

Dec. 15, 1931.

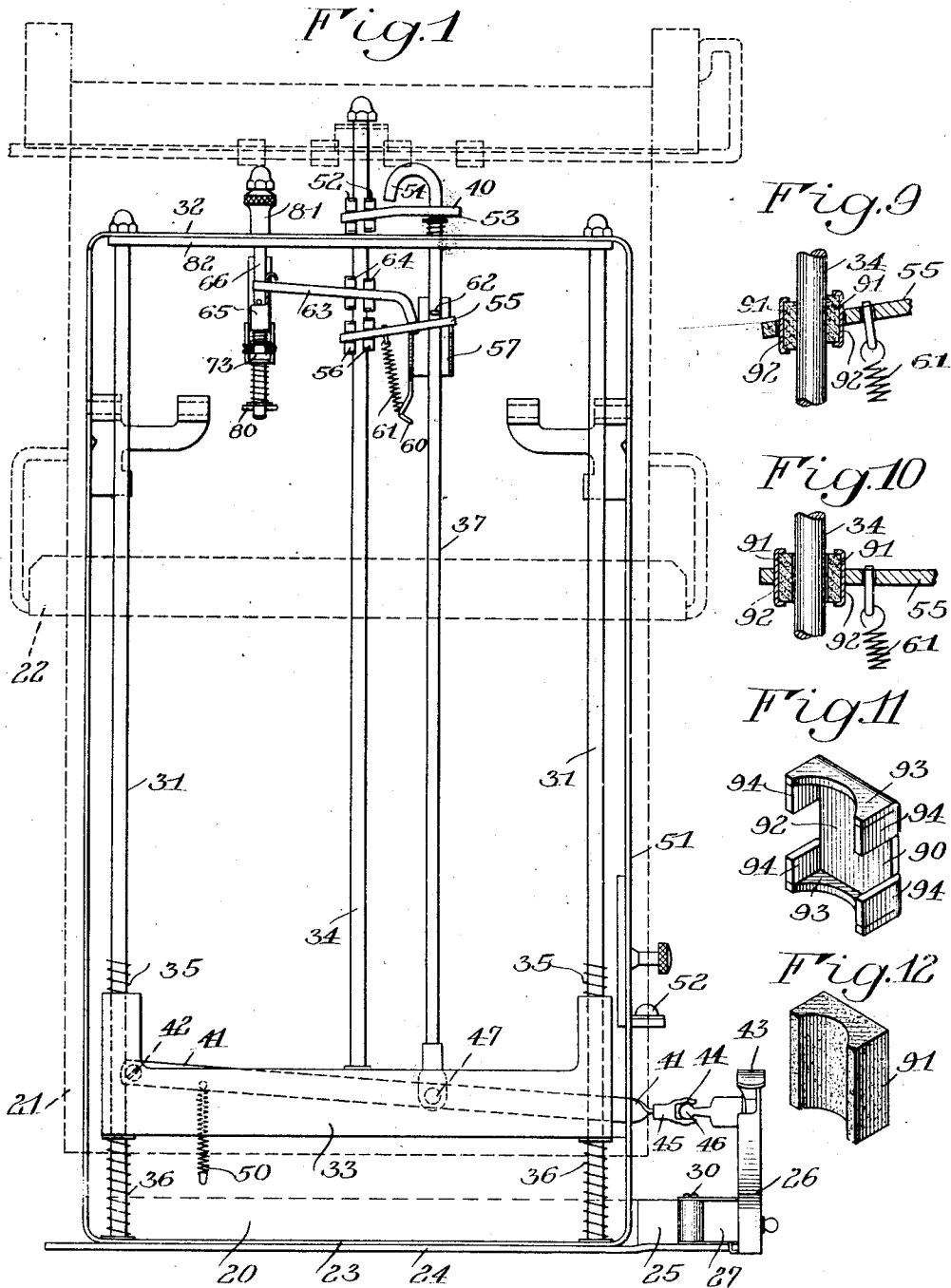
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1,837,027

