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J. T. OWEN.  
WELL DRILLING DEVICE.  
APPLICATION FILED AUG. 25, 1910.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

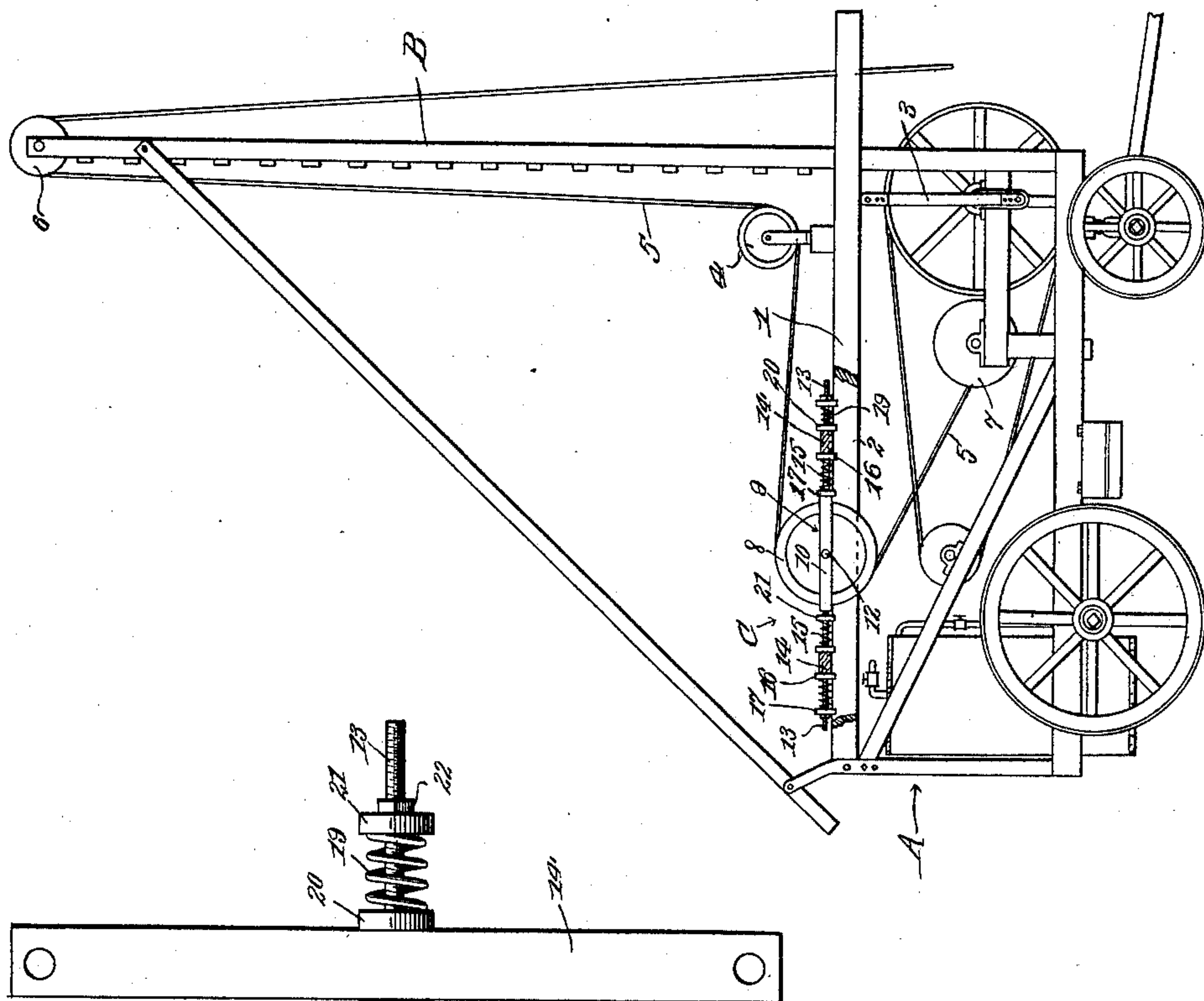


Fig. 1

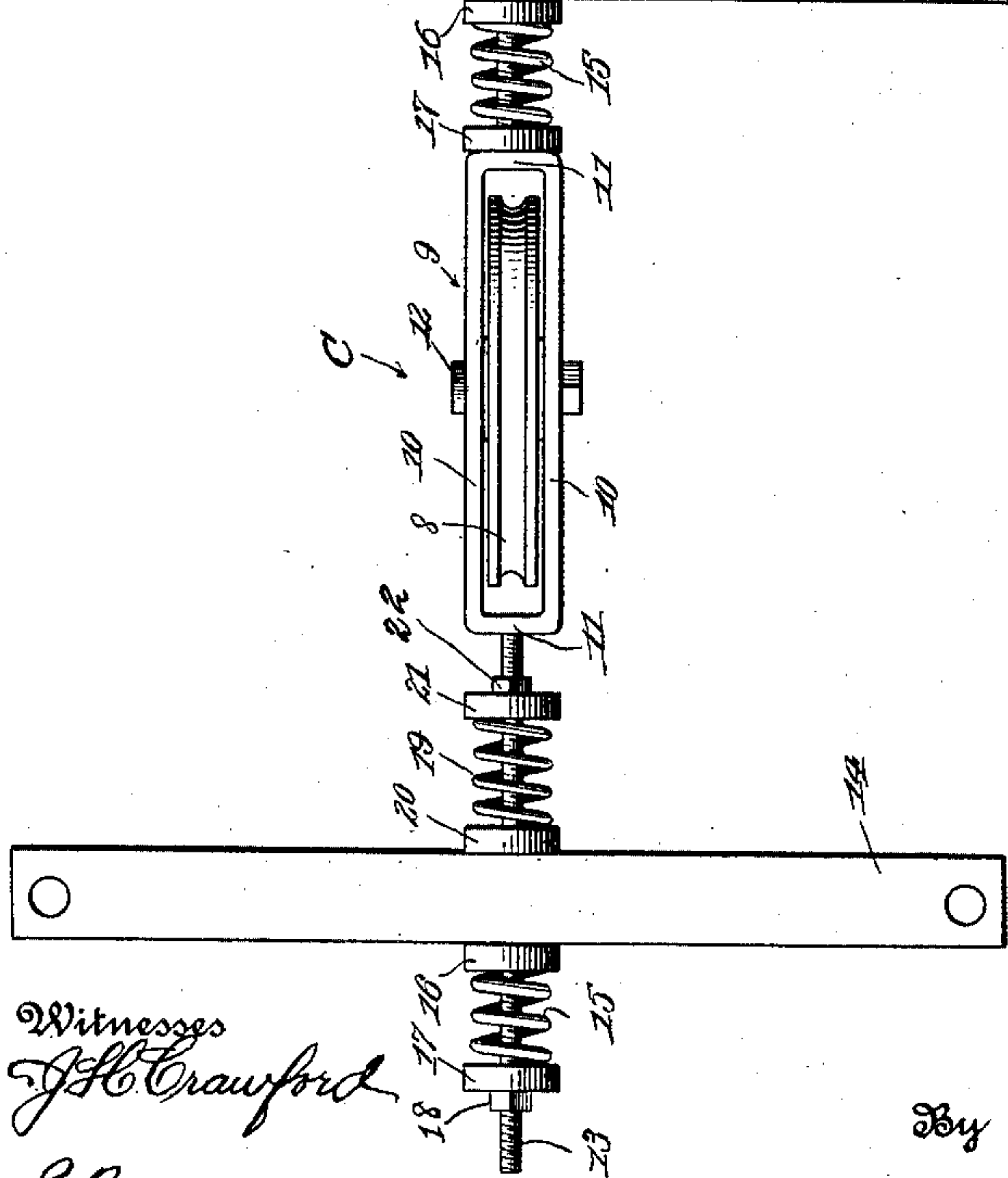


Fig. 2

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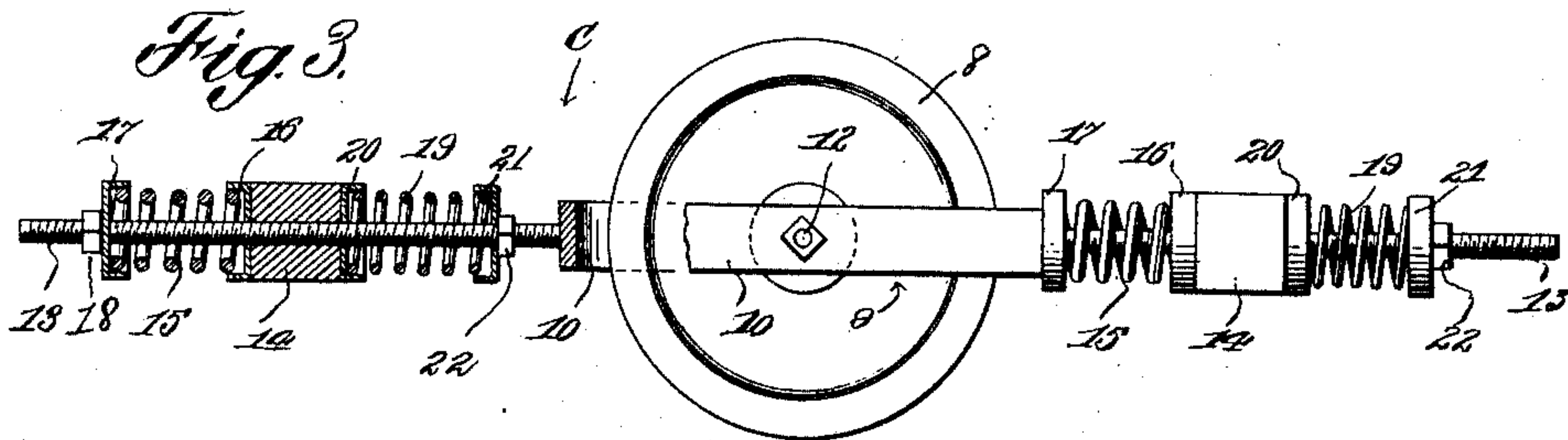
