practical and useful. It can be assembled and used by unskilled persons and does not require frequent care to see that the parts are properly positioned. It is practically fool proof and yet is inexpensive and economical in its operation. In fact, it is an extremely practical form of portable mill.

Further objects and advantages of the invention will appear more fully from the following description when taken in conjunction with the accompanying drawings which form a part thereof.

In the drawings:

Fig. 1 is a top plan view of one longitudinal half of the mill in assembled position.

Fig. 1*a* is a similar view forming a continuation of Fig. 1 of the other half of the mill.

Fig. 2 is a side elevation of the portion of the mill shown in Fig. 1.

Fig. 2*a* is a continuation of Fig. 2 showing the other portion of the mill.

Fig. 3 is a side elevation of the live roll bed with one of its walls partly removed.

Fig. 4 is a cross section through the first unit of the slab and strip conveyor.

Fig. 5 is a detail cross section of the connection between the units.

Fig. 6 is a perspective view of the hinge connection between the end section and the body of the saw unit.

Fig. 7 is a cross section on the line 7—7 of Fig. 6.

Fig. 8 is a perspective view of the connection between the two sections of the saw unit.

Fig. 9 is a detail cross section through the shaft coupling.

As shown in Figs. 1 and 2, the invention comprises a saw and carriage unit A and an edger unit B. The first unit includes a track C, a carriage D mounted on the track for carrying logs, and a saw frame E. The edger unit includes a live roll bed F, an edger G, tables H, and supports one end of a slab and strip conveyor I. The two units are arranged as shown, partially overlapping and side by side, with the saw frame at a point intermediate the ends of the unit A and the unit B located principally or wholly to one side of this saw frame and extending beyond the end of the unit A.

The saw unit includes a framework or beam-like structure consisting of longitudinal elements, transverse elements and bracing elements. At each corner is a longitudinal element formed of two angle irons 2 bolted together so as to present a T form having the two joined flanges extending downwardly at the top and upwardly at the bottom. The vertical transverse members comprising girders or other suitable rigid metallic members 4 secured to the angle irons 2 by means of fish plates 6 which are riveted to the members 4 and extend between and are secured to the flanges of the angle irons. Angular bracing members 8 are also secured to the fish plates and run diagonally across the spaces formed by the longitudinal and vertical members 2 and 4. Horizontal transverse girders 10 are also rigidly secured to the longitudinal members 2 by fish plates 11 or the like. Along the top and bottom of the saw unit are also diagonal bracing members 12 secured in the spaces formed by the horizontal and longitudinal members by means of fish plates 11. This arrangement forms a rigid frame.

Mounted in the lower portion of the frame A and away from the center thereof is an axle 14 carrying wheels 16 which extend below the frame. On the endmost horizontal member 10 at the opposite end of the frame is a plate 18 suitably apertured or otherwise arranged to be attached to a tractor or the like.

Rigidly mounted on one side of the frame A and between the ends thereof is the saw frame E. This frame is carried by girders 20 which are secured to the longitudinal and transverse members of the framework. This frame includes a shaft 22 mounted in suitable bearings and having at its outer end a pulley 24. At its inner end this shaft carries the saw 26 which operates in a slot 28 in the frame. Beneath the saw is a hopper 30 the sides of which slope downwardly towards its bottom. A chain conveyor 32 runs through a slot 34 in the bottom of the hopper and passing through the lowest portion of the hopper picks up and removes the sawdust which drops from the saw. This conveyor is driven in a manner which will be described below. The chain extends outwardly and around a sprocket suitably supported at a distance from the mill and the lower reach returns beneath the hopper and around a sprocket 36 mounted on a shaft 38 on the lower side of the saw frame E.

Mounted on the upper longitudinal members 2 are rails 40 forming a track along which moves a carriage D which brings the logs up to the

saw for cutting. This carriage may be of any well known type and may be driven in any suitable manner.

On the side of the unit A opposite the saw frame I provide hinged supports which may be swung out to the position shown in Fig. 1 to support a walk 42 alongside the carriage tracks. Each of these supports comprises a vertical member 44 turnably mounted on the side of the frame A and a horizontal portion 46 which is braced and supported by the portion 48. Obviously these parts may be swung inwardly for transportation or may swing out so that planks can be placed on them to form a walk for the operator who is working on the carriage D.

Rotatably mounted in the lower part of the frame A is a shaft 50 which is driven from any suitable source of power K through a belt and pulley located on the opposite side of the unit from the saw frame. This shaft preferably extends some distance outwardly from the frame and is braced by suitable braces 52. It extends completely through the frame and carries at its end on the same side of the frame as the saw frame one section 54 of a separable coupling of any suitable nature, one form of which will be described below.

