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Westfall

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[54] **LOG POSITIONERS**

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[21] Appl. No.: **425,288**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 264,739, June 21, 1972, abandoned.

[52] **U.S. Cl.** **83/723;** 83/435.1; 83/713; 83/716; 83/722

[51] **Int. Cl.**..... **B27b 7/00;** B27b 29/10

[58] **Field of Search** 83/713, 714, 716, 719, 83/720, 721, 722, 723, 724, 726, 727, 728, 83/435.1

[56] **References Cited**

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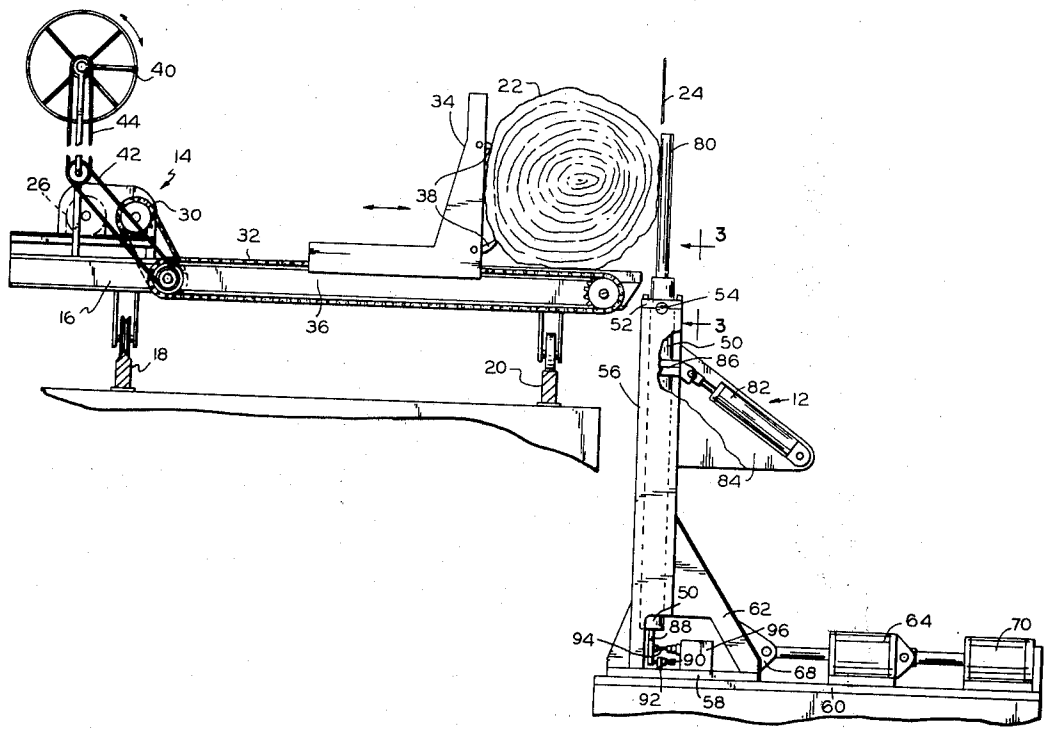
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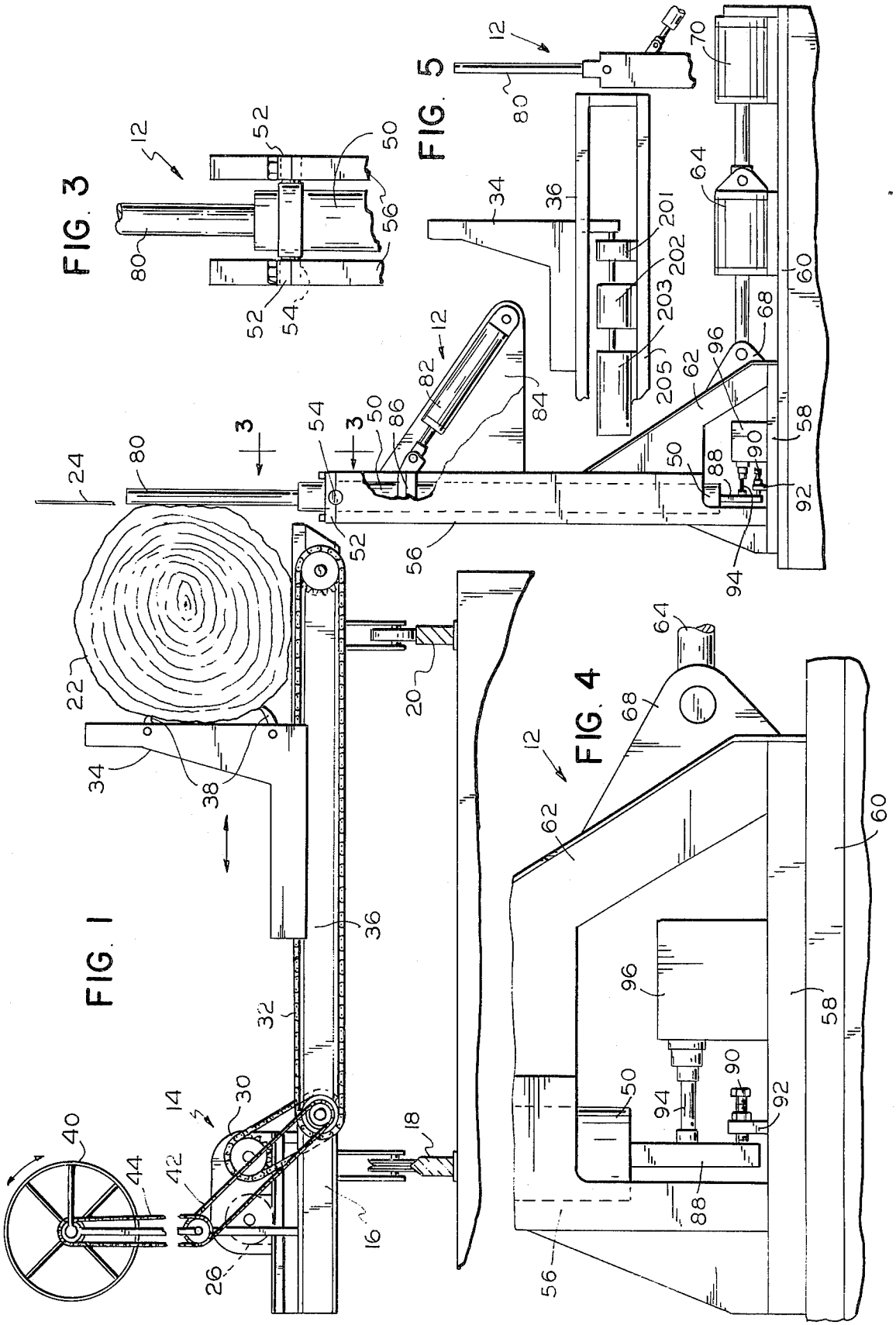
Primary Examiner—Donald R. Schran
Attorney, Agent, or Firm—Klarquist, Sparkman, Campbell, Leigh, Hall & Whinston

