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Hood et al.

[11] **3,916,541**

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[54] **ADJUSTABLE MECHANISM FOR A SCRAPER ELEVATOR**

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[73] Assignee: **General Motors Corporation,** Detroit, Mich.

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[52] **U.S. Cl.** **37/8**

[51] **Int. Cl.**[2] **E02F 1/00**

[58] **Field of Search** 37/8, 124, 126

[56] **References Cited**

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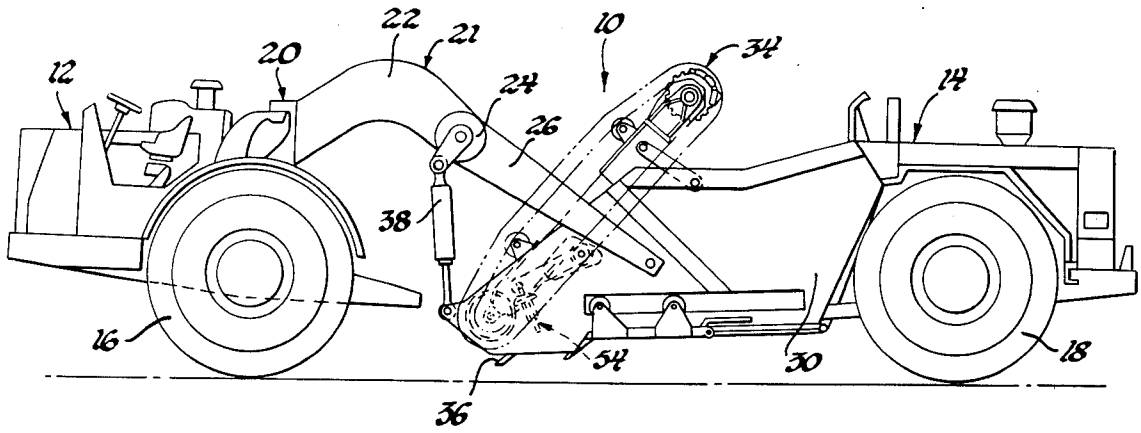
Attorney, Agent, or Firm—Edward J. Biskup

[57] **ABSTRACT**

An adjustment mechanism for varying the normal operating position of the lower end of a scraper elevator that includes an arm which supports a portion of the elevator mounting linkage. The support arm extends outwardly from a bracket attached to the side wall of the scraper and has a pair of pins which cooperate with a slot and a plurality of teeth formed with the bracket for allowing adjustment of the arm.