From the shaft 50 a belt 55 drives a pulley 56 on a second transverse shaft 58 located beneath the saw frame. This shaft through bevelled gearing 60 drives the shaft 38 on which is mounted the pinion of the sawdust conveyor.

It is sometimes desirable to hinge the ends of the frame A to the body so that they can be folded up on to the body, thus shortening the length of the unit. For this purpose, a double framework is formed at any suitable point along the length of the unit as at 62 and the two frames are secured together by a hinge 64 at the top and by bolts 66 at the bottom. By removing these bolts the hinged section may be raised up on the top of the body of the unit.

For units which are to be shipped by rail, it is sometimes necessary to remove a considerable length from one end to permit placing the device in a freight car. For this purpose, at one point along the length of the unit the longitudinal rails are divided at spaced points 68 and 70 as shown in Figs 1, 2 and 8. By means of suitable bolts 72 the two sections can be secured together rigidly through this overlap. To permit separation at this point, the diagonal bracing member is also made removable by the use of suitable bolts at its ends.

The edger unit is likewise formed as a metallic framework of substantially the same nature as the unit A. The greater part of the top of the edger unit is covered by a metallic flooring 74 or other suitable platform construction which provides a table for the workmen. This flooring is adapted to support two or more tables H for the use of the operators which may be fixed in place or may be removable from the unit.

Means are provided for securing the edger unit rigidly beside the saw unit. This preferably comprises upright members 76 on the saw unit A and similar upright members 78 on the edger unit B, these uprights having aligned apertures through which bolts 80 are passed to hold the two units rigidly in side by side relation. The uprights are so located that the edger unit will be positioned on the same side of the saw unit as the saw frame and to one side of the saw frame. The opposite end of the edger unit extends a considerable distance beyond the saw unit as is clearly shown in the drawings. The two units are thus arranged in partially overlapping relation.

Mounted on the side of the edger unit next to the saw unit and along the overlapping portion is a live roll bed F. This is composed of a framework 82 having carrying rolls 84 rotatably mounted therein. Between the carrying rolls and at each end of the frame 82 are guide rolls 86 for a belt 88 which is driven in a manner which will be described below. These live rolls receive the slabs and planks cut off by the saw 26 and carry them to a position adjacent the edger tables H.

The planks are picked up by the operator who stands near the edger table H and are fed by him to the edger which consists of a frame 90 carrying a shaft 92 on which are mounted three saws 94. This edger may be of any suitable type well known in the art and its specific construction is not a part of my invention. From the edger, the boards pass to the second table H from which they are loaded on to a truck or disposed of in any suitable manner.

The shaft of the last guide roll 86′ of the live roll bed F carries on its end a pinion 96 which meshes with another pinion 98 carried by a shaft 100 mounted in the frame 82. On the shaft 100 is mounted a sprocket 102. Beyond the end of the live roll bed and on the flooring and framework of the edger unit is mounted a slab and strip conveyor I formed in two sections each of which comprises a trough 104 having a central groove 106. The first section I′ is supported on three frame members 108 of increasing height which rest on the top of the edger unit and may be secured thereto by bolts or the like. This section has a lower member 110 spaced below the trough proper which serves to guide the chain in its return movement. The second section I″ of the slab and strip conveyor is removably secured at its inner end to the outer end of the first section I′. It is supported about midway of its length by an A frame 112 or in any other suitable manner. At its outer end the section I″ carries a sprocket 114 in alignment with the groove 106. A chain 116 runs over the sprockets 102 and 114 and travels through the groove 106 and on its return above the member 110 back to the sprocket 102. At intervals on this chain are arranged cleats 118 of the width of the trough which will pick up any material missed by the chain itself.

At the lower side of the edger unit is arranged a transverse shaft 120 which, when the two units are secured together, will be aligned with the driven shaft 50 of the first unit. This shaft carries at its end a member 122 which can be coupled to the member 54 of the first shaft or released therefrom. Preferably this coupling member is one which will permit of slight deviations between the two shafts. For example, it may consist of discs 54 and 122 on the end of the shafts, these discs having openings 123 through which can be passed bolts 125 of slightly less diameter than the openings. (See Fig. 9.)

On the shaft 120 is arranged a pulley 124 from which runs a belt 126 to the pulley 24 on the saw mandrel 22. A suitable tightener 128 is provided on the saw frame for regulating the tension of belt 126. A second pulley 127 drives a belt 129 which engages the pulley 130 of the edger saw shaft 92. A third pulley 132 drives the belt 88 which passes up from this pulley over the two end guide rolls of the live roll conveyor.