[57] **ABSTRACT**

A positioner includes a feeler rod extensible by a piston carried by a pivotably mounted cylinder biased toward a normal position actuating a switch to one condition. When a log is moved laterally by a bottoming out type of setworks of a head rig into engagement with the feeler rod, the cylinder is pivoted away from its normal position to actuate the switch to a different condition, which causes an indication of a precise position of the log. A setworks in which a series of additively connected cylinder drives functions to locate a knee means for a desired cut on a log. A setworks in which a vernier adjusting mechanism precisely locates the knee means, which is held in position by an independent stopping means, and wherein while the knee means is so held the vernier mechanism is reset for subsequent full range operation.

2 Claims, 8 Drawing Figures




FIG. 1
FIG. 3
FIG. 4
FIG. 5

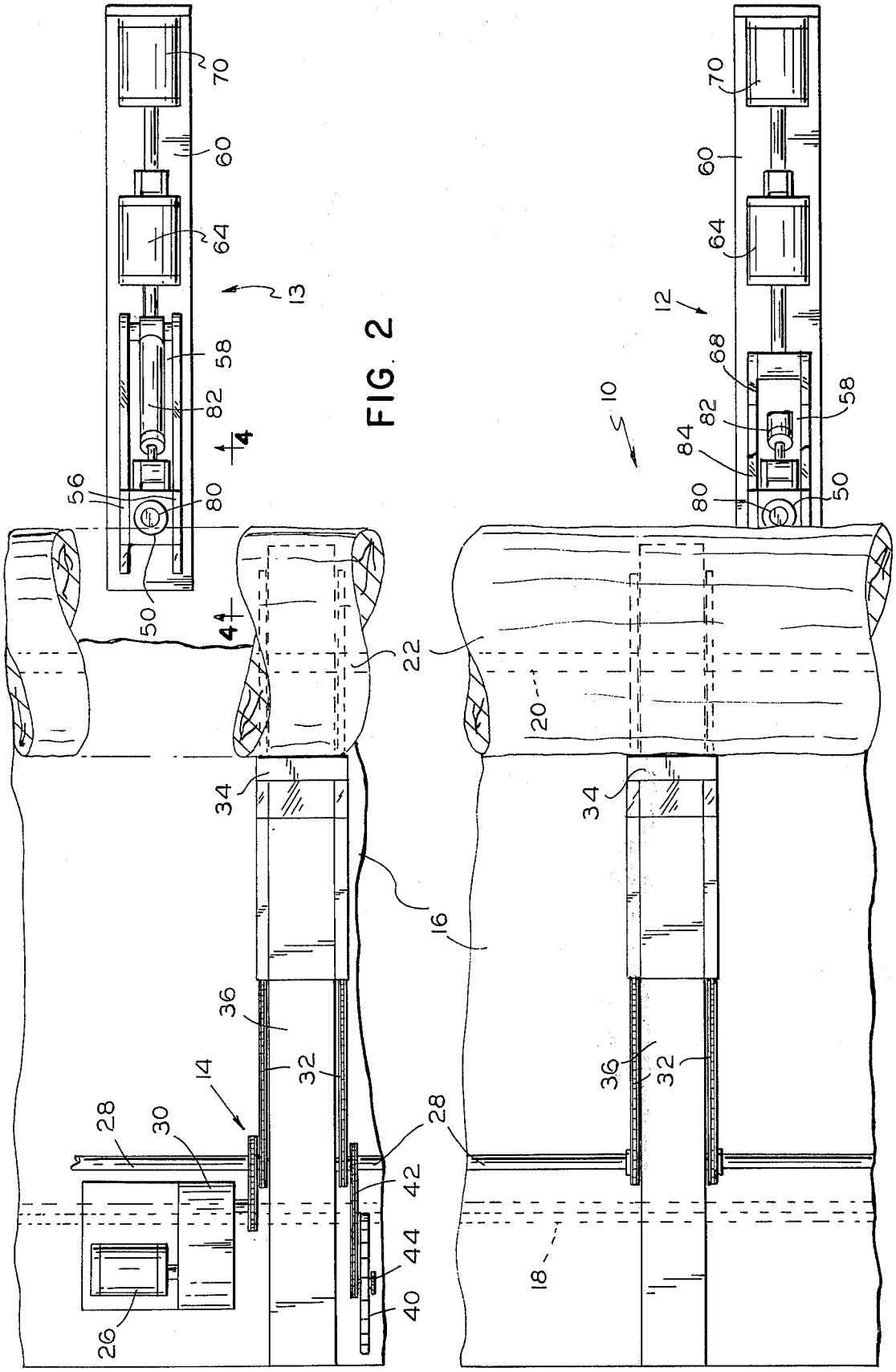

70
60
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13
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82
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14
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30
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68
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18

