

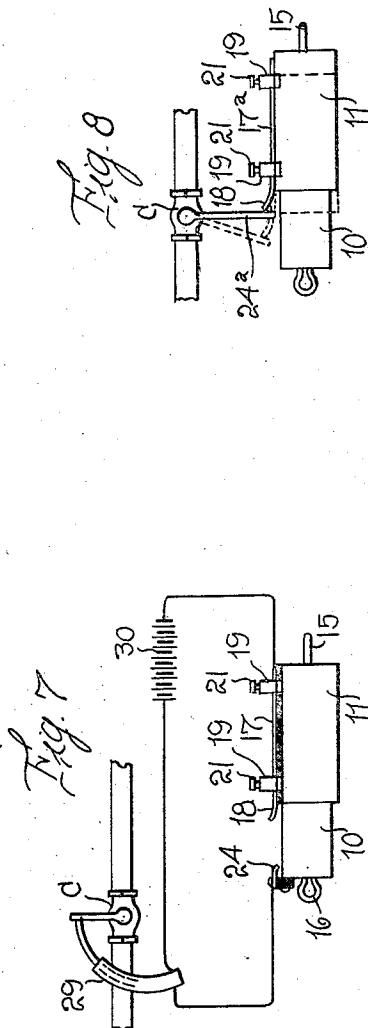
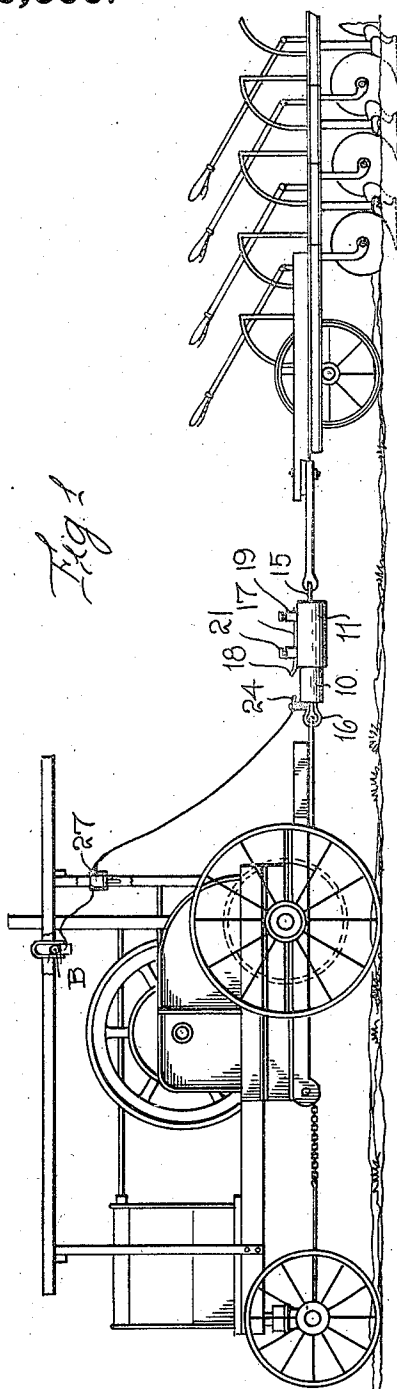
AUTOMATIC SAFETY DRAW BAR FOR FARM TRACTORS.

APPLICATION FILED APR. 30, 1917.

1,280,666.

Patented Oct. 8, 1918.

