J. F. WILLEY.

JACK.

APPLICATION FILED JUNE 29, 1918.

1,339,613.

Patented May 11, 1920.

4 SHEETS—SHEET 1.

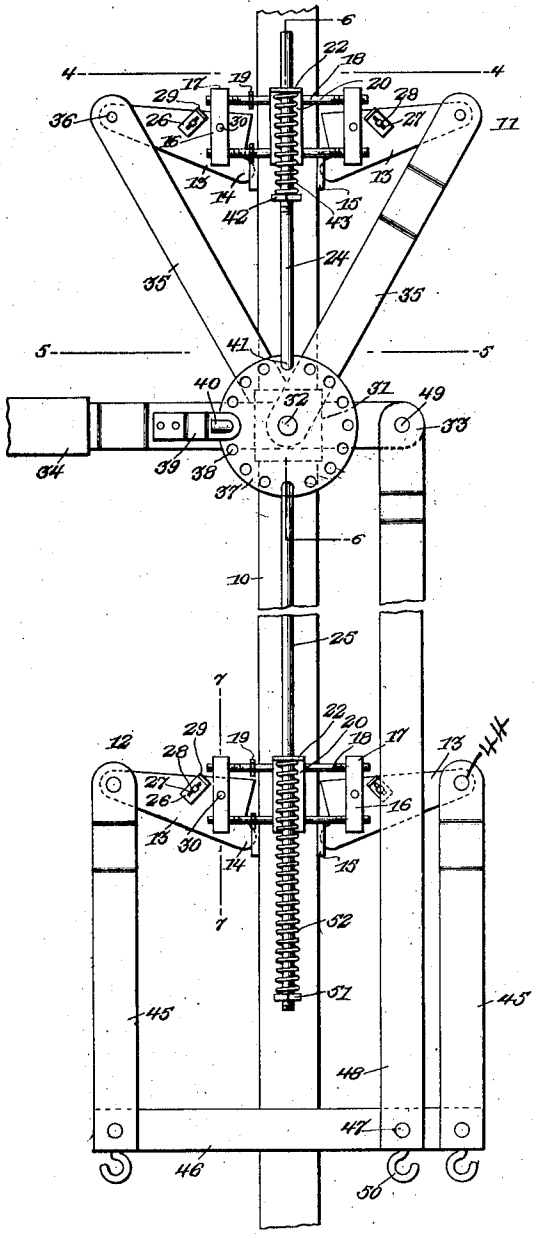


Fig. 1.

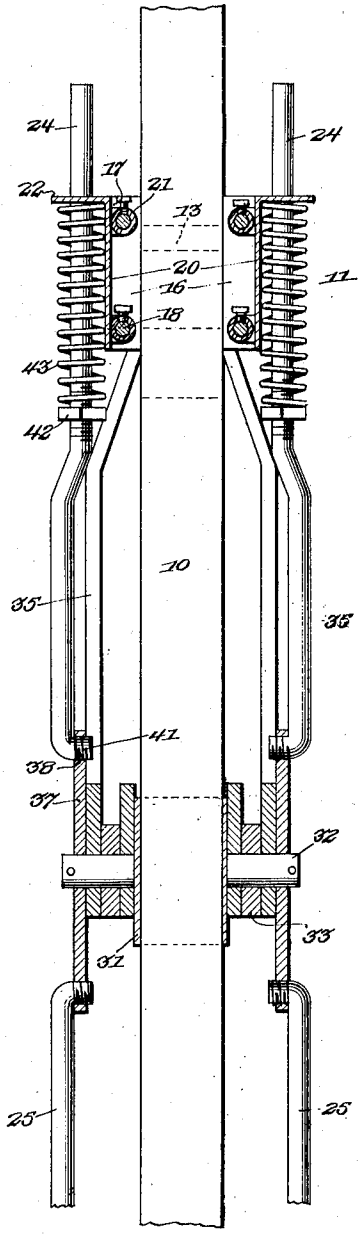


Fig. 6.