FIG. 2

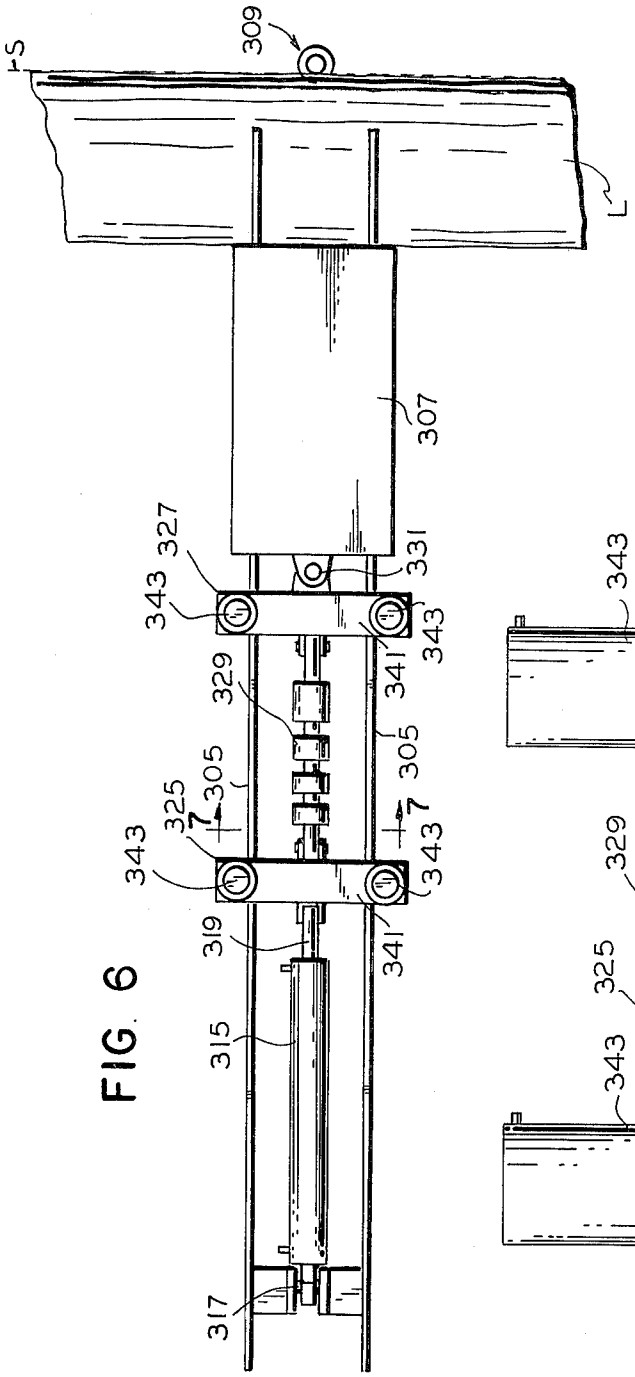


FIG. 6

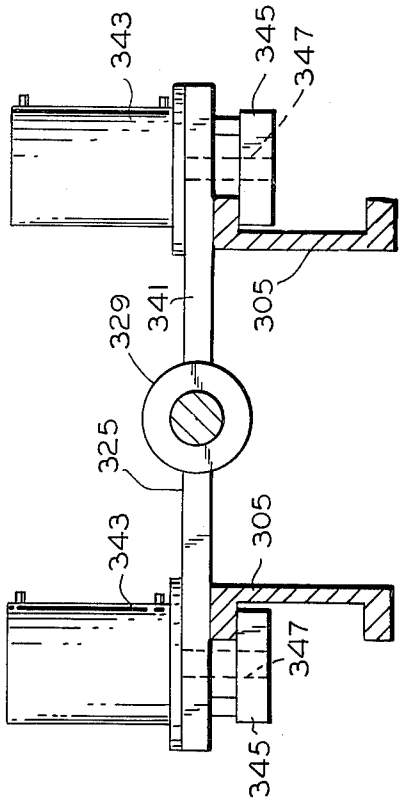


FIG. 7

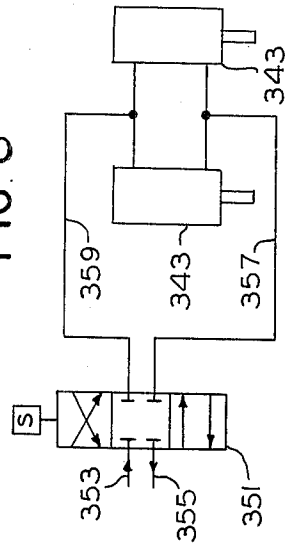


FIG. 8

LOG POSITIONERS

PREVIOUS APPLICATION

This application is a continuation-in-part of my prior co-pending application entitled "Improved Log Positioners," Ser. No. 264,739, filed June 21, 1972 now abandoned.

DESCRIPTION

This invention relates to improved log positioners, and more particularly to new and improved head rig log positioners.

An object of the invention is to provide new and improved log positioners.

Another object of the invention is to provide new and improved head rig log positioners.

