G. W. WILMOT.

JACK.

APPLICATION FILED APR. 5, 1909.

989,744.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 1.

Fig. 2.

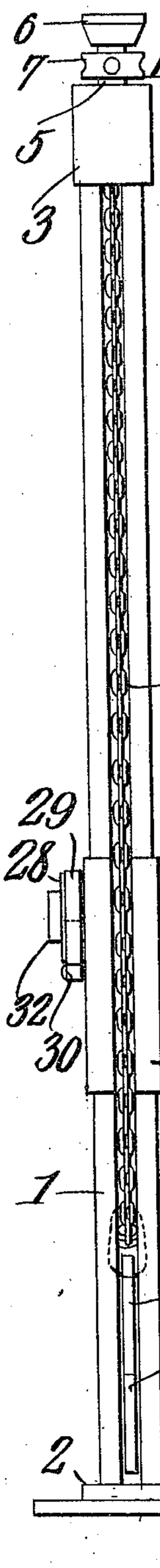


Fig. 1.

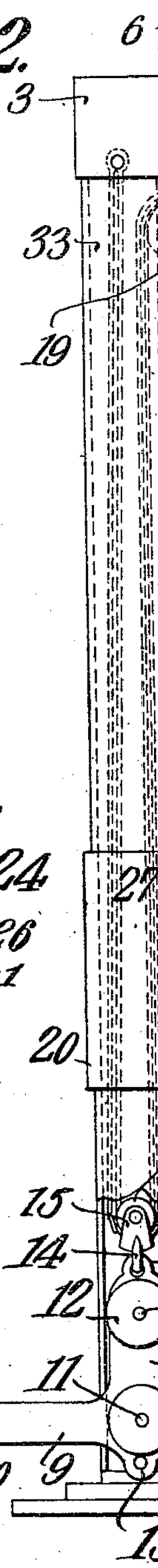


Fig. 3.

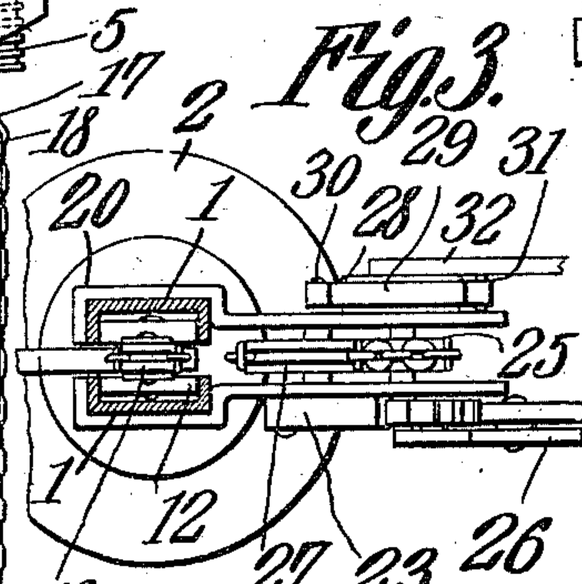


Fig. 4.

