Dec. 14, 1965 H. L. SCHNAIDT ETAL 3,222,851

AUTOMATIC PICKER HEAD ELEVATION CONTROL

Filed Feb. 1, 1963 2 Sheets-Sheet 1

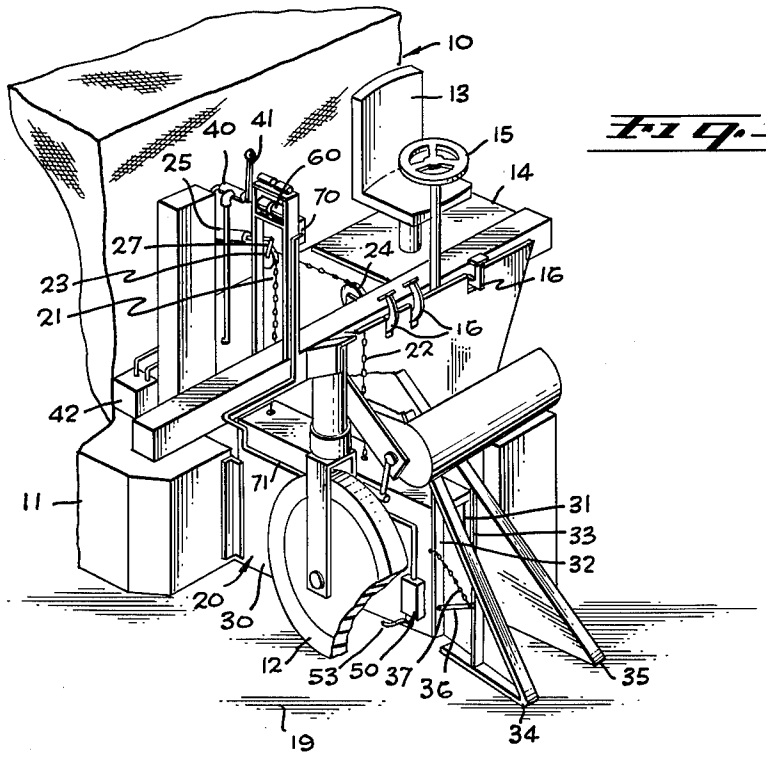
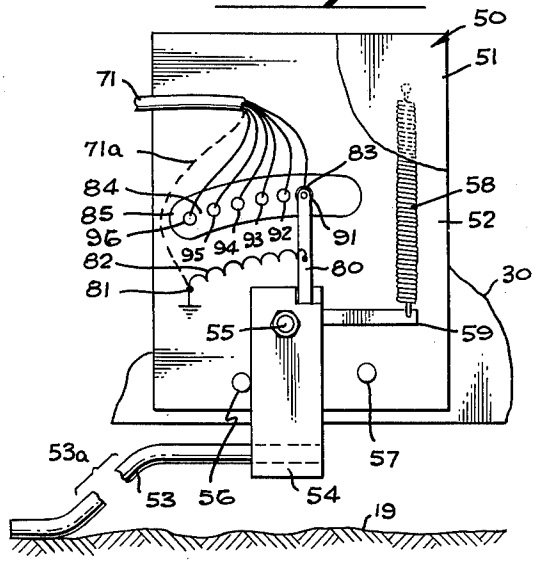


Fig. 1

Fig. 2



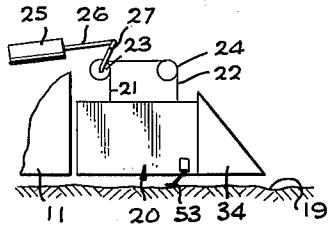


Fig. 1a

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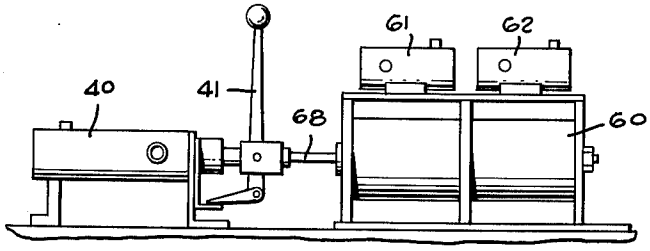
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Fig. 3



