Oct. 8, 1957 R. C. SCHNECKLOTH 2,808,666

SLACK ELIMINATOR FOR ADJUSTABLE TYPE OF BULLDOZER

Original Filed April 1, 1953 2 Sheets-Sheet 1

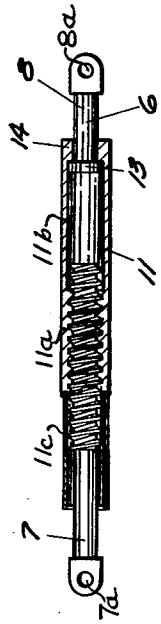

FIG-2

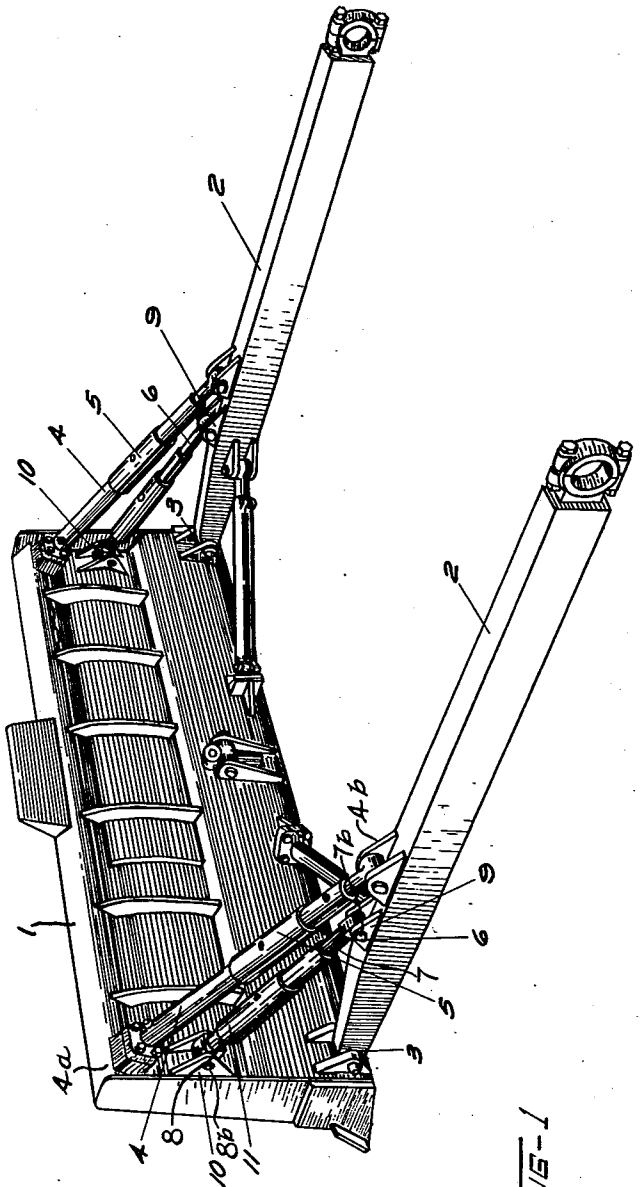

FIG-1

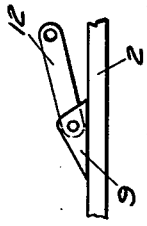

FIG-3

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SLACK ELIMINATOR FOR ADJUSTABLE TYPE OF BULLDOZER

Original Filed April 1, 1953 2 Sheets-Sheet 2

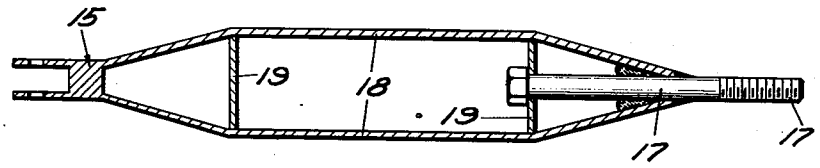

FIG-5

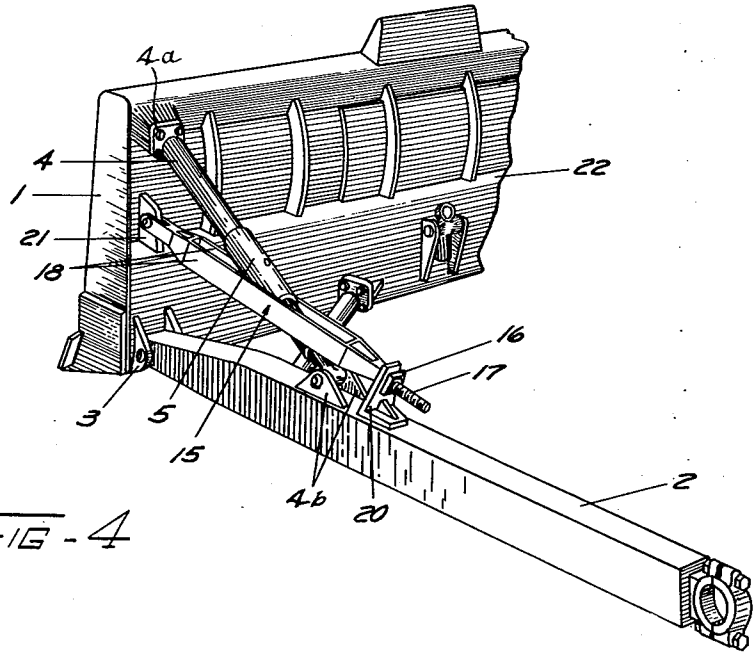

FIG-4

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2,808,666

SLACK ELIMINATOR FOR ADJUSTABLE TYPE OF BULLDOZER

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Substitute for abandoned application Serial No. 346,119, April 1, 1953. This application November 2, 1954, Serial No. 466,327

6 Claims. (Cl. 37—144)

This application is a substitute for application No. 346,119, filed April 1, 1953, now abandoned.

The present invention relates to improvements in bulldozers, and particularly to means for taking up lost motion, due to wear. It especially relates to the looseness of the blade connections which results from use of the blade in scraping the surface of the earth. It is an object of this invention to provide means for taking up such looseness in the three points where it may occur, and such further objects and advantages as will hereafter appear and as are inherent in the structure disclosed herein. My invention further resides in the construction and arrangement of parts illustrated in the accompanying drawings and, while I have shown therein what is now regarded as the preferred embodiment of this invention, I desire the same to be understood as illustrative only and not to be interpreted in a limiting sense.

In the drawings annexed hereto and forming a part hereof,

Fig. 1 represents, in perspective, a bulldozer blade and the arms used in operating the same;

Fig. 2 shows a sectional elevation of one of the adjusting means by which the looseness of the blade connections is removed;

Fig. 3 shows an elevation of a part of a modified brace;

Fig. 4 represents a modified form of this invention; and

Fig. 5 represents a longitudinal section of the part used in taking out the looseness in the modified form as shown in Fig. 4.