3 Claims, 4 Drawing Figures



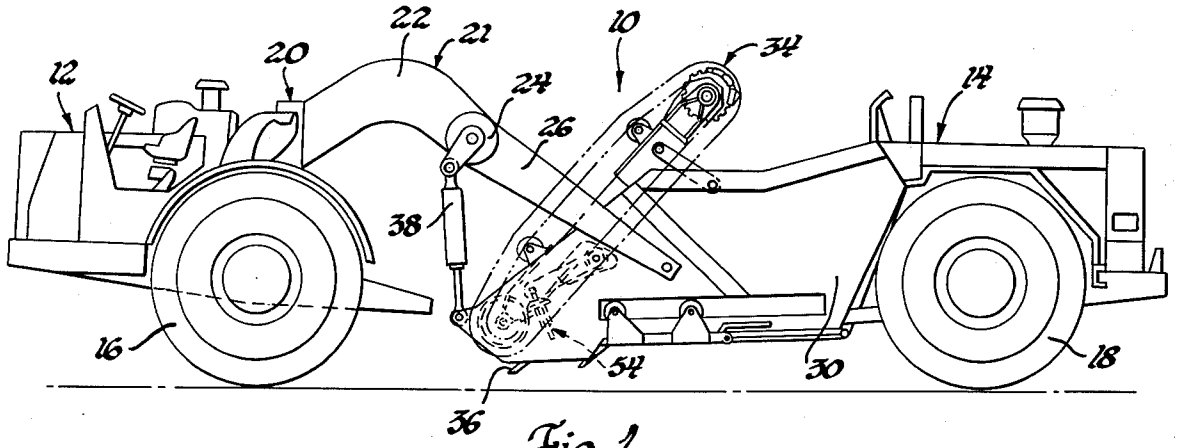

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Fig. 1

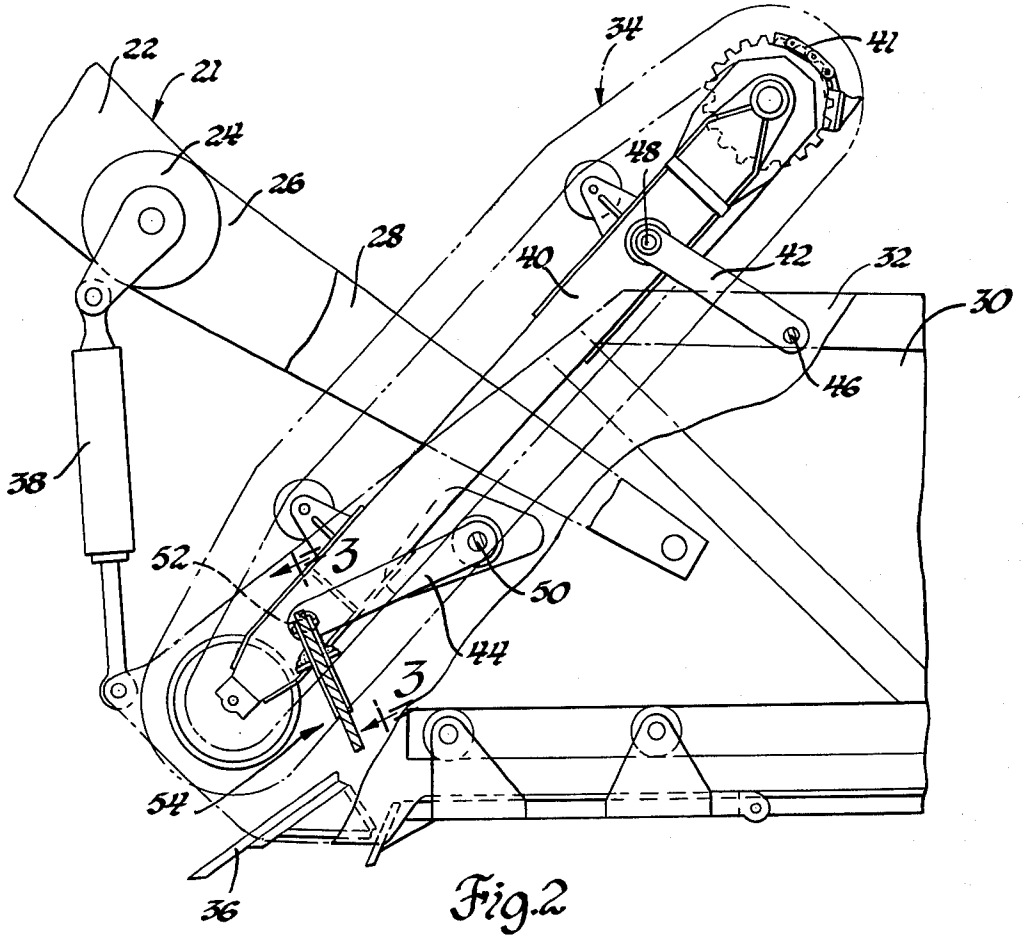
22
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Fig. 2