By Victor J. Evans  
Attorney

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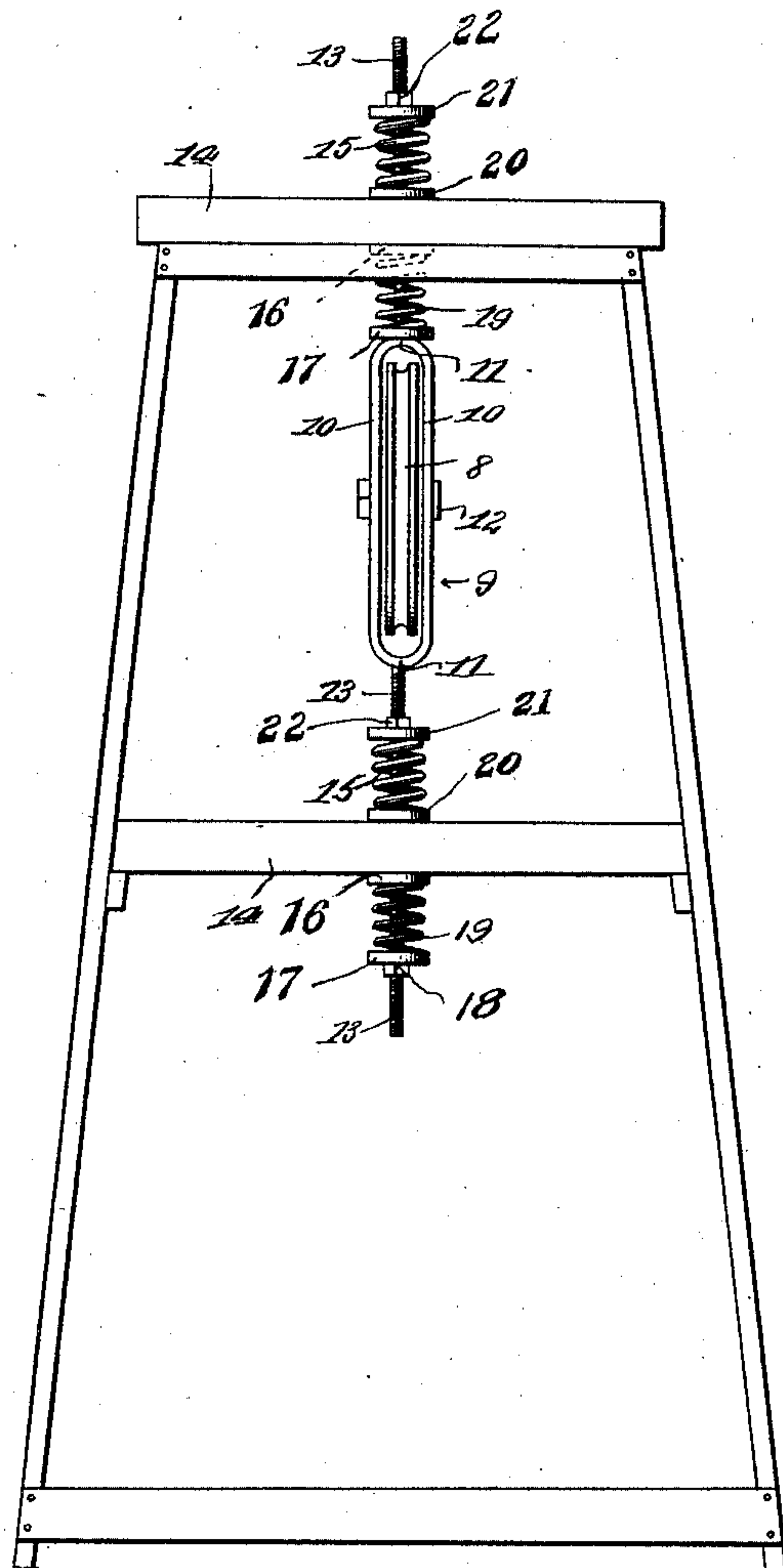
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2 SHEETS—SHEET 2.