2 SHEETS—SHEET 1.



Inventor

ALVAH J. COLWELL

By *Watson E. Coleman*

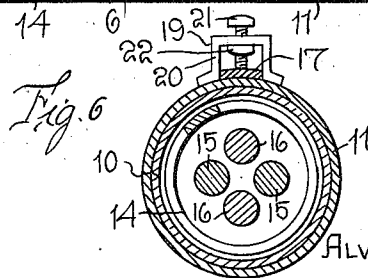
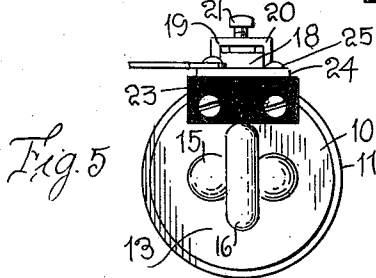
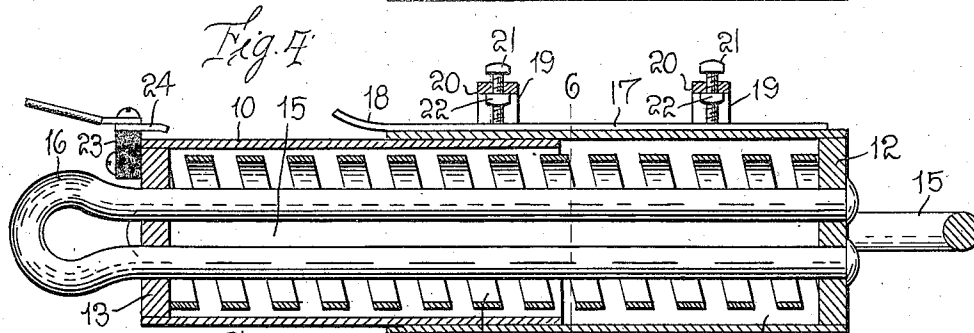
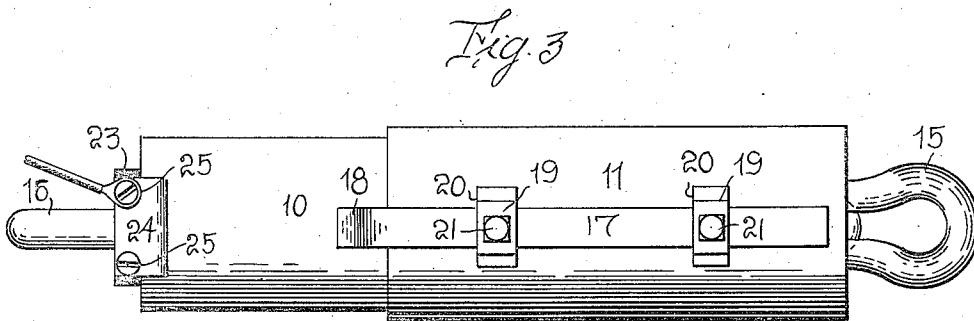
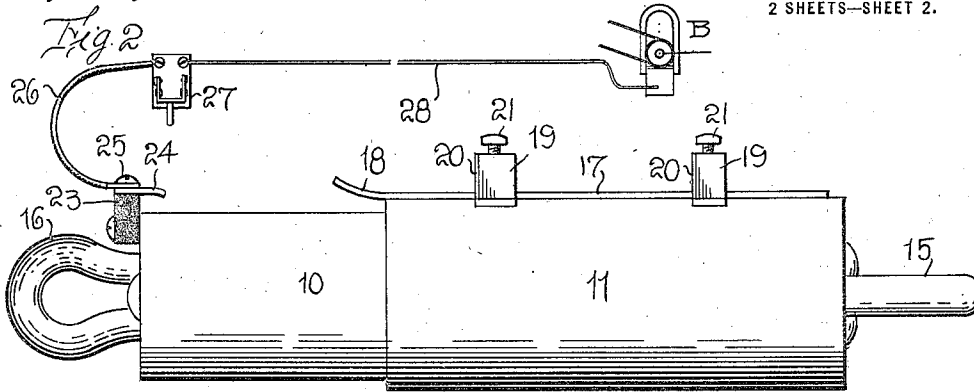
Attorney

A. J. COLWELL.
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2 SHEETS—SHEET 2.



Inventor

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ALVAH J. COLWELL, OF NORFOLK, NEBRASKA.

AUTOMATIC SAFETY DRAW-BAR FOR FARM-TRACTORS.

1,280,666.

Specification of Letters Patent.

