

No. 870,458.

PATENTED NOV. 5, 1907.

C. T. PAINTER.
HOISTING APPARATUS.
APPLICATION FILED JAN. 4, 1907.

2 SHEETS—SHEET 1.

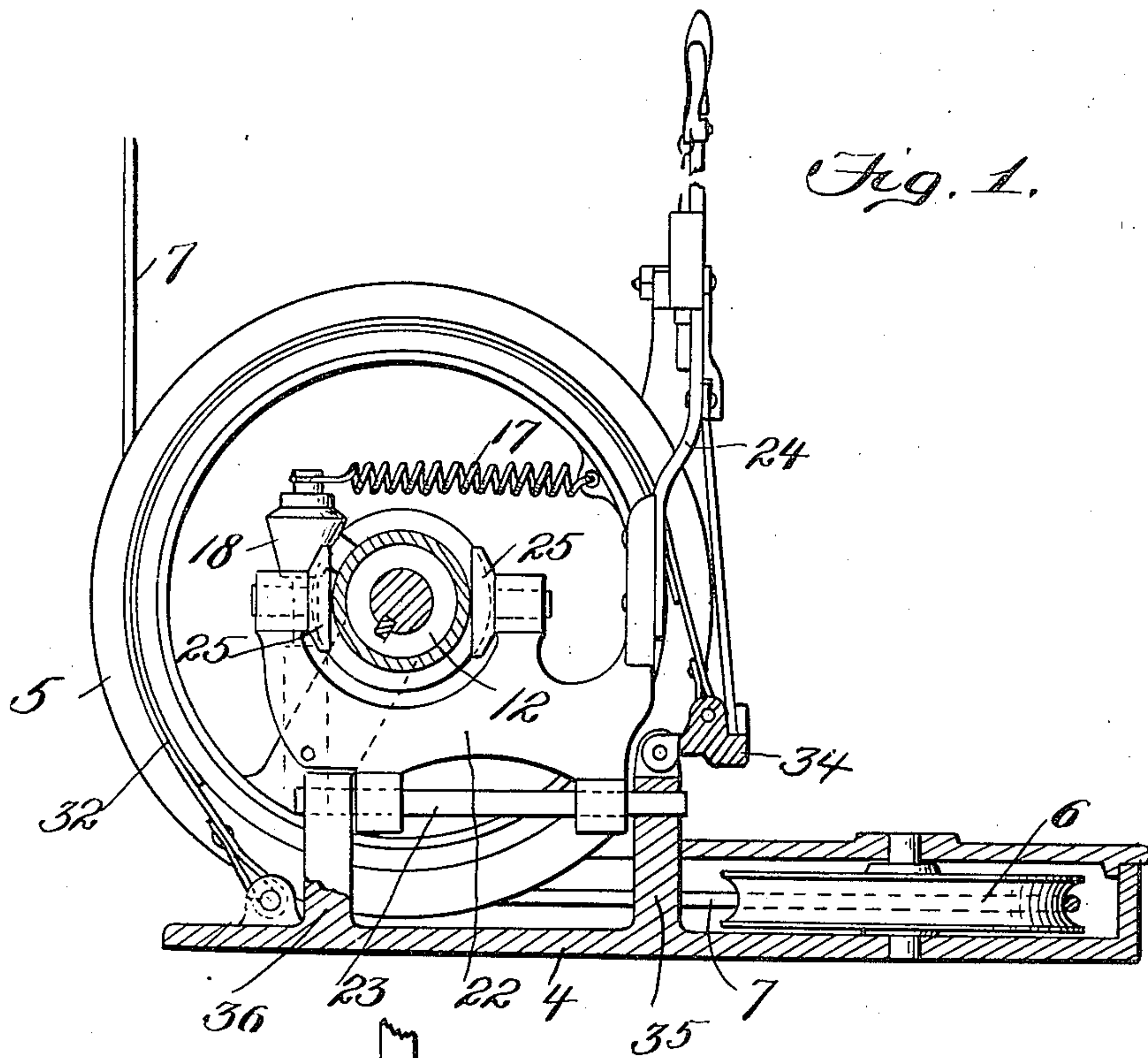


Fig. 1.

