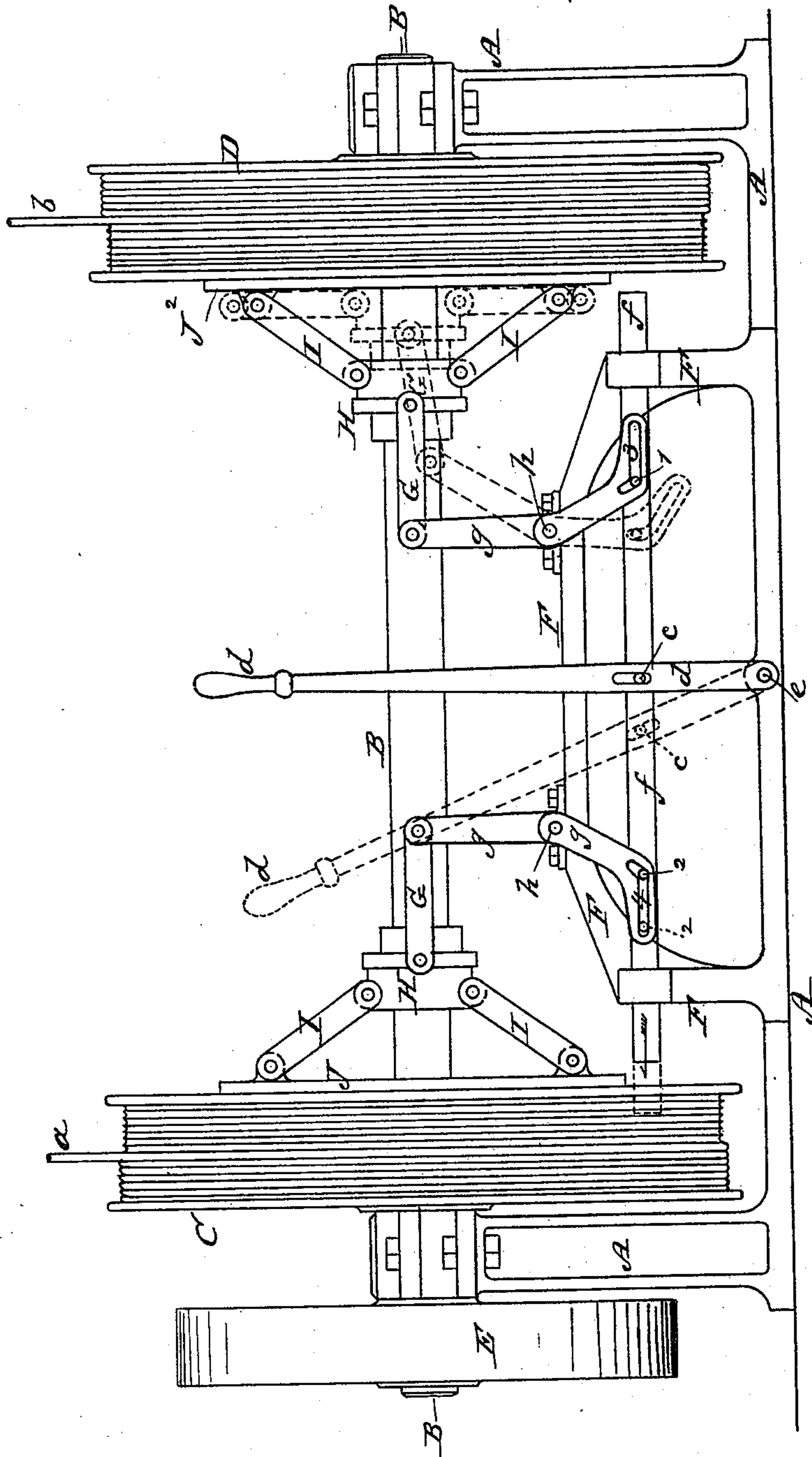


(No Model.)

A. E. BROWN.
CLUTCH MECHANISM.

No. 428,376.

Patented May 20, 1890.



Witnesses
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CLUTCH MECHANISM.

SPECIFICATION forming part of Letters Patent No. 428,376, dated May 20, 1890.

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To all whom it may concern:

Be it known that I, ALEXANDER E. BROWN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Clutch Mechanisms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification.

