

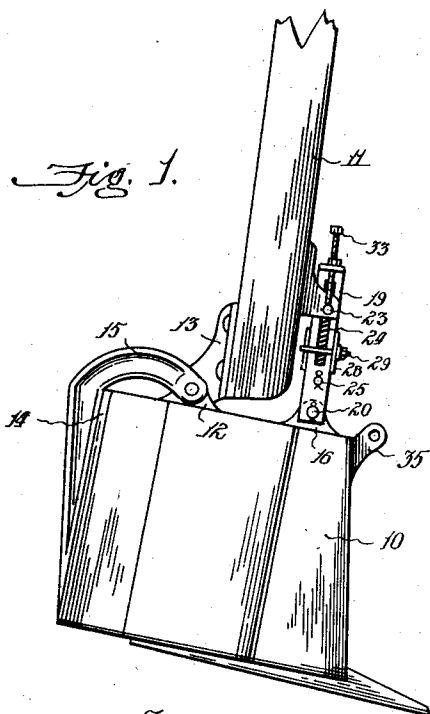
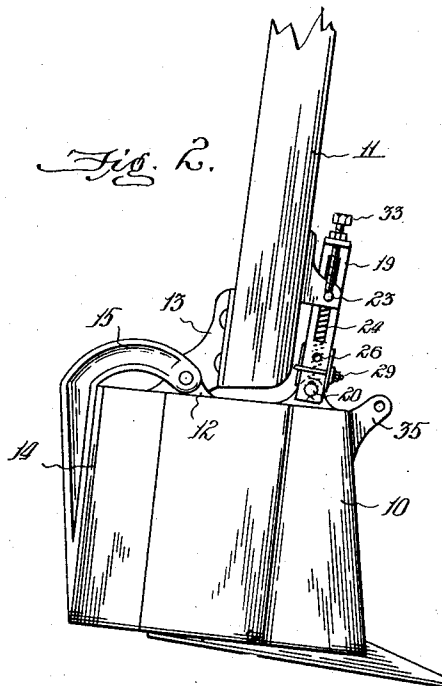
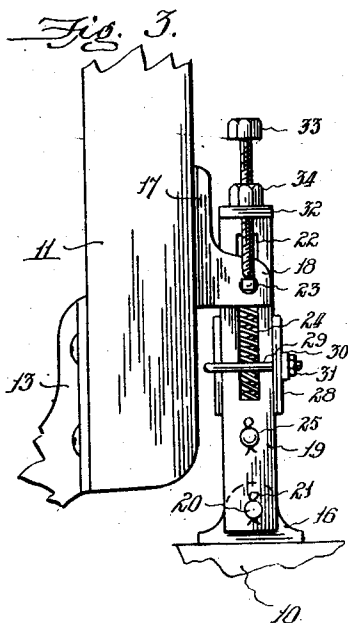
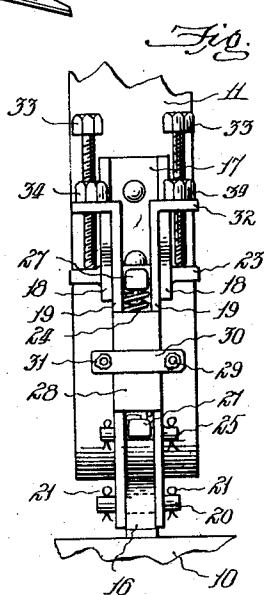
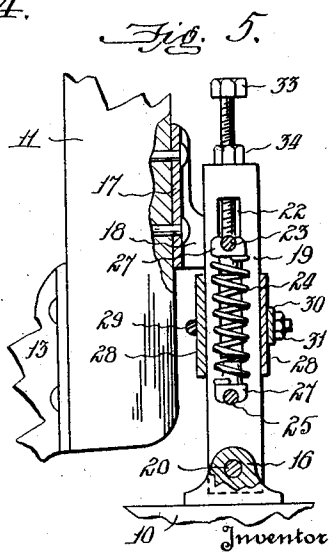
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G. L. MARTIN

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BUCKET ATTACHMENT FOR EXCAVATING MACHINES

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BUCKET ATTACHMENT FOR EXCAVATING MACHINES

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My invention relates to excavating machines of that particular type in which the digging or excavating is done by means of a bucket operating at the lower end of a swinging spar or crowding stick and pulled by ropes or cables extending from the shovel over pulleys at the outer end of the inclined boom of a derrick.

attachment in connection with the lower end of the spar or crowding stick.

