April 17, 1934. H. E. OESER ET AL 1,955,437

POLE PLANING MACHINE

Filed March 12, 1932 7 Sheets-Sheet 1

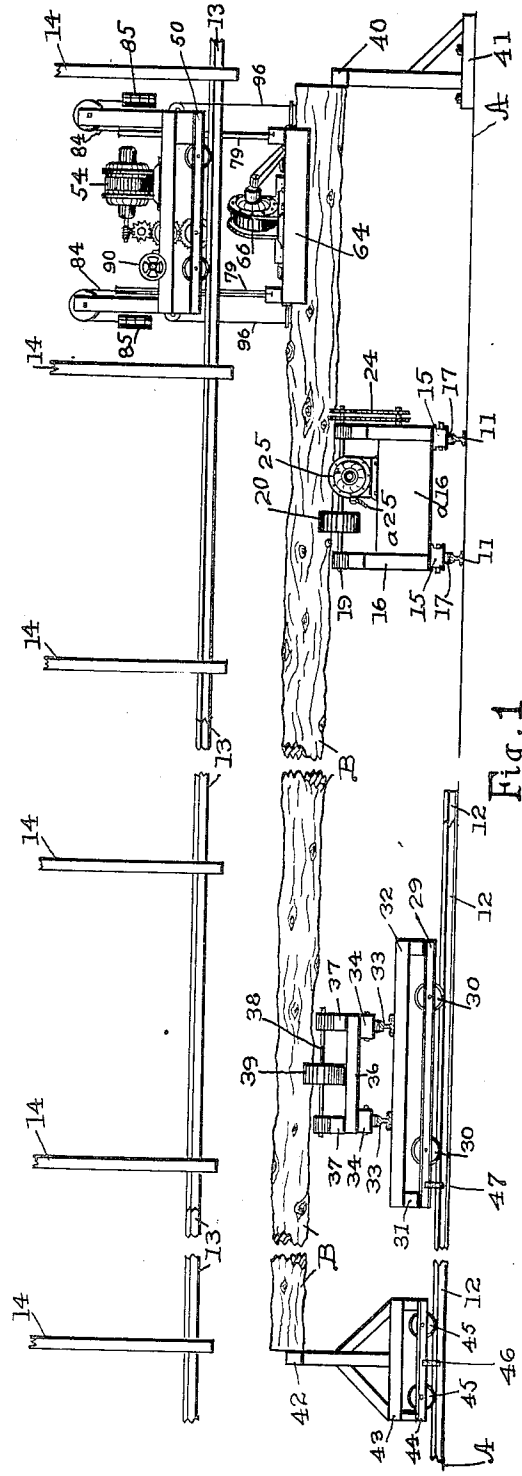


Fig. 1

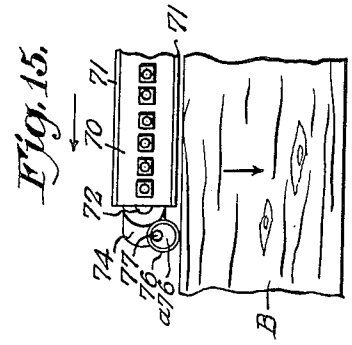


Fig. 15.

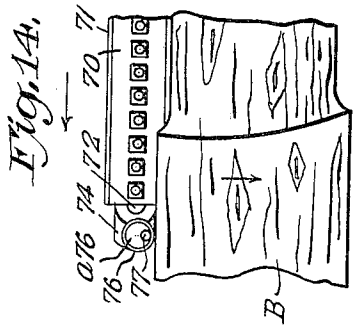


Fig. 14.

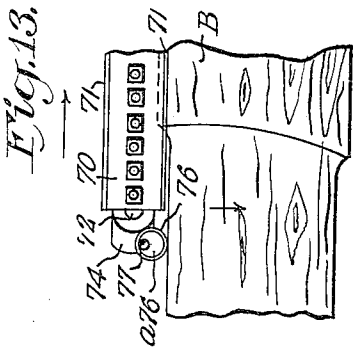


Fig. 13.