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

JAMES T. OWEN, OF VEGA, TEXAS.

WELL-DRILLING DEVICE.

998,385.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed August 25, 1910. Serial No. 578,824.

*To all whom it may concern:*

Be it known that I, JAMES T. OWEN, a citizen of the United States, residing at Vega, in the county of Oldham and State of Texas, have invented new and useful Improvements in Well-Drilling Devices, of which the following is a specification.

This invention relates to well drilling machines and has reference particularly to an attachment for different types of machines of this character whereby wire cable can be used for the drill.

Heretofore, it has been the usual practice to employ fiber cable such as Manila rope, but this has certain disadvantages in that the rope has a comparatively short life, is expensive, requires greater power owing to the excessive friction between the rope and the sides of the hole or water, and results in relatively slow drilling, because of the low number of strokes per minute. Owing, however, to the resiliency or elasticity of the flexible cable, the drilling operation can be carried on without racking the machine to pieces.

The object of the present invention is to overcome the objections above noted, attending the use of fiber rope, by providing an attachment which will render the use of wire cable perfectly satisfactory and afford the necessary resiliency or spring in the cable. This attachment includes a pulley over which the drill cable passes and springs which yield during the strokes of the drill so that the resiliency inherent in Manila rope will be closely approximated, and by this simple device non-elastic wire rope may be employed. It has been demonstrated, by actual operation, that a wire cable substituted for Manila rope is about two-thirds cheaper, about ten times more lasting, and enables the strokes to be multiplied considerably with the result that the drilling takes place with greater rapidity, and besides this, less power is required because the cable is of smaller diameter, and hence does not develop the same friction in the hole as does the Manila rope, and since the cable is inelastic, it is unnecessary to take out the stretch in the cable each morning, as is necessary with a flexible cable.

With such and other objects in view, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described

hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a side view of a drilling machine of the double walking beam type, showing the attachment applied to the walking beams. Fig. 2 is a plan view of the attachment. Fig. 3 is a side view thereof. Fig. 4 is a side view of the upper portion of a tower or mask showing another use of the attachment.

Similar reference characters are employed to designate corresponding parts throughout the views.

In the present instance, I have elected to illustrate the invention as applied to a portable machine, but it is not necessarily limited thereto, as it can be applied to stationary machines and also to single or double beams.

Referring to the drawings, A designates the frame of the machine, from which rises the usual derrick or tower B, and mounted on the frame are the beams 1 and 2 operated by a pitman 3 connected with the driving mechanism of the machine, and on the beams at the base of the derrick is the pulley 4 under which the wire drill cable passes, the said cable passing around the usual guide pulley 6 at the top of the tower or derrick. The cable is wound on the usual drum 7 mounted on the frame of the machine.

Between the drum and pulley 4 is arranged the attachment C which constitutes the subject-matter of the present invention. This attachment comprises a pulley 8 which is mounted between the beams 1 and 2 on the machine at a point behind both the pulley 4 and drum 7 so that the cable will pass over the top of the pulley 8, downwardly behind and under the same, and thence to the drum. This pulley 8 is yieldingly mounted so that there will be sufficient resiliency or spring in the cable to enable the drill to operate effectively without undue vibration or shock imparted to the machine. For this purpose, the pulley 8 is mounted in a stirrup or yoke 9 that consists of side bars 10 extending diametrically across the pulley at opposite sides and connected together at 11. The axle 12 of the pulley is journaled in bearings in the bars 10 of the stirrup, so that the pulley will rotate on a horizontal axis extending transversely to



the beams. This stirrup is mounted on the beams by means of longitudinally-extending rods 13 rigidly secured to the ends of the stirrup, and these rods pass through cross bars 14 that are disposed parallel to each other and extend from one beam to the other and are rigidly secured thereto.