INTERMITTENT OPERATING MECHANISM FOR COPYHOLDERS

Filed April 2, 1927

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2

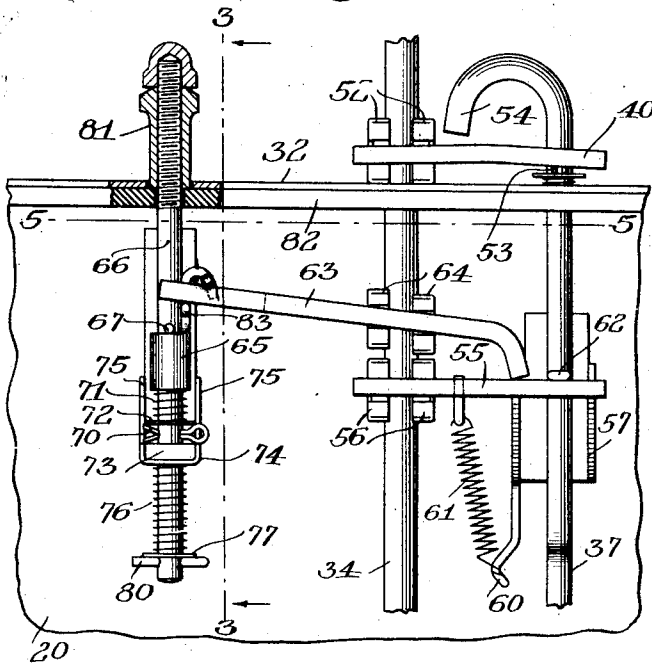


Fig. 3

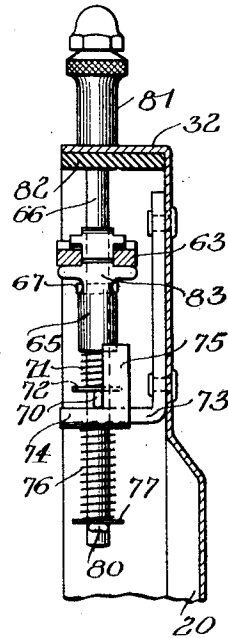


Fig. 4

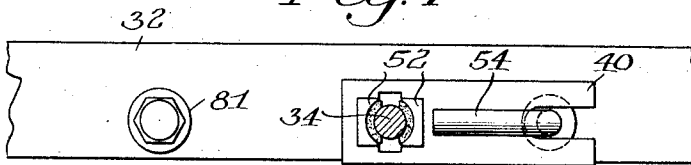


Fig. 13

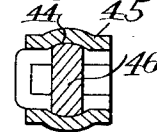


Fig. 5

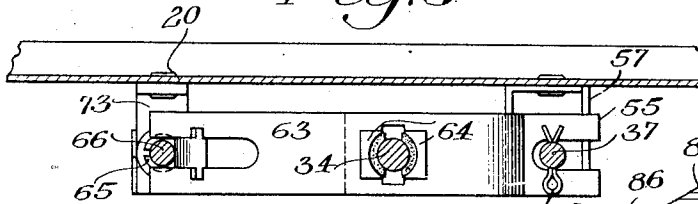


Fig. 6

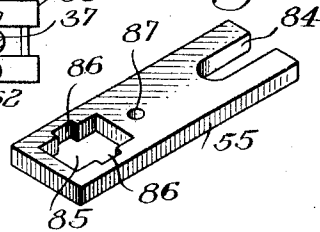
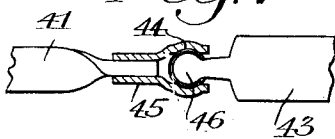


Fig. 7



UNITED STATES PATENT OFFICE

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INTERMITTENT OPERATING MECHANISM FOR COPYHOLDERS

Application filed April 2, 1927. Serial No. 180,485.

