R. V. LONGTINE.

WALKING BEAM.

APPLICATION FILED APR. 13, 1911.

1,009,537. Patented Nov. 21, 1911.

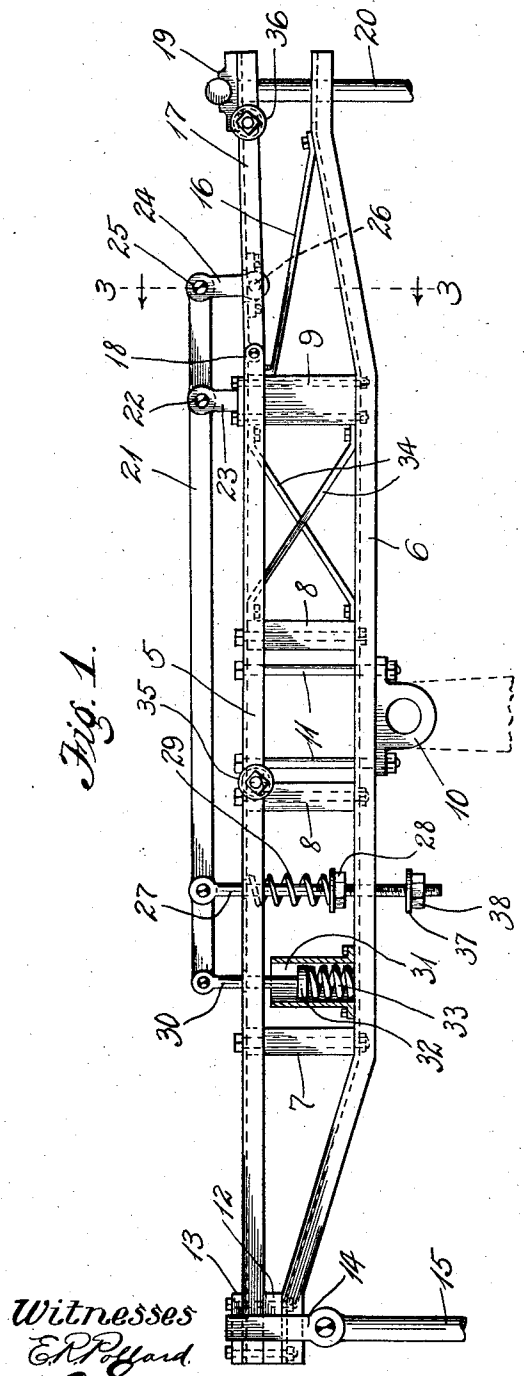

Fig. 1.

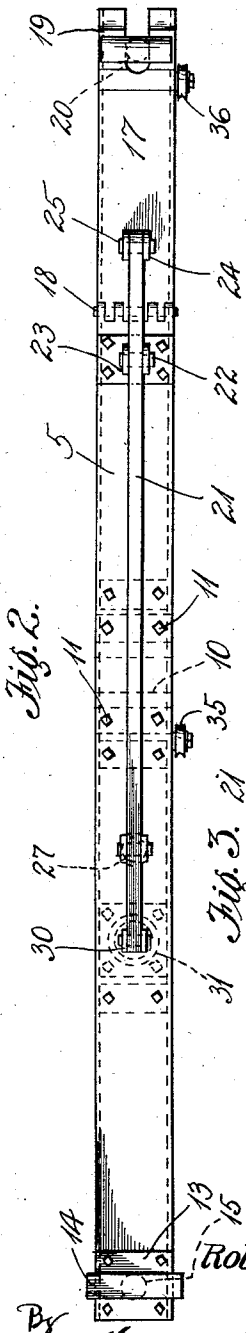

Fig. 2.

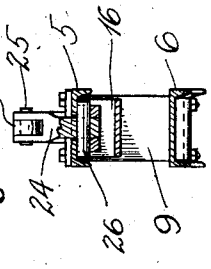

Fig. 3.

Witnesses
E. R. Pollard.
C. Severance

Inventor.
Robert V. Longtine.
By Hazard & Strauss
Attys.

UNITED STATES PATENT OFFICE.

ROBERT V. LONGTINE, OF TAFT, CALIFORNIA, ASSIGNOR OF ONE-THIRD TO W. E. WILDMAN AND ONE-THIRD TO DAVID KINSEY, BOTH OF TAFT, CALIFORNIA.

