July 27, 1926. 1,593,841

C. A. MONEY

FORM LIFTER

Filed August 20, 1923 2 Sheets-Sheet 1

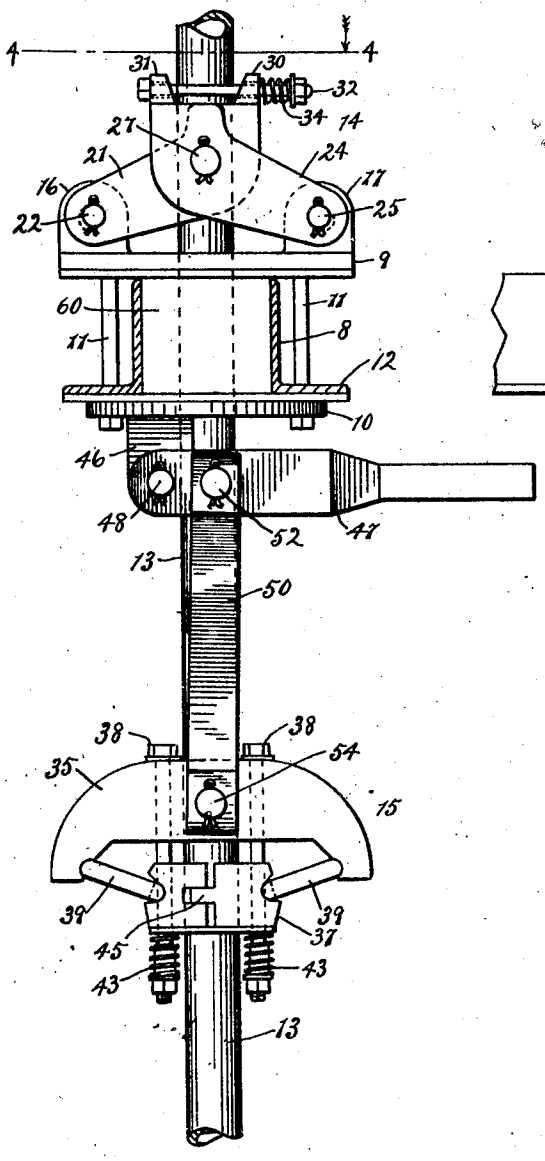


Fig. 1.

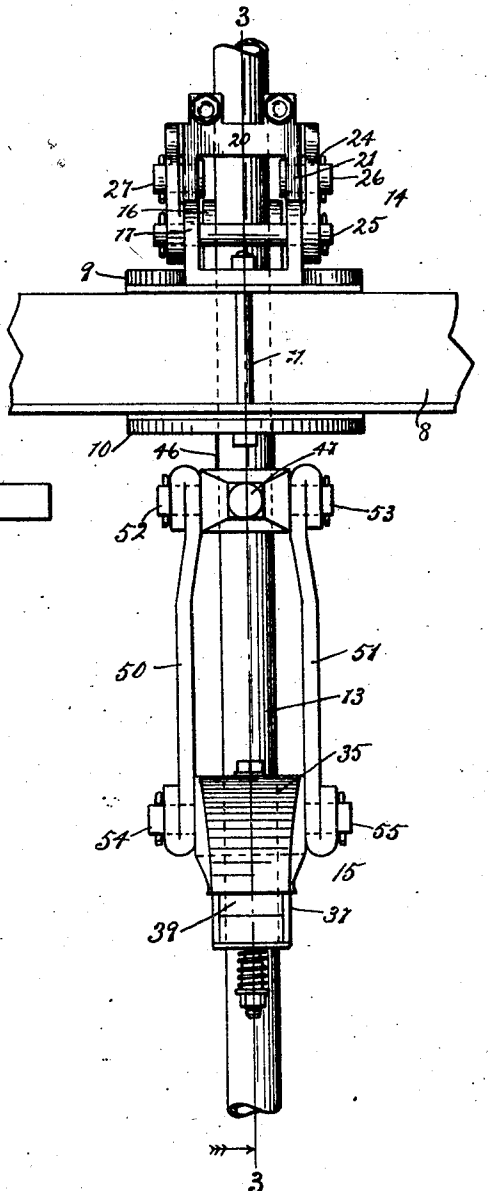


Fig. 2.