Reference will now be made in greater detail to the annexed drawings for a more complete description of this invention. The earth-engaging element or blade **1** is attached to the forward part of the earth-handling machine or bulldozer by a pair of thrust arms **2**. Normally, the blade is connected to the arms **2** by a pair of articulate joints or connections in the form of hinges **3** and a pair of diagonal braces **4** which may be lengthened or shortened by turnbuckles **5**. Each brace **4** is connected at its opposite ends respectively to the blade **1** and associated arm **2** by second and third articulate joints **4***a* and **4***b*, as is conventional. Changing the length of these braces **4** does not eliminate the looseness which results from use of the bulldozer. When it begins to get loose, continued use of the bulldozer makes the looseness more accentuated because of the hammering, but I provide adjustable-length devices in the form of connecting links **6** which may be lengthened or shortened or extended or contracted to fit the particular installation and which are contracted when in place to place the respective braces in compression and thereby to eliminate the looseness in the first, second and third joints or connections **3**, **4***a* and **4***b*.

These links **6** are preferably made up of three parts, including a threaded rod or member **7** and an unthreaded rod or member **8** and a tube or sleeve **11** having one end internally threaded at **11***a* and engaging the threaded rod **7** and having its opposite end **11***b* unthreaded to receive the unthreaded rod **8**. While this structure is not a true turnbuckle, it partakes of the nature of a turnbuckle in tension since the length thereof may be shortened without loosening either end of the brace **4**. The rod **7** has a clevis **7***a* at one end which, with a pin **7***b* received by ears **9** welded to the arm **3**, comprises connecting means for engaging that end of the device **6** with the arm. Connecting means for the other end of the device includes a clevis **8***a* on the rod **8**, a pin **8***b* and ears **10** welded to the blade. The ears **9** are adjacent to the joint **4***b* and the ears **10** are adjacent to the joint **4***a*. The end of the rod **8** opposite the clevis **8***a* has a head **13** abutted in one direction by a flange **14**, preferably annular, on the tube **11**. By turning the screw means or sleeves **11**, the devices **6** may be shortened and the looseness of the joints at the ends of the braces **4** is absorbed as the braces are placed in compression. Thus the braces and links act against each other, taking out all looseness. The turnbuckle **5** may operate in the reverse direction from the links **6** to eliminate looseness. A dirt shield **11***c* extends from one end of the tube and encloses the external part of the rod **7**.