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POLE PLANING MACHINE

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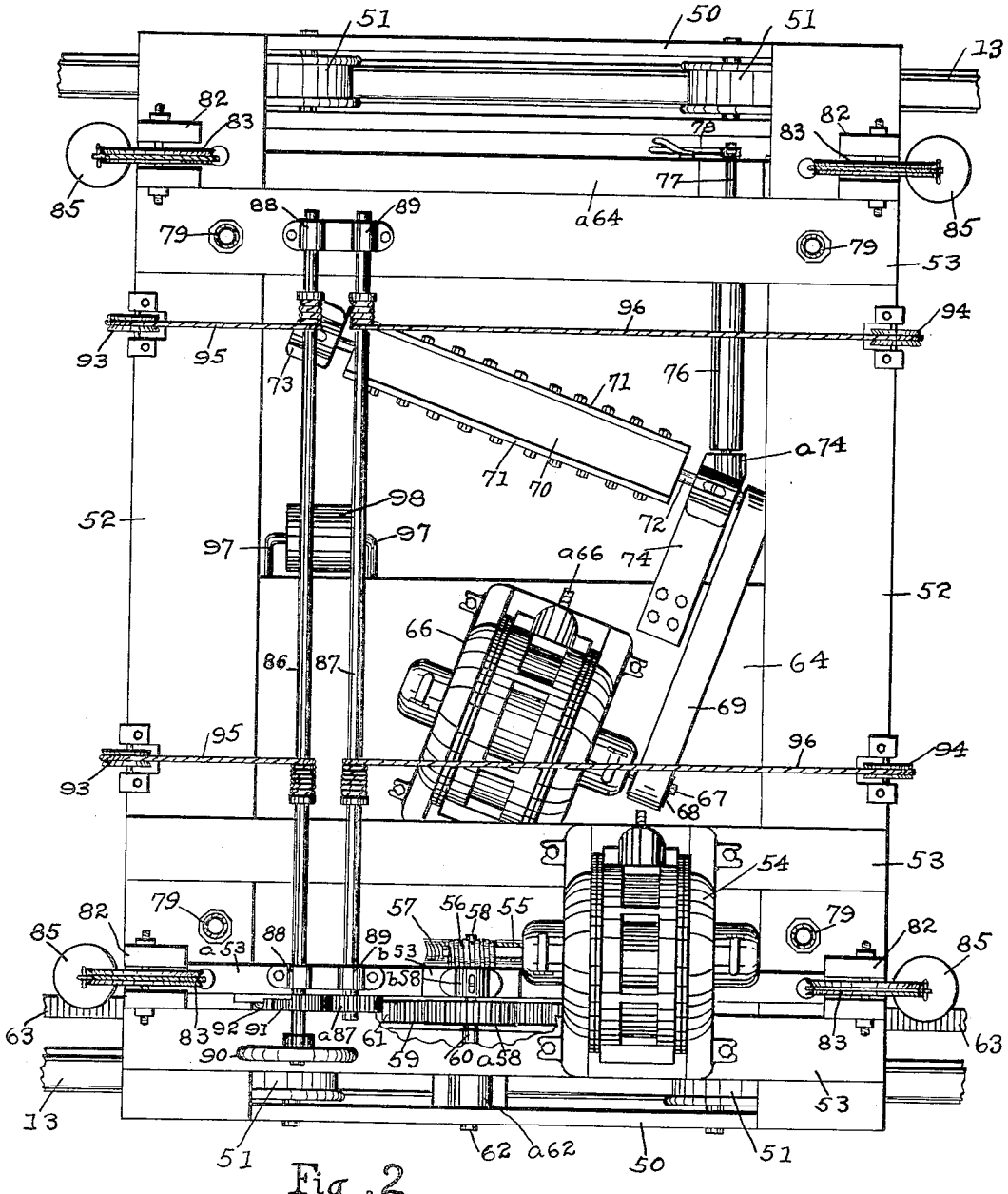


Fig. 2

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POLE PLANING MACHINE

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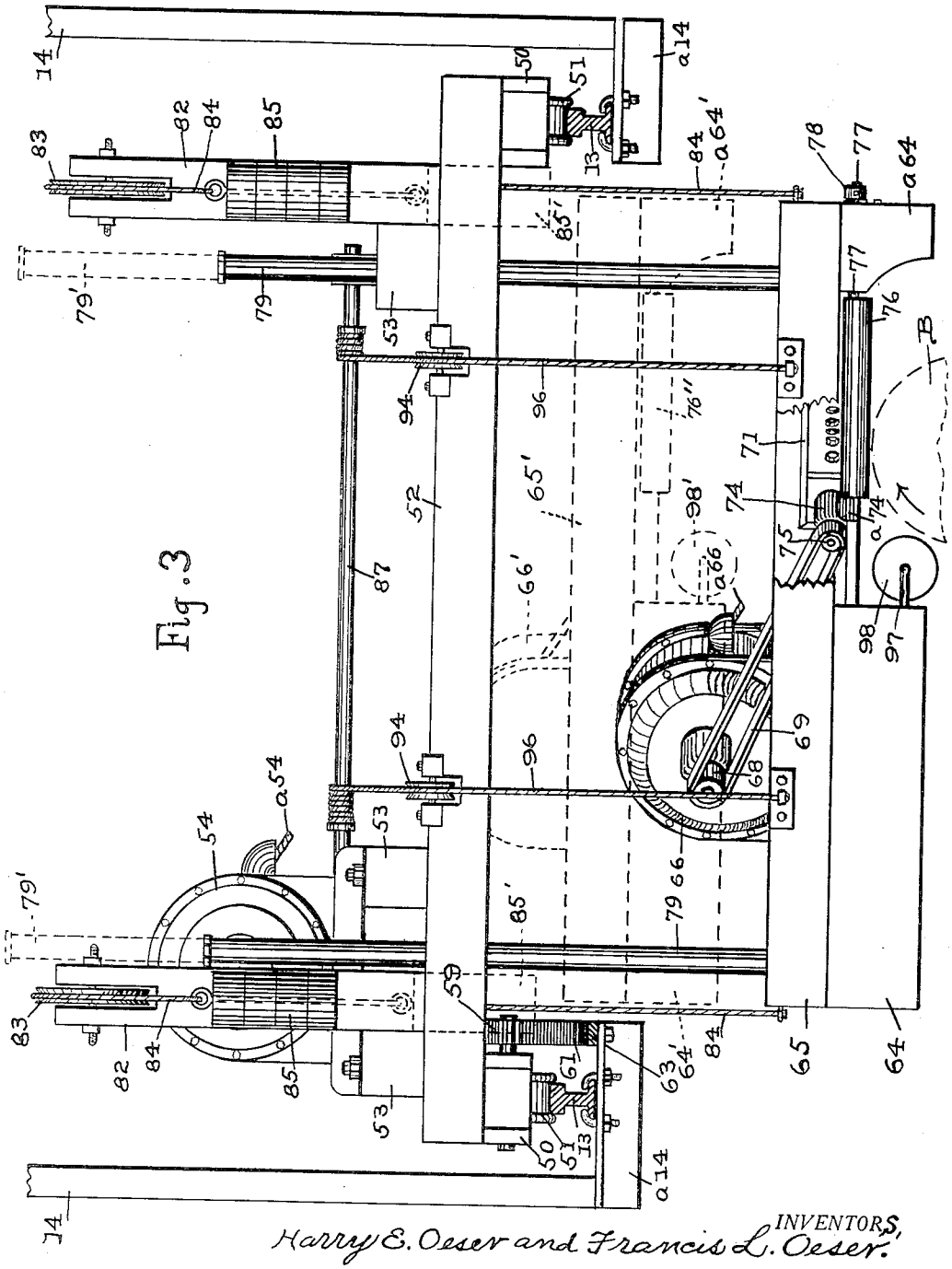


