

May 30, 1939.

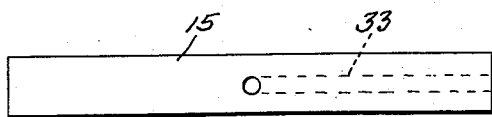
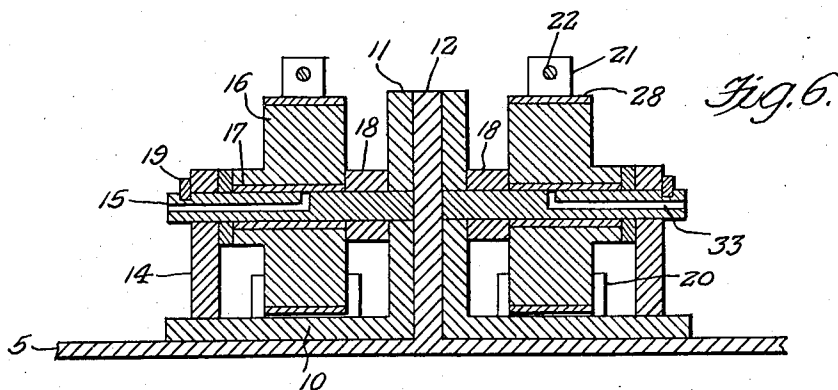
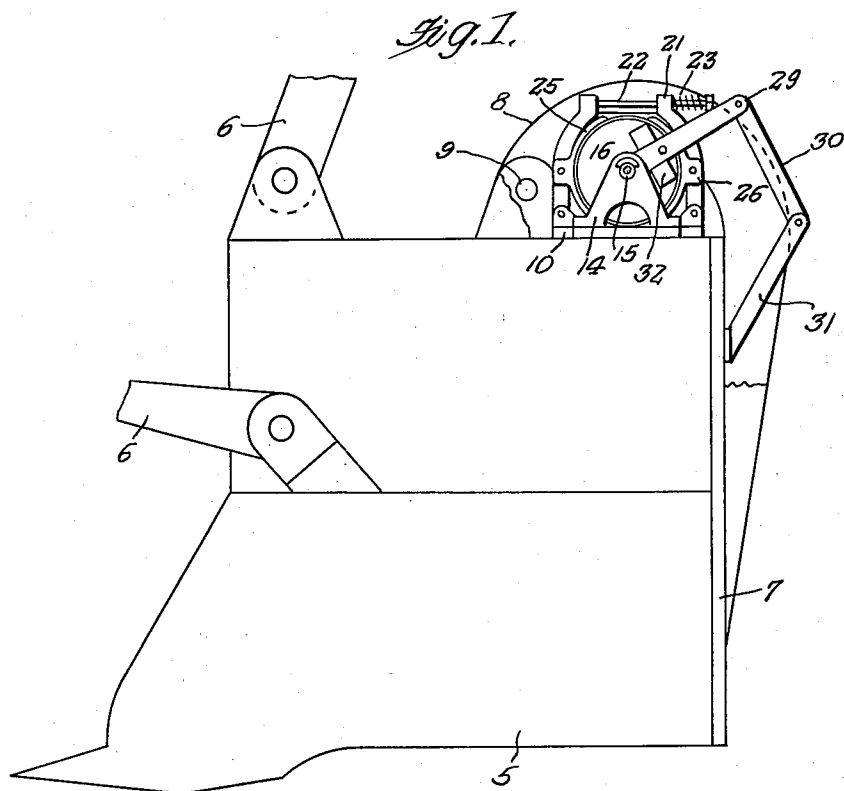
V. DAVIDSON

2,160,432

DIPPER DOOR CONTROL

Filed June 28, 1938

3 Sheets-Sheet 1



Inventor
Voris Davidson.

By *Clarence A. O'Brien*
and Hyman Berman
Attorneys

May 30, 1939.