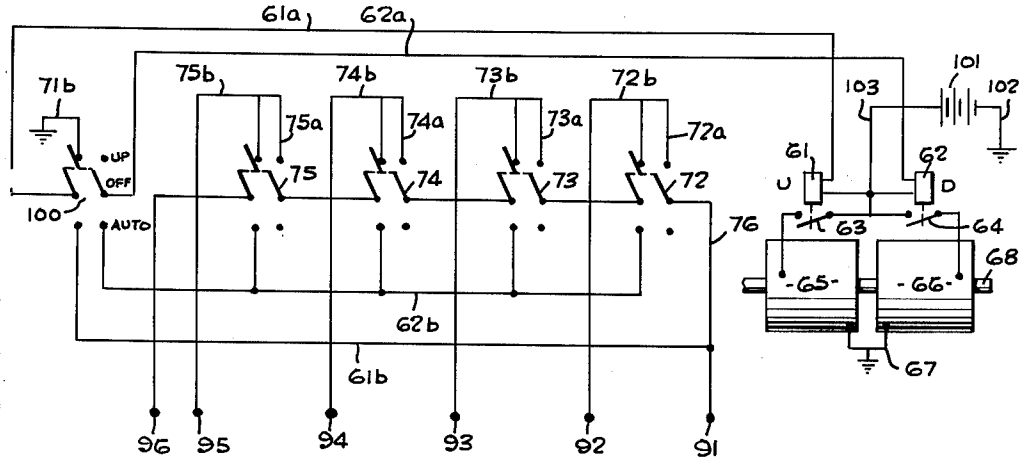


Fig. 4

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AUTOMATIC PICKER HEAD ELEVATION CONTROL

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7 Claims. (Cl. 56—11)

This invention relates generally to means for controlling the elevation above ground of the picker head of a cotton picking machine, and more particularly to an automatic elevation control system in which the elevation of the picker head, and the range of its vertical movement, are preset by the operator by electrical switching in an elevation control circuit. The elevation connects circuit ground-sensing pick-up means on the picker head to electrical head-control means which can be overridden by manual control at all times.

In all commercially used cotton picking machines, the cotton picker head is continuously raised and lowered in order to follow the contour of the ground as the cotton picking machine moves over a row of cotton plants being stripped of cotton. Lifting power is ordinarily supplied by hydraulic cylinder means, which is controlled by the operator by means of a valve adjacent his driving position. The operator is seated on a platform immediately overhanging the picker head, and while simultaneously steering and controlling the speed of the vehicle, he must continuously operate the elevation control valve to raise or lower the picker head to a suitable elevation.

The operator, from his overhead driving position, must estimate the elevation correction required by observing the ground and the forward projecting parts of the picker head. This method of operation is extremely tiring to the operator, and distracts him from his principal task of operating the vehicle. Also, it is an inaccurate method of maintaining elevation of the picker head, since the operator can make only crude judgments as to the actual elevation of the picker head and the adjustment required. He cannot see the point under the picker head at which elevation is most critical. It is impossible for him to make an accurate estimate of the vertical changes of only a few inches from a point several feet away, particularly when the position of the observer is almost directly overhead.

It has been proposed to relieve the cotton picker operator of the tedious task of continuously adjusting the picker head elevation by providing some form of automatic elevation control means for detecting the ground level and continuously adjusting the picker head to a predetermined elevation of a few inches. However, all previously known automatic means have been subject to certain major limitations which the present invention has overcome.

Previous devices have comprised a number of specially made mechanical parts designed to operate in conjunction with the picker head. Each different make of cotton picker has required a different set of mechanical connection to the picker head, or modifications of the mechanical parts available; in some cases, the elevation control means cannot be used at all on certain makes or designs of cotton picking machine.

In addition, the previously known mechanical elevation control means have required substantial mechanical skill and effort to install. They have presented exposed moving parts, which get damaged, or knocked out of alignment, during field use.