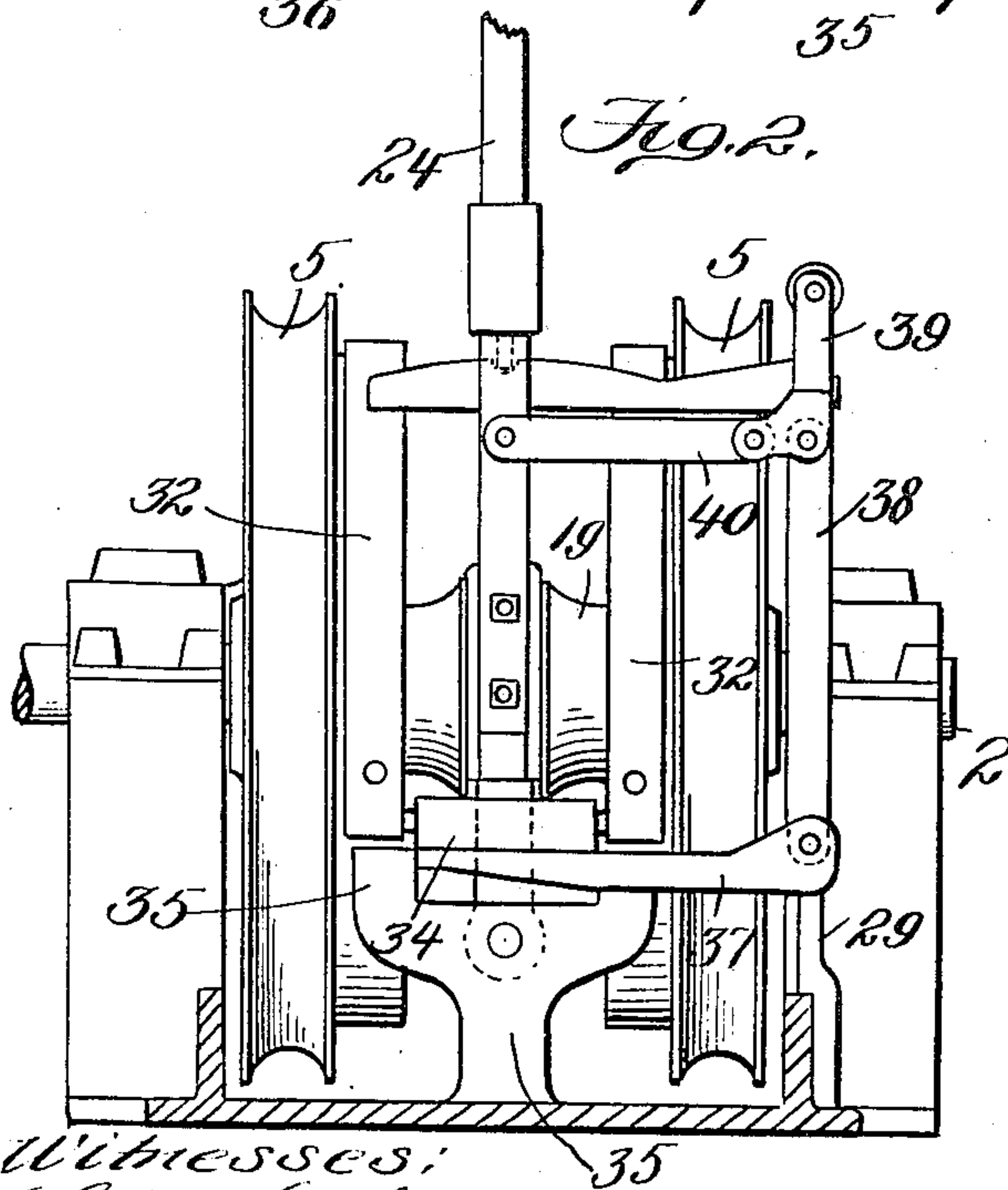