V. DAVIDSON

2,160,432

DIPPER DOOR CONTROL

Filed June 28, 1938

3 Sheets-Sheet 2

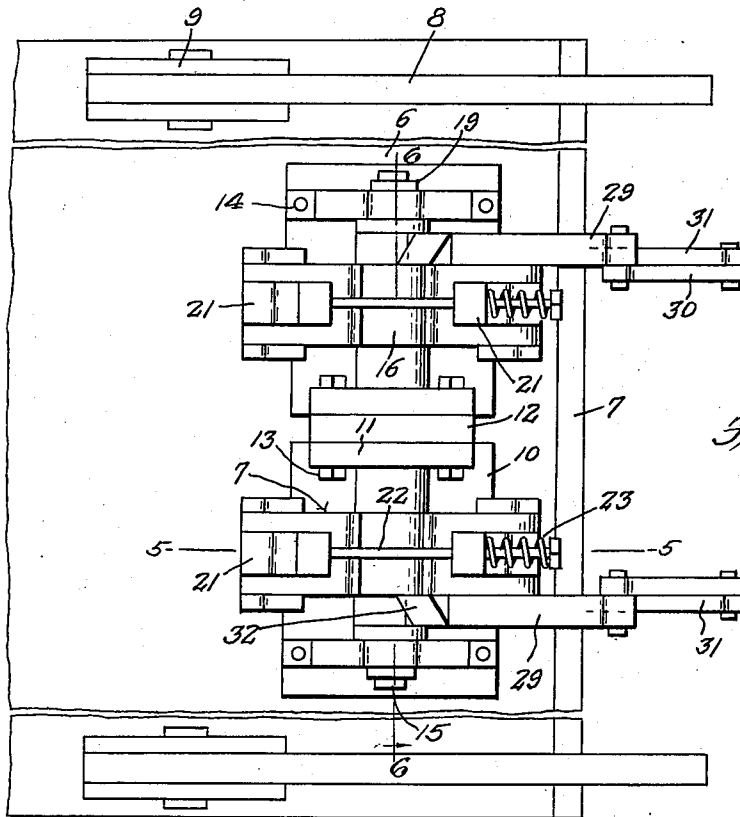


Fig. 2.

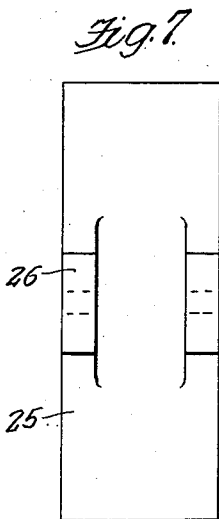


Fig. 1.

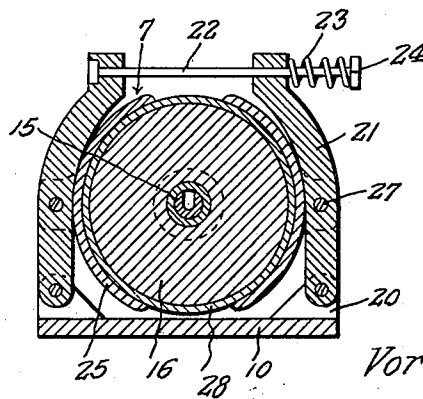


Fig. 5.

Inventor
Voris Davidson.

By *Clarence A. O'Brien*
and *Hyman Berman*
Attorneys

May 30, 1939.

V. DAVIDSON

2,160,432

DIPPER DOOR CONTROL

Filed June 28, 1938

3 Sheets-Sheet 3

Fig. 4.