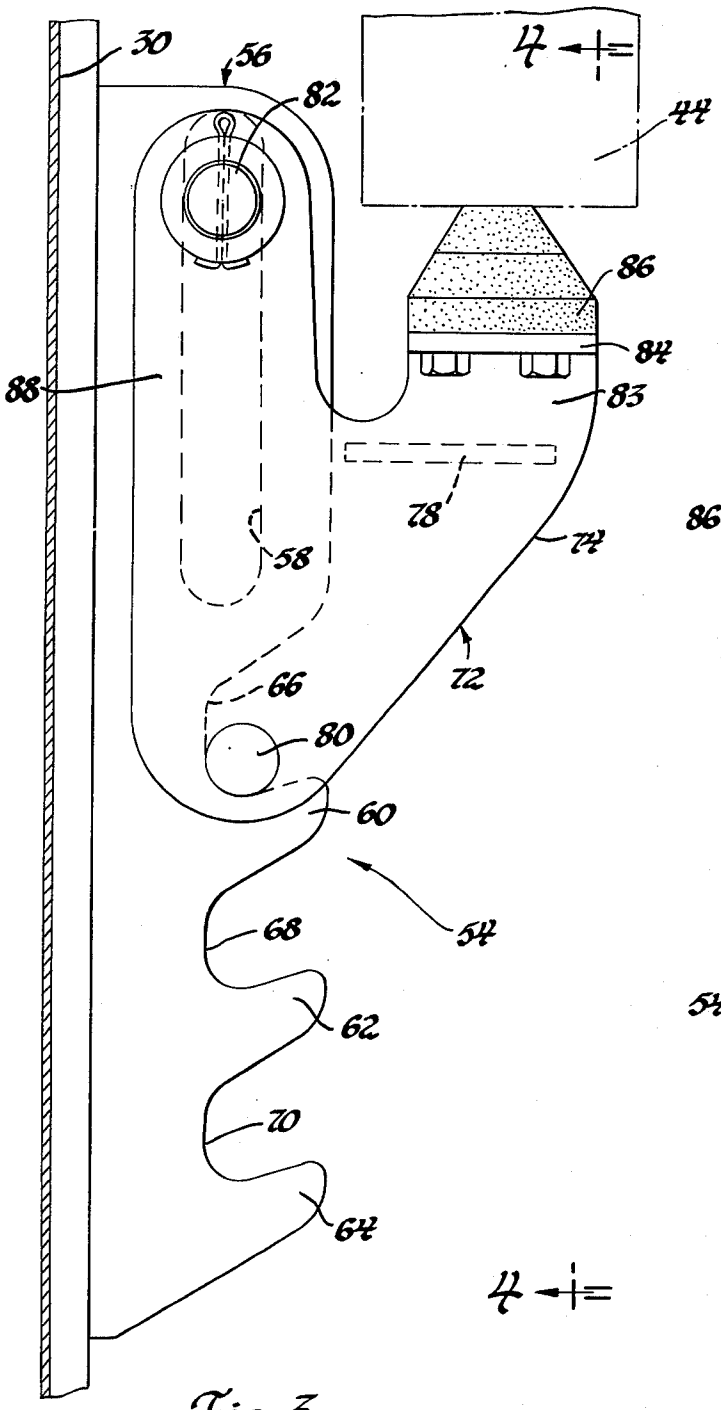
30
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Fig. 3

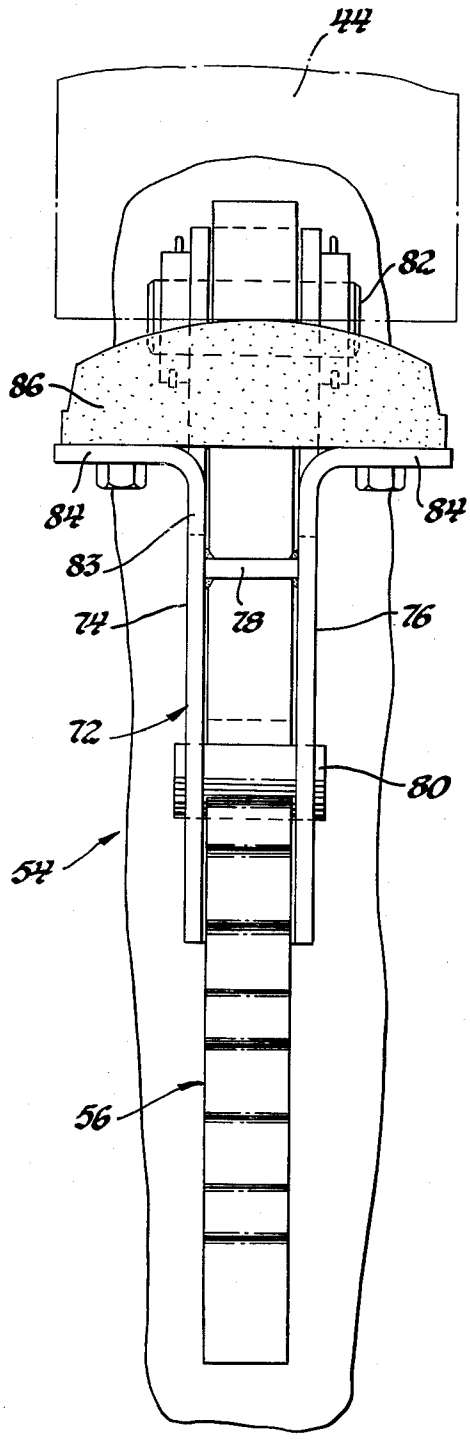
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Fig. 4

ADJUSTABLE MECHANISM FOR A SCRAPER ELEVATOR

The present invention concerns elevating scrapers in general and more particularly an adjustment mechanism for changing the operating position of the lower end of the elevator relative to the scraper cutting blade.

