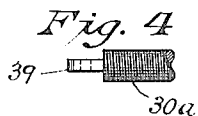
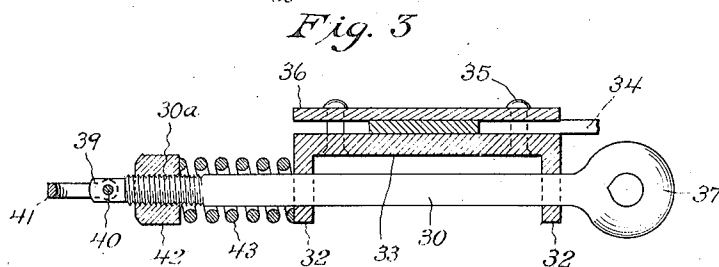
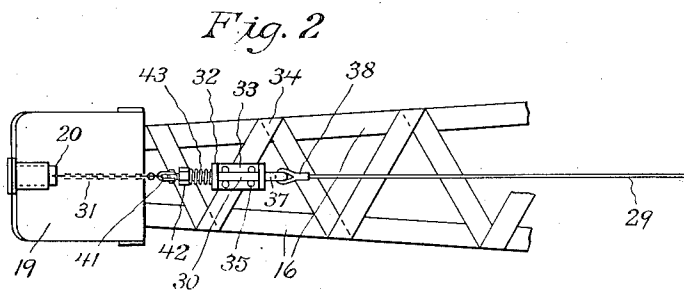
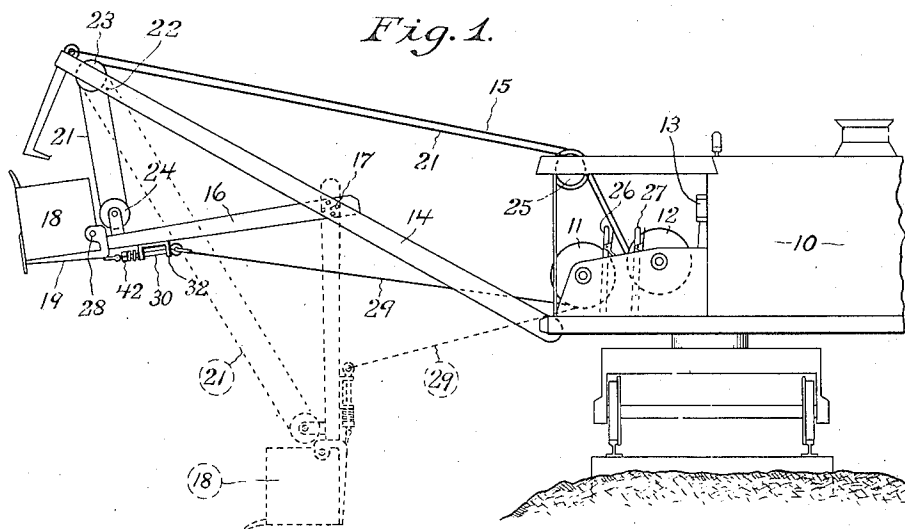


J. N. BELANGER.
LATCH OPERATING DEVICE FOR STEAM SHOVELS.
APPLICATION FILED JUNE 12, 1914.

1,148,432.

Patented July 27, 1915.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH N. BELANGER, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO J. A. BRUNELLE, OF ST. PAUL, MINNESOTA.

LATCH-OPERATING DEVICE FOR STEAM-SHOVELS.

1,148,432.

Specification of Letters Patent.

Patented July 27, 1915.

Application filed June 12, 1914. Serial No. 844,675.

To all whom it may concern:

Be it known that I, JOSEPH N. BELANGER, a subject of the King of Great Britain, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented new and useful Improvements in Latch-Operating Devices for Steam-Shovels, of which the following is a specification.

My invention relates to latch operating devices for steam shovels, or dredges, and more particularly to that class of steam shovels or dredges which comprise a main boom rigged and supported upon a turntable, a bucket-beam supported to oscillate upon the boom and also be swung therewith, a bucket having a hinged door provided with a latch and a "backing-line" for drawing the bucket back to its initial position for excavating.

In most steam shovels in present use there is required in addition to the engineer a second operator whose duty consists in watching the movements of the bucket and pulling a chain or cable connected with the bucket latch to trip the latch and cause the bucket door to open and dump its contents.

The object of my invention is to make the latch-tripping operations automatic, thus preventing the necessity for the extra operator. This object I attain in a simple, practical and effective manner, as herein-after fully set forth.

In the accompanying drawings, Figure 1 is a diagrammatic elevation of a steam shovel equipped with my invention. Fig. 2 is an enlarged bottom plan view of a device embodying the invention and the parts to which it is attached. Fig. 3 is a central longitudinal sectional view of said device, and Fig. 4 is a detail of one end of the bolt, omitting the shackle.