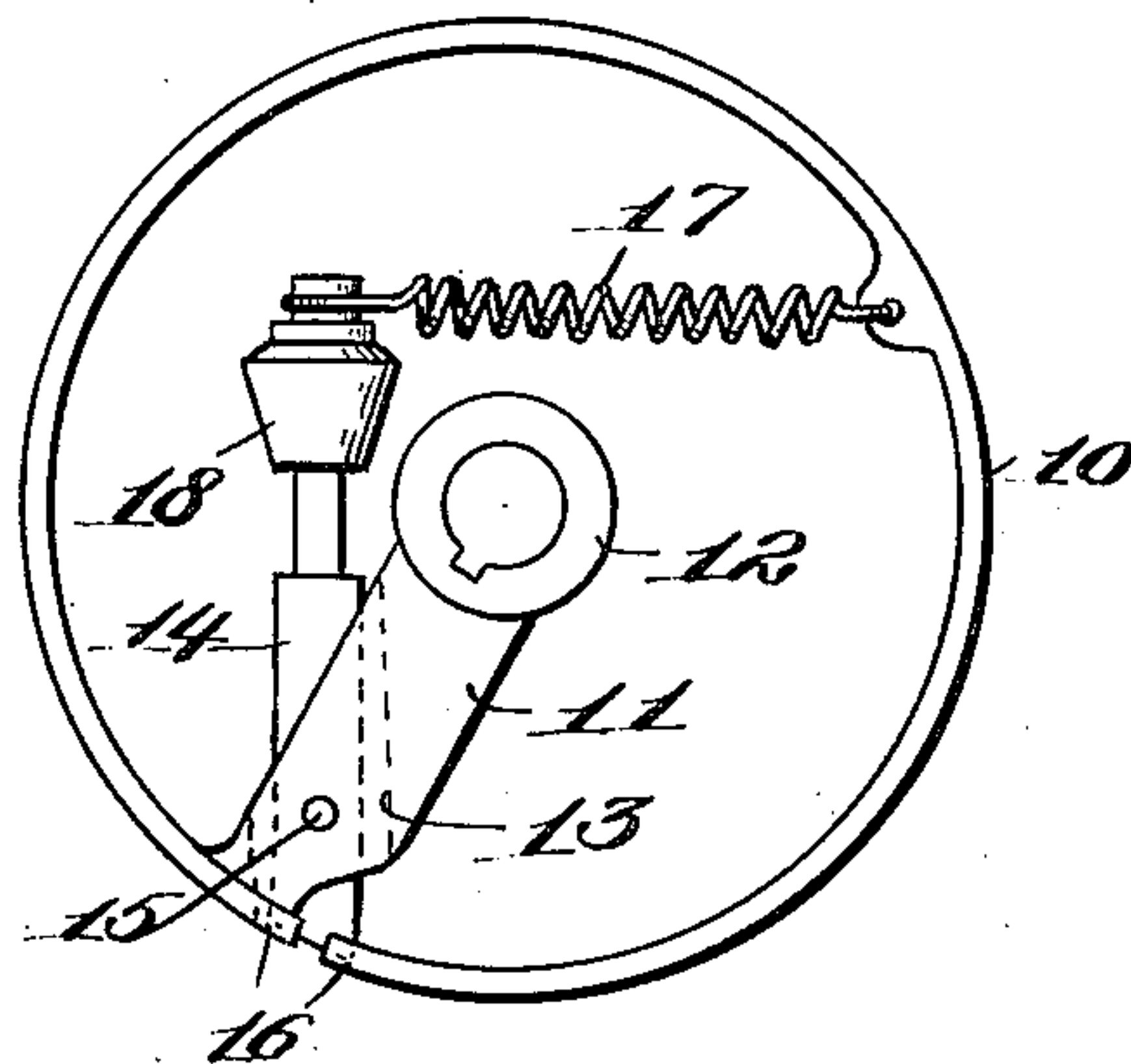