WALKING-BEAM.

1,009,537. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed April 13, 1911. Serial No. 620,772.

To all whom it may concern:

Be it known that I, ROBERT V. LONGTINE, a citizen of the United States, residing at Taft, in the county of Kern and State of California, have invented new and useful Improvements in Walking-Beams, of which the following is a specification.

This invention relates to improvements in walking beams and has particular reference to beams that are adapted for use in connection with the boring or drilling of wells of various kinds where the drilling tools are given a reciprocating movement.

It is an object of the invention to provide a structural beam which will be capable of withstanding the hard and unyielding jolting produced by the lifting and dropping of the tool in boring a well.

It is also the object of the invention to provide a walking beam with a structure adapted to withstand great strain and provided with yielding parts for supporting drill tools so as to prevent the excessive jarring produced by the action of said tools, from affecting the parts of the mechanism.

In the accompanying drawing forming a part of this specification; Figure 1 is a side elevation of the improved walking beam forming the subject matter of the present invention, the casing of the dash pot employed thereon being shown in section. Fig. 2 is a top plan view of said walking beam. Fig. 3 is a transverse sectional view thereof, taken upon the line 3—3 of Fig. 1.

The features of the invention will now be more fully described in detail, reference being had to the accompanying drawing in which 5 is a tension member and 6 a compression member. The said tension member 5 is spaced from the compression member 6, separated by a series of standards or struts 7 and 8 and 9. The strut 7 is near one end of the beam while the strut 9 is near the opposite end thereof and bolts pass through all of said struts and through the tension and compression beams 5 and 6 for binding the parts tightly together. The struts 8 are preferably arranged near the central bearing portion of the beam. The tension and compression members 5 and 6 are preferably formed of structural metal such as channel beams as clearly shown in Fig. 3 their flanges usually being turned downwardly.

To the under side of the tension member 6 near the center of the beam is secured a bearing 10 which is adapted to support the walking beam upon any suitable standard or support for operation, the said bearing being rigidly secured in place by bolts 11 passed through the flanges thereof and through the web portions of the members 5 and 6. At one end of the beam the compression member 6 is bent upwardly so as to be brought close to the tension member 5 and the ends of the two members are bolted together, a spacing block 12 being preferably introduced between them. The said bolts also usually hold in place a seat 13 arranged upon the top of the walking beam as shown in Fig. 1, the said seat being adapted to receive a clevis or clip 14 by which an actuating pitman as 15 extending to any suitable actuating mechanism is connected to the walking beam for operating the same. At the other end of the walking beam the compression member 6 is also bent upwardly and it is braced with respect to the member 5, by a brace rod or bar 16 which is bolted or riveted at its ends to said parts. Above this portion of the tension member 6 the compression member is provided with a pivotally mounted extension bar 17, the said bar being pivoted to the compression member 5 at 18 just outside the strut or standard 9. The outer or free end of the extension bar 17 is provided with any suitable bearing as 19 adapted to receive and support the drill tool carrying means 20. The drills are thus suspended upon the movable end of said extension bar 17 and are raised and lowered as the walking beam rocks upon its bearing. In order to support the said extension bar 17 in a yielding manner upon the walking beam, a lever 21 is pivotally mounted upon the top of the walking beam as at 22. The pivotal support 22 is carried by a standard 23 which extends a little above the walking beam so as to permit the lever to rise and fall under the action of the parts. The short end of the lever 21 as shown in the drawing extends outwardly over a portion of the extension bar 17 and is connected therewith by means of a link 24, one end of which is pivoted at 25 to the end of the lever 21 while its other end is pivoted as at 26 to a bearing secured to the extension bar 17. The other end of the lever 21 extends along the top of the walking beam to a point beyond the pivotal mounting of said beam and is connected with a rod 27, the said rod being pivotally

secured to the lever and extending downwardly through apertures formed in the tension and compression members of the beam. The lower end of said rod 27 is screw threaded and provided with an adjusting nut 28 and a washer mounted thereon while a spring 29 is interposed between the said nut and the washer and the under side of the tension member 5. The said spring 29 will thus through the agency of the lever 21 resist the downward movement of the extension bar 17 as in lifting the drilling tools.