In Fig. 1, the numeral 10 indicates the engine house for a common type of steam shovel; 11 and 12 friction drums; 13 an engine by which both of said drums are driven; 14 the main boom, controlled as to height by a cable 15 fastened to a third friction drum not shown; 16 the bucket-beam pivoted in the main boom 14 at 17; 18 the bucket; 19 the door thereof and 20 the latch which normally holds said door in closed position. The bucket-beam 16 is raised and lowered by a cable 21 fastened to the boom 14 at 22 and passing around the sheaves 23 and 24, thence over a pulley

25 on the engine house and to the friction drum 12. The drums 11 and 12 are respectively controlled by clutch-levers 26 and 27, in connection with clutches whose operation in these machines is well understood. The bucket-door 19 is hinged to the bucket 18 at 28, and will fall open by gravity when its latch 20 is retracted if the bucket is in an elevated position as shown by full lines on Fig. 1. The usual present practice is to run a line from this latch to the engine house where it is manually operated, as above noted. The latch is of the usual self-closing type. After the bucket-beam has descended to about the angle shown in dotted lines, the bucket is usually swung farther backward (*i. e.* toward the power plant) by means of a line running from the bucket-beam to one of the friction drums 11, said drum being actuated by throwing the clutch-lever 26 in the proper direction.

According to my invention the line 29, which I have just referred to, is not connected to the bucket-beam 16 but is connected to a slidably mounted spring-pressed bolt 30, the opposite end of which is connected by a chain 31 with the latch 20.

The bolt 30 is mounted on a hanger 32, the base 33 of which is riveted or bolted to the lower side of the beam 16 adjacent the bucket 18. As shown the hanger is fastened to one of the lattice-bars 34 by means of rivets 35 and a patch plate 36. The hanger comprises two lugs 32 having alined circular holes through which the greater part of the bolt 30 extends. Said bolt is formed with an eye 37 at the end opposite the bucket, and said line 29 from the friction drum 11 is fastened to said eye, preferably by an eye clamp 38 shown on Fig. 2.

The bolt 30 projects a few inches beyond one of the lugs 32 and has a threaded portion 30^a terminating in a reduced flattened ear 39 in which a perforation is made to receive a pin 40 having a shackle 41 thereon, connected with the latch-chain 31. On the threaded part 30^a of the bolt 30 is a thrust-nut 42, and between said nut and the hanger 32 is a stiff helical compression-spring 43. This spring yieldingly resists any pulling force upon the backing line 29, and must be stiff enough so that when the bucket-beam 16 is being advanced, as in making a working stroke, the latch 20 will not be retracted by the tension on the backing line 29; there-

fore the spring 43 must hold the line 29 while said line rotates the drum 11 against the breaking action of the clutch operated by the hand lever 26. Just before the 5 bucket-beam is started forward the engineer will throw this clutch to exert a minimum pressure. This pressure, however, is considerable. The bucket-beam swings up to the end of a stroke, thereby rotating the drum 10 11 as aforesaid. When the bucket has been positioned over a receptacle or dumping place the engine is started to turn the drum 11 in a reverse direction and said drum is clutched with the engine. The initial pull 15 of the backing line 29 will of course compress the spring 43 and trip the latch 20, and the door 19 will fall open.

From the above it will be apparent that the operation of unlatching the bucket door 20 will be entirely automatic, as no extra motions are entailed upon the clutch-lever operator and the backing-drum 11 must in any case be clutched to the engine shaft in order to return the bucket to its initial position.

25 Having described my invention, what I claim as new and desire to protect by Letters Patent, is:

1. The combination with a power-shovel having a swinging bucket beam, a bucket 30 carried thereby, said bucket being provided with a hinged door and a latch on said door for securing the same in closed position, of a bolt slidably mounted on said beam, a spring for yieldingly holding said bolt at one end of its stroke, a power-driven drum, a back- 35 ing line wound at one end on said drum and attached at the other end to said bolt and connecting means between said bolt and latch, said spring being adapted to resist the unlatching movement of said bolt caused by the tension on the backing line during the 40 forward stroke of the bucket.

2. The combination with a power-shovel having a swinging bucket beam, a bucket 45 carried thereby, said bucket being provided with a hinged door and a latch on said

door for securing the same in closed position, of a bolt slidably mounted on said beam, a spring for yieldingly holding said bolt at one end of its stroke, means for ad- 50 justing the tension of said spring, a power-driven drum, a backing line wound at one end on said drum and attached at the other end to said bolt and connecting means between said bolt and latch, said spring being 55 adapted to resist the unlatching movement of said bolt caused by the tension on the backing line during the forward stroke of the bucket.

3. The combination with a power shovel, 60 a swinging bucket beam, a bucket carried thereby, said bucket being provided with a hinged door and a latch for said door, of a power driven drum, a chain connected to and adapted to trip said latch, a hanger se- 65 cured to the bucket beam, adjacent the bucket, a bolt slidably supported by said hanger, a backing line on said drum, said chain and backing line being connected with said bolt, and a spring engaging a pro- 70 jection on said bolt, said spring being adapted to resist the unlatching movement of said bolt against the tension on the backing line caused by the forward stroke of said bucket.

4. The combination with a bucket beam, 75 a bucket door and its latch, of a hanger secured to said beam, a bolt slidable in said hanger, an eye at one end of said bolt, a latch chain connecting the other end of said bolt with said latch, an adjustable nut on 80 said bolt, and a spring on the bolt between said nut and said hanger, said spring yieldingly resisting movement of the bolt, tending to release said latch.

In testimony whereof, I have signed my 85 name to this specification in the presence of two subscribing witnesses.

JOSEPH N. BELANGER.

Witnesses:

J. E. STRYKER,
F. C. CASWELL.