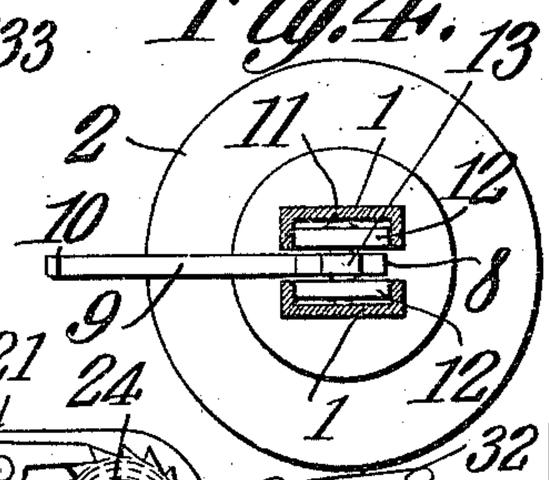
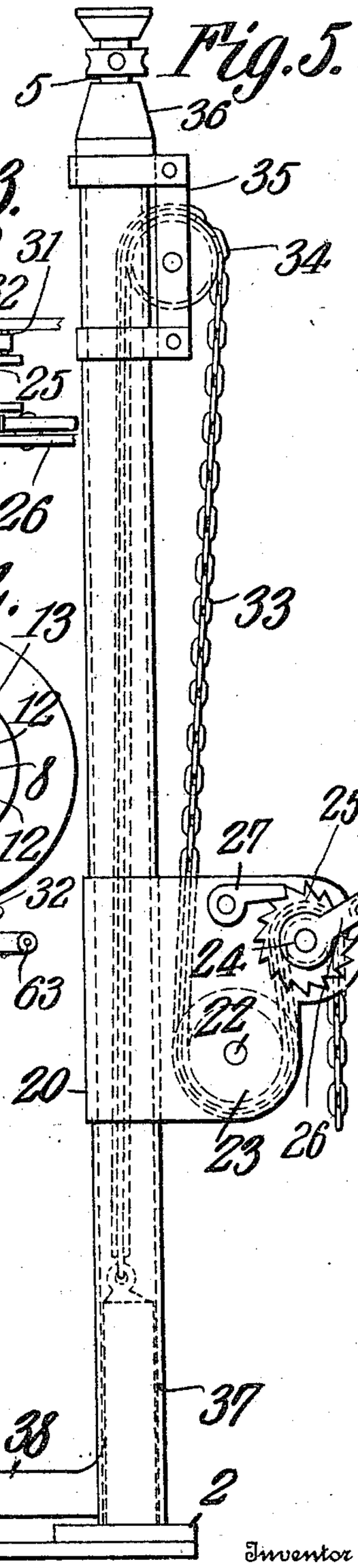


Fig. 5.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 6.

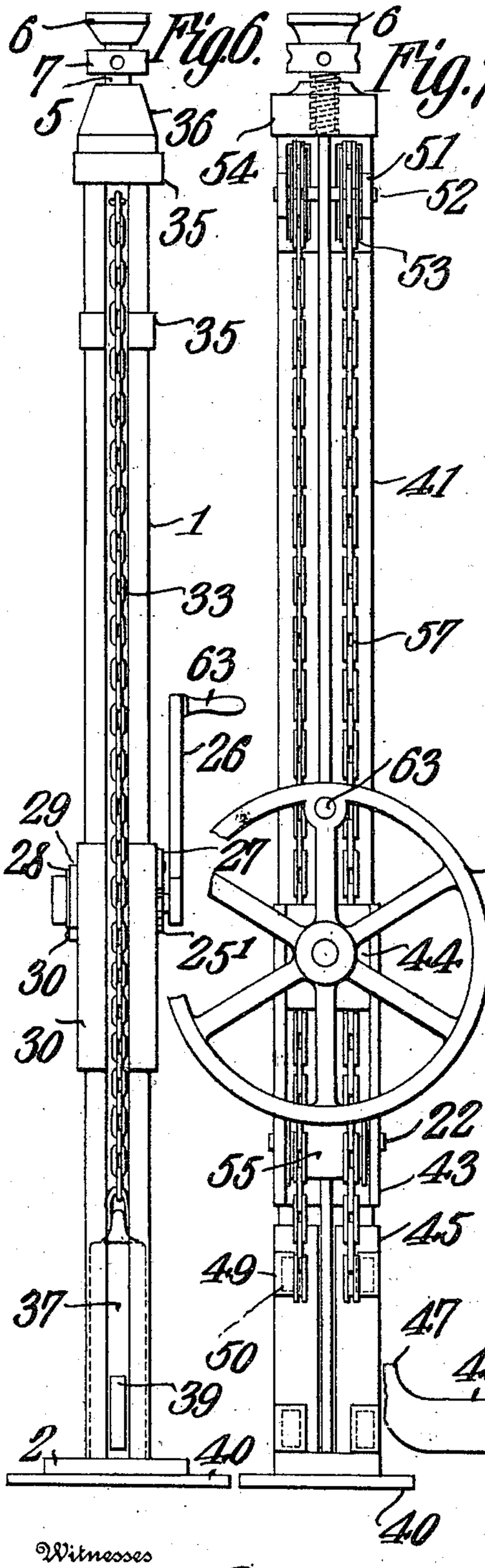

Fig. 7.

