

I. E. HINDMAN & J. VAN HAMERSVELD.
CONTROLLING DEVICE FOR JACKS.
APPLICATION FILED DEC. 6, 1917.

1,261,531.

Patented Apr. 2, 1918.
2 SHEETS—SHEET 1.

Fig. 1.

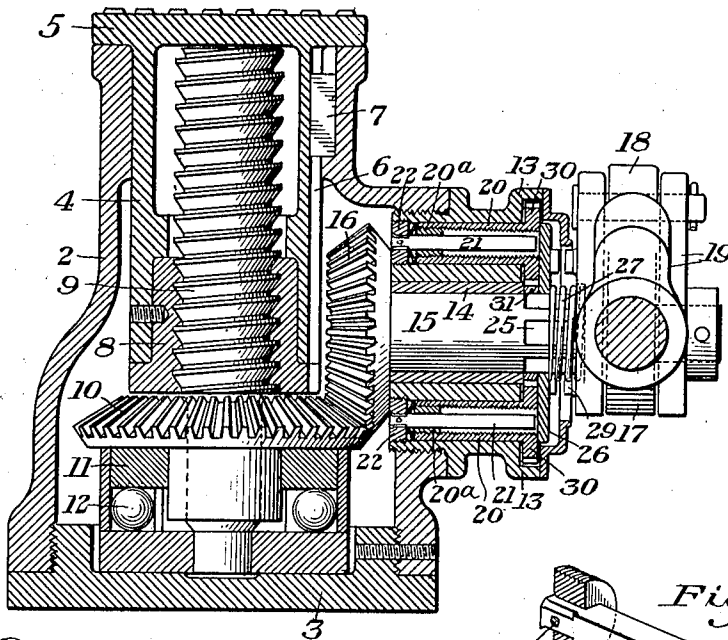


Fig. 2.

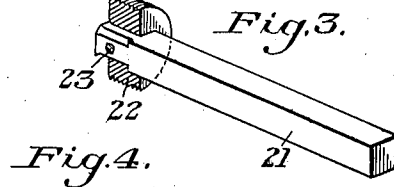
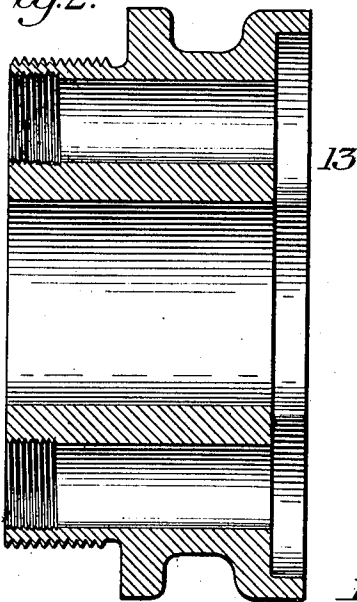


Fig. 4.

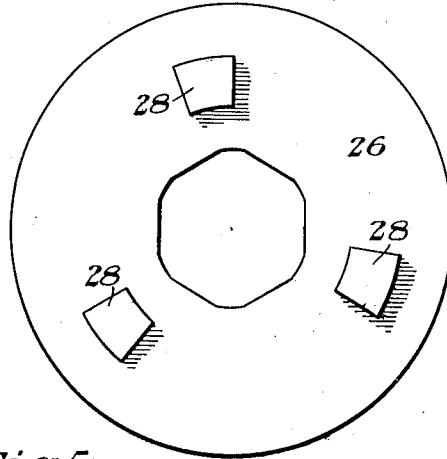
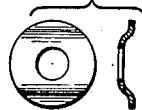


Fig. 5.



WITNESSES

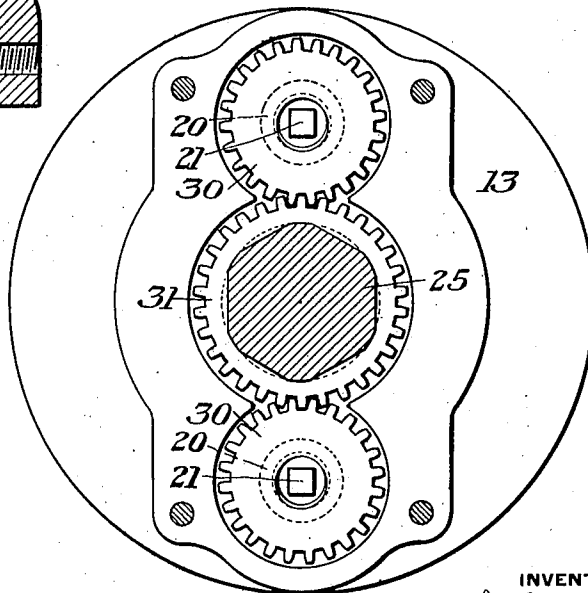
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APPLICATION FILED DEC. 6, 1917.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ISAIAH E. HINDMAN, OF BELLEVUE, AND JOHN VAN HAMERSVELD, OF AVALON, PENNSYLVANIA, ASSIGNORS TO THE DUFF MANUFACTURING COMPANY, OF NORTH SIDE, PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CONTROLLING DEVICE FOR JACKS.