This invention relates to copyholders of the type in which a copy plate carrying the page or sheet being followed and a line indicator extending across the copy plate are moved relatively to each other by mechanical means, and has for an object to provide a generally improved construction which may be more conveniently operated with greater efficiency and smoothness. Another object is to provide improved means for raising the copy plate. Another object is to provide improved means for retarding the downward movement of the copy plate. Another object is to provide improved means for gripping the lifting rod for various purposes. Another object is to provide an improved mechanical joint. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown one of the various possible embodiments of this invention,

Figure 1 is a front elevation of a copyholder embodying this invention; the copy plate and line indicator being shown in dotted lines in order to show the operating mechanism more clearly;

Figure 2 is an elevation of a portion of the operating mechanism, showing the clutch members for raising, holding, and retarding the motion of the lifting rod;

Figure 3 is a view taken on line 3—3 of Figure 2, and showing a portion of the adjustable lifting rod retarding means;

Figure 4 is a plan view of a portion of the support;

Figure 5 is a plan view taken substantially on line 5—5 of Figure 2;

Figure 6 is a perspective of one of the clutch members;

Figure 7 is a view partly in section of the mechanical joint which connects the clutch rod actuating lever and the operating lever;

Figure 8 is a plan view of the mechanical

joint as applied to the illustrated embodiment of this invention;

Figure 9 is a detail view partly in section, showing the holding clutch in a holding position;

Figure 10 is a view similar to that shown in Figure 9 in which the holding clutch is in a released position to permit movement of the lifting rod;

Figure 11 is a perspective of the clutch jaw casing;

Figure 12 is a perspective of the clutch jaw filler; and

Figure 13 is a sectional view of a portion of the universal joint.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings in detail, there is shown a support 20 on which the usual copy plate 21 is mounted for vertical movement and which has the usual line indicator 22 mounted thereon. The support 20 has the usual forwardly turned end and side flanges mounted thereon. The bottom flange 23 has an angle bar 24 rigidly attached thereto and extending beyond the opposite ends thereof; the extended end portions of the angle bar providing means for attaching the copy holder to a desk or table or other support, and one of said end portions serving as a support for a hinge member 25. The forwardly projecting side arm 26 has a hinge member 27 rigidly attached thereto adjacent an end and the hinge members 25 and 27 are pivotally connected by means of the pin 30. The length of the hinge member 27 is such that the side arm 26 may be folded to a position in which it is substantially in contact with and parallel to the front face of the copy plate, thus permitting the copyholder to be compactly folded for shipping or storage purposes.

Two stationary parallel guide rods 31 extend between the bottom flange 23 and top flange 32 and have the copy plate support 33 slidably mounted thereon. The member 33 is formed of sheet metal and has upper and lower rearwardly extending apertured flanges on opposite sides through which the guide rods pass, and a similar central flange

or lug to which the lifting rod 34 is attached. The lifting rod extends through a central aperture in the top flange 32 and is guided therein during its movement. Spring members 35 and 36 mounted on the guide rods 31 serve as upper and lower buffers for the supporting member 33.

For raising the lifting rod 34 there is provided a clutch rod 37 having a clutch member 40 mounted thereon for engagement with the lifting rod. The clutch rod is actuated by a lever 41 which is pivoted adjacent one end to the support 20 as at 42 and attached adjacent its other end to an operating lever 43 by means of the universal joint 44. The operating lever 43 extends forwardly of the copyholder and is pivotally mounted on the side arm 26.

In order to permit folding of the operating lever with the side arm to a position substantially parallel with the copy plate, the inner end of the operating lever is provided with a portion extending at right angles thereto and carrying the ball or disc member of the universal joint, and the universal joint is so positioned that its vertical axis is normally coincident with the axis of the pin 30.

The universal joint (shown in Figures 7, 8 and 13) comprises a sheet metal sleeve member having a bifurcated end portion and a ball member comprising a circular disc having an outwardly curved intermediate face and two oppositely disposed plane faces. The sleeve member 45 is preferably formed of a single piece of sheet metal. In forming the sleeve or socket member the arms formed at the bifurcated end are first bent outwardly adjacent their points of connection with the body portion and then bent inwardly at points between their ends and their points of connection with the body portion to provide substantially parallel inner faces. The bending operations described above are preferably performed while the sleeve member is in a flat sheet form. Either before or after the bending operations described, the inner faces of the arm members may be drilled or punched or otherwise treated to provide recesses or concavities having spherical surfaces. The ball member 46 may be described as a sphere from which opposite portions have been removed to provide two oppositely disposed plane faces. The thickness of the ball member between the plane faces is less than the distance between the plane faces of the arm members and the diameter of the circular or spherical portion is substantially equal to the distance between the bottom points of the concavities. Thus the ball member may be passed to a central position between the arm members and turned through ninety degrees to seat the spherical portions in the concavities and form a universal joint. A joint of the type shown and described may be quickly and cheaply manufactured and quick-

ly assembled and is highly efficient in its present and other applications.