Patented Oct. 8, 1918.

Application filed April 30, 1917. Serial No. 165,457.

To all whom it may concern:

Be it known that I, ALVAH J. COLWELL, a citizen of the United States, residing at Norfolk, in the county of Madison and State of Nebraska, have invented certain new and useful Improvements in Automatic Safety Draw-Bars for Farm-Tractors, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to draft devices, and particularly to draw bars or draft devices used in traction engines.

15 In the operation of traction engines, particularly when pulling plows or like implements, the plows often strike a boulder, stump or other relatively solid obstruction and unless the traction engine stops, the plow or other implement is liable to be broken.

20 The general object of this invention is to provide means whereby the traction engine shall be automatically stopped when the plow or other implement strikes an obstruction which is sufficient to detain the plow or other implement and prevent its moving forward.

25 And a further object is to provide means of this character in the form of a longitudinally contractible draw bar, which, when contracted a predetermined amount by the implement striking an obstruction, will cause the actuation of the engine stopping device.

30 A further object is to provide a construction of this character in which the amount of contraction of the draw bar necessary to actuate the engine stopping device may be adjusted.

35 A further object of the invention is to provide means of the character described, wherein a predetermined contraction of the draw bar will cause the completion of a short circuit through the ignition device of an internal combustion engine such as is used on most modern farm tractors.

40 Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

45 Figure 1 is a side elevation of a tractor with a gang of plows attached and showing my improved draw bar between the plows;

Fig. 2 is a side elevation of the draw bar with a portion of the electrical connections;

Fig. 3 is a top plan view of the draw bar;

50 Fig. 4 is a longitudinal sectional view of the draw bar;

Fig. 5 is an end elevation of the draw bar; Fig. 6 is a section on the line 6—6 of Fig. 4.

Fig. 7 is a side elevation of my improved 60 draw bar showing one manner in which it may be used to control the operation of a valve.

Fig. 8 is a like view to Fig. 7 but showing a valve directly operated by the draw bar. 65

Referring to these drawings, it will be seen that my improved draw bar consists of two cylindrical sections, one designated 10 and the other 11, the section 11 telescoping over the section 10 and being longitudinally 70 movable therealong. The section 11 is closed at one end by an end wall 12 and the section 10 is closed at its outer end by an end wall 13. These end walls are preferably of steel, as is the casing formed with the sections 10 and 11 and the end walls are securely welded or otherwise firmly connected to the tubular sections 10 and 11. 75

Disposed within the casing formed by the sections 10 and 11 is a relatively heavy 80 coiled spring 14, one end of which bears against the cap or end wall 13, the other end of which bears against the cap or end wall 12. Extending longitudinally through the casing is a draft iron 15 having two legs, 85 which have sliding engagement with the head 12 and which are attached to the wall 13 by being headed over onto this wall or head. At the other end of the device is the draft iron 16 having two parallel legs each having sliding engagement through the wall 13 and each extending longitudinally through the spring and which have rigid engagement with the end wall 12. Both of these draft 90 irons are formed with eyes at their extremities. Preferably the draft irons, as before stated, are U-shaped and are disposed in planes at right angles to each other. It will thus be obvious that if, for instance, the draft iron 15 be connected to the implement 100 and the draft iron 16 be connected to the tractor that if the implement be stopped on its onward course and the tractor continues to move forward, the draft iron 16 will cause the end wall 12 to move toward the end wall 105 13 thus compressing the spring. The same operation, of course, would occur if the tractor was attached to the draft iron 15 and the implement was attached to the draft iron 16. 110

Mounted upon the section 11, and movable therewith, is a contact bar 17 having one

extremity slightly turned upward as at 18. This contact bar is held upon the tubular section 11 in any suitable manner, as by the clamps 19, these clamps being so constructed that the contact bar may be shiftably adjusted through the clamps so as to project to a greater or less distance beyond the inner end of the section 11. As illustrated, these clamps are formed with straps 20, which arch over the contact bar and through these straps pass set screws 21 held in engagement with the contact bar by means of set nuts 22. I do not, of course, wish to be limited to this particular method of adjustably clamping the contact bar.