A further object of the invention is to provide a new and improved feeler device for establishing the backstand of a log carriage.

Another object of the invention is to provide a head rig feeler device including a feeler member bodily movable into and out of the path of a log being positioned.

Another object of the invention is to provide a feeler device movable by setworks.

Another object of the invention is to provide a very precise, rugged feeler device for a head rig.

Another object of the invention is to provide a non-creeping setworks for a head rig carriage.

Another important object is to provide a setworks having a vernier drive for a knee, and independent stopping means for holding the knee in fixed position until release of the stopping means, in combination with other means for resetting the vernier means while the knee means are so held.

In the drawings:

FIG. 1 is a fragmentary, vertical, sectional view of a head rig carriage and a positioner structure forming one embodiment of the invention;

FIG. 2 is a fragmentary, top plan view of the carriage and the positioning structure of FIG. 1;

FIG. 3 is an enlarged, fragmentary, elevation view taken along line 3—3 of FIG. 1;

FIG. 4 is an enlarged, fragmentary, elevation view taken along line 4—4 of FIG. 2;

FIG. 5 is a side elevation view of a preferred form of my invention;

FIG. 6 is a plan view of a vernier type mechanism for adjusting the position of a knee;

FIG. 7 is an enlarged sectional view taken along line 7—7 of FIG. 6; and

FIG. 8 is a schematic circuit diagram of certain of the stopping cylinders.

DETAILED DESCRIPTION

Referring now in detail to the drawings, there is shown therein a head rig **10** (FIG. **1**) including identical positioners **12** and **13** forming one embodiment of the invention. The head rig includes a known electromechanical setworks **14** on a carriage **16**, which is movable along track rails **18** and **20** to move a log **22** to and past a saw band **24** to saw cants from the logs. The setworks **14** includes a reversible electric motor drive **26** (FIG. **2**), which drives a line shaft **28** through reduction gearing **30**. The line shaft drives chain-and-sprocket drives **32** to move knees **34** along transverse guides **36** of the carriage to move the log **22** laterally on the carriage. The knees **34** carry dogs **38** (FIG. **1**), which hold

the log against the knees. The line shaft also drives an indicator **40** through chain-and-sprocket drives **42** and **44** to give a visual indication of the position of the right-hand edge of the log.

In the drawings, the upper reach of the chain drive to the knee is shown as projecting above the upper face of the guide **36** for convenience in illustration. In practice, it is below such face so that the log rests on the guide, not the chain.

The positioners **12** and **13** very precisely position the log **22** at the zero position to calibrate the setworks **14**, and also may be used to very precisely position the log for cutting cants. The positioner **12** includes a double-acting cylinder **50** pivotally mounted by bearings **52** and a trunnion **54** near the upper end of the cylinder. The bearings are mounted on uprights **56** on a slide **58** movable along a guideway **60** extending transversely of the track rails **18** and **20**. The uprights are rigidly connected to a clevis **68** brazed to the brace **62** and also is connected to a fixed setworks unit **70**. The two setworks units **64** and **70** are shown in FIG. **1** in their extended position, and each may be retracted individually under the control of the operator, it being understood that the positioner **13** is set identically with the setting of the positioner **12**.

A piston rod **80** serves as a feeler, and is carried by the piston (not shown) in the cylinder **50**. The cylinder **50** may be actuated to move the rod **80** to its extended position as shown in FIG. **1** and hold the rod in this position, and the cylinder **50** also may be actuated to retract the rod to a position below the top of the carriage. A single-acting cylinder unit **82** is connected between a bracket **84** fixed to the uprights **56** and a band **86** fixed to the cylinder **50**. The cylinder unit **82** urges the cylinder **50** counterclockwise, as viewed in FIG. **1**, toward a vertical position in which a bar **88** on the lower end of the cylinder engaging a stop **90** in the form of an adjustment screw on a bracket **92**. In this position, the bar **88** also engages a plunger **94** of a limit switch **96** mounted on the slide **58**. When the log **22** reaches the desired position on the carriage, the log pushes the rod **80** to move the bar **88** away from the stop **90** just sufficiently to cause the switch **96** to be actuated. The switch **96** may be connected to the motor drive **26** to stop the motor drive **26** with the log precisely at the zero point, or the switch may be connected to a suitable indicator (not shown) to indicate to the operator when the log is at the zero point. When the cylinder unit **64** is retracted, positioner **12** or positioner **13** with the switch **96** and the corresponding switch of the positioner **13** connected in series to the motor drive, disconnects a clutch and applies a brake of the motor drive when the log is precisely in position for a cut of a predetermined thickness by the saw band **24**. Similarly, when both the cylinder units **64** and **70** are retracted and the switch **96** and that of the positioner **13** are so connected to the motor drive, the positioner **12** or **13** stops the motor drive when the log is precisely in position for a cut of a greater predetermined thickness.