Fig. 2.

Fig. 3.



Witnesses:
Chas. Hester
John K. Cooper

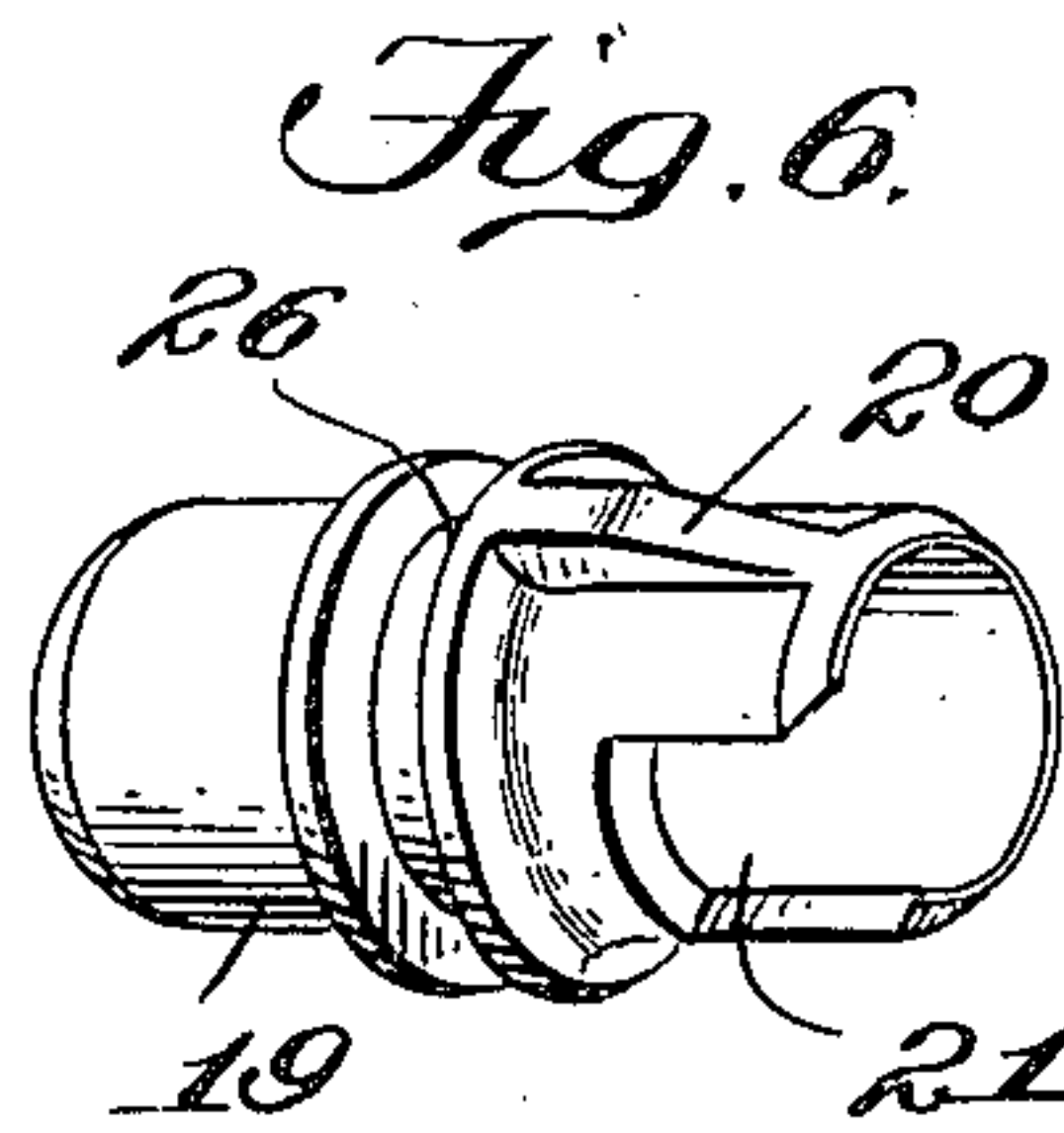
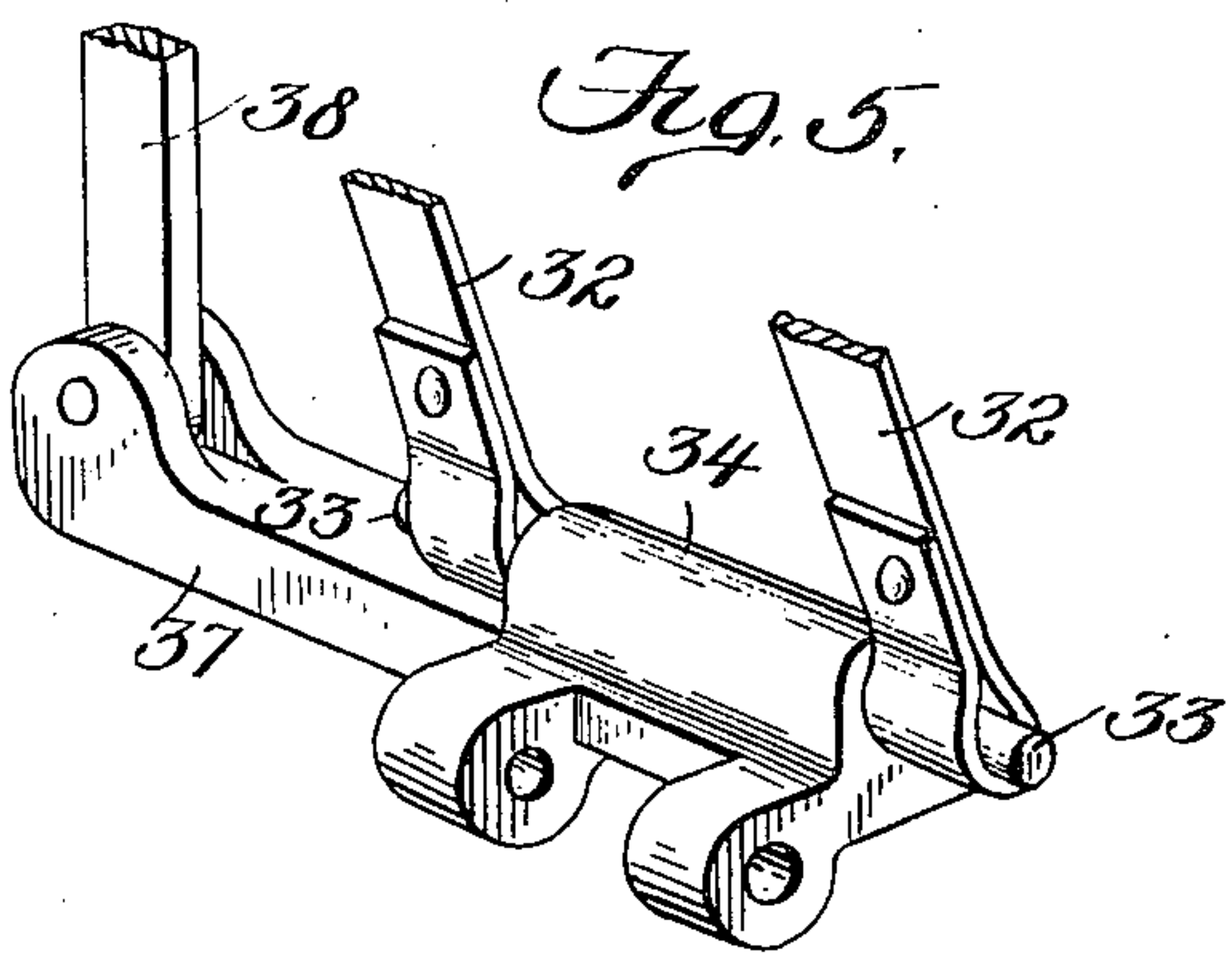
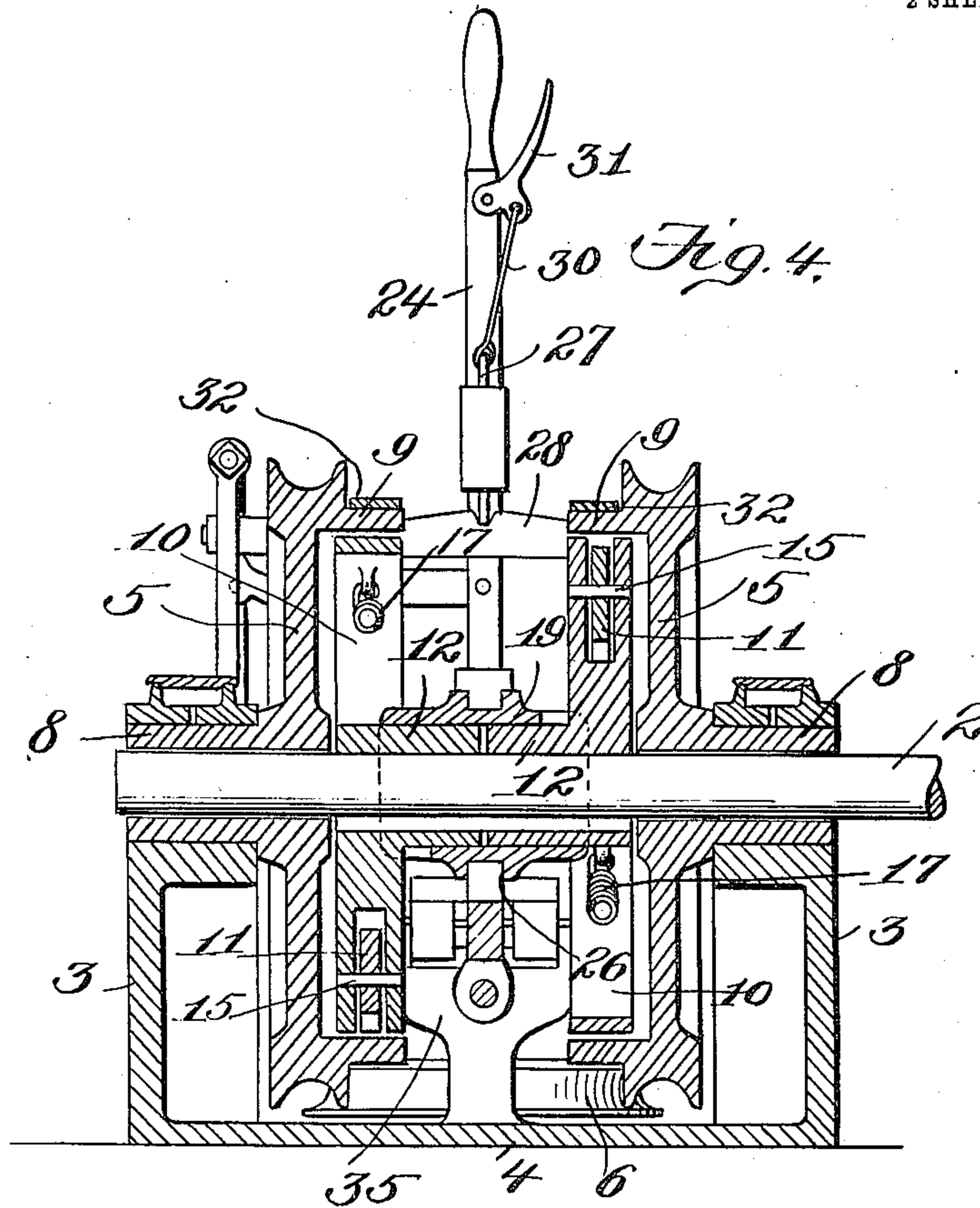
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CARL T. PAINTER, OF CHATTANOOGA, TENNESSEE, ASSIGNOR TO PATTEN MANUFACTURING COMPANY, OF CHATTANOOGA, TENNESSEE, A CORPORATION OF TENNESSEE.