1,261,531.

Specification of Letters Patent.

Patented Apr. 2, 1918.

Application filed December 6, 1917. Serial No. 205,726.

To all whom it may concern:

Be it known that we, ISAIAH E. HINDMAN and JOHN VAN HAMERSVELD, both citizens of the United States, residing at Bellevue and Avalon, respectively, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Controlling Devices for Jacks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section through one form of jack showing our improved controlling device.

Fig. 2 is a sectional view of the bearing plug for the operating pinion shaft.

Fig. 3 is a perspective view of one of the nut shafts and its securing device.

Fig. 4 is a face view of the movable clutch member.

Fig. 5 is a face view and a sectional view of one of the sleeve cushioning spring disks.

Fig. 6 is a sectional view of a portion of the device shown in Fig. 1 on a larger scale; and

Fig. 7 is a sectional view on the line VII—VII of Fig. 6.

This invention relates to an improvement in controlling devices for jacks, and is designed to provide a cheap and efficient device of this character for controlling the extent of movement of the lifting bar of the jack.

The object of our invention is to provide a device of this character which will prevent the rotation of the lifting screw or the further movement of a lifting bar after it has moved below a predetermined distance in order to prevent injuring any parts of the jack by moving the lifting member beyond the safety point.

We have shown our invention applied to a lifting jack of the screw type, in which the lifting member is elevated by means of a screw, and which lifting member is prevented from rotating by means of a key, the mechanism being so arranged that after the lifting member has been elevated to a predetermined point, the ratcheting mechanism for the screw will be locked to the screw operating shaft, so that the operating shaft will be oscillated in both directions when the socket lever is operated.

The precise nature of our invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and the general arrangement of the parts, without departing from the spirit and scope of our invention as defined in the appended claims.

Referring to the accompanying drawings, the reference character 2 designates the casing having a bottom plate 3 connected thereto. Slidably mounted within this casing 2 is a lifting member 4, having a lifting head 5. This lifting member is provided with a key-way 6 which is engaged by a key 7 seated in a key seat in the casing 2, the arrangement being such that the lifting member 4 can be raised and lowered but is prevented from rotation with relation to the casing 2. Connected to the lifting member 4 is a nut 8, which is engaged by the threads of an elevating screw 9. Connected to the screw 9 is a bevel gear 10, which is supported on a ring 11 which forms the upper part of a ball-bearing 12 for the screw. The side of the casing 2 is provided with a screw-threaded opening for the reception of a bushing 13, having a bearing sleeve 14 in which is rotatably mounted the operating shaft 15. Connected to this operating shaft 15 is a bevel gear 16 which meshes with the bevel gear 10 for transmitting the motion from the shaft 15 to the screw 9.

Connected to the end of the shaft 15, so as to rotate therewith, is a ratchet wheel 17 which is actuated by means of a pawl 18 mounted in a lever socket 19. This lever socket is mounted on a shaft 15 in the usual manner, so that when operated in one direction the screw shaft will be rotated and when moved in the reverse direction the pawl will move idly over the teeth of the ratchet-wheel 17. The bushing 13 is provided with two threaded sleeves 20 diametrically opposite to each other and which are arranged to rotate therein. The threads in these bushings are engaged by nuts 20^a, which are arranged to slide over the fixed square shafts 21. These shafts may be secured to the bushing 13 in any desired manner, but in the construction shown in the drawings, one end of each of the shafts is

octagonal and is seated in a similar shaped opening in a threaded plug 22. The shouldered ends of the shafts abut against the plugs, the outer ends thereof being peened over to securely fasten them to the plug members. These shafts may be further secured by driving pins through the plug members and the ends of the shaft as indicated at 23. These plug members are threaded into openings in the bushing 13, so that the shafts will be concentric with their respective threaded openings. Surrounding each of these shafts, and interposed between the sleeve 20 and the screw plug, is a spring disk 24 which acts as a cushion for the sleeve, as indicated in Figs. 1 and 6.

Mounted on a polygonal portion 25 of the shaft 15, in such a manner as to be rotated therewith, and at the same time slide longitudinally thereon, is a clutch plate 26 which is arranged to be normally held in the position shown in Figs. 1 and 6 by means of a spring 27 surrounding the shaft. 28 are clutch teeth connected to the plate 26, and which are arranged to engage similar clutch teeth 29 on the lever socket 19 to lock the lever socket to the shaft 15 when the plate is moved to the right as hereinafter described.

One end of each of the threaded sleeves 20 is provided with a pinion 30 which is in mesh with a gear 31 on the polygonal portion 25 of the shaft 15, the arrangement being such that the threaded sleeves 20 will be rotated when the shaft 15 is rotated.