Fig. 3

Harry E. Oeser and Francis L. Oeser. INVENTORS,

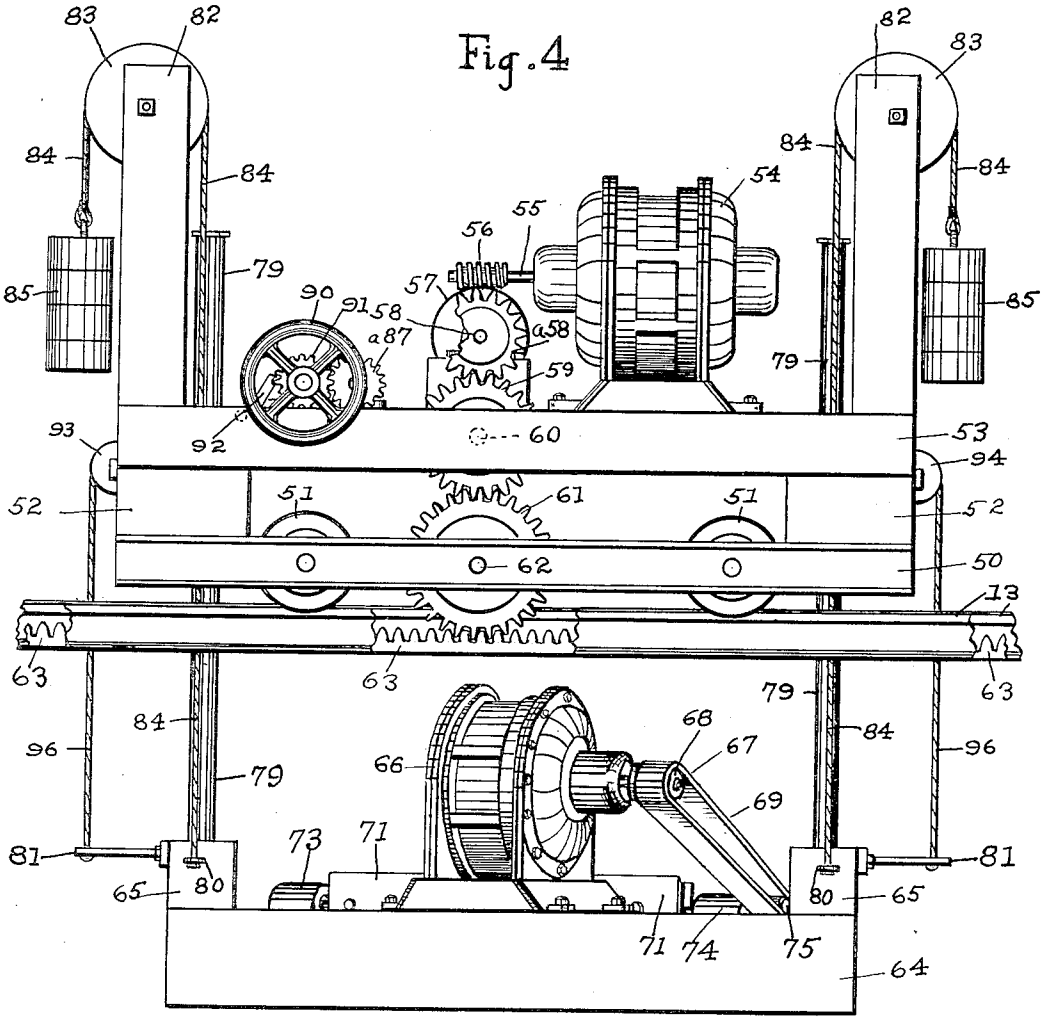
BY David E. Lain, ATTORNEY.

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POLE PLANING MACHINE

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Fig. 4



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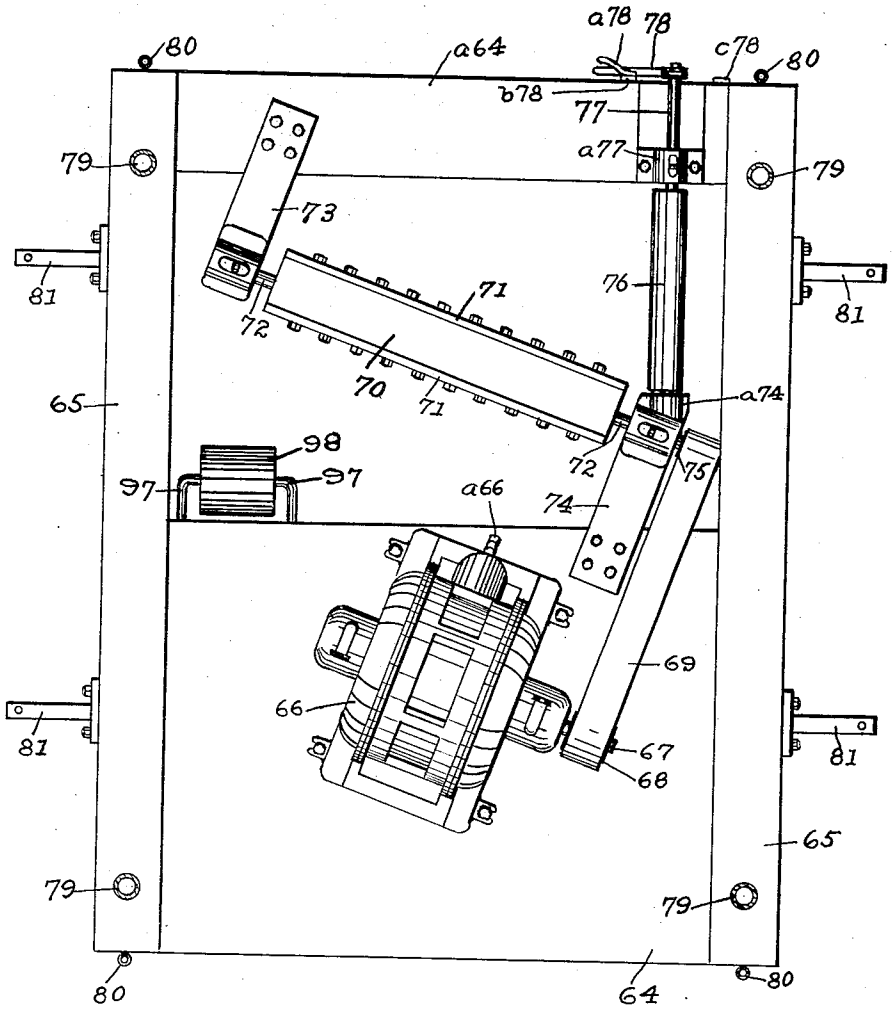