The switch **96** (and that of the positioner **13**) is actuated by movement of its plunger of only a few thousandths of an inch, and the length of the lever arm formed by the point of contact of the log on the rod **80** to the trunnion **54** is a small fraction of the length of the lever arm from the trunnion to the plunger **94** of the switch **96**, which amplifies the movement of the feeler

rod by the log. Preferably, in setting the zero position, the switches of both the positioners **12** and **13** are connected in series to the motor drive **26** so that whichever positioner is actuated first by the log stops the carriage setworks.

Embodiment of FIG. 5

FIG. 5 shows a preferred embodiment of the invention in which the positioner **12** is bodily stationary, rather than being moved by cylinders **64** and **70**, while each knee **34**, instead of being driven by a motor **26**, is driven by a series of "bottoming out" double acting cylinders, three of which **201**, **202** and **203**, are shown. The cylinders are supported on a guide **205**, which in turn is rigidly affixed to the associated guide **36**. The cylinders vary in size (bottoming out movement) from, say one thiry-second inch up to **16** inches of **32** inches in a geometric progression, so that any distance between one thirty-second inch and **63 31/32** inches can be obtained to one thirty-second of an inch. Controls (not shown) enable all or any combination of the cylinders to be energized. While the motor **26** is not used, the chain drive to the indicator **40** is retained.

In operation, the feeler **80** would be retracted to allow the log to be passed over it and against the knees to be clamped thereagainst. Now, the cylinders are energized to move the log out until the feeler is engaged, which breaks the circuits to the solenoid valves for the cylinders to hold them stationary, and lowers the feeler. This establishes a "zero" or backstand position for the log which is observed by the operator on the indicator **40**.

The fluid is then selectively routed either manually or by an override logic circuit to the cylinders until the backstand position is attained to one thirty-second of an inch with all cylinders bottomed out. Now, a cut is selected, and the fluid re-routed to obtain the desired cut with all cylinders bottomed out. For instance, assume that there is a **27** ½ inch backstand (distance from the knee face to the saw line). This would be obtained by bottoming out the following cylinders, **16** inches, **8** inches, **2** inches, **1** inch and ½ inch. Now to get a **4** inch cut, the **4** inch cylinder would be energized and bottomed out to move the log forwardly exactly four inches and hold it there without creep.

However, suppose that the backstand is **22** inches. This would be obtained by bottoming out the following cylinders: **16** inches, **4** inches and **2** inches. Now, to get a four inch cut with all cylinders bottomed out, the **4** inch cylinder would be contracted while the **8** inch cylinder is expanded — both bottomed out — to get an exact **4** inch cut without creep.

It is evident that while the cylinders could be manually controlled, a logic circuit would be much more desirable.

Embodiment of FIGS. 6 – 8

Referring to FIG. **6**, there is a pair of guides **305** for a knee **307**, there being a pair of such knees for the log L. The knees carry the log L into contact with a gauge generally entitled **309**, which is like the gauge in FIG. **5**. The letter S indicates the saw line and thus the expected cut.

The knee **307** is actuated by a cylinder arrangement which includes a master or reset cylinder **315**, and a vernier mechanism in the form of a series of binary cylinders **329**. The master cylinder has its rear end anchored at **317** in stationary relation to the guides **305** of the carriage. The piston rod **319** of the cylinder **315** is in driving relation to the binary cylinders, there being a hydraulic clamp **325** interposed between the rod **319** and the rear end of the series of binary cylinders. The binary cylinders in turn are in driving relationship to the knee **307**, there being a second hydraulic clamp **327** interposed between the head or front end of the series of binary cylinders and the knee means. The second hydraulic clamp is coupled at **331** to the knee **307**. The hydraulic clamps are mounted in sliding or guided engagement with the guides **305**, but when actuated clamp against the guides and hold certain elements in fixed position.