Controls which require direct mechanical linkage to the picker head cannot be located at the point at which elevation control is most desirable. A cotton picking machine operates by being driven down a row of cotton plants so

that a pair of forwardly diverging shields gather the branches of the cotton plant into a compact vertical bundle above the stalk. As the machine continues forward, it receives the stalk and closely bunched branches into a narrow passage between two parallel vertical panels, which lead in turn to the picker drum. It is desirable that the operator be able to select a point of elevation control best suited for the operation of this particular design of cotton picking machine, and the type of terrain in which it is to operate. The forwardly flaring gathering shield will not ordinarily be the best location for the ground sensing means, although it has been used for this purpose in previously known designs. The best location will ordinarily be as close as possible to a line defined by the stalks of the cotton plant, without regard to irregularities in ground surface and some lateral distance from the direction of travel of the cotton picking machine. For example, the cotton field may lie on gently sloping ground, so that ground elevation detection on the uphill side, or the downhill side, or even an average of the two, will result in unsatisfactory elevation control.

Other previously known devices have required complex and expensive auxiliary hydraulic systems. Most owners of expensive cotton picking machines would prefer not to make extensive permanent alterations in their construction, such as are required by complex hydraulic and mechanical systems.

Still other previously known elevation control systems have failed to be accepted by cotton picking machine operators because the operator could not suddenly resume manual operation of the elevation control, in case of an emergency, without first shutting off the automatic system.

Picker head elevation control systems heretofore known have often been vulnerable to damage by a proper operation by the operator, or by a tool or loose metal part falling into the working mechanism.

Previously known picker head elevation controls could not be converted from one elevation height to another without stopping the machine and making an adjustment in the mechanical parts. Operators would much prefer to be able to shift from one elevation to another, during continuous forward movement of the cotton picking machine, and while it is on automatic head control.

The present invention avoids all the foregoing objections and achieves many additional advantages by utilizing an electrical system. There is no mechanical or hydraulic connection whatever required between the vertically movable picker head and the chassis of the cotton picker. Instead, a flexible electrical cable runs from a ground sensing means on the picker head to an electrical control circuit within convenient reach of the operator's right hand.

The control system of the invention can be easily and quickly installed on any design of cotton picker, without any special parts and without any special skills on the part of the installer.

It is an important object of the present invention to provide an elevation control in which the ground surface can be detected at the best operating location. The ground sensing means can be installed at any convenient place on the picker head, generally on the exterior of one of the walls of the narrow cotton stalk passageway, and the electrical cable run from there. The ground sensing means is merely a trailing follower rod, and can be very light in construction, since it nead only move a small electrical switch contact, instead of a relatively massive mechanical linkage, as in previously known devices of this kind.

Another major object of the invention is to provide the operator with convenient and rapid means for shifting the height at which the picker head is automatically main-

tained. In the present invention, the operator merely flips the selection switches comprised in the electrical circuit of the invention, in order to shift from one operating elevation to another without interrupting the continuous forward movement of the cotton picking machine.

The present invention does not require any alteration whatever in the mechanical or hydraulic system of the cotton picking machine. It may be installed on any design of machine so as to cooperate with the machine's standard manual control means. Moreover, the invention may be used substantially unchanged with cotton picking machines which might be designed to use some auxiliary power means other than a hydraulic cylinder.

The present invention permits the operator to suddenly take over manual operation of the picker head elevation control. He may do this momentarily, in order to avoid some obstacle in the path of the machine, without shutting off the automatic control. If the electrical cable is torn, it can be easily spliced. The ground follower can be unbolted and replaced with a spare in a few moments. The same is true of the electrical circuit and its associated solenoid, although experience has demonstrated that these parts are extremely unlikely to be exposed to abuse, or to breakdown.

