

1,056,347.

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UNITED STATES PATENT OFFICE.

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BUCKET-LINE FOR OIL AND WATER ELEVATORS.

1,056,347.

Specification of Letters Patent.

Patented Mar. 18, 1913.

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To all whom it may concern:

Be it known that I, STEPHEN W. MACK, a citizen of the United States, residing at Glendale, in the county of Los Angeles and State of California, have invented new and useful Improvements in Bucket-Lines for Oil and Water Elevators, of which the following is a specification.

This invention relates to the bucket-lines used in that class of oil and water elevators in which a cable provided with buckets is arranged to run around a pulley and through pump tubing to elevate the oil or water. In elevators of this kind where a wire cable is used, crystallization of the cable occurs on account of the short and sharp bends made in the cable at the ends of the buckets as the buckets go around the pulley.

An object of this invention is to provide means whereby crystallization is avoided.

Another object is to effect the result above stated by cheap, simple and effective means that may easily be applied to and removed from the cable.

Another object is to hold the buckets from slipping along the cable under load or when catching on any obstruction; at the same time avoiding rigid connections between the buckets and the cable.

The invention comprises the bucket line and the parts and combinations of parts set forth in the subjoined detail description.

The accompanying drawings illustrate the invention.

Figure 1 is a view of a fragment of a cable with a bucket thereon and a pair of bucket protectors arranged on the cable in operative position. The bucket and one of the protectors are shown in axial section on line indicated at w^1-w^1 , Figs. 3 and 4. Fig. 2 is a section transverse the axis of a foot pulley around which the cable is trained; a fragment of the cable bucket and two bucket protectors being shown in the position they occupy when the bucket is going around the pulley. Fig. 3 is a cross-section on line w^2-w^2 , Fig. 1. Fig. 4 is a sectional plan from line w^4-w^4 , Fig. 1. Fig. 5 is a perspective view of the protector cushion spread open preparatory to applying the same to the cable. Fig. 6 is a perspective view of the clamping band detached and also spread open preparatory to application to the cushion. Fig. 7 is a perspective

view of the fastening pin by which the cushion and band are fixed to the cable. Figs. 8, 9 and 10 represent three of the elements for forming the bucket shown in Figs. 1 and 2.

The cable 1 may be of any suitable material, usually steel wire in the case of deep wells. The bucket 2 may be of any suitable material and construction and in the form shown in Figs. 1, 4, 8, 9 and 10 comprises a main member having a head 3, a dove-tailed seat 4 and an externally-threaded nipple 5; two semi-cylindrical packing members 6 each provided with reversely arranged dove-tailed seats 7; and a nut provided with a head 8 and dove-tailed seat 9; and adapted to be inclosed inside a cylinder formed of the two members 6, and to screw home on the nipple to clamp the dove-tailed seats of said members 6 between the seats of the nut and body.

The nipple of the bucket is internally flared at the ends, so that when mounted on the cable it will allow a flexure of the cable inside both ends of the bucket. The bucket protector comprises a split cushioning sleeve 10 adapted to fit the cable, and slit along one side to receive the cable and provided with taper ends 11, the extremities of which may enter the flaring ends of the bucket. These taper ends also allow the sleeve to pass around the pulley p without jar or injury by or to sharp corners. Said sleeve is also provided with diametrically opposite orifices 12, 13 to receive the fastening pin. The sleeve 10 is held on the cable by a split band 14, one of the ends of said band being, as at 15, indented and the other band pointed as at 16 to fit the indenture, there being diametrically opposite holes 17, 18 in the band to receive the fastening pin which has cylindrical tips 19 and a flattened middle 20, the cylindrical ends 19 being adapted to enter the orifices 12, 13, 17 and 18 of the sleeve and band. The sleeve 10 is preferably of leather or some other durable flexible and compressible material and the band is preferably of malleable steel, iron or other metal that can be bent onto and tightly compressed upon the leather sleeve and that will retain its form thereon thus to hold the sleeve on the cable. The sleeves 10 are applied to the cable on opposite sides of each bucket and are spaced apart to allow the bucket to work loosely between them, so

that in going around the pulley *p* the bucket and both its protectors may at the same time contact with the pulley as the bucket passes underneath as shown in Fig. 2, so that the greater strain upon the cable is supported by three points of support, viz., the bucket and the protectors. The protectors are of less diameter than the buckets so as to gently lead the buckets around the pulley.

When the parts are applied to the cable as shown in Figs. 1, 2, 3 and 4 the bucket 2 is free to slide from protector to protector and will be caught by one or the other of the tapering ends of the sleeves 10 as occasion may require. When the bucket and protector reach the foot pulley *p* they are apt to be disposed somewhat as shown in Fig. 2, and tips of the flexible cushioning sleeves at opposite sides of the band 14 being capable of bending with the cable; and the band and sleeve being capable of resisting the pressure between the cable and pulley, the forward protector leads the bucket onto the pulley without jar.

In practical use the band is most liable to damage from wear and when the band is worn it is readily removed by unbending it and then bending a new band to take its place. The flat middle portion 20 of the pin fit between the cable strands without injuring the cable and the cylindrical ends 19 project beyond the sides of the cable and prevent the pin from slipping out of the cable and engage both the sleeve and the clamping band, so that they are oppositely held against slippage along the cable. Thus the buckets are supported and held against displacement and at the same time are given such free movement on the cable as to accommodate it to a comparatively small pulley. By means of the indenture 15 and the pointed end 16 of the band the band when in clamping position is held true on the sleeve. The orifice 18 is made at the tip of and communicates with the indenture 15, in the end of the band, so that the band may be applied by putting it onto the sleeve and then drawing the orifice 17 onto one of the projecting ends 19 of the fastening pin, and then bending the band home with the orifice 18 around the other end of the pin. The joint formed by the indenture 15 and tip 16 of the band will preferably be on the side

of the cable opposite the split of the sleeve, so that the joints of sleeve and band are thus broken.

I claim:—

1. The combination with an oil or water elevator cable, of a bucket free to slip along the cable and bucket protectors on opposite sides of the bucket, and spaced apart therefrom for the purpose of leading the bucket onto and from a pulley substantially as set forth.

2. The combination with an oil and water elevator cable of a pin inserted through the cable, a cushioning sleeve provided with orifices to fit the ends of the pin and a clamping band to bend onto the sleeve and provided with orifices to engage the ends of the pin.

3. A bucket protector for an oil and water elevator cable comprising a flexible compressible sleeve adapted to fit the cable, means to fasten the sleeve to the cable and a split malleable band bent onto the sleeve.

4. The combination with an oil and water elevator cable, of a split sleeve to fit the cable, a split band bent onto the sleeve and means for fastening the sleeve and band to the cable.

5. The combination with an oil and water elevator cable, of a split sleeve to fit the cable, a split band bent onto the sleeve and a pin for fastening the sleeve and band to the cable; said band being provided with an indented end and a pointed end to fit together and with orifices to receive the ends of the pin.

6. The combination with an oil and water elevator cable, of a split sleeve to fit the cable, a split band bent onto the sleeve and a pin having a flattened middle portion and projecting ends for fastening the sleeve and band to the cable; said band being provided with an indented end and a pointed end to fit together and with orifices to receive the ends of the pin.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 20th day of September, 1911.

STEPHEN W. MACK.

In presence of—

JAMES R. TOWNSEND,
L. BELLE RICE.