The clutch rod 37 is pivotally attached to the lever 41 at 47. A helical spring 50 anchored on the support 20 and attached to the lever 41 tends to return the said lever to its lower operative position. The outer end of the lever 41 extends through a slot in the side flange 51 of the base 20 and an adjustable stop member 52 is positioned adjacent the upper end of the said slot to regulate the movement of the said lever and thus regulate the movement of the copy plate.

The clutch member 40 is preferably formed of a rigid piece of sheet metal and has a substantially rectangular aperture adjacent one end and a longitudinally extending open end slot adjacent the other end. The lifting rod 34 extends through the rectangular aperture and clutch jaws 52 are loosely or movably mounted on the said clutch member on opposite sides of the said rod. The clutch rod 37 extends through the slot and has a pin 53 extending therethrough upon which member 40 is supported. A helical spring and washer are positioned on the clutch rod between the pin 53 and the flange 32 and serve to hold the member 40 normally spaced above the flange 32. The clutch member 40 is bowed in such a manner that when its slotted end portion is supported substantially horizontally, the clutch jaw supporting end portion extends downwardly at such an angle that when the clutch rod 37 is in its normal lowermost position the clutch jaws 52 are substantially in contact with the lifting rod 34. Thus when the clutch rod 37 is operated through the actuating lever 41 and operating lever 43 the clutch jaws 52 are in position to grip the lifting rod 34 immediately and there is no lost motion. The member 40 may slide longitudinally of itself on the clutch rod 37 and consequently any tendency of the clutch jaws to stick on the lifting rod during the return movement of the clutch rod will not cause a binding of the member 40 between the lifting rod and clutch rod. The downwardly extended end portion 54 of the clutch rod serves to prevent the member 40 from assuming such an angle that the clutch jaws 52 may grip the lifting rod during the downward movement of the clutch rod.

As explained, the clutch jaws 52 grip the lifting rod 34 and move it upwardly, during the upward movement of the clutch rod 37, an amount depending upon the movement of the actuating lever 41. In order to hold the lifting rod in its raised position a holding clutch comprising a clutch member 55 and clutch jaws 56 is provided. The structure of the clutch member 55 is similar to the structure of the clutch member 40 except that the member 55 is formed of a straight piece of metal. The member 55 is supported on a bracket 57 which is attached to the support 20 and

which has two arms the upper edges of which lie in the same horizontal plane. The innermost arm of the bracket 57 has a depending rigid arm 60. A helical spring 61 is anchored on the arm 60 and attached to the clutch member 55 for normally maintaining the said clutch member inclined downwardly from the inner arm of the bracket 57 to the lifting rod 34 and thus holding the clutch jaws 56 normally in engagement with the lifting rod and preventing downward movement of the same (shown in Figure 9).

For the purpose of releasing the holding clutch to permit the lifting rod to slide downwardly a pin 62 is mounted on the clutch rod 37. When it is desired to release the lifting rod the outer end of the operating lever 43 may be raised to depress the actuating lever 41 and thus move the clutch rod 37 downwardly from its normal position. During the downward movement of the clutch rod, the pin 62 engages the clutch member 55 causing it to assume a horizontal position in engagement with the horizontal arms of the bracket 57 and thus releasing the lifting rod (shown in Figure 10).

Sometimes during the use of the copyholder the combined weight of the manuscript being copied, the copy plate, and lifting rod is so great that if the mass is released without restraint it gathers considerable speed during its downward movement and the force of the impact when it reaches the end of its downward travel may be sufficient to injure the apparatus or displace the manuscript and the noise may be disturbing to workers in the vicinity. For the purpose of regulating the speed of heavy loads on the copy plate a retarding clutch comprising a clutch member 63 and clutch jaws 64 has been provided.