The foregoing and other objects and advantages of the invention will be obvious from the following description of one specific embodiment, which is illustrated in the accompanying drawings in which:

FIG. 1 is a perspective view of the forward end of a typical cotton picking machine, with some parts broken away or removed in order to reveal the parts pertinent to the operation of the present invention;

FIG. 1*a* is a simplified sketch of a typical elevation control means for a picker head;

FIG. 2 is an elevational view of the ground sensing means of the invention, as seen from one side of the cotton picking machine, with the cover broken away to reveal the ground sensing switch;

FIG. 3 is a side elevational view of the hydraulic valve control, and the electrical solenoid and relay means which operate it during automatic operation; and

FIG. 4 is an electrical diagram of the electrical circuit used for electrical selection of the elevation at which the picker head will be automatically maintained.

In FIG. 1, the cotton picker, indicated generally by the numeral **10**, is seen to be a truck or tractor-like automotive vehicle. Only the forward part of its chassis **11** is shown. In the particular design selected for purposes of illustration, the machine is a tricycle type, but only the single front wheel **12**, fragmentarily broken away for purposes of illustration, is shown.

The operator who drives the cotton picker **10** is seated in an operator's seat **13** located on an elevated platform **14**, which overhangs the forward part of the chassis **11**. In this seat **13**, the operator can steer the vehicle by means of steering wheel **15**, and operate various foot controls **16**. The cotton picker head is identified all-inclusively by the numeral **20**, and is suspended at the forward end of chassis **11** by means of a pair of chains **21** and **22**, which pass over sheaves **23** and **24** respectively. As seen in FIGS. 1 and 1*a*, the entire picker head assembly **20** can be raised by the action of a hydraulic means **25**, typically a piston and cylinder having a piston rod **26** connected to a crank arm **27** on the sheave **23**.

The picker head **20** has a housing **30** which forms a tunnel or passageway **31** between parallel vertical side panels **32** and **33**. The passageway **31** is open at the bottom to permit the picker head **20** to pass over the cotton plants.

Just forward of the passage **31**, the picker head **20** is provided with a pair of forwardly diverging gathering shields, **34** and **35**.

The present invention may be used on almost any design or make or cotton picking machine, and it is not pertinent to describe the internal workings of the various cotton picking heads, or the parts which follow it in the cotton picking process. It is sufficient to point out that the cotton plant must have its branches gathered into a bunch by the shields **34** and **35**, and the relatively narrow passage **31**, before it is swept into the cotton picking apparatus immediately to the rear of passage **31** by the forward movement of the cotton picking machine **10**. Generally, the cotton picking apparatus will comprise revolving picker drums, doffers and vacuum collecting systems all well known in the art of cotton picking machine design.

In the present invention, the forwardly projecting gathering shields **34** and **35** are suspended from the forward ends of panels **32** and **33** by swinging links **36** and chains **37**, so as to float freely, and ride easily upward over any ground irregularity. The forward ends of gathering shields **34** and **35** extend several inches lateral to the line of cotton plant stalks, and may encounter obstacles or rising ground elevation which should not be allowed to influence the operating elevation of picker head **20**.

The operator, while seated in seat **13**, can manually control the elevation of picker head **20** by means of a hydraulic valve **40**, which is operated by manual operating lever **41**. The novelty and utility of the present invention is not restricted to hydraulic devices, nor to a particular type of hydraulic system; any hydraulic system, or other auxiliary power system, which can be selectively controlled to produce up or down movements of picker head **20** can be connected to work automatically with the present invention. However, the typical cotton picker head hydraulic system employs a hydraulic pump which is driven by the gasoline engine which provides the automotive power for cotton picker **10**. Such a pump is indicated schematically at **42**, although it may, inactuality, be near the engine (not illustrated) at the rear of cotton picker **10**. It is common to employ a single acting cylinder **25**, hydraulic fluid under pressure being admitted to the cylinder in order to displace the piston therein and lift the picker head **20** for upward movement. For downward movement, reversal of valve lever **41** shuts off the hydraulic fluid, opens a discharge valve, and permits the operation of gravity on the weight of the picker head **20** to carry it downward and thereby displace the hydraulic fluid from the cylinder **25**.