Fig. 8.

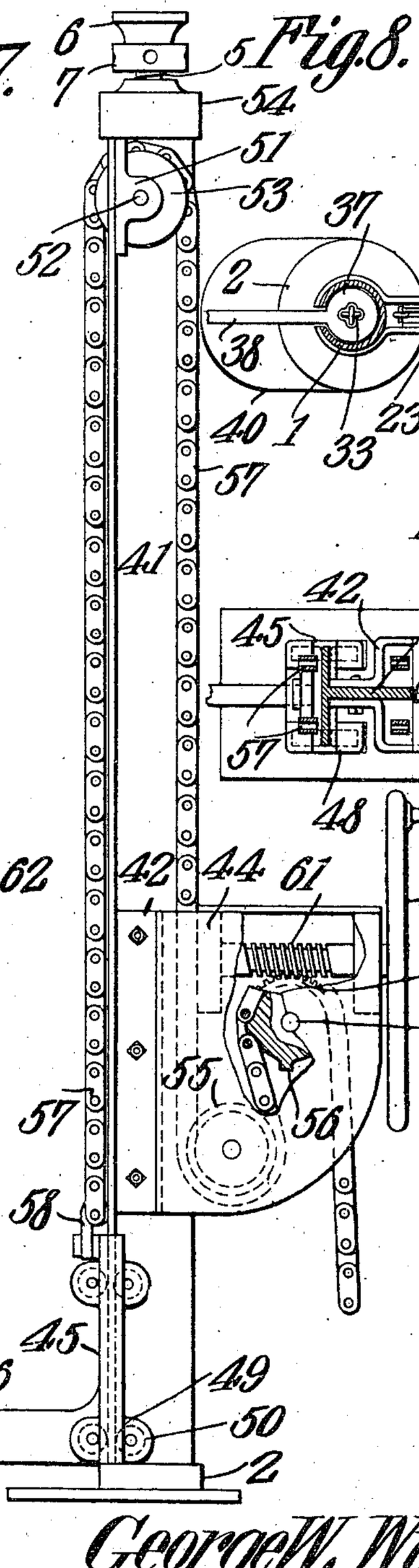

Fig. 10.

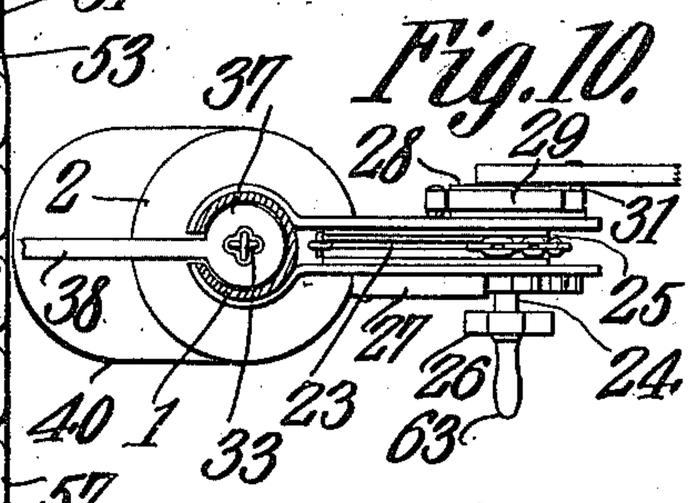

Fig. 9.

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989,744. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed April 5, 1909. Serial No. 488,016.

To all whom it may concern:

Be it known that I, GEORGE W. WILMOT, a citizen of the United States, residing at Hazleton, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Jack, of which the following is a specification.