The binary cylinders **329** are like the cylinders **201**, **202** and **203** in that the piston of one is connected to the cylinder of the next so that the movements of the pistons are additive.

FIG. **7** shows the construction of the hydraulic clamp **327**. It includes a base member **341** slidably engaging the guides **305** and overhanging them. There is a hydraulic cylinder **343** at each end of the base member having an angle clamp lug **345** actuated by the piston rod **347**.

When the clamp lugs **345** of the two ends of the base member are clamped upwardly, the whole clamp unit is held in a rigid, fixed relationship to the guides **305**. When the clamp lugs are moved downwardly, the hydraulic clamps are released for movement along the guides **305**. Clamp **325** is similar in construction to clamp **327**.

FIG. **8** shows the hydraulic circuit for the cylinders **343** of the hydraulic clamp **327**. A similar circuit is provided for the hydraulic clamp **325**. In FIG. **8** a pressure line **353** and a return line **355** are connected to one side of a solenoid operated reversing valve **351**, whereas routing line **357** and **359** lead from the valve to the lower and upper portions of the cylinders **343**, respectively. The reversing valve **351** can have a neutral position as shown and two operative positions. To activate the cylinders **343** the valve is shifted to supply fluid under pressure through the line **357**. To inactivate the cylinders, the valve **351** is shifted to supply fluid under pressure to line **359**.

In operation, assume that the double acting binary cylinders **329** are collapsed and both hydraulic clamps are in released condition. The master cylinder **315** is energized to move the log L forwardly until it engages the gauge **309**. Such engagement actuates the switch associated with the tilt gauge. This switch is electrically connected to the solenoid valve **351** of clamp **325**, so as to shift the spool of the valve so as to supply fluid under pressure through line **357** to actuate clamp **325**. Thus the clamp **325** is now held in rigid relation to the guides **305**.

After the gauge rod has been lowered, the appropriate binary cylinder or cylinders are actuated to move the log L beyond the saw line S the desired amount for the desired cut. Thereupon, the reversing valve for clamp **327** is actuated to energize the clamp to fixedly hold the knee **307** in the desired cutting position for the log L. Now, the carriage can be advanced along the saw line to pass the log through the saw.

While this is happening, clamp **325** is released and the master cylinder actuated to take up the movement of the binary cylinders so as to collapse them, whereafter the clamp **325** is again energized to set it. Thus, by

the time that the log has returned to its FIG. 6 position (in spaced relation from the saw) the binary cylinders are in condition for resetting the log for the full range of movement available to the binary cylinders.

Now, leaving the clamp **325** activated, the clamp **327** is released and the appropriate binary cylinder or cylinders are activated to reposition the knee **307** and thus the log L for a second or subsequent cut of the log to a desired extent. Then the clamp **327** is again activated to hold the log fixed and to enable the carriage to be advanced to take the subsequent cut, during which the clamp **325** is again inactivated to reset the binary cylinders for subsequent full range operation.

An advantage of the FIG. 6 form of the invention is that the binary cylinders need only have a combined travel equal to the greatest cut that is to be made. They do not have to have a combined travel equal to the entire range of movement of the knee. Another advantage of the FIG. 6 form of the invention is that it is unnecessary to rely upon the holding power of the binary cylinders. Instead, the hydraulic clamp **327** functions to rigidly hold the knee in a desired adjusted position. Thus, it is only necessary that the binary cylinders be used for adjustment, not holding purposes.

What is claimed is:

1. In combination,

feeler means at a sawline having a log contact member,

setwork means for advancing a log laterally toward and past the feeler means,

means responsive when the contact member is engaged by the forward side of the log for indicating a position of the log in which the forward side of the log is at the sawline,

and retracting means for lowering the contact member out of the path of the log to permit the setworks means to advance the log beyond said position, the retracting means comprising a cylinder for raising the contact member to an extended position in the path of a log and for lowering the contact member to a retracted position out of the path of a log, said responsive means including sensing means responsive to the contact of the log with the contact member for giving an indication of the contact.

2. The combination of claim **1** including mounting means mounting said cylinder pivotally, and limit switch means operable by pivoting of said cylinder.

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