It is well known that in order for an elevating scraper to realize operating efficiency in the loading of various types of materials, it is important to have the capability to readily change the normal spacing between the lower flight members of the elevator device and the cutting blade of the scraper bowl. As a result, it is quite common to have an adjustment mechanism associated with the elevator support linkage for achieving the desired spacing for the type of material that the scraper is loading.

The present invention is directed to an improved adjustment mechanism of the above described type which is adapted to be incorporated with an elevator device mounted in a scraper bowl having an open end defined by a pair of laterally spaced side walls and a transversely extending cutting blade. The elevator device is located in the open end of the scraper bowl and is suspended from the bowl side walls by a linkage consisting of upper and lower link members pivotally connected to each side of the elevator device in a manner whereby the lower end of the elevator can float towards and away from the cutting blade. The adjusting mechanism is connected to each side wall of the bowl and serves to support the forward end of the lower link member and provide adjustable vertical positioning thereof so as to change the spacing between the lower flight members and the cutting blade. More specifically, the adjustment mechanism according to the invention includes a base member attached to the associated side wall and formed with an elongated slot. The base member is also formed with a plurality of teeth at its outer edge that are located along a line that is substantially parallel to the longitudinal axis of the slot. An arm is combined with a base member and serves to support the forward end of the lower link member and provide adjustable positioning thereof through a pair of vertically spaced and parallel pins carried by the arm with the upper pin being slidably received by the slot while the lower pin is adapted to be located between a pair of adjacent teeth for limiting downward movement of the arm. Repositioning of the support arm, and accordingly, the lower end of the elevator device, is realized by pivoting the arm about the upper pin so as to remove the lower pin from engagement with the teeth followed by vertical movement of the arm to a new position and the reengagement of the lower pin with the teeth.

The objects of the present invention are to provide an improved mechanism for quickly adjusting the position of the lower end of a scraper elevator relative to the cutting blade without requiring special tools; to provide an improved adjustment mechanism for varying the position of the lower end of a scraper elevator that includes a vertically adjustable arm supporting a portion of the linkage connecting the elevator to the scraper bowl; and to provide an improved scraper having an elevator device connected by a linkage to the side walls of a scraper bowl with a portion of the linkage being supported by a pair of arms that extend laterally inwardly from the side walls and with each arm carrying a pair of pins which cooperate with a slot and a plurality of teeth formed with a bracket attached to the associated side wall for allowing adjustment of the normal operating position of the lower end of the elevator.

Other objects and advantages of the present invention will be apparent from the following detailed description when taken with the drawings in which:

FIG. 1 is an elevation view showing a rubber-tired overhung elevating scraper incorporating an elevator device adjustment mechanism made in accordance with the invention;

FIG. 2 is an enlarged view of the elevator device employed with the scraper of FIG. 1 and shows the adjustment mechanism more clearly;

FIG. 3 is an enlarged view taken on lines 3—3 of FIG. 2 showing the details of construction of the adjustment mechanism; and

FIG. 4 is a view taken on line 4—4 of FIG. 3.

Referring to the drawings and more particularly FIG. 1 thereof, an elevating scraper **10** is shown having the usual overhung tractor **12** and a trailing scraper bowl **14** which are respectively supported by rubber tires **16** and **18.** The tractor **12** is connected through a universal coupling **20** to a pull yoke **21** which includes a goose neck **22** that extends rearwardly for rigid connection with the usual transverse torque tube **24.** As is conventional, the opposite ends of the torque tube **24** are provided with laterally spaced pull arms **26** and **28** the rear ends of which are connected by transversely aligned pivot connections to the side walls **30** and **32** respectively of the scraper bowl **14.** An elevator device **34** is located at the front end of the scraper bowl **14** between the side walls **30** and **32** and above a cutting blade **36** which extends between the side walls. The elevator device **34** serves as a means for assisting loading of cut material into the scraper bowl **14.**

As is also conventional with elevating scrapers of this type, the front end of the scraper bowl **14** is supported by a pair of double-acting hydraulic bowl cylinders one of which is only shown and identified by reference numeral **38.** The upper end of each bowl cylinder is pivotally mounted to the torque tube **24** adjacent the outer end thereof while the lower end of each bowl cylinder is pivotally connected to the lower forward end to the scraper bowl **14.** The bowl cylinders serve to move the scraper bowl **14** between a raised carry-position and a lowered dig-position.