On the rear side of each cross bar 14 and coiled around the rods 13 are stiff helical springs 15 that yield during the drilling stroke so that any effective cable will acquire a springiness or resiliency resembling that of Manila rope. The ends of the springs are seated in cupped washers 16 and 17, the former bearing against the cross bars 14, while one of the cups 17 bears against the yoke 9, and the other cup 17 bears against the nut 18 threaded on the rod 13, as shown at the left end of Fig. 2. During the initial stage of boring, the nuts 18 and 22 are unscrewed so that the tension of the springs will be such that the desired resiliency in the cable will be provided for, and, as the drilling proceeds and the weight of the cable and drill increases, the nuts should be tightened. In order to oppose the rebound of the drill, the rods 13 are provided with lighter helical springs 19 which are disposed at the front sides of the bars 14 and have their ends seated in cupped washers or bearing elements 20 and 21. The washers 20 bear against the cross bars 14, while the washers 21 bear respectively against nuts 22 threaded on the rods 13. If the springs are adjusted so that the pulley can move bodily forward an inch, the cable will have a movement of about two inches, owing to the cable being practically doubled around the pulley.

When the attachment is used on a tower or derrick, as shown in Fig. 4, the pulley support or stirrup will be disposed vertically, and the stiff springs 15 will be arranged at the top so that they will support the weight of the cable in the drill and the recoil springs 19 will be disposed under the cross bars 14.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim is:—

1. A well drilling machine comprising a drill cable, a guide pulley therefor, and a

pair of opposing springs of different tensions disposed at diametrically opposite points with respect to the pulley for yieldingly mounting the same.

2. A drilling machine comprising a drill cable, a guide over which the cable passes, a movable support for the guide, and sets of opposed springs for cushioning the said support, said sets being arranged in the same plane with and at diametrically opposite sides of the pulley.

3. A well drilling machine including a drill cable, a movable guide over which the cable passes, a support for the guide, means for movably mounting the support on the machine, pairs of cushioning devices operatively related to the support and disposed in alinement, the pairs of devices being disposed at opposite sides of the guide and arranged to yield during the drilling stroke of the cable, and cushioning means for taking up the recoil of the support.

4. An attachment of the class described comprising a pulley, a support therefor, rigidly disposed members in which the support is mounted for a limited movement, cushioning elements disposed between the support and said members for yieldingly opposing movement of the support in one direction, and additional cushioning elements of less tension than the first-mentioned elements and arranged to yieldingly oppose the movement of the support in the opposite direction, the cushioning elements being arranged in a line passing through the axis of the pulley.

5. An attachment of the class described comprising a pulley, a stirrup in which the pulley is mounted, rods extending from the ends of the stirrup, supporting members through which the rods extend, springs on the said rods and arranged at opposite sides of the said members for yieldingly opposing the movement of the pulley in both directions.

6. An attachment of the class described comprising a pulley, a stirrup in which the pulley is mounted, rods extending from the ends of the stirrup, supporting members through which the rods extend, springs on the said rods and arranged at opposite sides of the said members for yieldingly opposing the movement of the pulley in both directions, and means for adjusting the tension of the said springs.

7. An attachment of the class described comprising a pulley, a stirrup in which the pulley is mounted, threaded rods extending in opposite directions from the ends of the stirrup, fixed supporting bars through which the rods move longitudinally, and oppositely-acting cushioning devices of different resiliency operatively connected between each rod and the bar through which it passes.

8. An attachment of the class described



comprising a pulley, a stirrup in which the pulley is mounted, threaded rods extending in opposite directions from the ends of the stirrup, fixed supporting bars through which  
5 the rods move longitudinally, oppositely-acting cushioning devices of different resiliency operatively connected between each rod and the bar through which it passes, threads on the said rods, and nuts on the rods for ad-  
10 justing the tension of the said cushioning devices.

9. An attachment for well drilling machines comprising spaced parallel supports, a pulley disposed between the supports, a  
15 stirrup in which the pulley is rotatably mounted, threaded rods extending in opposite directions from the ends of the stirrup

and passing freely through the said supports, helical springs mounted on the rods at the same sides of the said supports, heli- 20 cal springs of lighter tension arranged on the rod at the opposite sides of the said supports, cupped washers in which the ends of the springs are seated and through which the said rods extend, and adjusting nuts on 25 the rods bearing against certain of the washers to serve as adjustable tension-varying means.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES T. OWEN.

Witnesses:

T. B. JONES,

MEL ARMSTRONG.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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