Fig. 5

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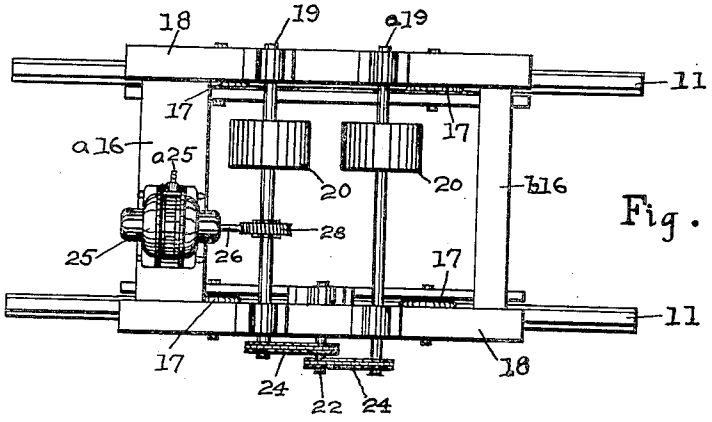


Fig. 6

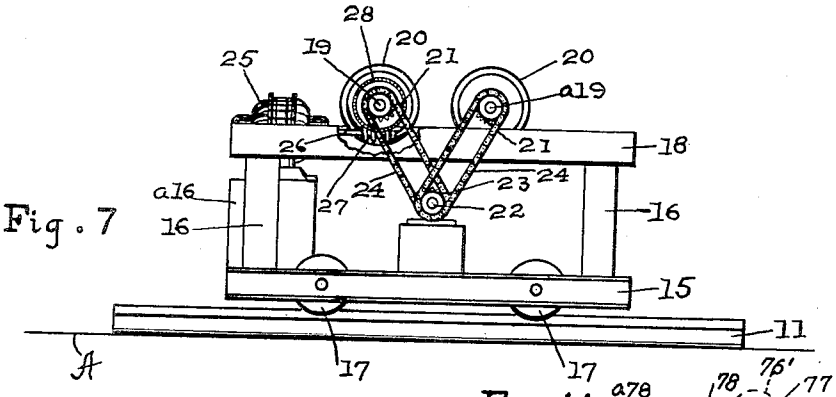


Fig. 7

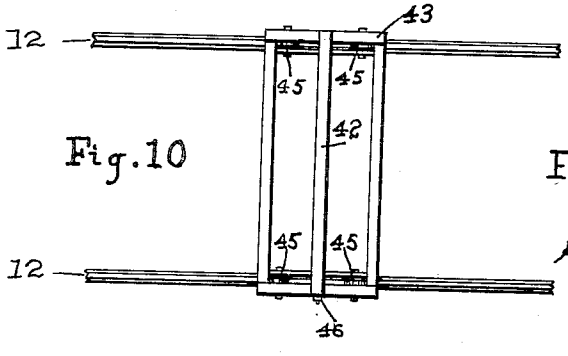


Fig. 10

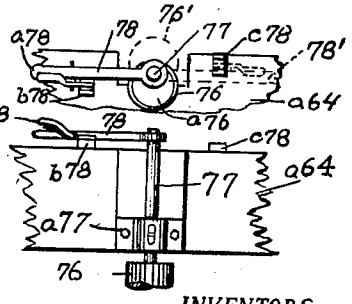


Fig. 11

Fig. 12

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POLE PLANING MACHINE

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Fig. 8

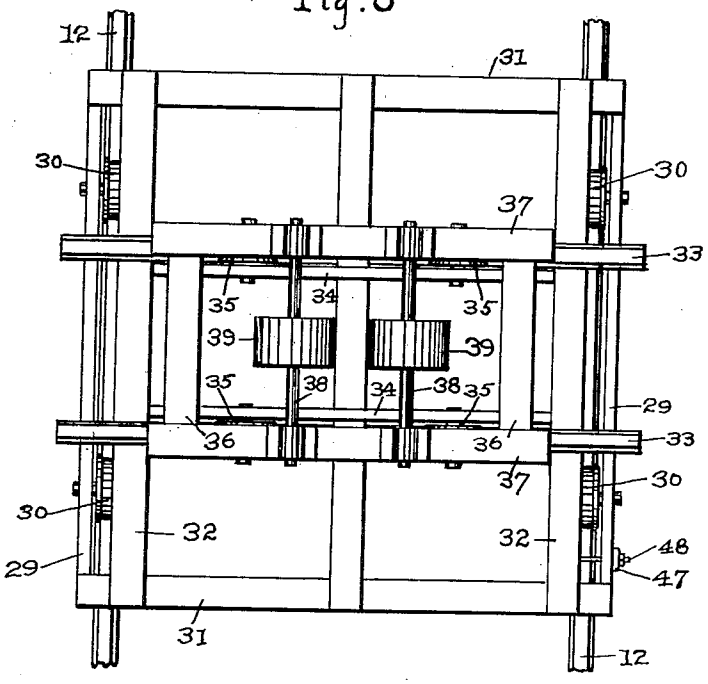
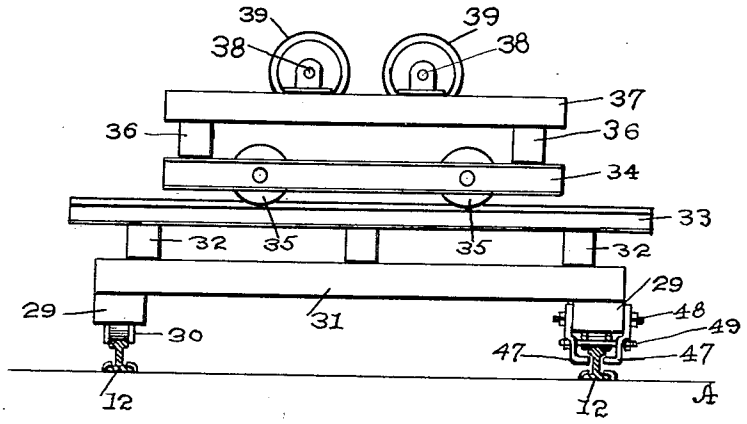