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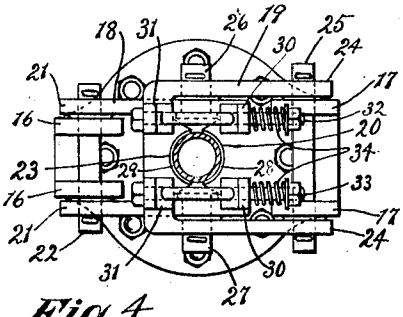


Fig. 4.

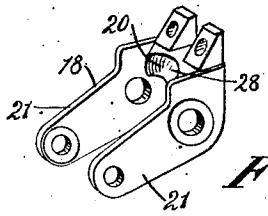


Fig. 5.

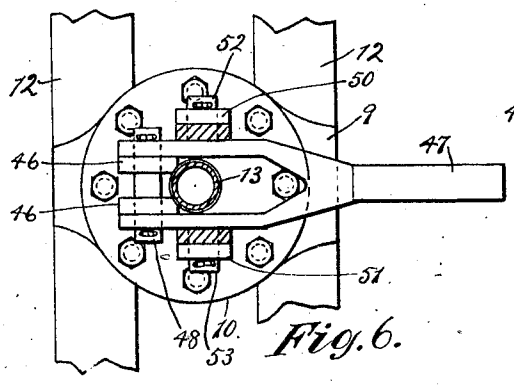


Fig. 6.

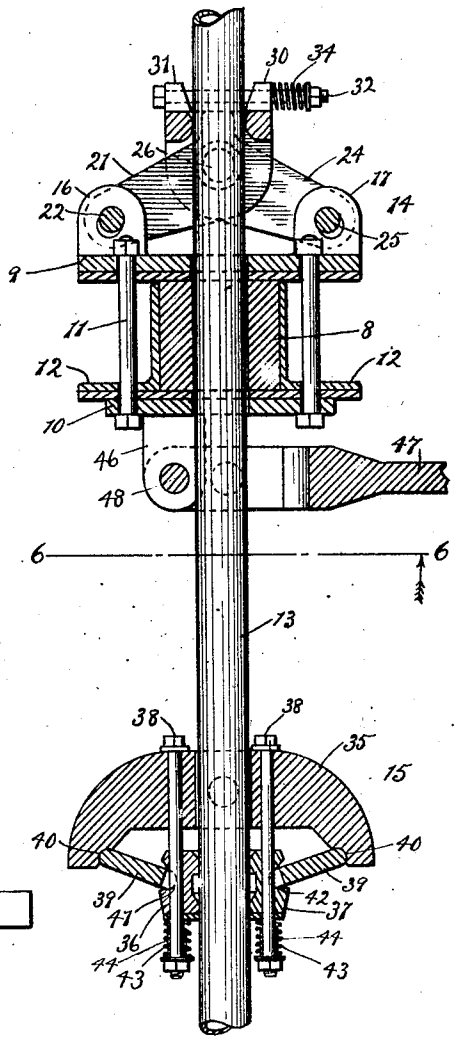


Fig. 3.

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UNITED STATES PATENT OFFICE.

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FORM LIFTER.

Application filed August 20, 1923. Serial No. 658,343.

This invention relates to form lifters and has for its objects the provision of new and improved means for lifting and supporting concrete forms, used in building construction, that is efficient and reliable in operation, simple in construction, cheap to manufacture, that may be readily assembled, is adapted to withstand rough usage, is composed of few moving parts and that is not likely to become broken or get out of order.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawings, in which—

Fig. 1 is a side elevation of the device shown in operative position, with parts in section and parts broken away;

Fig. 2 is an elevational view at right angles to that shown in Fig. 1;

Fig. 3 is a vertical section on line 3—3 of Fig. 2;

Fig. 4 is a plan view on the line 4—4 of Fig. 1;

Fig. 5 is a perspective view of one of the upper clamping jaws; and

Fig. 6 is a section on line 6—6 of Fig. 3.