The clutch member 63 has a longitudinal slot similar to the slots of the members 40 and 55 and a rectangular aperture substantially at its center. The inner end portion of the said member is bowed downwardly and its end engages the upper surface of the member 55 directly above the inner arm of the bracket 57 which serves as a fulcrum for the member 55. The movement of the portion of the member 55 engaged by the member 63 is very slight. Consequently the inner end of the member 63 is maintained substantially at a fixed height. The forked outer end of the member engages an adjustably mounted bracket 65.

The bracket 65 is sleeved for sliding movement on a rod 66 between the upper and lower pins 67 and 70 which are mounted on the rod. A helical spring 71 and a washer 72 are mounted on the rod between the lower end of the sleeve portion of the bracket 65 and the pin 70 and the spring serves to hold the bracket normally in contact with the pin 67. The rod 66 is guided for vertical movement

in a slot in the flange 32 and a slot in the bracket 73 is rigidly mounted on the support 20. A locking member 74 having an apertured channel-shaped base for engaging the projecting portion of the bracket 73 and two upstanding arms 75 for engaging opposite end portions of the pin 70 and thus locking the rod against rotation is held in engagement with the bracket 73 by a helical spring 76 mounted on the rod 66 and seated on a washer 77 which is maintained in position on the rod by means of a pin 80 extending through the rod adjacent its lower end. The spring 76 also tends to hold the rod in its lower position and return it to its lower position when it is displaced.

The upper end of the rod 66 is screw threaded and a threaded sleeve 81 is mounted thereon. The lower end of the sleeve 81 bears upon a fiber board strip 82 mounted on the under surface of the flange 32 and it may be turned to move the rod upwardly or downwardly.

The bracket 65 has an integral upwardly extending extension 83 which is provided with two spaced pairs of sidewardly projecting arms. The upper end portion of the extension 83 is bowed outwardly and downwardly and when the member 63 is resting on the lower side arms the upper side arms are normally in engagement with the upper surface of the member 63 and the end portion of the extension 83 projects into the longitudinal slot in the member 63.

The bracket 65 through the rod 66 may be lowered to a position in which the major portion of the clutch member 63 extends horizontally, when the clutch jaws 64 have no retarding effect on the lifting rod. Also the bracket 65 may be moved upwardly to cause the clutch jaws 64 to grip the lifting rod with varying degrees of firmness and thus provide the desired retarding effects.

In Figure 6 there is shown a perspective of the clutch member 55 in which the longitudinal slot 84 and rectangular aperture 85 are clearly shown. The rectangular aperture is provided with parallel rectangular grooves 86 in its side walls. An aperture 87 through which a pin extends for attaching the spring 61 is also shown. The clutch members 40, 55 and 63 all have rectangular apertures and longitudinal slots of the same shapes.

The clutch jaws 52, 56 and 64 are all similarly constructed and each comprises a sheet metal casing 90 (Figure 11) and a non-metallic filler 91 (Figure 12). The filler member may be formed of fibrous material, cork, rubber, bakelite or a similar substance which provides a good friction surface. The casing is formed of a single piece of sheet metal having a rectangular body portion 92, two arcuately grooved end extensions 93 and two spaced extensions 94 on each side. The extensions are all folded to project perpen-

dicularly from one face of the body portion. One face of the filler 91 has an arcuate or substantially semi-cylindrical groove formed therein. As a result of the structure of the casing and the filler the assembled clutch jaw has an arcuate or semi-cylindrical groove on one face extending from end to end thereof and centrally disposed rectangular grooves in its opposite side faces extending transversely of the arcuate groove.