Mounted upon the section 10 and illustrated as mounted upon the end wall 13 is a block 23 of insulating material and mounted upon this block is a contact member 24, which may be made of brass or any other electrically conductive material, and which is held in place upon the insulating block by means of the screws 25. The extremity of this contact member 24 is downwardly inclined so that it may have electrical engagement with the upwardly turned end 18 of the contact bar 17 when the two sections are drawn in proper co-active relation to each other. Electrically connected to the contact plate 24, as by means of the screws 25, is a conductor 26 leading to an electrical switch 27 from which switch a conductor 28 leads to the magneto or other equivalent device B on the engine, so that when the contact plates 24 and 17 are in engagement with each other, the magneto or equivalent device will be short circuited, thus preventing ignition of the charge in the engine and stopping the motor and tractor.

The operation of the construction, as above described, will be obvious. In case the plow or other implement pulley by the tractor strikes an obstruction, the spring 14 will be compressed and the contact bar 17 is drawn into contact with the contact plate 24 which causes a short circuit in the magneto, timer or other equivalent device so that no spark will be produced at the spark plug of the engine when the engine is stopped. The spring 14 prevents sudden shocks and the breaking of parts and it will be seen that the power of the motor is instantly cut off before excessive strains are produced by the tractor plow after the obstruction is engaged by the implement. If for any reason this electric cut-out is not wanted for use for short periods of time, the switch 27 may be opened so that no current can pass through the short circuit conductors 28 and 26 and thus the timing device or magneto will not be short circuited in case the contact members 17 and 24 are pulled into electrical engagement with each other.

The contact bar or member 17 is made adjustable so that any desired compression of

the spring can be obtained before the contact takes place to stop the motor so that the resistance formed by different implements or the differences in the resistance formed by one or more plows may be compensated for. While preferably the spring of the draw bar will be inclosed within a tubular body comprising two telescopic sections, it will be understood that it is within the purview of my invention to form this draw bar in any suitable manner and without the use of the intersecting casing.

If a steam engine is used, instead of an internal combustion engine or motor, various means may be provided for stopping the engine when the spring is compressed to a predetermined amount. Thus in Fig. 7 I have illustrated a solenoid 29, operatively connected to the throttle valve C of a steam tractor engine, this magnet 29 being connected in circuit with a storage battery 30, or other suitable source of electricity and the contact members 17 and 24 being used as a circuit closer in said circuit so that when the spring is compressed, a predetermined amount, these contact members will electrically engage each other, close the circuit through the magnet and the storage batteries and thereby shift the throttle valve to cut off the passage of steam to the cylinders of the engine.

It is obvious also that a purely mechanical device may be used for this purpose, actuated, as illustrated in Fig. 8, by a member 17^a mounted upon one section of the draw bar and shiftably engaging a movable member 24^a mounted on the other section of the draw bar which in turn is operatively connected to the throttle valve C. I, therefore, do not wish to limit myself to the use of purely electrical means for stopping the engine as mechanical means may be used for the same purpose, nor do I wish to limit myself to short circuiting the ignition system of an internal combustion engine.

Preferably the barrel of the spring 14 as, for instance, the barrel section 10, is calibrated to indicate the pull in pounds on the draw bar, as indicated in Fig. 2. This calibration is particularly convenient in that it affords means for determining the draw bar pull of the tractor at all times and further provides means whereby the contact bar 17 in Fig. 2 may be properly set.

Having described my invention, what I claim is:—

1. The combination with a tractor, a motor therefor, and means for stopping the motor, of a draft device comprising coacting elements movable with relation to each other, one connected to the tractor and the other to the implement being moved thereby, a spring resisting movement of said elements under strain, and a member operatively connected to one of said elements and positively

movable therewith in opposite directions, said member being normally held out of engagement with the motor stopping means by the action of the spring but engageable with said motor stopping means when the resistance to the movement of the implement by the tractor reaches a certain predetermined point, and means for supporting said member whereby it may be adjusted along its line of travel toward or from the motor stopping means to thereby adjustably predetermine the instant of actuation of the motor stopping means.