10 In the use of a series of friction-clutches in any kind of machine or mechanism under such circumstances that it is necessary or desirable to throw the clutches into and out of operation alternately, and to set all of them
15 into a condition of disuse through the medium of a single motive lever or other device under the control of the operative, it has always heretofore been necessary to have the movable part of the clutch mechanism possess an
20 unnecessary degree of motion, and to be moved to an extent unnecessary for the purpose of a perfect disengagement and re-engagement of one or another of the clutch devices. This has been necessary because in moving through
25 the medium of a single actuating device either one of the clutch devices to throw it into engagement, the other clutch device, connected with the same actuating contrivance, has of course necessarily been moved farther
30 away from its engaging position than was necessary to have it completely disengaged from that part of the clutch mechanism with which it is designed to be in contact when in engagement, and whenever the series of
35 clutches have been set in a condition of disengagement it has been indispensably necessary to have both of them farther away from the contacting or engaging condition than was necessary or desirable. I have devised means
40 by which this defect or objection to all devices or mechanisms for thus operating friction-clutches have been heretofore subject, and by which a series of friction-clutches may be operated through the medium of a
45 single actuating device, and at the same time in such manner that the contacting devices of each one of the friction-clutches need only be moved to the minimum extent necessary either to throw it into engagement or to dis-
50 engage the parts of the clutch mechanism, the novel feature or pith of my invention in this direction consisting, essentially, in con-

necting the single operating or motive lever or other device with each one of the movable parts of the clutch mechanism in such manner, as will be hereinafter explained, that the device connecting the motive lever with the part to be moved influences said part only when said device is moved in one of its two directions of motion.

To enable those skilled in the art to make and use my invention, either in the form in which I have shown it carried into effect or under some modification thereof, I will now proceed to more fully describe my improvement, referring by letters and figures to the accompanying drawing, which forms part of this specification, and in which I have shown my invention applied to a series of two friction-clutches of a type in connection with which I have successfully practiced my invention.

In the drawing the figure is an elevation showing so much of a hoisting-machine as is necessary for the purpose of clearly exhibiting a pair or series of friction-clutches such as have been employed in such machines, said friction-clutches having applied to them for the purpose of manipulating them an operating mechanism or contrivance embodying my invention.

In the drawing, A represents an ordinary metallic bed-plate and frame-work, on which is mounted to run in suitable bearings the main or drive shaft B of a pair of winding-drums C and D of an ordinary hoisting-machine, the said shaft being shown as provided, as usual, with a drive-pulley at E, through the medium of which the necessary motive power is supplied to drive the said shaft with its said drums. As usual, the winding-drums are provided with ropes or cables *a* and *b*, and, as is quite common, each of the winding-drums is mounted loosely on shaft B, so that either the one or the other may be rotated by said shaft at pleasure, according as either one or the other may be clutched to the shaft by means of some sort of clutch mechanism.

The clutch-mechanisms shown in the drawing are of that type known as "friction-clutches," one of them J operating to effect a coupling of the drum C with the drive-shaft B, while the other J² is designed to effect at pleasure an engagement between said drive-

shaft and the drum B. These friction-clutches are supposed to be of the usual approved pattern or construction, and each involves, as shown, the necessary devices of a collar, or
 5 hub H, which is splined to the shaft B, and links I, working, as usual, to effect the expansion of the engaging rim-pieces of the friction-clutches. In lieu of these usual friction-clutch mechanisms being operated in the
 10 usual manner and by some one of the means or appliances heretofore employed for the purpose, I have illustrated these clutch mechanisms as having combined with them and as being operated by the novel means which
 15 constitute the subject of my invention. This novel mechanism or contrivance consists (in the form in which my invention is shown in the drawing) of a suitable supporting-stand or frame-work F, which projects upwardly from
 20 the plate of the main frame of the hoisting-machine, in which frame-work F is mounted to slide endwise in suitable supporting bearing-boxes an operating shaft or bar *f*, which is adapted to be moved endwise in either direction by means of the hand-lever *d*, the lower end
 25 of which is pivoted at *e* to the metallic frame or casting, and which at a proper distance above its fulcral point is slotted or perforated longitudinally for the accommodation of a projecting pin or pins *c*, that project laterally from the sliding shaft or bar *f* and engage with said slot.

Mounted on suitable rock-shafts or pivots *h*, that are supported in suitable bearing-boxes on the top of the frame E, are two bent
 35 levers *g*, the upper ends of which are pivotally connected, as clearly shown, with one set of ends of the links G, which links, as shown, are at their opposite ends connected with the
 40 hubs H of the friction-clutch mechanisms proper. Each one of the said bent levers *g* has formed in its lowermost foot-shaped portion a slot, marked 3 in one case and 4 in the other, the peculiar shape of which slot is
 45 clearly shown in the drawing, and into these slots 3 and 4 of these bent levers projects, so as to properly engage with the slot, a pin, which projects laterally from the sliding bar or shaft *f*. These pins (marked, respectively,
 50 1 and 2) operate to move the bent levers *g* whenever the shaft or bar *f* is moved endwise, in a manner and for the purpose which I will presently explain.