Automatic elevation control of the picker head **20** is achieved by means of a ground surface follower means **50**, a solenoid valve operating means **60**, and an electrical control circuit **70**, which are interconnected by means of a multistranded cable **71**.

In FIG. 2 the ground follower means **50** has its cover **51** broken away to reveal a mounting plate **52**, which can be bolted to the best operating location on panel **30**. A ground follower rod **53**, partially broken away at **53***a* for purposes of illustration, is rigidly mounted in the lower end of an arm **54**, which is suspended from pivot mounting **55**. Preferably, arm **54** is a relatively massive metal block on which other parts may be replaceably mounted, and which has a thickness of a half inch or more so that it can be limited in its arc of swing by limit pins **56** and **57** which project from the mounting plate **52**. Follower rod **53** can be bent to a suitable shape and elevation for any particular machine by a few blows of the hammer. If it is damaged during use in the field, it can be quickly replaced with a spare rod.

As illustrated in FIG. 2, the arm **54** is seated against the low elevation limit pin **56**, since the picker head **20** has been allowed to drop to its lowest level, and the follower rod **53** has been raised by the ground surface **19**. However, the arm **54** is urged to swing in a counterclockwise rotation, when raising of picker head **20** permits it to swing, by virtue of the pull of helical spring **58** on spring arm **59**.

Arm **54** also carries an electrical switch contactor arm **80**, which is grounded to the metal structure of the cotton

picking machine 10 at ground connection 81 by means of a flexible lead 82. When arm 54 swings between the low elevation limit pin 56 and the high elevation limit pin 57, the electrical contact end 83 of contactor 80 sweeps over a contact path 84 on an insulating mounting 85.

Six contact terminals, 91, 92, 93, 94, 95 and 96 are mounted on the insulating mounting 85 in an arc along the contact path 84. It will be understood that six terminals are selected merely for purposes of illustration, and that the invention may be practiced with a smaller or greater number of contact terminals, or with a different type of switching arrangement, or a different kind of movement linkage between ground sensing rod 53 and the moving contactor 80. Also, the invention is not restricted to a system in which the contactor 80 serves as a grounding connection; it may be connected to the high potential side of the battery which supplies the operating power, instead of to the ground side.

It should be noted also, that the contact terminals 91 and 96, located at the extreme ends of the contact path 84, are really minimum elevation and maximum elevation limit terminals, whereas only the four intermediate contact terminals 92 to 95 actually provide for selection of elevation and operating range.

All six contact terminals 91 to 96 are connected to the circuit 70, illustrated diagrammatically in FIG. 4, by the multistrand cable 71, which preferably also includes a ground wire 71*a*, to insure against any possible potential different between electrical grounding at ground sensing means 50 and electrical grounding at the circuit 70.

The control circuit 70, which is diagrammatically illustrated in FIG. 4, employs five switches, a three way master switch 100, and four two way switches, 72 to 75, for selectively connecting intermediate contact terminals 92 to 95.

Preferably, the circuit 70 does not operate directly on the solenoid 60, but upon relatively low current coils in up and down relays 61 and 62, which, in turn, operate the relay contacts 63 and 64 which energize up or down coils 65 or 66 of solenoid 60.

Electrical power is supplied by battery 101, one side of which is grounded at 102, the other side being connected by line 103 to relays 61 and 62 and their solenoid control members 63 and 64.

The solenoid coils 65 and 66 are grounded at 67. Depending on whether up relay 61 or down relay 62 is energized, coil 65 or coil 66 will move the plunger 68 (see, also, in FIG. 3) to left for up, or right for down. However, it will be appreciated that the solenoid 60 is selected to tolerate manual overriding; thus, at any time during automatic operation, and without interrupting automatic operation, the operator seated in the operator's chair 13 can, for momentary emergency reasons, seize manual operating lever 41, and overcome the force of the solenoid 60, to establish a desired up or down movement of the picker head 20. Solenoid 60 may be overheated somewhat by continuous treatment of this type, although it will be understood that it is very unlikely that the device would be left on automatic if continuous treatment were necessary; however, there are suitable commercial solenoids available which are not damaged by the prolonged heating.