The operation of the device is as follows:

Assuming the parts to be in the position shown in Figs. 1 and 6, and in which the nut 8 is in its lowermost position, while the nuts 20^a are at their extreme left positions, the lever socket is now operated to rotate the screw 9 step by step to raise the nut 8 together with the lifting member 4 to raise the load, and during this step by step motion the nuts 20^a will gradually be moved to the right along their shafts 21. Just prior to the time that the lifting member 4 will be elevated to a point where its end would pass the lower end of the key 7, the nuts 20^a will engage the clutch plate 26 and move it to the right so that the clutch members 28 thereon will engage the clutch members 29 on the lever socket 19. This movement of the clutch members into engagement with each other will lock the lever socket to the shaft 15, so that when the socket lever is moved upwardly the shaft 15 will be moved therewith, and thereby prevent any further step by step movement of the elevating screw 9, and prevent moving the lifting member 4 to a point of danger, or a point where there would be insufficient length of bearing surface between the lifting member and the casing.

In the drawings we have shown a well-known type of jack, in which we have merely removed the bearing sleeve for the operating shaft and inserted a new bearing sleeve, together with the operating mechanism in place thereof. By this arrangement we are enabled to readily apply our invention to old jacks.

The advantages of our invention result from the provision of a controlling device for jacks, in which the step by step actuating device is locked to the lifting bar of the mechanism therefor, so that the lifting bar will be raised and lowered with the operating mechanism or socket lever.

We claim:

1. A device of the character described, comprising a jack operating shaft, an operating wheel connected to the shaft, means freely movable on the shaft and arranged to actuate the operating wheel, a clutch device for locking the operating device to the shaft, and clutch shifting means arranged to be shifted after the shaft has been moved a predetermined distance to lock the shaft operating means to the shaft, substantially as described.

2. A device of the character described, comprising a jack operating shaft, a ratchet wheel on said shaft, an oscillating lever on the shaft, a pawl on said lever for engagement with the ratchet wheel, a clutch device, and clutch shifting means arranged to be shifted after the shaft has been moved a predetermined distance to lock the shaft to the lever, substantially as described.

3. A device of the character described, comprising a jack operating shaft, means for operating the shaft in one direction to actuate the jack, a clutch device for locking the shaft operating means to the operating shaft, and clutch shifting means arranged to be shifted after the shaft has been moved a predetermined distance to lock the shaft operating means to the shaft, substantially as described.

4. A device of the character described, comprising a jack operating shaft, means for operating the shaft in one direction to actuate the jack, a clutch device for locking the shaft operating means to the operating shaft, clutch shifting means arranged to be shifted after the shaft has been moved a predetermined distance to lock the shaft operating means to the shaft, and gearing interposed between the clutch shifting means and the shaft, substantially as described.

5. A device of the character described, comprising an operating shaft for the jack, ratcheting mechanism for moving the shaft step by step, a clutch having a movable member for locking the ratchet mechanism to the shaft, and clutch shifting mechanism connected to the shaft and arranged to shift the clutch after the shaft has been moved

a predetermined distance; substantially as described.

6. A device of the character described comprising a shaft for actuating the jack, a lever socket connected thereto and arranged to move the shaft step by step, a clutch member connected to the lever socket, a movable clutch member connected to the shaft, a spring for holding the movable clutch member out of engagement with the clutch on the lever socket, a plurality of threaded sleeves, a nut in each sleeve arranged to engage the movable clutch member to move it into engagement with a clutch member on the lever socket, and means connected to the shaft for rotating said sleeves to shift the nuts and cause them to shift the movable clutch member into engagement with the clutch member on the lever socket after the shaft has been moved a predetermined distance; substantially as described.

7. A device of the character described, comprising an operating shaft, means for operating the shaft in one direction, a clutch device slidably mounted on the shaft for locking the shaft operating means to the shaft, a rotary sleeve, actuating connections between the rotary sleeve and the shaft, and a nut having a screw-threaded connection with the sleeve and arranged to be moved relative thereto to move the clutch member

after the shaft has been moved a predetermined distance, substantially as described.

8. A clutch device of the character described, comprising a rotary shaft, an actuating member for the shaft, a clutch arranged to connect said actuating member with the shaft, a plurality of internally threaded sleeves, a gear wheel connected to the shaft, gear wheels on said sleeves meshing with the gear wheel on the shaft, and a threaded nut in each of the sleeves arranged to be moved thereby to shift the clutch member, substantially as described.

9. A clutch device of the character described, comprising a rotary shaft, an actuating member for the shaft, a clutch arranged to connect said actuating member with the shaft, a plurality of internally threaded sleeves, a gear wheel connected to the shaft, gear wheels on said sleeves meshing with the gear wheel on the shaft, a threaded nut in each of said sleeves arranged to be moved thereby to throw the clutch, and spindles on which said nuts travel arranged to prevent them from rotating with the sleeves, substantially as described.

In testimony whereof, we have hereunto set our hands.

ISAIAH E. HINDMAN.
JOHN VAN HAMERSVELD.