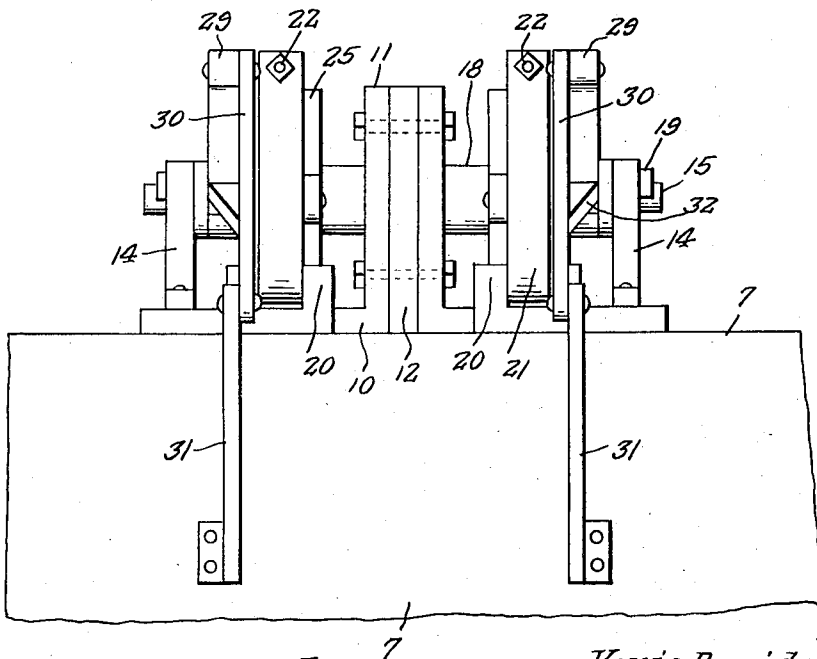
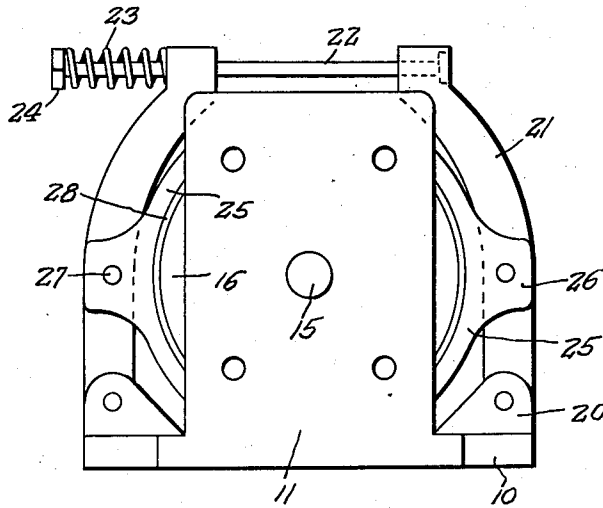


Fig. 3.

Inventor

Voris Davidson.

By

Clarence A. O'Brien
and Hyman Berman
Attorneys

UNITED STATES PATENT OFFICE

2,160,432

DIPPER DOOR CONTROL

Voris Davidson, Lyons, Ind., assignor of one-half
to George P. Buzan, Lyons, Ind.

Application June 28, 1938, Serial No. 216,359

4 Claims. (Cl. 214—146)

The present invention relates to shovels and more particularly to a control for the dipper door thereof.

In power shovels the door is secured to the dipper by suitable latch mechanism to close it while the dipper is receiving or carrying its load, and is allowed to swing free during the discharge of the load. Frequently the dipper door is rapidly opened and shut as in the shaking of the dipper during discharge operations and repeated contact of the door against an unyielding part of the shovel structure results in damage to the part and eventual depreciation and breakage.

It is accordingly an object of the present invention to provide a simple and efficient construction for restricting the free swinging movement of the door, the invention embodying essentially a plurality of friction drums at the pivot of the door for the aforesaid purpose.

Another object is to provide an apparatus of this character of simple and practical construction, which embodies means for adjusting the friction control means and to generally provide an apparatus of this character which is well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the dipper.

Figure 2 is a top plan view.

Figure 3 is an end elevational view.

Figure 4 is an end elevational view of one of the friction drums and associated mechanism.

Figure 5 is a sectional view through one of the drums taken substantially on a line 5—5 of Figure 2.

Figure 6 is a sectional view taken substantially on a line 6—6 of Figure 2.

Figure 7 is a rear elevational view of one of the brake shoes, and

Figure 8 is a detail of one of the lubricating shafts.