In the operation of the devices shown and
 55 so far described for manipulating the friction-clutches proper whenever the hand-lever *d* stands in the vertical or neutral position in which it is represented in full lines in the drawing, both of the friction-clutches are out of
 60 engagement with the drums of the hoisting-machine. When, however, the hand-lever *d* shall be moved into the position illustrated, for instance, by the dotted lines in which it is drawn at Fig. 1, such vibration of the hand-lever on its pivotal point *e* will operate, through the medium of an engagement of its slot or perforation with the projecting pin *c*

of the sliding bar *f*, to move the said bar *f* in the direction indicated by the arrow on said bar and into the position illustrated by the
 70 dotted lines at the left-hand side of the figure of the drawing. This longitudinal movement of the bar *f* causes that one of its laterally-projecting pins marked 1 to move or oscillate that one of the bent levers *g* which is located
 75 at the right-hand side of the drawing into the position indicated by dotted lines, which movement of said bent lever *g* operates, of course, through the medium of the connecting-link G to slide the collar H of the clutch
 80 mechanism which is combined with the drum D so as to throw said clutch mechanism into engagement and securely clutch the drum D to the drive-shaft B. During the movements and operations thus of the parts, however, it will
 85 be understood that that one of the projecting pins of the sliding bar *f* that is marked 2 will simply travel along in the horizontal portion of the slot 4 of the bent lever *g* at the left-hand side of the drawing, without in the least
 90 affecting the normal position or condition of said bent lever *g*, and hence without producing any effect on the other clutch mechanism, which is designed to affect the drum C.

In like manner when the hand-lever D may
 95 be returned to its vertical or neutral position for the purpose of throwing out the clutch mechanism, just described as being thrown into engagement on drum D, that one of the friction-clutches which operates in conjunction with the drum C will still remain unaffected, the pin *c* simply returning to its original position. Whenever it may be desired to
 100 operate the friction-clutch which is arranged in connection with drum C, the hand-lever must be vibrated in the opposite direction, of course, to that in which it is shown in dotted lines in the drawing, whereupon the brake
 105 J will be thrown into engagement without in any manner affecting the condition of the clutch mechanism which is combined with the drum D. It will be understood, therefore, that while I am enabled to perfectly manipulate at different times in the proper manner
 110 either one of the clutch mechanisms through the medium of the single hand-lever *d*, in so doing each one of the clutch mechanisms has to be moved or operated only to the minimum extent of motion that is actually necessary for the perfect action of said clutch mechanism.
 120

Of course, in lieu of the peculiarly constructed and operating bent-levers *g*, engaging through the medium of their slots 3 and 4 with projecting pins on the sliding bar *f*,
 125 some other combination of device may be employed for imparting to each one of the clutch mechanisms proper the necessary movements for its perfect operation without having the main drive bar or shaft affect the other clutch
 130 mechanism.

I have, in fact, contemplated and devised other detailed constructions for operating on precisely the same principle, to set and unset

each one of the friction-clutches through the medium of a single hand-lever without affecting in the least the other clutch mechanism. I, however, have given preference to and have so far put into most successful practical operation that precise form of mechanism which I have herein shown.

I therefore wish it to be understood that while I have shown that precise form and arrangement of devices which I have so far used in practice I do not understand my invention to be restricted to the use of just such devices, since many other and differently-formed and arranged parts may be employed, acting upon the same novel principle as that embodied in the precise form of contrivance shown, and hence embodying equally well my invention, the pith of which lies in the combination, with the series of clutches to be alternately thrown into and out of use, of a single motive lever or other analogous device and intermediately-arranged devices operating to cause any movement of said motive lever in a given direction and back to the point of starting to efficiently apply and fully

release one of the clutch mechanisms without in the least influencing or affecting the other.

What I therefore claim, broadly, as my invention, and desire to secure by Letters Patent, is—

The combination of the following-named instrumentalities, arranged and operating together, as hereinbefore described, viz: first, a series of friction-clutches; second, a single actuating lever or device, and, third, suitable devices arranged intermediately of the said friction-clutches and the said actuating-lever, and acted upon by the said lever, which operate to positively apply and release one or the other of the friction-clutches without in the least affecting the condition of the other, whenever the said actuating-lever may be moved from its neutral position in either direction and back to its original location.

In witness whereof I have hereunto set my hand this 18th day of January, 1890.

ALEX. E. BROWN.

In presence of—

CHAS. W. KELLY,
C. B. KRAUSE.