This invention has reference to improvements in jacks, and its object is to provide a lifting jack designed more particularly for use in circumscribed spaces, and especially is the invention applicable for use in mines for lifting heavy timbers or other heavy structures where it is desirable to have a readily portable structure capable of elevating heavy weights and which can be readily braced against accidental displacement by engaging the floor and roof of the mine.

The invention comprises a jack structure consisting of a body portion terminating at one end in a suitable foot or base and at the other end provided with a screw member which may be manipulated so as to engage the roof of the mine. By this means the body of the jack is firmly braced against accidental displacement, and within the length of the body of the jack is included the lifting mechanism. For this purpose there is provided a movable lift capable of longitudinal travel along the body of the jack either interior thereto or guided by ways carried by the body of the jack, with a chain tackle, so arranged as to multiply the applied power, coupled to the lift and leading to a winch fast on the body of the jack and by means of which the lift may be elevated by the application of power and also allowed to move by gravity in a downward direction at the will of the operator.

The invention will be best understood by a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, and in which drawings:—

Figure 1 is a side elevation, partly in section, of a jack constructed in accordance with the present invention. Fig. 2 is a front elevation of the same. Fig. 3 is a cross section above the winch portion of the jack. Fig. 4 is a similar cross section of the structure of Fig. 1 below the winch. Fig. 5 is a side elevation of a somewhat different form than that shown in Fig. 1. Fig. 6 is a front elevation of the structure shown in Fig. 5. Fig. 7 is a rear elevation of a somewhat different form of jack than shown in Figs. 1 and 5. Fig. 8 is a side elevation, partly broken away and in section, of the structure shown in Fig. 7. Fig. 9 is a cross section of the structure shown in Fig. 8 above the winch mechanism, and Fig. 10 is a cross section above the winch mechanism of the structure shown in Fig. 5.

Referring to the drawings, the body of the jack is shown as composed of two channel beams 1—1 with their channel sides facing each other and the flanges separated for a short distance. The bottoms of the channel irons are secured on a suitable foot or base 2 adapted to rest upon the floor of the mine. The top of the channel irons are secured in a cap block 3 which in the structure of Fig. 1 has an off set 4 on one side provided with a vertical perforation suitably tapped for the reception of a jack screw 5 provided with a swivel head 6 and a capstan 7, by means of which the screw may be turned to firmly cramp the body of the jack between the floor of the mine drift and the roof thereof, thus doing away with braces or stays of any kind and at the same time providing a ready means for the bracing of the jack against displacement at any position desired. Furthermore, the jack is capable of transportation from place to place, and while the structure provides ample strength for the purposes of the jack it is still comparatively light. The body of the jack is of such length as to reach from the floor to near the roof of an ordinary mine drift and therefore the length of the screw 5 need only be sufficient to take up a comparatively short amount of space between the top of the jack and the roof of the mine drift.

The channel irons provide between them a space for the reception of a carrier 8 having an angle extension or foot 9 near one end, which foot may terminate in oppo-

sitely directed toes 10, one projecting upward and the other downward from the foot. The carrier 8 is provided near its ends with through pintles 11 carrying rollers 12 of such size as to fit snugly within the channel portions of the sides of the body of the jack, these rollers acting as anti-friction guides for the carrier. Each end of the carrier is formed into an eye 13 for the reception of a hook 14 on a sheave block 15 carrying a sheave 16 of such size as to readily travel within the interior of the body of the column of the jack. At the upper end of the body of the jack opposite the side from which the foot 9 projects are formed ears 17 for the reception of the journal 18 of a fixed sheave 19.

Fast on the sides 1 of the body of the jack at a convenient height are two channel plates 20 each terminating in a wing 21 projecting parallel one to the other from the rear edge of the body of the jack. Through these wings extends a journal pin 22 for a sheave 23 located between the wings, and also journaled in the wings is a shaft 24 carrying a chain wheel 25 between the wings. This shaft extends beyond each wing, and on one end has fast to it outside the respective wing a ratchet-wheel 25′, and beyond the latter a ratchet lever 26. Pivoted to the corresponding wing in the path of the teeth of the ratchet-wheel is a ratchet dog 27. Fast on the shaft 24 beyond the other wing 21 is a friction disk 28 arranged to be engaged by a brake strap 29 fast at one end to a pin 30 on the corresponding wing 21 and fast at the other end to a pin 31 on a hand lever 32 loosely mounted on the shaft 24 beyond the friction disk 28.