HOISTING APPARATUS.

No. 870,458.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed January 4, 1907. Serial No. 350,777.

To all whom it may concern:

Be it known that I, CARL T. PAINTER, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented
5 new and useful Improvements in Hoisting Apparatus, of which the following is a specification.

This invention relates to hoisting apparatus.

The apparatus shown in the drawings accompanying and forming a part of the present specification is of substantially the same type as that disclosed in Letters-
10 Patent No. 818,115, granted to me April 17, 1906, and to which reference may be had.

The apparatus in which my invention is embodied, like that shown in the Letters-Patent to which I have
15 referred, includes in its make-up a shaft, two sheaves or band wheels loose on said shaft, and means for alternately clutching the sheaves or wheels to the said shaft, or for simultaneously unclutching both of the sheaves from said shaft.

One of the prominent features of my invention is a means for blocking simultaneously the movement of the said sheaves when they are unclutched from their supporting shaft or when they are unclutched from any
20 other supporting means whether said supporting means is a shaft common to the two sheaves or otherwise. It is the custom to use the hoisting apparatus with an elevator. In fact I may as is obvious employ two of these
25 elevators. The advantage, therefore, of the feature to which I have referred will be at once apparent for there are times when an elevator is up and when it is in this relation it cannot accidentally fall when the wheels or sheaves are simultaneously blocked.

It is not essential that I employ some of the features of the present invention with hoisting apparatus such
30 as that shown in my said Letters-Patent for the same may be utilized advantageously in other connections.

In the drawings accompanying and forming a part of this specification I show in detail a form of embodiment of the apparatus which, and for such purpose alone,
35 is to enable those skilled in the art to practice the invention, which will be fully set forth in the following description, while the novelty of the invention will be included in the claims succeeding such description.

In a brief and general way I have alluded to the character and some of the results attained by an apparatus
40 including my invention; other objects and advantages follow said apparatus, as will hereinafter more fully appear.

Referring to the drawings, Figure 1 is a sectional side elevation of an apparatus involving my invention. Fig. 2 is a sectional front elevation of the same. Fig. 3 is an
45 inside view of a clutch means. Fig. 4 is a longitudinal sectional view of the apparatus. Fig. 5 is a detail view in perspective of part of the brake mechanism, and Fig.

6 is a similar view of a sliding sleeve, Figs. 5 and 6 and
55 and also Fig. 3 being upon a larger scale than the other figures.

Like characters refer to like parts throughout the several figures.

In the drawings and particularly in Figs. 1, 2 and 4
60 I have shown some of the elements appearing in the drawings of the hereinbefore referred to Letters-Patent, and these I will set forth briefly, as in themselves they form no part of the present invention. For example,
65 there is a shaft as 2 which may be operated by power in any desirable way and which is sustained by standards as 3 rising from the base or bed plate as 4, although said shaft is not directly supported by the standards. Loosely mounted upon the shaft 2 are represented
70 sheaves or wheels as 5, while the base or bed 4 rotatably supports a sheave as 6 movable about an axis transverse to the axis of movement of the two sheaves 5. In the present case the sheaves 5 turn about a horizontal axis while the sheave 6 turns about a vertical axis. I pass around the two sheaves 5 and the
75 transversely placed sheave 6 one or more times a band, cable or equivalent part as 7 which may be connected with the elevator or which may be connected with two elevators as may be required to suit the particular conditions. Or said band may be connected with any
80 other device, an elevator being mentioned simply as an illustration. I deem it desirable to state at this point that I use various terms employed in the present specification in their broad senses. It will be obvious
85 that if the band 7 be connected with the elevator and that if one of the sheaves 5 be clutched to the shaft 2 and that if the shaft be rotated the elevator will be moved in one direction and that if the other sheave be clutched to the said shaft the elevator will be operated in the opposite direction without the necessity
90 of changing the direction of movement of said shaft.

I do not restrict myself to any particular type of clutch mechanism for alternately rotatively connecting the two sheaves with the power shaft, but I find
95 that I can with advantage employ clutches for this purpose of the type shown in my contemporaneously pending application filed January 4, 1907, Serial Number 350,778, and which will be briefly set forth in order to explain the intent of the present invention. I have stated that the shaft 2 is not directly sustained
100 by the bearings 3, and the reason for this statement will be evident upon an inspection of Fig. 4 wherein the sheaves 5 are shown as having laterally elongated hubs 8 which rotate in their bearings in the heads of the standards or uprights 3 and through which the
105 shaft 2 projects.

I have shown as extending inward from each of the sheaves 5 an annular flange 9 and preferably interiorly

of these flanges clutches work, while on the outside thereof they are engageable by band or strap brakes as will hereinafter be set forth.

I have shown in detail in Fig. 3 a clutch and it will be understood that I employ two of these clutches in the apparatus, although there may be cases where only one need be utilized. I will, however, describe in detail the clutch shown in Fig. 3 and this description will, of course, apply to both clutches as they are the same in construction. The clutch includes in its make-up a split or divided ring 10 and from one end of the ring there extends inward an arm 11 provided at its inner end with a hub 12 which as shown clearly in Figs. 1 and 4 may be keyed or otherwise suitably rotatively connected with the shaft 2. The ring 10 is encircled by the annular flange 9 and when the clutch is in inoperative relation with the coacting sheave said ring will be out of contact with the inner surface of the flange. When, however, it is desired to clutch said sheave to its shaft said ring is radially enlarged or expanded to engage solidly the said flange. The arm 11 has a slot 13 through which the lever 14 extends, the said lever being pivoted as at 15 to said arm 11. The outer portion of the lever fits in notches as 16 formed in the ends of the ring 10. To the inner portion of the lever is shown connected one end of a spring 17, the opposite end of said spring being connected with the ring 10 and the spring by acting against the lever holds the toe thereof normally away from what might be considered the right end of the divided ring in Fig. 3 thereby to normally cause contraction of the ring. When however, the lever 14 is operated in opposition to the spring the toe of the lever will act against said right end in such a way as to expand the ring and cause the same to bite against the inner surface of the flange 9 so as to clutch the sheave of which said flange forms a part to the shaft 2. The lever 14 is represented as carrying a tapered member 18 engageable by a suitable clutch actuator to put the clutch in its operative relation.