Preferably, the five switches of circuit 70, illustrated in FIG. 4, are disposed to operate in a vertical line so as to suggest to the operator when they are up connected and when they are down connected. Thus, the master switch 100 is thrown into an up position when it is desired to drive the cotton picker 10 from one location to the other with the picker head 20 completely out of operation. In the up position of switch 100, the up relay 61 is connected to ground 71*b* by line 61*a*. When the master switch 100 is in an intermediate position, the electrical system is entirely disconnected, and the elevation of the picker head 20 is under the exclusive control of the operator as he manipulates lever 41.

When master switch 100 is thrown into a down position, it connects the up relay 61 to the low elevation contact terminal by way of lines 61*a* and 61*b*, and connects the down relay 62 to the down-position terminals of the relays 72 to 75 by way of lines 62*a* and 62*b*. It should be noted that when any of the switches 72 to 75 is in a down position, its related contact terminal of the group 92 to 95 is completely disconnected from circuit 70 and plays no role therein electrically, but is the location of median elevation between automatic up and down movements of picker head 20, in one mode of operation, as will be described hereinafter.

When switches 72 to 75 are all in an up position, they form a series connection between up relay 61 and maximum elevation contact terminal 96, by way of line 61*a*, master switch 100, line 61*b*, common switch line 76, and circuit closing loops 72*a* to 75*a*. Circuit closing loops 72*a* to 75*a* are each also connected to one of the grounding contact terminals 92 to 95, by means of lines 72*b* to 75*b*.

Inspection of the foregoing circuit will reveal that it will carry the picker head 20 in maximum up position, regardless of the movements of the ground rod 53, when all four switches 72 to 75 are in an up position. Operation under these conditions will be the same with master switch 100 thrown into a downward position on automatic, as if it were in an up position on continuous up for traveling.

When, however, the operator desires to place the picker head 20 under automatic elevation control at a particular elevation, he simply throws into a down position the one switch out of the group 72 to 75 which corresponds to the desired picker head elevation. Thus, for example, if he throws switch 74 into a down position, contact terminal 94 is disconnected from circuit 70 and becomes the median elevation position. If contactor 80 swings to any of the contactors 91, 92 or 93, up relay 61 is connected to ground, and the picker head 20 is raised until the movement of rod 53, under the pull of swing 59, causes contactor 80 to sweep over the contact path 84 to the disconnected contact terminal 94.

On the other hand, if the picker head encounters declining terrain, or is somehow raised too high, the pull of spring 58, as it brings ground follower rod 53 into contact with the ground, will sweep contactor 80 to contact terminals 95 or 96, both of which will, in the disposition of the switches under discussion, then actuate down relay 62 by connecting it to ground. This occurs because, with switch 74 in down position, and switch 75 in up position, the down relay line 62*b* is connected by way of part of the common series line 76 to both contact terminal 95 and contact terminal 96.

In a similar manner, any one of the four switches 72 to 75 may be used to establish a median elevation for the picker head 20, during automatic operation, by throwing the selected switch into a down position, with all the other switches, out of the group 72 to 75, in an up position. This method of control will give precise elevation control, and will correct any deviation from the desired elevation of more than an inch or two, which far surpasses the accuracy with which an operator can maintain picker head elevation by manual control.

However, it is desired in some instances to tolerate a wider range of picker head elevation movement. This can also be achieved in the control circuit 70, by simply switching more than one of the switches 72 to 75 to a down position. Thus, for example, if all four are switched to a down position, all four contact terminals 92, 93, 94 and 95, are electrically out of action, and the picker head 20 is allowed to move freely between limits established by the minimum elevation contact terminal 91 and the maximum elevation contact terminal 96, the latter being connected to down relay 62 through line 62*a*, master

switch **100**, and line *62b*, when switch **75** is in a down position.