As seen in FIG. **2,** the elevator device **34** comprises a support frame **40** the upper and lower portions of which carry the usual sprocket wheels and guide wheels about which an endless chain **41** is entrained that supports a plurality of transverse flight members. The support frame **40** is supported for pivotal movement by a mounting assembly which includes a pair of side wall supported link members **42** and **44.** The upper link member **42** has one end connected to the associated side wall by a pivotal connection **46** while the other end is connected to the upper portion of the support frame **40** by a pivotal connection **48.** The lower link member **44** has one end thereof connected by a pivotal connection **50** to the associated side wall while the other end extends forwardly and is connected by a pivotal connection **52** to the lower portion of the support frame **40.** An adjustment mechanism **54** according to the invention supports the forward end of the lower link member **44** to provide a predetermined spacing between the flight members of the elevator device and the cutting blade **36.** The arrangement is such that the mounting assembly for the elevator device **34** permits the lower end of the elevator device to be free to move

upwardly under the control of the link members **42** and **44**, and be limited in downward movement by the adjustment mechanism **54**. It will be understood that an identical adjustment mechanism supports the link member corresponding to the link member **44** located on the opposite side of the support frame **40**.

As seen in FIGS. **3** and **4**, the adjustment mechanism **54** includes a bracket which is rigidly secured to the associated side wall of the scraper bowl **14**. The bracket consists of an elongated base plate member **56** the upper end of which is formed with an elongated slot **58** extending slightly less than half the length of the base plate member and having its longitudinal center axis located in a vertical plane. The lower portion of the base plate member **56** along its outer edge is formed with three outwardly extending and upwardly inclined teeth **60, 62** and **64** which define U-shaped pockets **66, 68** and **70** that are identical in configuration and uniformly spaced along a vertical axis. A support arm **72** is combined with the base plate member **56** and is formed from a pair of plate members **74** and **76** each of which is a mirror image of the other. The plate members **74** and **76** are interconnected by a cross bar **78** and a pair of pins **80** and **82**, and as seen in FIG. **3**, each plate member is generally V-shaped having one leg **83** formed with an outwardly extending wing **84** which serves as a support surface for a cushion member **86** made from elastomeric material. The other leg **88** of each of the plate members **74** and **76** is normally positioned adjacent one side of the base plate member **56** and together with the corresponding leg of the other plate member serves to straddle the upper end of the base plate member **56**. The pin **82** interconnects the upper ends of legs **88** of the plate members while the pin **80** serves to interconnect the lower ends of both legs **83** and **88**.

From the above description it should be apparent that if it is desired to move the lower end of the elevator device **34** closer to the cutting blade **36**, this can be accomplished by first placing a large obstacle in front of the elevator device **34** so that the lower portion thereof is forced to climb the obstacle and be raised upwardly causing the lower end of the link member **44** to move away from the support arm **72** of the adjustment mechanism **54**. Thereafter, the support arm **72** is pivoted in a counterclockwise direction, as seen in FIG. **3**, about the pin **82** so as to remove the pin **80** from the uppermost pocket **66**. The support arm **72** is then free to move vertically downward as guided by the pin and slot connection provided by the pin **82** and the slot **58**. The support arm **72** can then be lowered to an intermediate position with the pin **80** being positioned in the pocket **68** or to a fully lowered position with the pin **80** located in the pocket **70**.

Various changes and modifications can be made in this construction without departing from the spirit of the invention. Such changes and modifications are contemplated by the inventor and he does not wish to be limited except by the scope of the appended claims.