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4 SHEETS—SHEET 2.

Fig. 9.

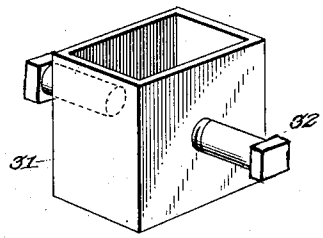


Fig. 10.

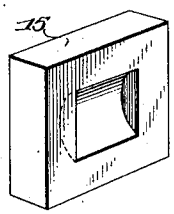
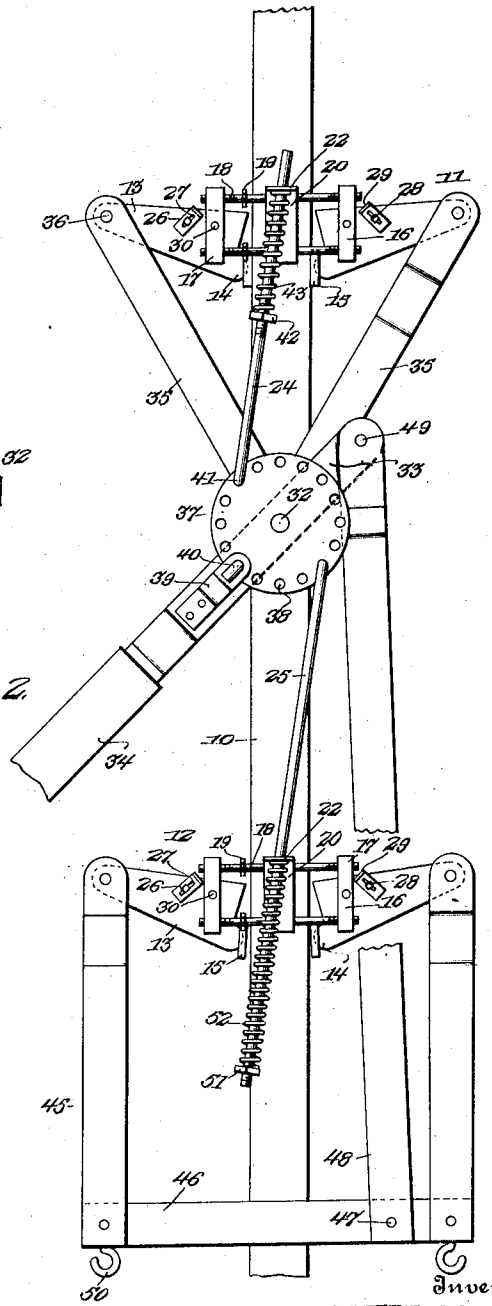


Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 11.

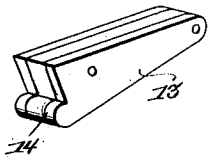


Fig. 3.