Referring now to the drawings in detail, wherein for the purpose of illustration I have disclosed a preferred embodiment of the invention, the numeral 5 designates a dipper generally having the usual supporting arms 6 and provided at its rear with a conventional type of door 7 having a plurality of arcuate arms 8 extending upwardly and over the top of the dipper and pivotally at-

tached thereto as at 9 to provide for the free swinging movement of the door.

To the top of the dipper is fixedly secured a pair of L-shaped plates 10 having their upstanding portions 11 secured to opposite sides of a plate 12 rising from the top of the dipper and bolted thereto as at 13. From the base portion of the plates or brackets 10 rise bearing brackets 14, within which one end of a pair of shafts 15 are supported, the opposite ends of the shafts being supported by the upstanding portions 11 of the brackets 10 as will be apparent from an inspection of Figure 6 of the drawings.

Freely rotatable on each of the shafts 15 is a drum 16, having a bushing 17 interposed between the drum and shaft, and spacing washers 18 positioned between the opposite sides of the drum and the adjacent supporting structure. The shafts 15 are secured in position by keys 19.

Pivotally mounted in brackets 20 are a pair of brake arms 21 having their upper ends terminating in spaced relation at the top of the drum and connected by an adjusting rod 22, one end of the rod being provided with a coiled spring 23 positioned between one of the arms and a head 24 on the rod. Brake shoe 25 is provided with a lug 26 pivotally attaching the same as at 27 to an intermediate portion of each of the arms 21, said brake shoes being positioned in frictional engagement at opposite sides of the drum 16. A brake lining 28 may be provided for the drum, if desired.

One end of an arm 29 is bolted to one side of each of the drums 16, the opposite end of the arm being pivotally connected to one end of a link 30 which has its opposite end pivotally connected to one end of an arm 31 which has its opposite end fixedly secured to the door 7.

Brace blocks 32 are secured to the side of the drum in engagement with opposite sides of the arm 29 to rigidly support the same.

The shafts 15 may be provided with ducts 33 extending outwardly through the ends of the shafts and to which a grease fitting may be attached for lubricating the bushings 17.

In the operation of the device it will be apparent that the nut 24 is adapted to place proper tension on the spring 23 to maintain the brake shoe 25 in frictional engagement with the drums 16 and by reason of the connection of the drums with the door 7 through the arms 29, links 30 and arms 31, the free swinging movement of the door is properly restricted.

It is believed that the details of construction and manner of operation of the device will be

readily understood from the foregoing without further detailed explanation.

Having thus described the invention, what I claim is:

- 5 1. In a dipper door control apparatus, a dipper having a door swingably carried thereby, a drum rotatably carried by the dipper, friction means restricting movement of the drum and a linked connection between the drum with the door and
10 including rigid members fixedly attached to the drum and door and a rigid connector pivoted to each of said fixed members.
2. In a dipper door control apparatus, a dipper having a door swingably mounted thereon, a
15 drum rotatably carried by the dipper, brake shoes for the drum, means yieldably urging the shoes into frictional engagement with the drum and a linked connection between the drum and the door to restrict free swinging movement thereof
20 and including rigid members fixedly attached to the drum and door and a rigid connector pivoted to each of said fixed members.
3. In a dipper door control apparatus, a dipper having a door swingably mounted thereon, a

drum rotatably carried by the dipper, brake shoes for the drum, means yieldably urging the shoes into frictional engagement with the drum and means connecting the drum to the door to restrict free swinging movement thereof, said last
5 named means comprising arms fixedly attached to the drum and the door and a link pivotally connecting said arms.

4. In a dipper door control apparatus, a dipper having a door swingably mounted thereon, brackets carried by the dipper, a plurality of
10 drums rotatably supported by the brackets, a pair of brake shoes for each of the drums pivotally mounted at one end, means yieldably connecting the free ends of the shoes for urging the shoes into frictional engagement with the drums
15 and means connecting each of the drums to the door to restrict free swinging movement of the latter, said means comprising an arm fixedly secured at one end to the drum, an arm fixedly
20 secured at one end to the door and a link pivotally connecting said arms.

VORIS DAVIDSON.