Fig. 4 is a front elevation thereof, and

Fig. 5 is a vertical transverse sectional view.

In the ordinary form of excavating machines of this type the bucket is attached to the lower end of the spar or crowding stick by pivot and link connections at the back and front of the bucket respectively which permits an adjustment of the angle of the bucket with respect to the spar or stick but provides an unyielding attachment which sometimes results in the breaking of the pulling rope or cable when the bucket strikes a rock embedded in the ground, and in order to overcome this difficulty I provide a yielding connection between the front end of the bucket and the swinging spar or crowding stick which will not interfere with the proper operation of said bucket.

My improved attachment is used in connection with that type of excavating bucket and crowding stick such as illustrated in the accompanying drawings in which the bucket is pivotally connected to the lower end of the stick 11 by companion ears 12 13 which permit of a swinging movement in the adjustment of the angle of the bucket with respect to the crowding stick, and in this type of excavating bucket a gate 14, pivoted by arms 15 to the pintle 16 connecting the ears 13 14, forms the rear wall of said bucket to provide for dumping the contents. Usually the forward end of the bucket is connected to the crowding stick by links (not shown) extending from an ear 16 on the bucket to a fixture 17 on the crowding stick; said fixture being in the form of a metal bracket having spaced apart ears 18 18, and is retained in the application of my improved attachment which is connected to the ear and bracket as hereinafter described. The bucket is also provided at its forward end with an ear 35 to which the pulling rope or cable is attached, and with the usual means (not shown) for tripping the gate.

In the preferred embodiment of my invention I replace the links which connect the front end of the bucket to the stick with an attachment including an interposed spring contracted under tension of the pulling rope or cable in the digging operation of the bucket to permit said bucket to yield in striking an obstruction such as a stone or rock embedded in the ground, the construction of the attachment limiting the expansion movement of the spring.

My invention also embodies a particular construction and arrangement of the parts constituting the attachment whereby adjustment of the bucket with respect to the swinging spar or crowding stick may be obtained; all as hereinafter fully described and more specifically set forth in the appended claims.

In the drawings:—

Figure 1 is a side elevation illustrating the application of the attachment embodying my invention.

Fig. 2 is a similar view with the bucket adjusted at a different angle.

Fig. 3 is an enlarged side view showing the

In carrying out my invention I employ a pair of plates 19 19 which are pivoted at their lower ends to the ear 16 by pintle 20 preferably held in place by cotter pins 21 with the upper portions of said plates provided with vertical slots 22 through which passes a pintle 23 connecting the plates to the inner sides of the ears 18 of bracket 17. The plates enclose a helical spring 24 which in one adjustment of the bucket with respect to the crowding stick bears at its lower end on the ear 16 and at its upper end against the pintle 23 (as indicated in dotted lines Fig. 2) and for the adjustment of the bucket at the angle shown in Fig. 1 said spring is interposed between the pintle 23 and a removable pin 25 extending between the plates through apertures 26 (Fig. 2) therein. To hold the ends of the spring in engagement with the ear 16

and the pintle 23 or pin 25, and said pintle 23 in the different adjustments of the bucket, as hereinafter explained, bearing pieces 27 are employed having a head grooved to engage the pintle or pin and a stud projecting into the helical spring, and for preventing the spring from being distorted it is retained by short plates 28, 28 clamped against the edges of said plates at opposite sides thereof by means of a U-bolt 29 and crosspiece 30, the bight portion of said U-bolt embracing one of the short plates and the crosspiece extending across the other for the engagement of the tightening nuts 31, it being noted by reference to Figs. 1 and 2 that the position of said short plates for retaining the spring in place is shifted according to the adjustment of the bucket, and to provide for this adjustment or retain the required tension on the spring in either situation the upper ends of the connecting plates 19 19 are bent outwardly to provide lugs 32 through which are threaded set screws 33 bearing at their lower ends on the outer squared ends of the pintle 23. The adjustment of the set screws is secured by means of nuts 34 bearing on the upper ends of the lugs 32, it being understood that when the spring bears on the pin under desired tension the pintle 23 will be near the upper ends of the slots 22 with the bucket at a greater inclination with respect to the crowding stick than when said spring is in its lowermost position bearing on the ear 16 of the bucket, and that the plates 19 19 being pivotally connected to the forward end of the bucket move upward between the ears of the bracket 17 as said spring is contracted under the pulling strain in the operation of the bucket in digging or excavating, the set screws moving away from the pintle 23 with the plates as the spring is contracted.