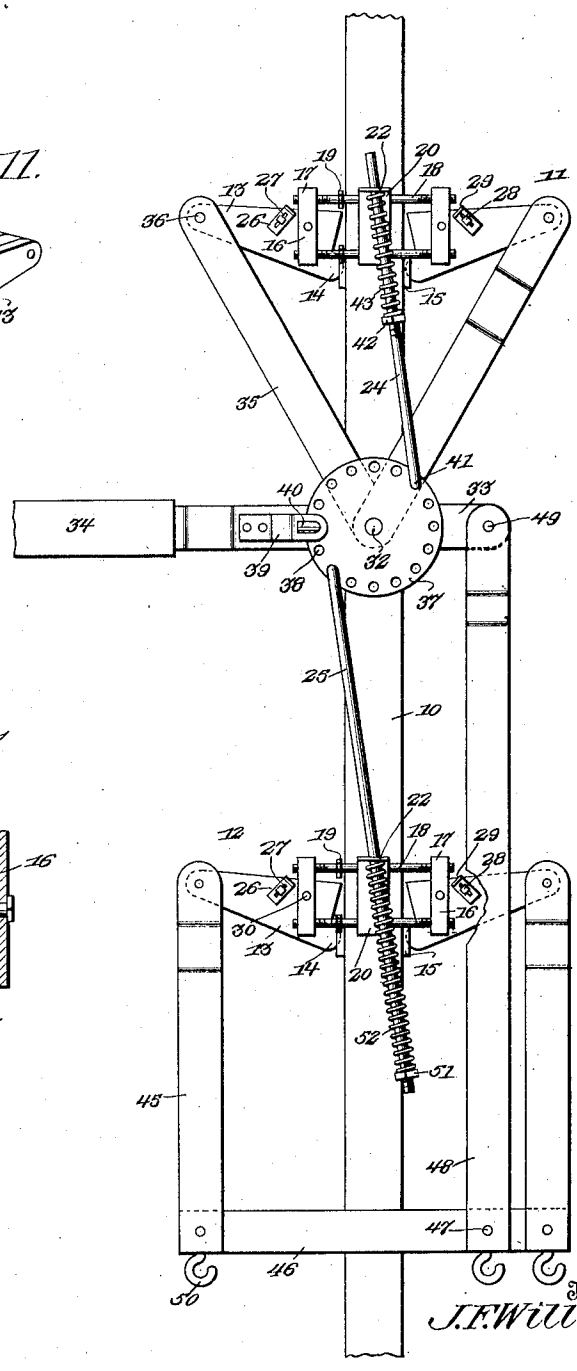
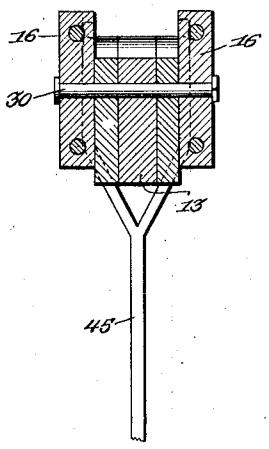


Fig. 7.



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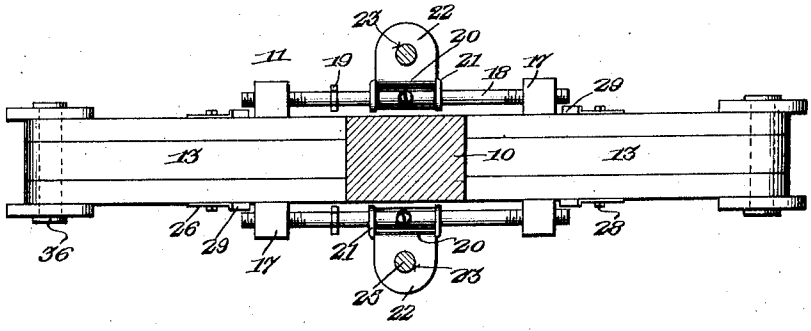
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4 SHEETS—SHEET 4.

Fig. 4.



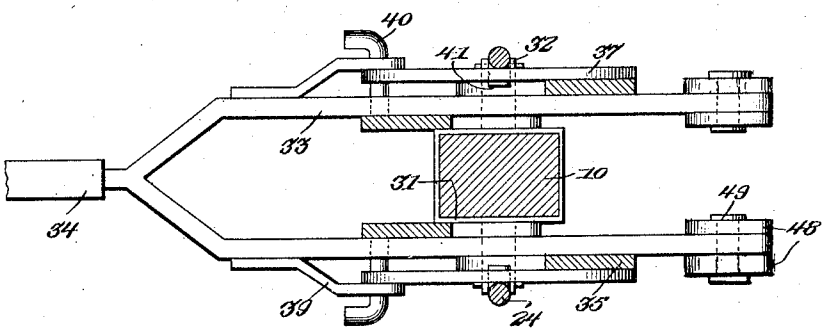


Fig. 5.