Secured to the block 3 is one end of a chain 33 extending downwardly between the two channel irons 1 and around the sheave 16, thence upwardly and over the sheave 19, and thence downward under and around the sheave 23, and finally upwardly over the chain wheel 25 with its free end hanging idly downward.

Suppose that it is desired to lift some heavy weight in a mine drift, such for instance as raising timbers or other such bodies, then the foot 9 is inserted under the timber and the lever 26 is moved in the proper direction, and acting through the chain 33 the power applied at the lever 26 is greatly multiplied so that with comparatively little effort on the part of the operator the foot 9 is elevated the desired distance with the carried weight. When it is desired to lower such a weight, the dog 27, which is in normal engagement with the teeth of the ratchet 25, is moved out of the way and the lever 32 is so manipulated as to bring the brake band into engagement with the friction disk 28 and so brake the descent of the carrier 8 with the weight sustained by the foot 9.

The distance of upward travel of the foot 9 and consequently the distance through which the weight may be lifted, is determined by the relative position of the sheave 16 with relation to the foot 9. For this reason, when it is desirable to lift weights to a greater elevation than would be possible with the structure as illustrated in Fig. 1, without change of the height of the body or column 1, then the carriage 8 is removed from between the channel irons 1 and is reversed so that the hook 14 engages the eye 13 close to the foot 9. Under these conditions the initial elevation of the foot 9 when in its lowermost position is greater than in the position illustrated, but it may be moved to a greater height than is the case in the relation of the parts shown in Fig. 1. In either case there is a toe 10 projecting upward and serving to hold the weight on the foot 9.

It is to be understood that the proportions of the parts as shown in the drawings are to be taken as indicative only since these parts may be very materially changed in their proportions in accordance with the conditions to be met.

In Figs. 5, 6, and 10 the structure is in the main similar to that shown in Figs. 1 and 2. There are some slight changes in the structure, however, which adapt it to special uses where the more powerful structure of Fig. 1 is not needed. In this case the column is cylindrical with a slot on one side, as indicated in Fig. 5, instead of being made up of two channel irons, as shown in Fig. 1. Also the sheave 19 is replaced by a sheave 34 fast in a bracket 35 secured to the upper end of the body 1 of the jack, while the block 3 has its overhang 4 replaced by a simple cap block 36 with the screw 5 entering the same centrally instead of being displaced with relation to the longitudinal axis of the body of the jack, as in Fig. 1. Furthermore, the carrier 8 and foot 9 are replaced by a simple sliding block 37 having a foot 38 formed on the end thereof and projecting laterally from one side of the block 37, the two parts being formed as one integral whole, and instead of having two toes 10 there is a single toe 39 at the end of the foot 38. The block 38 is made to slide in the space within the column 1 instead of being provided with rollers 12 as in the structure of Fig. 1. Furthermore, the foot 2 has its bottom plate 40 displaced so as to project laterally in the same direction as the foot 38 to a greater extent than is the case in the structure of Fig. 1. There is thus provided a more simple structure than that of Fig. 1 and also a less powerful structure, and the parts may all be of a

lighter construction so that the portability of the jack is increased. The general principles, however, are the same as those of the jack of Fig. 1.