Likewise mounted on the lower side of the edger unit is an axle 134 carrying wheels 136. These wheels are preferably located near the end

of the unit which carries the live roll bed, while the lower transverse frame member on the opposite end has a plate 138 for connection to a tractor or truck. If desired, the end of this unit may be arranged by a hinge 140 to swing up and shorten the length of the unit in the same manner as the unit A. In case this is done, the transverse frame member at the hinge carries the plate for attachment to the tractor.

The operation and use of my device should be evident. During use, the parts are arranged in the manner shown in Figs. 1 and 2. The saw is driven by the shaft 50 which receives its power from the unit K which is located on the opposite side of the mill from the edger and is thus completely out of the way. The log carriage is driven by the saw mandrel in any suitable fashion. The sawdust conveyor is likewise driven to remove the sawdust from the hopper and drop it at a point remote from the mill where it will not interfere with the operation. The logs pass through the mill and as the planks are cut they drop on to the live roll bed F. By this they are conveyed to the edger table where they are treated and thus finished. The slabs are passed by the live roll bed directly on to the slab and strip conveyor and are carried by it to a point at a distance from the mill itself where they can be burned. The trash from the edger is likewise thrown on to the slab and strip conveyor and is carried away.

When it becomes necessary to remove the mill for any reason, the coupling between the shafts 50 and 120 is released and the belt 126 is removed from the pulley 24 on the saw mandrel. The outer section of the slab and strip conveyor is disconnected from the inner section and the chain 116 is removed from the sprocket 114 and coiled on the edger unit. If it is necessary to carry the mill where the clearance is very low, the inner section of the slab and strip conveyor may likewise be released from the edger unit and either laid on its side on that unit or carried separately. If the mill must be moved where sharp turns are necessary, the end sections of each unit may be swung back so as to shorten the length of the units considerably. If the mill is to be shipped in a railroad car, the saw unit may be separated into two sections in the manner described above for transportation. The units are secured to tractors or trucks by the plates provided and may then be easily drawn from place to place.

In setting up the mill at a new place, all that is necessary is to pick a number of spots and level them off. These spots must be suitably spaced to receive the logs which support the mill when it is in use. The two units are then run into place and raised up on jacks and squared logs 142 can be slid beneath them. The jacks are then removed and the units will rest on the logs free of their wheels. As the metallic framework thus rests on squared logs which are themselves level, the mill will be level throughout. Since the units are rigidly secured together, they will always be properly aligned and will operate in the proper manner.

It will be evident that the mill according to my invention, in spite of its simplicity, is very complete. It can be operated by a very few persons and yet there will be no accumulation of material around the mill. Because of its simplicity it can be made at a low cost, and because of its metallic framework structure it is not subject to destruction by fire or rotting or to the other disadvantages of wooden mills. It is compact and of the smallest size which is practical for the results obtained. The parts are simple and the connection between the two units is quite easy and does not require the services of a skilled mechanic. In separating or connecting the units all that is necessary is to undo a few bolts, one shaft coupling, and one belt. Nevertheless, when the units are assembled they are so rigidly held together that no harmful deviation is possible. The saw frame is rigid with the track unit and cannot get out of alignment therewith, so that proper sawing action is assured.

The mill is relatively high and therefore easily portable and the length of the units is no greater than is necessary to obtain proper results. It is strong and durable and will stand any reasonable wear to which it will be subjected in use.

While I have described herein one embodiment of my invention, I wish it to be understood that I do not intend to limit myself thereby except within the scope of the appended claims.

I claim:

1. A multiple unit portable sawmill comprising a portable unit having tracks thereon for a log carriage and a saw frame rigidly secured thereto at one side of said tracks and supported on said unit, a second portable unit having an edger mechanism mounted thereon, said units having means thereon independent of said saw frame whereby they may be rigidly secured together in side by side relation with said second unit on the same side of said first unit as said saw frame, power receiving means on the opposite side of the first unit from the second unit, a saw mandrel carried by said saw frame, and means to drive said saw mandrel and said edger mechanism from said power receiving means.

2. A portable sawmill comprising a portable unit formed of a metallic framework, tracks on said unit for supporting and guiding a log carriage, a saw frame rigidly mounted on said unit at one side of said tracks and carried by said unit for transportation therewith, a second portable unit formed of a metallic framework, edger mechanism mounted on said second unit, and means independent of said saw frame to secure said units rigidly together in side by side relation, said saw frame and said second unit being fixedly secured only through said first unit and said independent means.