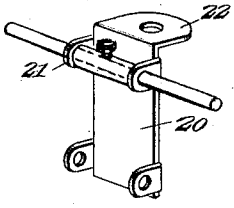


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOSIAH F. WILLEY, OF WICHITA, KANSAS.

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1,339,613. Specification of Letters Patent. Patented May 11, 1920.

Application filed June 29, 1918. Serial No. 242,560.

To all whom it may concern:

Be it known that I, JOSIAH F. WILLEY, a citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented new and useful Improvements in Jacks, of which the following is a specification.

This invention relates to a means for raising or lowering forms, beams, truss-guides, etc., employed in concrete or other building constructions, bridge constructions and the like, and has for its primary object to produce a device for this purpose in the nature of a jack, which shall be simple, strong and efficient, and which will perform its functions with ease and with accuracy.

The invention contemplates the employment of two clutch members, one of which being attached to elements supporting the beams, forms, or the like and both arranged for slidable movement on a suitable standard or other support designed to co-act one with the other to permit of the same being raised or lowered step by step on the support and at all times effectively held on the support.

For a full understanding of the improvement, reference is to be had to the accompanying drawings, forming part of this specification, and in which,

Figure 1 is a side elevation illustrating the application of the improvement.

Fig. 2 is a similar view showing the arrangement of parts when the lower truss member is raised to elevate the form, beam or staging supported thereon.

Fig. 3 is a similar view illustrating the arrangement of parts when the device is to be moved in a downward direction.

Fig. 4 is a sectional view approximately on the line 4—4 of Fig. 1.

Fig. 5 is a sectional view approximately on the line 5—5 of Fig. 1.

Fig. 6 is a sectional view approximately on the line 6—6 of Fig. 1.

Fig. 7 is a sectional view approximately on the line 7—7 of Fig. 1.

Fig. 8 is a perspective view of one of the brackets.

Fig. 9 is a similar view of one of the sleeves.

Fig. 10 is a similar view of one of the shoes.

Fig. 11 is a similar view of one of the dogs.

Referring now to the drawings in detail the numeral 10 designates a beam which is suitably braced to sustain the weight of the improvement and the sliding concrete form or other device or devices connected with the improvement. The beam, in the showing of the drawings, is in the nature of an upright, which is square or rectangular in cross section, but it is to be understood, and it will be obvious as the nature of the improvement progresses that the beam may be of other cross sectional contour.

The improvement primarily includes an upper clutch 11 and a lower clutch 12. Each of these clutches include a pair of oppositely disposed dogs 13 which preferably have their lower edges arranged at an inclination so that each of the said dogs is substantially V-shaped in side elevation. The dogs, upon their inner and wider ends are provided, at their lower corners with transverse enlargements, which are preferably rounded and which form lips 14. On these lips are arranged shoes 15, the same being preferably in the nature of rectangular blocks having their outer faces provided with grooves within which the lips 14 are received, but, if desired, the shoes may be loosely connected to the dogs. The shoes 15 are designed to contact with two of the diametrically opposite faces of the beam 10 and to be held in such contact by means which will presently be described.

Pivotally and approximately centrally connected to the opposite sides of each of the dogs 13, and arranged a comparatively short distance from the active faces of the said dogs are vertically disposed plates 16. Each of the plates has its ends provided with outwardly extending bosses 17 having threaded openings therethrough, and the threads in the bosses on the plates of one of the dogs 13 is arranged at a different pitch from the threads in the boss of the co-acting dog 13. Engaging with the oppositely pitched threads in the bosses of the adjacent plates are the right and left hand threaded ends of bolt members 18, each of the said bolts having a square or rectangular portion 19 providing a wrench hold whereby the bolts 18 may be turned to adjust the contacting relation of the dogs, or rather the contacting engagement of the shoes 15 with the sides or faces of the upright beam 10. Loosely connected with the pairs of bolts 18 for the

dogs of the respective clutches 11 and 12, and arranged upon the non-threaded central portions of the bolts are brackets 20, the said brackets, on their inner faces being provided with lugs or ears 21 receiving the bolts 18. Each of the brackets 20, upon its upper edge is provided with an outstanding flange 22 having a central, and if desired elongated opening 23 therein, and through these openings pass rod members 24 and 25 respectively.