Fig. 9



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Patented Apr. 17, 1934

1,955,437

UNITED STATES PATENT OFFICE

1,955,437

POLE PLANING MACHINE

Harry E. Oeser and Francis L. Oeser,
Bellingham, Wash.

Application March 12, 1932, Serial No. 598,416

4 Claims. (Cl. 142—1)

Our invention relates to improvements in pole planing machines and has for an object to provide a machine for removing the sap or cambium layer from poles, more especially from those to be used for supporting over-head electric wires.

Another object of our improvement is to provide a pole planing machine suited for removing knotty protuberances from poles and reducing the surface thereof to approximate uniformity.

Another object of our improvement is to provide a machine suited for finishing the surface of poles without changing the general longitudinal shape thereof.

Another object of our improvement is to provide a pole planing machine in which a revoluble planer head is mounted for revolution on an axis across the pole and also mounted for moving longitudinally of the pole during said revolution.

Another object of our improvement is to provide a pole planing machine adapted for revolving the pole which is being planed thereby while the pole is automatically adjusted laterally to conform to the disposition of the longitudinally moving planer head thereof which is being revolved for planing the pole.

Another object of our improvement is to provide automatic vertical adjustment for said planer head whereby it may follow the contour of the revolving pole vertically while revolving and moving along the same.

Other objects of our improvement will appear as the description proceeds.

We attain these and other objects of our improvement with the mechanism illustrated in the accompanying seven sheets of drawings, which form a part of this specification, in which Figure 1 is a side elevation of my pole planer, drawn on a small scale, from which certain intervening parts are broken away for lack of space, Fig. 2 is a plan view of the planer truck with the planer-head frame mounted in operative position thereon, Fig. 3 is an end elevation of Fig. 2, Fig. 4 is a front side elevation of Fig. 2, Fig. 5 is a plan view of the planer-head frame shown by itself, Fig. 6 is a plan view of the live-roll cradle truck with rolls and motor mounted thereon in operative position, Fig. 7 is a front side elevation of Fig. 6, Fig. 8 is a plan view of the dead cradle-roll truck with rolls in place thereon, including also a main truck on which said dead cradle-roll truck is mounted, Fig. 9 is an end elevation of Fig. 8, Fig. 10 is a plan view of the adjustable pole-stop truck with the stop in place thereon, Fig. 11 is a fragmentary end elevation of a part of the planer-head frame showing an end view of the eccentric feed roll in place thereon, Fig. 12 is a plan view of Fig. 11, Figs. 13, 14 and 15 are details illustrating the relative positions of the knife edge, the pole and the eccentric roller with the planer carriage moving in the direction indicated by the arrows above the corresponding views.

Similar characters refer to similar parts throughout. Certain parts are broken away to show other parts hidden thereby or for lack of space.

With more particular reference to the designated parts: On the floor at the planer location near the head end of the same and transversely thereof are fastened live cradle-roll truck track rails 11, 11. On said location near said rails 11 and extended to the rear end of the planer are longitudinal floor-track rails 12, 12.

Suspended above the floor rails 12 and parallel therewith are the shear-track rails 13, 13. The rails 13, preferably, are supported on the hangers 14 which have brackets *a*14 fastened on their bottom ends to which said rails 13 are fastened. The hangers 14 are fastened on an overhead structure not shown.

The truck beams 15, 15 of the live-roll truck mount the wheels 17 for revolution and these wheels are mounted on transverse rail tracks 11. Said truck beams 15 are joined by the cross beams *a*16, *b*16 providing the lower truck frame. The four posts 16 are fastened to the cross beams *a*16, *b*16 and support the upper side rails 18, 18. The live-roll shaft 19 is mounted for revolution in bearings on rails 18 at right angles with track rails 11 and has one of the smooth live rolls 20 fastened thereon. The live-roll shaft *a*19 is mounted for revolution in bearings on the rails 18 parallel with shaft 19 and has the other smooth live roll 20 fastened thereon. The live rolls 20, 20 preferably have rubber tires which revolve the poles mounted thereon without scarring the same. Each of the shafts 19 and *a*19 has a sprocket wheel thereon in chain relation with one of two sprocket wheels fastened on the short shaft 22 which is mounted for revolution in a bearing fastened on the truck frame. The construction provides for driving shaft *a*19 by the shaft 19 in the same direction by two chains 24 on the said two pairs of sprocket wheels.

The electric motor 25, having electric wires *a*25 leading therein, is fastened on the truck cross beam *a*16 and its shaft 26 has worm 27 fastened thereon. On the shaft 19 is fastened the worm wheel 28 engaged with worm 27. The construction provides for driving both of live rolls 20 by electric motor 25 at a reduced speed.