To prevent the sudden return of the lever 21 and the extension bar 17 when the walking beam moves in the direction for lowering the tools, and the tools engage the bottom of the well, the end of the lever 21 is provided with a piston rod 30 which extends downwardly into a dash pot 31, the said dash pot being usually mounted upon the compression member 6, as clearly shown in Fig. 1. The piston rod 30 usually carries a piston 32 which moves in the said dash pot and a compression spring 33 or other yielding pressure means may be interposed beneath the piston 32 and the compression beam 6 for receiving the jar due to the tools striking the bottom of the well. The tension and compression members may be further braced by diagonal brace rods as 34 arranged at any suitable points between the parts of the beam. The beam is also usually provided with pulleys as 35 and 36 mounted upon the side edges of the tension bar and adapted to receive a weighted cable to which the temper screw may be secured as when removing the drill tools from the well.

It will be observed that the structure set forth is admirably adapted for compensating for all of the jars and jolts occasioned by the rise and fall of the drill tools in a well and particularly the striking of said tools upon materials in the bottom of the well. The cables which carry such tools are usually wire cables and are sufficiently rigid and stiff to communicate a great deal of jarring action to the walking beam so that in practice the parts of the walking beam and mechanism connected therewith are apt to become loosened.

By the use of the present beam the movable tool supporting extension bar 17 is thoroughly cushioned against such jolts and strains through the lever 21, the spring 29 and the dash pot 31. The end of the compression member 6 which extends beneath the movable extension bar 17 acts as a safety support beneath the same in the event of any accident happening to the parts so that said extension bar should fall below its normal positions. The structure of the invention also provides a trussed walking beam which can be made of great strength out of ordinary structural material.

It is important at times that the structure of the walking beam be made rigid and for this purpose the rod 27 is projected a sufficient distance below the compression member 6 to receive a washer 37 and a nut 38. The said nut 38 is usually adjusted to a point near the lower end of the said rod 27 so as to permit of the action of the lever 21 as above described. When, however, it is desired to make the structure rigid, the nut 38 is screwed upwardly upon the said rod 27 so as to engage the under side of the member 6 and hold the lever 21 against movement. The extension bar 17 will thus be held rigid until the nut 38 is loosened again. It is generally necessary that the beam be made rigid in this manner when the operation of fishing for lost tools in the well is to be performed or where a casing spear is used to jar a casing out of the hole of the well.

What I claim is;—

1. A structural walking beam having a movable tool supporting member, a lever pivotally connected therewith, a spring means interposed between the said lever and the walking beam for cushioning the movement of the tool supporting member.

2. A walking beam comprising a body portion, a tool carrying member pivoted thereon, a supporting lever connected with said tool carrying member, a cushion spring connecting one end of said member with the walking beam and a dash pot interposed between the end of the said lever and the walking beam, the structure being such that the jarring action of the tools in drilling will be compensated for by the supporting means of the tool bearing member.

3. A structural walking beam for drilling mechanisms comprising a tension member and a compression member, bracing means joining the same, means for connecting power machinery with one end of said members, the other end of the walking beam having a tension bar extension pivoted to the tension bar and adapted to carry drill tools, a lever pivotally mounted upon the tension member, a link connecting one end of said lever with the pivotal extension bar, and connected with the other end of the lever and extending below the tension member, a spring interposed between the end of said rod and the tension member for cushioning the action of the lever, a plunger also connected with the end of said lever, and spring means interposed between the same and the compression member for preventing the rebound of the lever, and a safety support projecting beneath the end of the tool carrying member.

4. A structural walking beam having a pivoted tool operating portion mounted thereon, means for holding said pivoted part under spring tension, and means for clamp-

ing the said pivotal part rigidly with respect to the walking beam when the structure is to be rendered rigid throughout.

5. A structural walking beam having a movable tool supporting member, a lever pivotally mounted therewith, a rod connected with the lever having an adjusting nut mounted thereon, a spring interposed between the said nut and a portion of the walking beam for cushioning the action of the lever, and a second nut carried by the said rod and adapted to be secured tightly against the adjacent part of the walking beam when the lever is to be held from movement and the movable tool supporting member be made rigid with the walking beam.

In witness that I claim the foregoing I have hereunto subscribed my name this 29 day of March, 1911.

ROBERT V. LONGTINE.

Witnesses:
DAVID KINSEY,
EDMUND A. STRAUSE.