On the opposite sides of the dogs 13, outward of the pivoted plates 16 are arranged gage plates 26, the same being provided with elongated slots 27 through which pass the shanks of headed binding elements 28 whereby the gages may be adjusted on the dogs. One end of each of the gage plates 26 is provided with an offset flange or lip 29 arranged in the path of contact with one of the ends of each of the plates 16 whereby the swinging of the dogs on the pivots 30, which connect the said dogs with the plates 16, is limited, so that the active faces of the dogs, or rather the shoes carried by such active faces can be moved only a predetermined distance away from the sides of the upright 10 with which they normally contact.

Loosely arranged on the upright 10, between the clutch members 11 and 12 is a sleeve 31, the same having on two of its opposite sides outwardly extending short shafts or trunnions 32. These trunnions provide pivots for the arms 33 on the bifurcated end of an operating lever 34. In addition to this the trunnions provide supporting means for the lower ends of angularly disposed links 35, the outer ends of the said links being bifurcated to receive the outer ends of the dogs 13 of the upper clutch member 11, pivots 36 connecting the said bifurcated ends of the links to the said dogs.

Journaled on each of the trunnions 35 is a flat annular member or disk 37, and each of the said disks is provided, adjacent its periphery with spaced apertures 38. The disks 37 are arranged outward of the arms 33 provided by the bifurcated end of the lever 34, and the said arms 33 have secured upon their outer faces substantially U-shaped brackets 39 receiving therein a portion of each of the disks 37. The outer inclined member of each of the brackets 39 is provided with an opening through which is passed a pin 40 and this pin is designed to enter one of the apertures 38 in each of the disks to lock the lever 34 to the said disks.

The rod 24, which is arranged on the bracket connected with the bolt or screw members for the dogs of the upper clutch 11 has its lower end offset as at 41 and these offset ends are arranged in the upper apertures of the disks, or the apertures upon the upper edge of the disk centrally with respect to the upright 10, when the device is arranged for travel in an upward direction, as illustrated in Figs. 1 and 2 of the drawings. On each of the rods 24 is secured a collar or lug 42, and arranged on the said rods 24 and exerting a pressure between the elements 42 and the flanges 22 of the brackets 20 are helical springs 43. These springs serve to normally force the brackets 20 upward of the beam and consequently cause the dogs 13 to be swung upon their pivots 36 so that the active faces or shoes of the dogs are normally retained in frictional engagement with the sides of the upright 10.

To the outer ends of the dogs 13 for the lower clutch member 12 is pivotally secured the bifurcated ends of straps or plates 45, and the lower ends of these straps are pivotally connected to a cross plate 46. To the cross plate, inward of one of the straps 45 is pivotally connected, as at 47 an upwardly extending arm 48, the said arm having its upper end bifurcated and pivotally secured, as at 49 to the outer ends of the arms 33 at the bifurcated end of the lever 34. By reference to the drawings it will be noted that the arms 33 of the lever 34 are approximately centrally journaled on the trunnions 32, so that the same project a suitable distance outward from the disks 37.

The cross or connecting plate 46 for the strap members of the lower clutch 12 may be in the nature of a staging and are provided with means, such as hooks 50 for connecting forms, beams, etc., thereto. The rods 25 passing through the openings in the brackets 20 connected with the bolts or screws associated with the plates that are pivotally secured to the dogs of the lower clutch member 12, have preferably adjustably arranged on their ends members 51 which may be in the nature of nuts that threadedly engage with the said rods. In this connection it should be stated that preferably the elements 42 on the upper rods 24 are likewise in the nature of nuts which threadedly engage with the said rods, so that these elements also may be adjustable. Between the nuts 51 and the flanges 22 on the lower brackets 20, the rods 25 are provided with helical springs 52 which, of course, exert a pressure or tension between the nuts and the brackets.