Referring now to the structures shown in Figs. 7, 8 and 9 the body of the jack is formed of a single T-iron 41, to which is firmly bolted or riveted two L-strips 42 one on each side, and each provided with an elongated wing 43 so arranged that the wings 43 of the two strips lie parallel one to the other and spaced apart an appropriate distance, being held in this spaced relation by suitable spacing blocks 44. Extending across and exterior of the arms of the T-column 41 is a carrier 45 in the shape of a metallic plate, from one end of which projects a foot 46 terminating in an upturned toe 47. The sides of the plates are bent around the ends of the arms of the T-column and are returned on themselves for a distance, as indicated at 48. The embracing ends of the plate or carrier are so arranged as to move freely up and down the arms of the T-column, and in order to reduce frictional contact the plate is provided both top and bottom, with yokes 49 inclosing and supporting the journals of rollers 50 engaging the arms of the T-column on both faces thereof, so that the carrier 45 will move with comparatively no friction up and down the column 41. Beyond the column near the top of each arm of the T are fixed ears 51 supporting ends of a pintle 52, upon which latter between the respective ears and the stem or main portion of the T-column the pintles carry sheaves 53, one on each side of the main stem of the column. The top of the column carries a cap 54 suitably tapped for the reception of the jack screw 5, as in the other forms. Between the wings 43 are journaled two sheaves 55 and two chain wheels 56, while two chains 57 each connected by a link 58 to the carrier 45 on each side of the central line of the same, are each carried up over a sheave 53 and thence down and around a sheave 55, and finally up over and around a chain wheel 56 with the free end hanging idly downward. The chain wheels 56 are both fast on a pin 59 carrying between them a worm-wheel 60 engaged by a worm screw 61 journaled at one end in one of the blocks 44, and at the other end in the other block 44, beyond which latter it extends and there carries a hand wheel 62 provided with a suitable handle 63 for causing its rotation.

The structures of Figs. 7 and 8 are designed for the lifting of particularly heavy weights, and hence each chain 57 is made of the flat link type, after the manner of the powerful sprocket-chains, and the chain wheels 56 are of the sprocket-wheel type. Because of the introduction of the worm gear and the balance crank wheel 62 a single operator is enabled to lift much greater weights than is the case with the structure shown in Fig. 1.

It is to be observed that in all the structures the lifting mechanisms are within the limits of the length of the body, post or column of the jack, and this lifting mechanism is of the chain and sheave type, whereby the power may be multiplied to a great extent for the lifting of heavy weights.

The structure is particularly applicable for use in confined spaces where powerful chain hoists cannot be applied, for in mine drifts it is necessary that the lifting mechanism employed take up the least possible space because of the constricted area of the mine drift.

The present invention provides for the conditions found in mines since the room needed for the setting up of the jack or lift is comparatively small while the power which may be exerted by a single operator is far in excess of that needed to elevate any weights which may be found in the mine.

What is claimed is:—

1. In a lifting jack, a body portion having a base member at one end, a cap member at the other end, a jack screw on the cap end of the body portion and displaced with reference to the longitudinal axis of the body portion, a lifting member movable longitudinally along the body portion, and a multiplying chain tackle connected to the lifting member and confined within the limits of the length of the said body portion.

2. A lifting jack comprising a body portion composed of two channel members spaced apart with their channel sides adjacent, a base for the channel members, a cap for the said channel members, a jack screw carried by the cap member and displaced with reference to the longitudinal axis of the body portion, a reversible lifting member movable within the space between the channel irons and provided with a lifting foot projecting laterally beyond the channel irons, a winch carried by the body of the jack, and a multiplying chain tackle connected to the lifting member and in turn connected to the winch and confined within the limits of the length of the body of the jack.

3. A lifting jack comprising a body member formed of channel irons spaced one from the other with their channel sides adjacent, a base for said body member, a cap for the same, a jack screw carried by said cap and displaced with reference to the longitudinal axis of the body member, a reversible carrier movable within the space between the channel irons and provided with a laterally-extending foot projecting beyond the channel irons, a multiplying chain tackle carried by the body of the jack and confined

within the limits of the length of the same and also in operative relation to the lifting member, and a winch connected to the chain tackle and carried by the body of the jack, said winch being provided with a brake for controlling gravitating movements of the carrier.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE W. WILMOT.

Witnesses:
M. F. KOENIG,
HARRY J. MOYER.