In operation the pull on the bucket by the pulling ropes or cables swing it forward on its pivotal connection with the crowding stick so that the spring is contracted to a certain extent whereby should the bucket strike an obstruction it will yield sufficiently to permit the operator to release the pull on the ropes or cables thus preventing undue strain or breaking of said ropes or cables. It will be obvious therefore that my invention provides a yielding connection between the bucket and crowding stick which will eliminate danger of breaking the pulling ropes or cables, and although I have shown and described the preferred construction of the attachment it will be understood that changes or modifications may be resorted to within the spirit and scope of the claims.

I claim:

1. In an excavating machine operating a bucket carried by a crowding stick, the combination of the bucket pivoted at one end to the crowding stick, of plates pivotally connected to the other end of the bucket and

having slots through the same, a pintle on the crowding stick passing through the slots for slidably connecting the plates to said crowding stick, a connection extending between the plates and spaced from the pintle, and a spring bearing at one end against the pintle and at the other end against said connection to permit the bucket to yield in the operation of the same.

2. In an excavating machine operating a bucket carried by a crowding stick, the combination with the bucket pivoted at one end to the crowding stick, of plates pivotally connected to the other end of the bucket and having slots through the same, a pintle on the crowding stick passing through the slots for slidably connecting the plates to said crowding stick, a connection extending between the plates and spaced from the pintle, a spring bearing at one end against the pintle and at the other end against said connection, and means for adjusting the tension of the spring.

3. In an excavating machine operating a bucket carried by a crowding stick, the combination with the bucket pivoted at one end to the crowding stick, of plates pivotally connected to the other end of the bucket and having slots through the same, a bracket on the crowding stick having ears between which the plates extend, a pintle passing through the slots in the plates and ears of the bracket to connect said plates slidably between the plates and spaced from the pintle, a helical spring confined between the plates and interposed between said pintle and spaced connection, and comparatively short retaining plates clamped to opposite sides of the plates to prevent displacement of the spring.

4. In an excavating machine operating a bucket carried by a crowding stick, the combination with the bucket pivoted at one end to the crowding stick, of plates pivotally connected to the other end of the bucket and having slots through the same, a bracket on the crowding stick having ears between which the plates extend, a pintle passing through the slots in the plates and ears of the bracket to connect said plates slidably to said bracket, a connection extending between the plates and spaced from the pintle, a helical spring confined between the plates and interposed between said pintle and spaced connection, and comparatively short retaining plates clamped to opposite sides of the plates to prevent displacement of the spring; together with means for adjusting the tension of the spring.

5. In an excavating machine operating a bucket carried by a crowding stick, the combination with the bucket pivoted at one end to the crowding stick, of plates pivotally connected at the other end of the bucket and having slots through the same, said plates

being bent outwardly at their upper ends to provide lugs, a bracket on the crowding stick between which the plates extend, a pintle passing through the slots in the plates and ears of the bracket to connect said plates
5 slidably to said bracket, a connection extending between the plates and spaced from the pintle, a helical spring confined between the plates and interposed between said pintle and spaced connection, and set screws threaded through the lugs at the upper ends of the
10 plates to strike against the projecting ends of the pintle of the bracket on the crowding stick to limit the expansion of the spring.

15 6. In an excavating machine operating a bucket carried by a crowding stick, the combination with the bucket pivoted at one end to the crowding stick, of plates pivotally connected at the other end of the bucket and
20 having slots through the same, said plates being bent outwardly at their upper ends to provide lugs, a bracket on the crowding stick between which the plates extend, a pintle passing through the slots in the plates
25 and ears of the bracket to connect said plates slidably to said bracket, a connection extending between the plates and spaced from the pintle, a helical spring confined between the plates and interposed between said
30 pintle and spaced connection, and set screws threaded through the lugs at the upper ends of the plates to strike against the projecting ends of the pintle of the bracket on the crowding stick to limit the expansion of the
35 spring; together with comparatively short plates clamped to opposite sides of the plates to prevent displacement of the spring.

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