To facilitate the ease of operation the lever 34 is preferably provided with a socket extension 53, and the operation of the device may be briefly described as follows:

When the device is to travel upward of the upright 10 the upper clutch 11 provides the supporting means. The lever is swung downwardly, as illustrated in Fig. 2 of the drawings. This raises the arm 48 pulling directly upon the cross plate 46 and elevating the lower clutch 12. This also causes the straps 45 to swing the dogs 13 of the

lower clutch out of contacting engagement with the upright 10. The swinging of the lever throws the rods 24 and 25 to opposite angular positions and compresses the springs on the rods 25 so that as soon as the upward pull upon the lower clutch is relieved the springs 52 will expand, swinging the dogs 13 on their pivotal connection with the plates 16 to bring the shoes thereof again in frictional contact with the opposite sides of the upright, thus locking the lower clutch to the upright. When the lever is returned to its initial position the same being pivotally connected to the sleeve 31 will raise the said sleeve, and likewise move the links 35 upwardly. Such movement of the links will swing the dogs 13 of the upper clutch 11 on their pivots 36 to bring the engaging faces or shoes of the said dogs out of contact with the upright 10, permitting the upper clutch to be moved upwardly on the upright. In the meantime the rods 24 are returned to their initial position causing the springs 43 to be compressed between the brackets on the said upper clutch and the element 42 on the said rods, so that the said springs will exert a pressure against the brackets and swing the dogs on their pivots 36 to bring the shoes thereof again in frictional engagement with the beam. It will be obvious that by arranging the pin 40 so that the same will pass through the opening in the brackets 39 and enter an aperture in the disks 37, other than that engaged by the said pin, in the showing of the drawings, the steps in the elevation of the device on the upright may be lengthened or shortened as desired. By arranging the rods on the disks to the position illustrated in Fig. 3 of the drawings it will be seen that the lever may be swung in the same direction as that previously described but that the device will be caused to descend in a step by step movement on the upright 10, as when the structure carried by the device is to be lowered, and from the foregoing description, when taken in connection with the drawings, the simplicity and advantages of the construction will be apparent, it is thought, without further detailed description.

It should be stated, however, that the cross plate 46 may be in the nature of the load to be lifted by the device and therefore need not be a part of the jack construction, the members 45—45 and 48 being bolted or otherwise secured to the said member 46, and the employment of the hooks 50 are, of course, optional.

Having thus described the invention what I claim is:

1. A support, an upper and a lower clutch member thereon, pivoted dogs for said clutches, spring means for normally sustaining said dogs in engagement with the support, a pivoted lever loosely arranged on the support, links pivotally connected to the dogs of the upper clutch and to the pivots of the lever, and means operated by the lever for first bringing the dogs of the lower clutch member out of contact with the support and for sliding said clutch member on the support, and thereafter permitting the spring means associated with the clutch for returning the dogs to support engaging position.

2. In a device for the purpose set forth, an upright comprising a support, an upper and a lower clutch member on said upright each having spring influenced pivoted dogs which frictionally engage with the opposite sides of the upright, a pivoted lever loosely positioned on the upright, links connected with the pivot of the lever and pivotally secured to the dogs of the upper clutch, members pivotally secured to the dogs of the lower clutch, and means comprising connected elements operated by the lever and said members whereby to move said members, when the lever is swung in one direction, to bring the dogs of the lower clutch out of contact with the upright to raise the lower clutch a determined distance on the upright and thereafter permit of the springs influencing the said dogs to return the same to engage with the upright.