It is understood that a plurality of the form elevating devices are employed in connection with each form, but since they are identical in construction only one of the devices need be shown and described.

On the drawings, the reference character 8 designates a concrete form to which the upper and lower supporting plates 9 and 10 are adapted to be secured as by means of the bolts 11 which are adapted to extend through the plates and through the form. Some of the bolts may extend through the plates and spacer block 60 while others may extend through the horizontal flanges of the angle bars 12 constituting the principal portion of the cross head of the form.

Since the specific features of the form constitute no part of the present invention, only so much of the same is shown and described as is necessary to disclose the application thereto of the present invention.

The plates 9 and 10 and the form are provided with alined apertures through which the form supporting tube 13 is adapted to extend as is usual in such construction.

Suitable means are associated with the plates 9 and 10 for raising the form and for automatically clamping the tube 13 for holding the form in adjusted position. Suitable clamps with appropriate lever mechanism are employed for this purpose.

Since the form must be held in adjusted position by clamps that engage the tube 13, it is necessary that these clamps be powerful in operation. Accordingly the upper one which is adapted to support the form in its adjusted elevated position is constructed on the principle of the first class lever in the manner which will now be described.

Clamps 14 and 15 are associated with the plates 9 and 10 respectively. The upper plate, or plate 9 above the form is provided with upwardly extending lugs or ears 16 which are arranged in spaced relation at one side of the plate. A similar set of lugs 17 are arranged on the plate 9 opposite the lugs 16. The lugs 17 are spaced farther apart than the lugs 16 in order to accommodate the arms of the clamp 14 as will presently appear.

The member 18 comprises a jaw 20 to which a pair of parallel arms 21 are connected. The arms 21 are preferably though not necessarily rigidly secured to the jaws as by being integrally connected therewith. These arms extend downwardly and laterally at an angle to said jaw and are pivotally secured to the lugs 16 as by means of the pin 22 which engages in slots in said lugs, as shown in Fig. 5.

The member 19 is provided with a jaw 23 and arms 24 similar to those of the member 18. The arms 24 are spaced sufficiently far apart to embrace and extend on the outer sides of the arms 21 of the member 18. The lower ends of the arms 24 are pivotally secured to the lugs 17 as by means of the pivot pin 25 which engages in slots in said lugs, as shown in Fig. 5. The arms of the member 18 are pivoted to the corresponding arms of the member 19 at the crossing point as by means of the pivot pins 26 and 27.

The jaws 20 and 23 are provided on their inner surfaces with curved seats 28 and 29 for engaging the tube or rod 13.

Suitable means are provided for yieldingly pressing the jaws toward each other in order that they may remain in frictional contact with the tube 13 even during the raising of the clamp 14 whereby the jaws will be in clamping position at all times and will clamp the tube 13 the instant the weight of the form comes on them. In the embodiment illustrated, the jaws 20 and 23 are

provided with extensions 30 and 31 at each side of the tube 13, which are provided with alined apertures through which the bolts 32 and 33 are adapted to extend. Springs 34 are placed on the extended ends of the bolts 32 and 33 between the extensions 31 and nuts on the ends of the bolts. The tension of the springs is adjusted by means of said nuts. The tension of the springs 34 is such that the clamp 14 may be readily moved upwardly along the tube 13.

The lower clamp member 15 comprises an arch-shaped fulcrum block 35 to which the clamping jaws 36 and 37 are adapted to be secured as by means of the two bolts 38 which extend downwardly through the block 35 and the jaws 36 and 37, one through each jaw. Toggle members 39 having their upper ends loosely engaging in recesses 40 in the down-turned ends of the block 35 are adapted to have their lower ends engaging in recesses 41 and 42 in the jaws 36 and 37 respectively. These members converge downwardly, whereby, when the clamp member 15 moves downwardly these toggle members will cause the jaws 36 and 37 to clamp the rod or tube 13. The toggle members 39 are each provided with a recess on its lower edge to accommodate the bolt 38.