The main truck beams 29, 29 mount the four track wheels 30 for revolution. The beams 29 are joined by the cross beams 31, 31, forming the truck frame, and said wheels 30 are mounted on longitudinal floor track rails 12, 12. On top of main truck cross beams 31 are fastened track tie beams 32 on top of which are fastened the track rails 33, 33 at right angles with the track 12. The track 33 is short and entirely borne on main truck 29, 31.

The upper truck beams 34, 34 mount track wheels 35 for revolution and the cross beams 36, 36 fastened to the beams 34 complete the truck frame, the wheels 35 of which are mounted to roll on truck track 33. Parallel roll shafts 38, 38 are mounted for revolution in bearings on the truck beams 37 at right angles with rail track 33 and parallel with floor rail track 12. The smooth dead rolls 39, 39 are fastened on shafts 38, 38 for revolution therewith.

A track clamp consists of two L-shaped bars 47, 47 which are fastened on opposite sides of one of main truck beams 29 by a bolt 48 extended through holes in the upper ends of said bars 47 and through a hole in beam 29. The said bars 47, being disposed with their arms facing each other on opposite sides of the web of a track rail 12, have alined holes through the middle portion of their length through which is extended the clamping bolt 49 disposed above the rail 12 as shown in Fig. 9. By tightening the nut on the bolt 49 the arms of the bars 47 clamp the web of the rail 12 therebetween and secure the truck 29, 31 to a desired location on floor track 12. By loosening said nut the track is again free to move along track 12. The construction provides for moving the main truck 29, 31 to a desired location on longitudinal floor track 12 and fastening it in that location in order to provide for the operative, automatic, transverse reciprocation of dead-rolls truck 34, 36 on track 33, while at the said location.

The general floor surface on which our pole planer is shown as being set up is indicated by the line designated by A in Figs. 1 and 7.

On the floor A at the front end of the planer is disposed the front pole stop 40 which is fastened to base 41 and the latter is fastened to the floor. Ordinarily the front pole stop does not require resetting to other locations when planing poles of varying length.

Near the rear end of the planer, to bear on the rear end of the pole being planed, is releasably fastened rear pole stop 42. The stop 42 is fastened to the frame of the truck 43, 44 which has four track wheels 45 mounted to run on the longitudinal floor track 12. Also fastened to said truck frame is track clamp 46 which is similar in every important particular to track clamp 47 above explained. So that, when the stop 42 is in the desired location to bear on the rear end of the pole being planed the track clamp 46 is fastened to the web of one of the rails 12 and thus the stop is retained in operative position for that particular pole. When a pole of another length is to be planed, the stop 42 is moved to the proper location to retain that pole from moving rearward and the track clamp 46 is used to retain the truck 44 in the new location.

As stated, the shear track 13 is disposed above longitudinal floor track 12 parallel therewith and preferably supported on an overhead structure, not shown, thus providing clear space between the rails.

The planer truck has wheel beams 50, 50 on which are mounted track wheels 51 for revolution. These wheel beams are fastened together by cross beams 52 and on top of the cross beams are fastened longitudinal beams, three of which are designated by 53 and one by *a*53.

The vehicle motor 54 is fastened on two of beams 53 and has electric wires *a*54, shown as broken away, leading thereinto. The motor 54 has worm 56 fastened on one end of shaft 55 thereof. The worm wheel 57 engages the worm 56 and is fastened on the shaft 58 which is mounted for revolution in the bearing *b*58 fastened on block *b*53. The block *b*53 is fastened on top of truck beam *a*53.

The toothed rack 63 is fastened along side of one of the rails 13 with its teeth projected upward. The spur gear 61 engages rack 63 and is fastened on the shaft 62 which is mounted for revolution in the bearing *a*62 fastened to one of truck-wheel beams 50. The spur gear *a*58 is fastened on one end of the worm wheel shaft 58 and is connected with spur gear 61 by the intervening idler gear 59. The idler gear 59 is mounted for revolution on the axle 60 which is fastened to one of the truck beams 53.

The described construction provides for the slow revolution of spur gear 61 whereby the planer truck may be driven forth and back on the track 13. The electric motor 54 is controlled electrically by the electrical control devices used in similar cases, not shown, but well known in the art, whereby the operation of a switch and a lever by hand will cause the planer truck to move at desirable operative speeds in either direction on track 13.

The planer truck frame has four uprights 82 fastened thereto on the upper end of each of which is mounted a counterbalance cable sheave 83. Also, the planer truck frame has two parallel windlass shafts 86 and 87 mounted transversely thereon for revolution. The shaft 86 being mounted in bearings 88, 88 and the shaft 87 being mounted in bearings 89, 89. Two cable sheaves 93, 93 are mounted on the planer truck frame for revolution in connection with windlass shaft 86 and the two cable sheaves 94, 94 are mounted for revolution on said truck frame for use in connection with windlass shaft 87. The combined ratchet and spur gear 91 is fastened on shaft 86 and the spur gear *a*87 is fastened on shaft 87 engaged with the gear 91. Said engaged gears are of the same diameter. The pawl 92 is pivoted on the truck frame and is engageable with ratchet and gear wheel 91. Hand wheel 90 is fastened on one end of the shaft 86. The construction provides for revolving the shafts 86 and 87 at the same rate in opposite directions by hand wheel 90 and holding the shafts against being revolved in one direction by the pawl 92.

The planer head frame has the longitudinal platform 64 and the longitudinal rail or beam *a*64 fastened together by the transverse beams 65, 65. Diagonally on platform 64 is fastened the electric motor 66 with electric wires *a*66, shown as broken away, leading therein. Said motor has the shaft 67 on one end of which is fastened the pulley 68.

The planer head 70 has shaft 72 and knives 71, 71 fastened thereto. The planer shaft 72 is mounted for revolution in the bearings 73 and 74, the former of which is fastened to the beam *a*64 and the latter to the platform beam 64. The pulley 75 is fastened on one end of the shaft 72 in belting relation with the motor pulley 68. The

belt 69 is placed on pulleys 68 and 75 to drive planer head 70 by the electric motor 66. The motor is provided with the well-known control devices, not shown, whereby it may be started and stopped by hand.