The clutch actuator may be of any desirable character; for example, it may consist of a sleeve 19 slidable on the hubs 12 as shown clearly in Fig. 4, the inner ends of these hubs being contiguous so as to provide substantially a continuous sleeve along which the sleeve 19 is longitudinally slidable. The sleeve 19 is rotatively associated with the two hubs 12, although it is not keyed or pinned thereto as will hereinafter appear. Said sliding sleeve 19 has two wedge portions 20 for engagement against the tapered members 18 and these wedge portions are placed diametrically opposite each other and to maintain this relation I prevent rotation of the sleeve 19 with respect to the hubs 12; for example, by forming in said sleeve 19 apertures as 21 in which one or the other of the arms 11 will at all times fit. The action of the clutch mechanism will, it is believed, be clearly obvious from what has been hereinbefore stated. When the sleeve 19 is moved toward the right in Fig. 4 the wedge portion 20 at the right will engage against the corresponding tapered member 18 to expand the corresponding ring 10 and thereby clutch the sheave 5 on the right to the shaft 2. When the opposite movement of the sleeve occurs the opposite result will take place, it being understood that the sleeve 19 is shown as occupying its

neutral or intermediate position in said Fig. 4 and that it has opposite movements from said neutral position.

A hand lever is conveniently utilized for operating the sleeve 19 and in the present case said hand lever includes a base portion as 22 which may consist of a casting of substantially yoke form carried by a pivot or pin as 23 suitably supported by bearings upon the bed 4. The other member of the hand lever consists of a rod 24 attached by rivets, screws or in any other desirable way to the yoke 22, the rod being located at the forward end of the yoke and its handle being in such position as to be readily accessible by an attendant. To the arms of the yoke 22 I show pivoted shoes as 25 disposed opposite to each other and located in a peripheral groove or channel as 26 in the sleeve 19. In Fig. 4 the rod portion 24 of the oscillatory hand lever is indicated as occupying substantially a vertical position, the clutch actuating sleeve 19 at this time being as clearly apparent in its intermediate relation and both sheaves 5 being unclutched. At this time brake mechanism, however, is operative to prevent rotation of the two sheaves and like the clutches the brake mechanism may be of any desirable character, although an advantageous form of the same will be specifically described.

The hand lever is represented as carrying a detent as 27 which when said lever is in its neutral position fits in an aperture in a cross head as 28 at the top of the upright 29 rising from the base 4, this forming a simple means of preventing accidental movement of the hand lever. The upper end of the detent 27 is shown as pivoted to a link 30 likewise connected with the angle lever 31 pivoted upon the said hand lever. By the manipulation of the lever 31 the detent through the intervention of the link 30 can be lifted out of the aperture in the head 28 to permit of the swinging of the hand lever either to the right or left to connect alternately the sheaves 5 with the power shaft 2.

I have shown as surrounding the annular flanges 9 brake straps as 32, the outer ends of these straps as clearly shown in Fig. 1 being connected with lugs on the bed or base plate 4, while the forward ends thereof are connected with studs as 33 extending laterally from the body of a rocker as 34, said rocker 34 being shown as supported by the side branches of a substantially Y-shaped bearing as 35 on the top of the bed 4, this bearing 35 being complementary to the bearing 36 and the two sustaining the pivot pin 23 to which I have previously herein referred.

From one side of the body of the rocker 34 shown as the right side in Fig. 2 there is represented as extending an arm 37 to the outer end of which I have shown pivoted a link 38, the upper end of said link being pivoted to a shorter link as 39 jointed at its upper end to the upright 29. At the junction of the two links 38 and 39 but connected only to the upper link 39 is one end of a third link 40, said third link 40 being jointed to the rod 24. The two links 38 and 39 constitute a toggle for holding the two brake straps 32 set when said toggle is in its operative or straightened condition as shown in said Fig. 2. When the said toggle is straightened the hand lever is in its neutral position, both sheaves 5 being unclutched from the shaft 2 and at this time the two brake straps 32 are set. It will be assumed that it is desired to clutch the sheave 5 on the right in said Fig. 2 to the power shaft 2. To do this the