2. The combination with a tractor, a motor therefor, and means for stopping the motor, of a draft device comprising coacting elements longitudinally movable with relation to each other, one connected to the tractor and the other to the implement being drawn thereby, means yieldingly resisting the movement of the elements under strain, a motor stopping means, and a member mounted upon and positively movable with one of said elements for movement with the element toward or from the motor stopping means, said member being adjustable independently of the element upon which it is mounted toward or from the motor stopping means to thereby control the instant of actuation of the motor stopping means.

3. The combination with a tractor, a motor thereon, and means for stopping the motor, of a draft device comprising coacting sections, longitudinally movable with relation to each other, one connected to the tractor and the other to the implement being drawn thereby, a coiled compression spring resisting longitudinal movement of the sections under strain, and means for automatically actuating said motor stopping means comprising a member mounted upon the outermost of said sections and movable in opposite directions therewith, said member being longitudinally adjustable upon the section to which it is attached in the direction of its travel, to thereby control the instant of actuation of said engine stopping means.

4. A draw bar for connecting tractors to implements to be drawn thereby comprising coacting elements having sliding engagement with each other, one adapted to be connected to the tractor and the other to the object to be drawn, a spring yieldingly resisting movement of the elements under strain, and motor stopping members, each mounted on one of said elements for movement therewith in opposite directions and adapted to be brought into operative engagement with each other upon a predetermined movement of the elements under strain.

5. The combination with a tractor, a motor therefor and means for stopping the motor including an electrical conductor, of a draft device comprising coacting members

longitudinally movable with relation to each other, one connected to the tractor and the other to the implement to be drawn thereby, a spring yieldingly resisting longitudinal movement of said members, an electrical contact operatively mounted upon one of said members, and an electrical contact operatively mounted upon the other member and connected to said conductor, a relative movement of said members against the force of the spring bringing said contacts in electrical engagement to thereby stop the motor.

6. The combination with tractor and an internal combustion motor having an ignition system, of a draft device comprising coacting members longitudinally movable with relation to each other one connected to the tractor and the other to an implement to be drawn thereby, a spring yieldingly resisting relative movement of the said members in one direction, and means for automatically short-circuiting the ignition system comprising contacts operatively mounted upon said members and normally held in spaced relation by the spring, one of said contacts being electrically connected to the ignition system of the engine, said contacts being brought into electrical engagement upon a compression of the spring due to resistance offered by the implement being drawn.

7. A draft device of the character described comprising coacting members longitudinally movable with relation to each other, a spring resisting said movement, telescopic cylinders mounted upon said members and housing the spring and movable with the members, and electrical contacts mounted upon said cylinders exteriorly thereto, normally held out of operative engagement with each other by said spring, but brought into electrical engagement with each other by the movements of the members against the force of said spring.

8. A draft device of the character described comprising coacting members longitudinally movable with relation to each other, a spring resisting said movement, cylinders respectively mounted upon said members and connected therewith, said cylinders having telescopic engagement with each other and housing the spring and said members, and electrical contacts mounted upon said cylinders and normally held out of operative engagement with each other by the spring but brought into electrical engagement with each other by a movement of said members against the force of said spring, said contacts being relatively adjustable toward or from each other upon said members whereby to control the instant of engagement between said contacts.

9. A draft device of the character described comprising longitudinally extending draft irons, each draft iron at its end having a head through which the other draft iron

slidingly passes, whereby a movement of the draft irons away from each other will draw the heads toward each other, a compression spring disposed between said heads and resisting said inward movement of the heads, and contact members operatively supported upon the respective heads and movable into electrical engagement with each other upon a predetermined movement of the heads toward each other.