The eccentric roller 76 is mounted for revolution on eccentric *a*76 having shaft 77. The shaft 77 is mounted for revolution in a bearing shown at *a*74 as integral with bearing 74 and in the bearing *a*77 fastened on the beam *a*64 to dispose roller 76 transversely of the planer head frame. The end of shaft 77 in the bearing *a*77 is extended and has handle 78 fastened thereon. The handle 78 is provided with the spring-pressed pivoted finger *a*78 which may be engaged in notches *b*78 or *c*78, provided in the beam *a*64 and disposed to retain the handle 78 in either of two opposite positions in rotation. The construction provides for moving roller 76 from an extreme lower position in which it is shown in solid lines to an extreme upper position in which it is shown in dotted lines in Fig. 11 at 76′ when the handle is at 78′ and retaining the roller in either of these two extreme positions. When in said extreme lower position the bottom line of the roller 76 is in a horizontal plane through the bottom line of the path of knives 71 when the planer head 70 revolves, and when the roller 76 is in its extreme upper position at 76′ the bottom line of said roller is in a horizontal plane lying a distance above the horizontal plane through the bottom line of the path of the planer knives 71 equal to the depth of a planer cut.

Roller axle 97 is fastened to platform beam 64 and mounts the roller 98 longitudinally of the planer head frame and adjacent of the pole being planed by the machine as shown in Fig. 3 in which B indicates a fragmentary end elevation of a pole shown in dotted outline.

The roller 98 serves as a stop to prevent further movement of the pole transversely when it bears thereon.

Vertical guide posts 79, 79, 79, 79 are fastened near the ends of transverse beams 65, 65 and are extended through guide-way holes in transverse beams 52, 52 on the planer truck. The posts 79 and said guide-way holes coact to mount the planer-head frame on the planer truck for vertical reciprocation.

The four eyebolts 80 are fastened on the planer-head frame near the corners thereof and to them are fastened the lower ends of the four cables 84 each of which is placed over one of the sheaves 83 and has its other end fastened to one of the four counterweights 85. The counterweights 85 together weigh nearly but not quite as much as the fully equipped planer-head frame with all mechanism thereon in operative condition, so that while the planer head 70 always tends to move downward against the weight of the counterweights it is urged by a small force only in that direction.

Four windlass-cable brackets 81 are fastened to the planer-head frame beams 65, 65, and to them are fastened the lower ends of four windlass cables, two of which 95, 95 are placed on the sheaves 93, 93 and have their upper ends fastened to the shaft 86 and the other two 96, 96 are placed over sheaves 94, 94 and have their upper ends fastened to shaft 87. The construction provides for lifting the unbalanced weight of the planer-head frame by turning hand wheel 90 and retaining the frame in desired levels by pawl 92. So that the pawl 92 retains the planer-head frame at desired levels when not in operation, and when the planer is operating the planer-head frame is lowered by means of the hand wheel 90 and the weight thereof rests on the pole being planed with which planer knives 71 and the roller 76 contact.

To plane a pole in this machine, it is placed on cradle rolls 20, 20 and 39, 39, as shown in Fig. 1, with its butt end against stop 40 and its small end against stop 42. The stop 42 has been adjusted to bear lightly against the pole end, as above explained, by setting truck 44 at the proper place on the rails 12 and securing it in that place by means of the rail clamp 46. The motor 25 is started revolving to cause the pole B to revolve clockwise, as viewed at its butt end, as indicated by the arrow in Fig. 3. The roller 76 is set in its solid-line position shown in Fig. 3.

The motor 66 is caused to revolve, driving the planer head 70. The planer-head frame is lowered by means of handle 90 bringing the planer knives 71 on top of the pole at the butt thereof and also the roller 76 on top of the pole close to the revolving planer knives to roll over the surface of the pole as finished by the planer and retain the same on a level with said finished pole surface. With this cooperation between the roller 76 and the planer head the roller serves as a guide to determine the depth at which said knives may cut and causes them to follow nearly a straight line regardless of the irregular contour of the natural surface of the pole.

As soon as the desired character of work is started at the butt end of the pole, pawl 92 is disengaged, motor 54 is started and the planer truck together with the planer head is caused to slowly move toward the small end of the pole with the planer head smoothing the pole surface as it proceeds. Having thus reached the small end of the pole and smoothed the pole surface by making one cut thereover, if the surface is found to have been finished to the degree desired, the planer-head frame is raised by turning hand wheel 90 and retained above the pole by pawl 92 when motor 66 is at 66′, beam 65 at 65′, beam *a*64 at *a*64′, beam 64 at 64′, guide posts 79 at 79′, roller 76 at 76″, roller 98 at 98′, and counterweights 85 at 85′. Then motor 54 is started in the reverse direction and the said truck and planing mechanism is returned to the butt end of the pole, at a more rapid rate than during its cutting trip if desired. The pole, being finished, is removed from the cradles and its place taken by another to be planed.

Having made the first planer cut, if the surface is not satisfactorily smooth, when at the small end of the pole, the roller handle 78 is disengaged from catch *b*78 and turned to engage catch *c*78 at 78′ causing roller 76 to be at 76′, see Fig. 11, above the cutting level of knives 71. During the return cutting trip the roller 76 runs on the pole surface made by the first cut and allows knives 71 to make a second cut over the pole surface at a depth below the same equal to the distance of the bottom line of the roller above the bottom line of the revolving knives. In practice it has been found that not more than two cuts are needed to provide a satisfactory pole surface.

By referring to Fig. 3 roller 98 is shown adjacent pole B. The action here is that by revolving the pole forward, as indicated by the arrow, the pole, being engaged frictionally at its top surface by roller 76 and by the cutting knives 71 it may be said to fulcrum on its top surface and be urged toward the roller 98 by the said forward revolution of the pole. In practice, that is what occurs. During planing operations the pole is urged toward the roller 98 to alternately contact there-

with and then move a short distance therefrom. The stop roll 98 in cooperation with the described mechanism and the forces acting on the pole while being planed serve to retain a changing part of the pole beneath the revolving cutter head knives 71.