hand lever is swung over to the right and when this is done the toggle composed of the links 38 and 39 is flexed or broken at the joint between the sections thereof, the result being that the arm 37 and hence the rocker 34 are swung upward in order to carry the brake straps 32 out of binding relation with the flanges 9 and during this motion of the lever and after the sheaves have been relieved of the braking pressure of the two straps the one on the right on the final movement of the lever will be clutched to its shaft. When the latter result takes place the toggle will be flexed its maximum extent. When the hand lever is moved from its extreme shifted position toward the right to its neutral position the sheave on the right will first be unclutched from its shaft and after this is done the toggle will be straightened so as to lower the rocker 34 and thereby simultaneously draw the two brake straps 32 in solid engagement with the flanges 9 to thereby block any movement of said sheaves. The two sheaves, therefore, are simultaneously braked and after one of them has been unclutched from the supporting means therefor. When the hand lever is swung over to the left from said neutral position to clutch the left sheave to said supporting shaft and after returned the same results follow. It will be apparent that when I set forth the unclutching of a sheave from its shaft I mean the movement of the wedge 20 out of engagement with the tapered member 18 to such an extent that the spring 17 by pulling on the lever 14 will permit relaxation of the ring 10 by its inherent resiliency.

From what has been described it will be evident that the apparatus involves a pair of cooperative wheels or sheaves such as 5 about which a cable is adapted to pass and a cable guiding pulley such as 6 mounted to direct the cable from one of said sheaves to the other and that clutch mechanism is provided for alternately clutching such sheaves to a supporting means or for putting them alternately in working relation to some source of power. When both sheaves are unclutched the brake mechanism is operative and preferably acts simultaneously against both sheaves.

What I claim is:

1. A hoisting apparatus having a pair of sheaves, clutch mechanism to connect the sheaves alternately with a source of power, brake mechanism to act against the sheaves, and means to operate the clutch mechanism to simultaneously throw the sheaves out of cooperative relation with such source of power and for operating the brake mechanism to simultaneously block the motion of said sheaves.

2. A hoisting apparatus having a pair of sheaves, a power shaft loosely carrying said sheaves, clutch mechanism to connect the sheaves alternately with said power shaft, brake mechanism to act against the sheaves, and means to operate the clutch mechanism to throw the sheaves out of driving relation with such shaft and for operating the brake mechanism to simultaneously block the motion of said sheaves.

3. A hoisting apparatus having a pair of sheaves, a power shaft loosely carrying said sheaves, clutch mechanism to connect the sheaves alternately with said power shaft, a pulley to direct a cable from one of the sheaves

to the other, brake mechanism to act against the sheaves, and means to operate the clutch mechanism to simultaneously throw the sheaves out of cooperative relation with said power shaft and for operating the brake mechanism to simultaneously block the motion of said sheaves.

4. A hoisting apparatus having a pair of sheaves, a source of power, clutch mechanism to connect the sheaves alternately with such source of power, brake mechanism to act against the sheaves, and means to operate the clutch mechanism to simultaneously throw the sheaves out of cooperative relation with such source of power and to afterwards operate the brake mechanism to simultaneously block the motion of said sheaves.

5. A hoisting apparatus having a pair of sheaves, clutch mechanism, a hand operable member to actuate the clutch mechanism to alternately connect the sheaves with a source of power or to simultaneously throw said sheaves out of cooperative relation with such source of power, brake mechanism to act against the sheaves, and means connected with said hand operable member to operate the brake mechanism to simultaneously block the motion of said sheaves when the latter are out of cooperative relation with said source of power.

6. A hoisting apparatus having a pair of sheaves, clutch mechanism to connect the sheaves alternately with a source of power, a manually operable member for actuating the clutch mechanism to alternately throw the sheaves into operative relation with such source of power or to simultaneously move them both out of such operative relation, brake mechanism to act against the sheaves, a toggle operable by said manually operable member, and means between the toggle and the brake mechanism for actuating said brake mechanism to simultaneously block the motion of said sheaves when the toggle is in its effective relation and after the sheaves are out of cooperative relation with such source of power.

7. A hoisting apparatus having a pair of sheaves, clutch mechanism to connect the sheaves alternately with a source of power, strap brakes surrounding the sheaves, a rocker to which one end of each strap brake is connected, a toggle cooperative with the rocker, means for operating the toggle to cause the same to simultaneously set the two strap brakes and for also shifting the clutch mechanism into a position to simultaneously throw the two sheaves into inoperative relation.

8. A hoisting apparatus having a pair of sheaves, clutch mechanism to connect the sheaves alternately with a source of power, a hand lever for actuating the clutch mechanism, brake mechanism to act against the sheaves, and means involving a toggle operable by said hand lever for operating the brake mechanism to simultaneously block the motion of said sheaves and after the clutch mechanism has unclutched said sheaves.

9. A hoisting apparatus having a pair of sheaves, clutch mechanism to connect the sheaves alternately with a source of power, a hand lever for shifting the clutch mechanism to throw the sheaves alternately into and out of operative relation with said source of power, a rocker, brake straps for the sheaves connected with said rocker, a toggle connected with said rocker and with a fixed part, and a connection between the toggle and the hand lever, said hand lever when it is operated to simultaneously unclutch the two sheaves being also operable to move said toggle into its effective position for simultaneously setting the two strap brakes.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL T. PAINTER.

Witnesses:

LEWIS M. COLEMAN,
J. K. HODGES.