We claim:

1. An earthmoving self-loading scraper having a tractor connected by a pull yoke to a trailing scraper bowl, said scraper bowl having an open end defined by a pair of laterally spaced side walls and a transverse cutting blade extending between the side walls, an elevator device having an upper end and a lower end, a linkage including upper and lower link members mounting said elevator device at said open end of the scraper bowl with the lower end of the elevator device being supported adjacent to and above the cutting blade and being movable about a transverse horizontal axis relative to said cutting blade, one end of each of said link members being pivotally connected to said scraper bowl and the other end of each of said link members being pivotally connected to the elevator device, a mechanism for adjusting the position of the lower end of the elevator device relative to the cutting blade, said mechanism comprising a base member rigidly attached to one of said side walls, said base member having an elongated slot formed therein, a plurality of teeth formed along an outer edge of said base member, an arm supporting one of said link members adjacent the other end thereof and being provided with a pair of pins, one of said pins being located within said slot so as to provide a connection with the base member that allows said other pin to pivot outwardly relative to said base member and permits the arm to move upwardly and downwardly whereby said other pin can be adjustably located between a pair of said plurality of teeth to vary the position of said other end of one of said link members and the spacing between the lower end of the elevator device and the cutting blade.

2. An earthmoving self-loading scraper having a tractor connected by a pull yoke to a trailing scraper bowl, said scraper bowl having an open end defined by a pair of laterally spaced side walls and a transverse cutting blade extending between the side walls, an elevator device having an upper end and a lower end, a linkage including upper and lower link members mounting said elevator device at said open end of the scraper bowl with the lower end of the elevator device being supported adjacent to and above the cutting blade and being movable about a transverse horizontal axis relative to said cutting blade, one end of each of said link members being pivotally connected to said scraper bowl and the other end of each of said link members being pivotally connected to the elevator device, a mechanism for each side wall for adjusting the position of the lower end of the elevator device relative to the cutting blade, said mechanism comprising a base member rigidly attached to one of said side walls, said base member having an elongated slot formed therein, the longitudinal axis of said slot being located in a vertical plane that is parallel to the longitudinal axis of the scraper, a plurality of upwardly inclined teeth formed along an outer edge of said base member along a line substantially parallel to the longitudinal axis of said slot, a generally V-shaped arm having a pair of legs, one of said legs supporting the other end of one of said link members the other of said legs being provided with a pair of vertically spaced parallel pins, one of said pins being located within said slot and said other pin normally being located between a pair of said plurality of teeth so as to provide a connnection with the base member that allows said other pin to pivot outwardly relative to said base member and permits the arm to move upwardly and downwardly whereby said other pin can be adjustably located between a pair of said plurality of teeth to vary the position of said other end of one of said link members and the spacing between the lower end of the elevator device and the cutting blade.

3. An earthmoving self-loading scraper having a tractor connected by a pull yoke to a trailing scraper bowl, said scraper bowl having an open end defined by a pair of laterally spaced side walls and a transverse cutting

blade extending between the side walls, an elevator device having an endless chain supporting a plurality of transverse flight members, said elevator device having an upper end and a lower end, a linkage including upper and lower link members pivotally mounting said elevator device at said open end of the scraper bowl with the lower end of the elevator device being supported adjacent to and above the cutting blade and being movable about a transverse horizontal axis relative to said cutting blade, one end of each of said link members being pivotally connected to said scraper bowl and the other end of each of said link members being pivotally connected to the elevator device, a mechanism for each side wall for adjusting the position of the flight members at the lower end of the elevator device relative to the cutting blade, said mechanism comprising an elongated base member rigidly attached to one of said side walls and having an upper portion and a lower portion, said base member having an elongated slot formed in the upper portion thereof, the longitudinal axis of said slot being located in a vertical plane that is parallel to the longitudinal axis of the scraper, a plurality of upwardly inclined teeth formed in the lower portion of the base member along an outer edge thereof and along a line substantially parallel to the longitudinal axis of said slot, a generally V-shaped arm having a pair of legs, one of said legs being provided with a resilient member for supporting the other end of one of said link members, the other of said legs being provided with a pair of vertically spaced parallel pins, one of said pins being located within said slot and said other pin normally being located between a pair of said plurality of teeth so as to provide a connection with the base member that allows said other pin to pivot outwardly relative to said base member and permits the arm to move upwardly and downwardly whereby said other pin can be adjustably located between a pair of said plurality of teeth to vary the position of said other end of one of said link members and the spacing between the flight members at the lower end of the elevator device and the cutting blade.

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