In Fig. 3 is shown an extension **12** for link **6** which can be used for a standard length of link to increase the length of the link for a larger size of bulldozer. These are made with different sizes of blades and require different sizes of links **6** to fit different sizes of bulldozers.

When a bulldozer has been in use for a time there is a tendency for the bearings of the braces to wear, making the joints loose. By having the links **6**, which are capable of being lengthened or shortened, the operator can change the length of the links **6** without disconnecting the links from the blades **1** or the arms **2**, simply by turning the sleeve or sleeves **11**, since the tube or sleeve **11** rotates relative to the rods **7** and **8**. Likewise, the braces **4** can be readily shortened without removing the braces, because the rod **8** can telescope within the sleeve.

In the construction shown in Figs. 4 and 5, a link or device **15** may take the place of the link **6**, and a nut **16** on the extension member or bolt **17** is used as screw means for shortening or lengthening the link **15**. Preferably each of the links **15** is made by welding together at their ends a pair of members or straps **18**, which straddle the associated brace **4** and which are held apart by metal plates **19**, through one of which there is formed a hole for the reception of the bolt **17** which is welded in place. This bolt **17** passes through affixation means in the form of a bracket **20** and, when the nut **16** is tightened up, it has the tendency to take out any looseness which has developed. Pivot member **21** may be welded to the approximate middle, vertically, of the blade **1** and to a rib **22** which extends longitudinally of the blade **1** and serves as affixation means for the straps **18**.

It is of course understood that the specific description of structure set forth above may be departed from without departing from the spirit of this invention as disclosed in this specification and as defined in the appended claims.

Having now described my invention, I claim:

1. In an earth-handling machine of the class described, including a thrust arm, an earth-engaging element generally normal to the arm and a brace diagonally related to the arm and element to afford a triangular structure having a first articulate joint between the arm and the element, a second articulate joint between the brace and the element and a third articulate joint between the brace and the arm, the improvement residing in an adjustable-length device comprising: first and second relatively movable members; first connecting means engaging one end of one member with the element adjacent to the second articulate joint; second connecting means engaging the other member with the arm adjacent to the third artic-

ulate joint; and screw means interconnecting the members for effecting shortening thereof to place the brace in compression and thereby to take up looseness in the articulate joints.

2. The invention defined in claim 1, in which: the members are coaxial rods, one rod having a threaded portion at its end opposite to its connection means and the other rod having a head at its end opposite its connection means, said threaded end portion and said head being proximate to each other but normally axially spaced apart; and the screw means comprises a tubular member having at one end an internally threaded part engaging the threaded rod portion and having at its other end an unthreaded part receiving the headed rod and including an abutment engaging the head and preventing axial outward escape of the headed rod from said tubular member.

3. The invention defined in claim 2, including: a tubular dirt shield coaxial with the first end of the tubular member and extending axially outwardly therefrom to enclose that portion of the threaded rod between the tube and the proximate connection means.

4. The invention defined in claim 2, in which: the headed rod is rotatably received in the unthreaded part of the tubular member, and said abutment engages the head from one side only so as to permit telescoping of the headed rod into said tubular member.

5. In an earth-handling machine of the class described, the combination with a thrust arm, an earth-engaging element generally normal to the arm and connected thereto by a first articulate joint, and a brace running diagonally from the element to the arm and connected at opposite ends respectively to said element and arm by second and third articulate joints, of an adjustable-length device connected at one end to the element adjacent to the second joint and connected at its other end to the arm adjacent to the third joint, and means operative to shorten said device to place the brace in compression and thereby to take up slack in the aforesaid joints.

6. The invention defined in claim 1, in which: one of the connecting means includes a removable link for varying the starting length of the device to accommodate different lengths in the brace.

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