3. In a device for the purpose set forth, an upright comprising a support, upper and lower clutch members on the upright each including oppositely disposed pivoted spring influenced dogs normally contacting with the opposite sides of the upright, a pivoted lever loosely positioned on the upright, angularly disposed members on the pivots of the lever and loosely secured to the outer ends of the upper dogs, depending members pivotally secured to the outer ends of the dogs carried by the lower clutch member, a cross member connecting said depending members, and an arm pivotally secured to the lever and to the said cross member, as and for the purpose set forth.

4. In a device for the purpose set forth, an upright beam comprising a support, an upper holding clutch and a lower lifting clutch on said support, supporting means for said clutches, spring influenced dogs associated with both of the clutch members engaging said support, a slidable member between the clutch members, a revoluble member thereon, a lever for operating said revoluble member, oppositely disposed rods adjustably connected with the revoluble member and slidable through the clutch supporting means, adjustable springs on said rods contacting with the clutch supporting means, a staging supported by the lifting clutch, an arm pivotally connected to the staging and to the outer end of the lever, and links pivotally connected to the outer ends of the dogs of the holding clutch

and to the pivot between the revoluble member and the slidable member on the support.

5. In a device for the purpose set forth, an upright beam, an upper and a lower clutch member thereon, pivoted dogs for said clutches designed to contact with the opposite sides of the beam, means for adjusting said dogs toward or away from each other, means for limiting the swinging of the dogs away from the beam, spring means for normally retaining the dogs in engagement with the beam, regulating means for said spring means, a pivoted lever loosely positioned on the beams between the clutches, elements between the pivot of the lever and the dogs of the upper clutch, and between the lever and the lower clutch and actuated by said lever whereby to first bring the dogs of the lower clutch out of engagement with the beam, when the lever is swung in one direction, then to permit of the spring means returning said dogs to beam engaging relation after the lower clutch has been raised on the beam, and upon the returning of the lever to its initial position to slide the lever on the beam and to cause the elements between the pivot of the lever and the dogs of the upper clutch to actuate such dogs to releasing position and thereafter permit of the spring means returning said dogs to beam engaging position.

6. In a device for the purpose set forth, a supporting beam, spaced upper and lower clutches on the beam, each of said clutches comprising oppositely disposed pivoted dogs designed to contact with the opposite faces of the beam, means for adjusting the dogs toward or away from each other, means for limiting the swinging of the dogs outward of the beam, rods having springs thereon associated with each of the clutches and said springs designed to normally retain said dogs in beam engaging position, a sleeve on the beam between the clutches, trunnions on the sleeve, a lever having a bifurcated end journaled in the trunnions, links journaled on the trunnions and pivotally connected with the dogs of the upper clutch, disks journaled on the trunnions, means for adjustably locking the disks to the lever, means for adjustably connecting the rods to the disks, pivoted members depending from the dogs of the lower clutch, a connecting element therefor, and an arm secured to the said connecting member and pivotally secured to the outer end of the lever, all as and for the purpose set forth.

7. In a device for the purpose set forth, a beam, an upper and a lower clutch member on said beam, each of said clutches including oppositely disposed dogs, shoes on the engaging faces of the dogs, plates pivotally secured to the dogs, adjustable elements connecting the plates, a slidable gage on each of the dogs and having an offset portion in the path of contact with the ends of the plates, brackets secured to the adjustable elements, rods slidable through said brackets, an adjustable member on each of the rods, a spring on each of the rods between said adjustable member and said brackets, said rods having their confronting ends offset, a sleeve on the beam between the rods having oppositely extending trunnions, a lever having a bifurcated end journaled on said trunnions, links having one of their ends journaled on said trunnions and their opposite ends pivotally secured to the dogs of the upper clutch, disks having concentric apertures journaled on said trunnions and the offset ends of the rods designed to be received in certain of the apertures, a pin member carried by the lever and adapted to engage in other of the apertures to lock the lever to the disks, depending members pivoted to the dogs of the lower clutch, and a connecting element for said members, an arm pivotally secured to said element and pivotally connected with the outer end of the lever, all as and for the purpose set forth.

In testimony whereof I affix my signature.

JOSIAH F. WILLEY.