Springs 43 on the lower ends of the bolts 38 are adapted to engage beneath the jaws and hold the same in frictional engagement against the rod or tube 13. The springs 43 not only hold the parts in assembled relation, but also hold the jaws against the rod 13 whereby when the clamp is elevated the jaws will be in position to grip the rod at any moment weight is brought to bear upon the said clamp. Sleeves 44 may, if desired, be employed on the lower ends of the rods 38 for the purpose of limiting the downward movement of the jaws 36 and 37. The jaws 36 and 37 are provided with curved recesses on their inner sides for engaging the rod or tube 13 as is usual in such constructions. These jaws may also be provided with a loose interlocking connection as at 45 whereby the jaws are permitted to approach and recede from each other but are caused to move together along the tube 13.

Suitable means are provided for moving the clamp members toward and from each other for the purpose of elevating the form. Any suitable means may be employed for this purpose. As shown on the drawings, the plate 10 is provided with a downwardly extending lug 46, at each side of the aperture for the tube 13. A lever 47 is adapted to have its bifurcated end secured to the lugs 46 at each side of the tube 13 as by means of the pivot bolt 48. Links 50 and 51 have their upper ends pivoted to trunnions 52 and 53 secured to an intermediate portion of said lever. The lower ends of the links 50 and 51 are secured to pivots or trunnions 54 and 55 rigidly secured to the sides of the block 35.

In the operation of the device, when it is desired to elevate the form, the outer end of the lever 47 is moved upwardly which will elevate the clamping member 15. The outer end of the lever 47 is then moved downwardly and the downward movement of said lever will tend to move the clamp 15 downwardly, which in turn will, through the action of the toggle members 39, cause the jaws to grip the tube 13. A further movement downwardly of the outer end of the lever 47 will then elevate the clamp member 14. The initial upward movement of said member will cause the walls of the slots in the ears 16 and 17 to cam or move the ends of the arms 21 and 24 slightly outwardly, thereby releasing the clamp 14 which is then elevated, together with the form attached thereto. When pressure is relieved on the lever the jaws 20 and 23 will clamp the tube 13 and hold the form in adjusted position.

I claim as my invention:—

1. In combination, a concrete form, supports above and below said form, means for securing said supports to said form, a supporting member extending through said supports, jaws pivoted to one of said supports and adapted to engage said member, means for pivotally connecting said jaws together, means for moving said jaws toward said supports, a lever pivoted to said other support, a link pivoted to said lever, and clamping means connected to said link and adapted to engage said member.

2. In a device of the class described, a supporting plate, clamping members pivotally secured to said plate and to each other, and resilient means for normally holding said members in clamping position.

3. In a device of the class described, a plate, a clamping member mounted on said plate, said member comprising a pair of jaw members each having a pair of arms, means for pivoting the arms of one jaw to those of the other and means for pivoting the ends of the arms to said plate.

4. In a device of the class described, a plate adapted to be attached to a concrete form, a pair of clamping jaws, a pair of arms connected to each jaw, means for pivotally connecting the arms of one jaw to those of the other, means for pivotally connecting said arms to said plate, and resilient means for urging said jaws toward each other.

5. In a concrete form lifter, a plate, a pair of jaws, means for pivotally connecting said jaws to said plate, and means engaging the free ends of said jaws and extending transversely thereof for forcing the same toward each other.

6. In combination, an upper clamp including jaws and means acting on the principle

of a first class lever for operating said jaws, a lower clamp including jaws and toggle acting means for operating said jaws, means for connecting one of said clamps to a concrete form and means for moving said clamps toward and from each other.

7. In combination, an upper clamp member including jaws and means including levers of the first class for operating said jaws, a lower clamp member, means for securing one of said members to a concrete form and lever means for moving said members toward and from each other.

8. In a device of the class described, a base member, arms pivotally secured to said member, means for pivotally securing said arms together, clamping jaws connected to said arms and resilient means for forcing said jaws toward each other.

CLARENCE A. MONEY.