It will be seen from the foregoing description of one preferred embodiment of our invention that we have disclosed an electrical automatic elevation control system which enables the operator to select operating elevation, and range of picker head movement, merely by switch operation. Also, he may, without interrupting the forward movement and cotton picking operation of the cotton picker **10**, revise his selections of either elevation or range of movement or both. However, it is not our intention to be restricted to the details of the foregoing preferred form of the invention; it is our intention to comprehend all equivalent forms falling within the scope of the appended claims.

Having thus described the invention, what is claimed as new in support of Letters Patent is:

1. In a cotton picking machine having a vertically movable picker head and auxiliary power means for raising said picker head, an automatic picker head elevation control which includes: a control means for controlling said auxiliary power means to selectively move said picker head in up or down direction; electrical operating means, including electrical power source means, for selectively operating said control means; ground follower means pivotally mounted on said picker head; spring means urging said follower means into contact with the ground surface; a switch contactor movable with said follower means over a contactor path corresponding to the range of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals corresponding to intermediate elevations of said picker head; a switching circuit for selectively connecting said electrical operating means to its power source through said switch contactor and said contact terminals; and a plurality of elevation selection switches in said switching circuit for selecting which of said contact terminals shall be connected for up and down operation, respectively, of said electrical operating means.

2. In a cotton picking machine having a vertically movable picker head and auxiliary power means for raising said picker head, an automatic picker head elevation control which includes: a control means for controlling said auxiliary power means to selectively move said picker head in up or down direction; a manual operating means for operating said power means during manual control of said picker head elevation; electrical operating means, including electrical power source means, for selectively moving said manual operating means and said control means; ground follower means pivotally mounted on said picker head and trailing rearwardly therefrom in contact with the ground; spring means urging said follower means into contact with the ground surface; a switch contactor movable with said follower means over a contactor path corresponding to the range of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals corresponding to intermediate elevations of said picker head; a switching circuit for selectively connecting said electrical operating means to its power source through said switch contactor and said contact terminals; and a plurality of elevation selection switches in said switching circuit for selecting which of said contact terminals shall be connected for up and down operation, respectively, of said electrical operating means.

3. In a cotton picking machine having a vertically movable picker head and auxiliary power means for raising said picker head, an automatic picker head elevation control which includes: a control means for controlling said auxiliary power means to selectively move said picker head in up or down direction; a manual operating means for operating said power means during manual control of said picker head elevation; electrical operating means, including electrical power source means, for selectively moving said manual operating means and said control means; a ground follower pivot mounting on said picker head; an arm member pivotally suspended from said pivot mounting; stop means for limiting the swing of said arm member; ground follower means mounted in said arm at the lower end thereof and trailing rearwardly therefrom in contact with the ground; spring means urging said arm to bring said follower means into contact with the ground surface; a switch contactor integral with said arm member and movable therewith over a contactor path corresponding to the range of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals including maximum elevation and minimum elevation terminals at opposite ends of said contact path, and intermediate terminals corresponding to intermediate elevations of said picker head; a switching circuit for connecting said electrical operating means to its power source through said switch contactor and said contact terminals; and a plurality of double throw elevation selection switches in said switching circuit for selecting which of said contact terminals shall be connected for up and down operation, respectively, of said electrical operating means.

4. In a cotton picking machine having a vertically movable picker head and hydraulic means for raising said picker head, an automatic picker head elevation control which includes: a longitudinally operated hydraulic valve for controlling said hydraulic means to selectively move said picker head in up or down direction; longitudinally reciprocable solenoid means and associated power source for selectively moving said hydraulic valve; up and down relay means for selectively operating said solenoid means in either direction; a ground follower pivot mounting on said picker head; an arm member pivotally suspended from said pivot mounting; stop means for limiting the swing of said arm member; ground follower means mounted in said arm at the lower end thereof and trailing rearwardly therefrom in contact with the ground; spring means urging said arm to bring said follower means into contact with the ground surface; a switch contactor integral with said arm member and movable therewith over a contactor path corresponding to the range of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals including maximum elevation and minimum elevation terminals at opposite ends of said contactor path, and intermediate terminals corresponding to intermediate elevations of said picker head; a switching circuit for selectively connecting said power source to said up and down relay means for up and down movement of said picker head; a multistrand electrical cable means connecting said switching circuit to said plurality of contact terminals; and a plurality of double throw elevation selection switches in said switching circuit, one for disconnecting each of said intermediate contact terminals from said switching circuit and simultaneously connecting contact terminals on opposite sides of said disconnected terminal for oppositely correcting control of said automatic elevation control means.