10. A draft device of the character described comprising a pair of longitudinally extending parallel draft irons, a head carried upon each draft iron at the extremity thereof and through which head the other draft iron slidingly passes, coacting telescopic casing sections mounted upon the heads, a coil spring disposed within said casing section and bearing against the heads and resisting a movement of the heads toward each other, and electrical contact members operatively supported upon each of said casing sections and movable into electrical engagement with each other upon a predetermined movement of the heads toward each other against the force of said spring.

11. A draft device of the character described comprising a pair of longitudinally extending parallel draft irons, a head carried upon each draft iron at the extremity thereof and through which head the other draft iron slidingly passes, coacting telescopic casing sections mounted upon the heads, a coil spring disposed within said casing sections and bearing against the heads and resisting a movement of the heads toward each other, and electrical contact members operatively supported upon each of said casing sections and movable into electrical engagement with each other upon a predetermined movement of the heads toward each other against the force of said spring, one of said contact members being adjustably mounted for longitudinal movement toward or from the other contact member to thereby control the instant of engagement between the contact members.

12. The combination with a traction engine having an internal combustion motor including an electrically operated device, of a draft device including two parallel draft irons disposed in overlapping relation, one of said draft irons being connected to the traction engine and the other to the article to be drawn, said draft irons each having a head through which the other draft iron slidingly passes, a coiled compression spring surrounding the draft irons and bearing against the heads and resisting movement of the heads toward each other, tubular sections mounted upon the respective heads and having telescopic engagement with each other, a contact mounted upon one of said heads, a contact mounted upon the opposite tubular section and adjustable longitudi-

nally thereon, a conductor attached to the first named contact and extending to the said magneto, to short-circuit the same, when the contacts are brought into electrical engagement with each other, and a switch in the circuit between the contact and the magneto for breaking said circuit.

13. The combination with a tractor and a motor therefor, of a draft device comprising coacting elements movable toward and from each other, one connected to the tractor and the other adapted to be connected to an implement being drawn thereby, a spring resisting movement of the elements under strain, a member for stopping the motor, and an actuating member therefor operatively connected to one of said elements and movable therewith in opposite directions, said actuating member being normally disposed out of engagement with the motor stopping member but shiftable into actuating engagement therewith by a relative movement of the elements under a predetermined strain and shiftable out of engagement therewith by a relative movement of the said elements in the opposite direction under the action of the spring.

14. A draft device of the character described comprising longitudinally extending draft irons, each having a head through which the other draft iron yieldingly passes, whereby a movement of the draft irons away from each other will draw the heads toward each other, a compression spring disposed between said heads and resisting said inward movement of the heads, and members operatively supported upon said heads and normally held in spaced relation to each other by the force of said spring, said members when engaged with each other being adapted to stop the operation of a motor, one of said members being longitudinally adjustable toward or from the other member to thereby control the instant of engagement of said members with each other.

15. A draft device of the character described comprising a pair of longitudinally extending parallel draft irons having sliding engagement with each other, a head carried upon each draft iron at the extremity thereof and through which head the other draft iron slidingly passes, coacting telescopic casing sections mounted upon the heads, a coiled spring disposed within said casing sections and bearing against the heads and yieldingly resisting a movement of the heads toward each other, clamps mounted upon one of said tubular casing sections, and an actuating bar mounted in said clamps and adjustable therethrough longitudinally with relation to the casing section upon which it is mounted.

16. A draft device of the character described comprising coacting elements longitudinally movable with relation to each

other, one of these elements being adapted to be operatively connected to a tractor and the other to an implement being moved thereby, a spring resisting longitudinal movement of said elements, and movable therewith in both directions a member operatively mounted upon one of said elements and being longitudinally adjustable with relation to the element upon which it is mounted, and a coacting actuating member disposed in the path of movement of the

first named member, normally in spaced relation thereto and being engaged thereby when the said elements are longitudinally moved relative to each other against the force of the spring.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ALVAH J. COLWELL.

Witnesses:

L. P. PASEWALK,

A. F. WENTWORTH.