3. A portable sawmill comprising a portable unit formed of a metallic framework comprising longitudinal members and transverse members, tracks on the longitudinal members of said unit for supporting and guiding a log carriage, a saw frame rigidly mounted on said unit at one side of said tracks and carried by said unit for transportation therewith, a second portable unit formed of a metallic framework, edger mechanism mounted on said second unit, and means independent of said saw frame to secure said units rigidly together in side by side relation with said second unit extending beyond the first unit, said saw frame and said second unit being fixedly secured only through said first unit and said independent means.

4. A portable sawmill comprising a portable unit formed of a metallic framework comprising longitudinal members and transverse members, tracks on the longitudinal members of said unit for supporting and guiding a log carriage, a saw frame rigidly mounted on said unit at one side of said tracks and carried by said unit for transportation therewith, a second portable unit formed of a metallic framework, edger mechanism

mounted on said second unit, and means independent of said saw frame to secure said units rigidly together in side by side relation with said second unit extending beyond the first unit, said saw frame and said second unit being fixedly secured only through said first unit and said independent means, and a slab and strip conveyor formed of metal and having at least a portion supported on the extending part of said second unit.

5. A multiple unit portable sawmill comprising a portable unit having tracks thereon for a log carriage and a saw frame rigidly secured to said unit and supported thereon at one side of the tracks, and a second portable unit having an edger mechanism mounted thereon, said units having means thereon independent of said saw frame whereby they may be rigidly secured together in side by side relation, said saw frame and said second unit being fixedly secured only through said first unit and said independent means, said first unit having wheels thereon, and said saw frame being so secured to said unit that it is supported by said wheels during movement of said unit.

6. A multiple unit portable sawmill comprising a portable unit having a track thereon for a log carriage, a saw frame rigidly mounted on said unit between its ends and at one side of said track and carried by said unit for transportation therewith, and a second portable unit adapted to be arranged side by side with said first unit, means independent of said saw frame to secure said units rigidly together with said second unit on the same side of the first unit as the saw frame and principally to one side of the saw frame, said saw frame and said second unit being fixedly secured only through said first unit and said independent means, said second unit extending beyond the end of the first unit far enough to support at least a portion of a slab and strip conveyor, and edger mechanism mounted on said second unit.

7. A multiple unit portable sawmill comprising a portable unit having a track thereon for a log carriage, a saw frame rigidly mounted on said unit between its ends and at one side of said track, and a second portable unit adapted to be arranged side by side with said first unit, means independent of said saw frame to secure said units rigidly together with said second unit on the same side of the first unit as the saw frame and principally to one side of the saw frame, said second unit extending beyond the end of the first unit far enough to support at least a portion of a slab and strip conveyor, edger mechanism mounted on said second unit, power receiving means on the opposite side of the first unit from the second unit, a saw mandrel carried by said saw frame, and means to drive said saw mandrel and said edger mechanism from said power receiving means.

8. A multiple unit portable sawmill comprising a portable unit having a track thereon for a log carriage, a saw frame rigidly mounted on said unit between its ends and at one side of said track, and a second portable unit adapted to be arranged side by side with said first unit, means independent of said saw frame to secure said units rigidly together with said second unit on the same side of the first unit as the saw frame and principally to one side of the saw frame, said second unit extending beyond the end of the first unit far enough to support at least a portion of a slab and strip conveyor, edger mechanism mounted on said second unit, a transverse shaft in each of said units, said shafts being aligned when the units are secured together, releasable means for coupling said shafts together, and power receiving means on said shaft on the opposite side of the first unit from the second unit.

9. A multiple unit portable sawmill comprising a portable unit having a track thereon for a log carriage, a saw frame rigidly mounted on said unit between its ends and at one side of said track, and a second portable unit adapted to be arranged side by side with said first unit, means independent of said saw frame to secure said units rigidly together with said second unit on the same side of the first unit as the saw frame and principally to one side of the saw frame, said second unit extending beyond the end of the first unit far enough to support at least a portion of a slab and strip conveyor, edger mechanism mounted on said second unit, a transverse shaft in each of said units, said shafts being aligned when the units are secured together, releasable means for coupling said shafts together, a live roll bed on the side of said second unit nearest said first unit, and means for driving said edger mechanism and live roll bed from the shaft in the second unit.

10. In a device as claimed in claim 2, conveying means on the side of said second unit nearest said first unit for conveying planks to said edger mechanism.

11. In a device as claimed in claim 2, a transverse shaft in each of said units, said shafts being aligned when the units are secured together, and releasable means for coupling said shafts together.

12. In a device as claimed in claim 2, a transverse shaft in each of said units, said shafts being aligned when the units are secured together, releasable means for coupling said shafts together, a saw mandrel mounted in said saw frame, and means for driving said saw mandrel from the shaft in the second unit.

13. In a device as claimed in claim 2, a hopper beneath said saw frame, and a conveyor for removing sawdust from said hopper.

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