5. In a cotton picking machine having a vertically movable picker head and hydraulic cylinder means for raising said picker head, an automatic picker head elevation control which includes: a longitudinally operated hydraulic valve for controlling said hydraulic cylinder means to selectively move said picker head in up or down direction; a manual operating lever for operating said hydraulic valve during manual control of said picker head elevation; longitudinally reciprocable solenoid means for selectively moving said hydraulic valve, said solenoid means having a thrust large enough to operate said hydraulic valve, but small enough to be readily overriden by manual operation of said lever; up and down relay means and associated power source for selectively operating said solenoid means in either direction; a ground follower

pivot mounting on said picker head closely adjacent the point of passage of cotton plant stalks through said picker head at which elevation is most critical for said cotton picking machine; an arm member pivotally suspended from said pivot mounting; stop means for limiting the swing of said arm member; ground follower means mounted in said arm at the lower end thereof and trailing rearwardly therefrom in contact with the ground; spring means urging said arm to bring said follower means into contact with the ground surface; a switch contactor integral with said arm member and movable therewith over a contactor path corresponding to the range of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals including maximum elevation and minimum elevation terminals at opposite ends of said contact path, and intermediate terminals corresponding to intermediate elevations of said picker head; a switching circuit near the operator location on said cotton picker, said switching circuit providing electrical connection between said up and down relay means and its associated power source; a multistrand electrical cable means connecting said switching circuit to said plurality of contact terminals; a three way main switch in said switching circuit adapted to energize said up relay in a first position, to de-energize both of said relays in a second position, and to connect said up and down relays to said switching circuit in a third position; and a plurality of double throw elevation selection switches in said switching circuit, one for disconnecting each of said intermediate contact terminals from said switching circuit, each of said relays being disposed to assume an up or down position in the view of the operator, with the down position disconnecting the corresponding contact terminal, to permit free picker head movement at the elevation corresponding to that terminal.

6. In a cotton picking machine having a vertically movable picker head and auxiliary power means for raising said picker head, an automatic picker head elevation control which includes: a control means for controlling said auxiliary power means to selectively move said picker head in up or down direction; electrical operating means, including electrical power source means, for selectively operating said control means; ground follower means pivotally mounted on said picker head; spring means urging said follower means into contact with the ground surface; a switch contactor movable with said follower means over a contactor path corresponding to the range

of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals corresponding to maximum, minimum, and intermediate elevations of said picker head; a switching circuit for selectively connecting said electrical operating means to its power source through said switch contactor and said contact terminals; and a plurality of elevation selection switches in said switching circuit for selecting which of said intermediate contact terminals shall be disconnected from said power means while simultaneously connecting other contact terminals on said contactor path to actuate said controller oppositely on opposite sides of said disconnected terminals.

7. In a cotton picking machine having a vertically movable picker head and auxiliary power means for raising said picker head, an automatic picker head elevation control which includes: a control means for controlling said auxiliary power means to selectively move said picker head in up or down direction; electrical operating means, including electrical power source means, for selectively operating said control means; ground follower means pivotally mounted on said picker head; spring means urging said follower means into contact with the ground surface; a switch contactor movable with said follower means over a contactor path corresponding to the range of elevations at which said picker head is to be operated; a plurality of contact terminals disposed along said contactor path, said contact terminals corresponding to maximum, minimum, and intermediate elevations of said picker head; a switching circuit for selectively connecting said electrical operating means to its power source through said switch contactor and said contact terminals; and a vertically disposed double throw switch for each of said intermediate contact terminals, said switches contacting said contact terminals to produce picker head movement indicated by the vertical direction in which the switch is connected.

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