The thickness of the clutch jaw is slightly less than the width of the grooves 86 in the clutch members, and less than the distance between an end wall and an adjacent wall of a groove 86, and the width of the side grooves in the clutch jaw is greater than the thickness of the clutch members. Also, the distance between the outer side faces of the clutch jaw is greater than the distance between the side walls of the rectangular aperture and slightly less than the distance between the bottoms of the grooves 86 in the side walls of the rectangular aperture, and the distance between the bottoms of the side grooves in the clutch jaw is slightly less than the distance between the side walls of the rectangular aperture. Consequently, a clutch jaw may be inserted between the bottom walls of the grooves 86 until its side grooves register with the side walls of the aperture when it may be moved forwardly or rearwardly of the center of the aperture and thus suspended in position. Each clutch is formed by inserting two clutch jaws in each aperture with their grooved surfaces adjacent. When the lifting rod is passed between the clutch jaws they are effectively locked against removal. The clutch jaws fit loosely upon the clutch members and when the clutch members are moved from a position in which they extend perpendicularly from the lifting rod, the clutch jaws are moved toward each other and grip the lifting rod.

The provision of the relatively soft non-metallic filler members for the clutch jaws eliminates the objectionable noises caused by the rubbing of one metal upon another. Clutch jaws of the type described permit relatively large friction surfaces to be provided and eliminate all possibility of the outer surface of the lifting rod becoming rough and marred, due to the clamping action of the clutch jaws.

From the foregoing, it will be seen that there is herein provided an apparatus which embodies the features of this invention and achieves the objects thereof. A copyholder is provided which by reason of the inclusion of many improved elements in its structure is thoroughly efficient and dependable in operation and by reason of its durability and smoothness of operation is a valuable office accessory.

As many possible embodiments may be

made of the above invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In a copyholder, the combination with a lifting rod, of a clutch member, removable clutch jaws loosely mounted on said clutch member on opposite sides of the lifting rod, said lifting rod cooperating to maintain said jaws in said clutch, and means for moving said clutch jaws into engagement with said lifting rod.

2. In a copyholder, the combination with a lifting rod, of a lever provided with an aperture through which the rod extends, a removable clutch jaw loosely mounted on said lever and extending through the aperture therein, and means for moving said lever to move said clutch jaw into engagement with the lifting rod, said lifting rod cooperating to maintain said jaw against removal from said lever.

3. In a copyholder, the combination with a support and a lifting rod mounted thereon, of a holding clutch mounted on the support at one side of the lifting rod to normally engage the latter, a brake clutch adapted to engage the lifting rod and having one end engaging the holding clutch and maintained in an inoperative position thereon when said holding clutch is in engagement with said lifting rod and the opposite end adjustably mounted on the support and means for moving the holding clutch out of engagement with said lifting rod and simultaneously moving said brake clutch to an operative position with said lifting rod.

4. In a copyholder, a support, a vertically extending lifting rod guided in said support, a vertically extending clutch rod guided in said support in spaced relation to said lifting rod, and a clutch member extending between said rod members and having a normally horizontally extending end portion supported by said clutch rod and a downwardly extending end portion engaging said lifting rod.

5. A clutch jaw having an outer casing of sheet metal and a filler of relatively soft non-metallic material, said filler and said casing being cut away to form an arcuate groove on one face of said jaw extending from end to end thereof, and the opposite side walls of said casing being cut away to form parallel grooves extending transversely of said arcuate groove.

6. In a copyholder, a support, a lifting rod guided for vertical movement in said support, a clutch rod guided for vertical movement in said support, means for selectively moving said clutch rod upwardly or downwardly, a clutch member on said clutch rod adapted to

engage and lift said lifting rod upon upward movement of said clutch rod, clutch means on said support for automatically engaging said lifting rod upon downward movement of said clutch rod to prevent gravitational retrograde movement of said lifting rod, release means associated with said clutch rod for actuating said clutch member and said clutch means to release said lifting rod for gravitational downward movement, and a brake clutch mounted on the support and adapted to automatically frictionally engage said lifting rod during gravitational downward movement thereof.

7. In a copyholder, a support, a lifting rod guided for vertical movement in said support, a clutch rod guided for vertical movement in said support, means for selectively moving said clutch rod upwardly or downwardly, means connecting said rods upon upward movement of said clutch rod, clutch means on said support adapted to engage said lifting rod to prevent retrograde downward movement thereof, release means associated with said clutch rod for operating said clutch means to release said lifting rod for gravitational downward movement, a braking clutch on said support adapted to slidably engage said lifting rod upon release of said clutch means and adjustment means on said brake clutch to vary the frictional engagement of said brake clutch with said lifting rod.

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