The poles which this planer is designed to surface are selected in the forest for their straightness. But, of course, they are not straight and our planer is designed to accommodate its operations to poles which are crooked to a degree.

As described, the planer head while revolving also moves along the shear track 13 forward and backward. The planer head also is free to move vertically in guides to accommodate the changing positions, vertically, of the particular eccentric part of the pole being planed thereby. Hence, this particular portion of the pole must be maintained beneath the planer head which requires that the remainder of the pole be moved laterally to attain this end. Meanwhile the pole must be continually revolved.

In practice these requirements are met by using the two automatically transversely adjustable pole cradles the rolls of one of which are driven. As described, the pole B is mounted in operative position on the two pairs of cradle rolls 20, 20 and 39, 39, the former pair being driven by electric motor 25 causing the pole to rotate, and each truck on which each of the pairs of cradle rolls is mounted is free to reciprocate transversely of the said track 13 thus providing the required lateral freedom for different parts of the revolving crooked pole.

Having thus disclosed our invention, what we claim as new therein and desire to secure by Letters Patent is,—

1. The pole mounting and revolving mechanism of a pole planing machine including two pole cradle roll trucks, separate parallel tracks for said pole cradle roll trucks to roll thereon, a pair of smooth pole cradle rolls mounted for revolution in bearings on each of said trucks on parallel axes disposed at right angles with said tracks, means for revolving the pair of pole cradle rolls on one of the said trucks while rolling on one of the said tracks, and pole stops disposed to prevent reciprocation of poles being revolved on the said cradle rolls.

2. A pole planing machine including a revoluble planer head, a planer shear track on said machine disposed longitudinally thereof, controllable means for moving said planer head forward and backward on said shear track while being revolved, guides providing for the vertical reciprocation of said planer head while being revolved and moving on said shear track, means for revolving said planer head, while moving longitudinally and vertically, two pole cradle trucks, separate parallel tracks disposed beneath said shear track at right angles to one another for rolling said pole cradle trucks thereon, a smooth pair of pole cradle rolls mounted for revolution on each of said pole cradle trucks, means for revolving the said pair of cradle rolls on one of said cradle roll trucks while the said truck is rolling on the said truck tracks, and pole stops disposed to bear on the ends of poles being revolved on and by the said cradle rolls preventing reciprocation of the said poles.

3. In a pole planing machine in combination, a shear track disposed longitudinally of the machine, a planer truck to run on the shear track having vertical guide ways therein, counterweight sheaves mounted for revolution on the planer truck, windlass sheaves mounted for revolution on the planer truck, a pair of windlass shafts mounted for revolution on the planer truck, mechanical driving connections between the windlass shafts, a ratchet wheel and a hand wheel fastened on one of the windlass shafts, a pawl pivoted on the planer truck to engage the windlass shaft ratchet wheel, a planer head frame disposed beneath the planer truck, vertical guides fastened on the planer head frame being engaged in the said planer truck guideways for reciprocation, a plurality of cables one end of which is fastened to the planer head frame each being passed over one of the counterweight sheaves on the planer head truck, a counterweight fastened to the other end of each of the cables on the counterweight sheaves, a plurality of windlass cables one end of which is fastened to the planer head frame each being passed on one of the said windlass sheaves on the planer head truck having its other end fastened to one of the said windlass shafts on the planer head truck, a planer head having planer knives fastened thereon mounted for revolution on a horizontal axis on the planer head frame, an electric motor, having electric wire connections, fastened on the planer head frame being mechanically connected with the planer head to revolve the same, a vertically adjustable roller mounted for revolution on the planer head frame parallel with a horizontal plane through the planer head axis disposed for rolling on the work to control the depth of cutting by the planer head knives therein, means to set and retain the vertically adjustable roller, a pole guide roller mounted for revolution on an axis longitudinal of the planing machine to limit the transverse movements of the work in one direction, disposed on the planer head frame adjacent the planer head, a driver cradle roll truck disposed beneath the shear track to reciprocate at right angles therewith, a pair of driver cradle rolls mounted for revolution on axes operatively parallel with the said shear track on the driver cradle roll truck, means to drive both of the driver cradle rolls simultaneously while they reciprocate beneath the shear track, a dead cradle roll truck disposed beneath the shear track to reciprocate at right angles therewith, a pair of dead cradle rolls mounted for revolution, on axes operatively parallel with the shear track, on the dead cradle roll truck, mechanical means to reciprocate the planer truck on the shear track during the revolution of the planer head and the vertical reciprocation of the planer head frame, a stationary pole-end stop disposed beneath the shear track near one end of the same, and an adjustable pole-end stop releasably fastened beneath the shear track near the other end of the same.

4. A pole planing machine including a planer head carriage, a revoluble planer head mounted on the said carriage, a planer shear track on the said machine disposed longitudinally thereof, controllable means for moving the said planer head carriage forward and backward on the said shear track while the said planer head is being revolved guides providing for the vertical reciprocation of the said planer head carriage while the same is moving on the said shear track, means for revolving the said planer head while the same is being moved in the said vertical guides and on the said shear track, two pole-cradle-roll trucks, separate tracks beneath the said shears at right angles therewith on which the said pole-cradle-roll trucks are mounted for rolling, means for revolving the said rolls on one of the said cradle-roll

trucks while the same is rolling, a roller mounted for revolution on an eccentrically mounted shaft, the said shaft mounted eccentrically for revolution in bearings on the said planer head carriage disposing the said roller thereon for contact with a pole mounted for revolution on the said pole-cradle-roll trucks controlling the depth of cut being made in the said pole by the said planer head, and manually controlled means to set and retain the said eccentrically mounted shaft in either one of two desired positions.

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