S. E. COWLES.

LIFTING DEVICE.

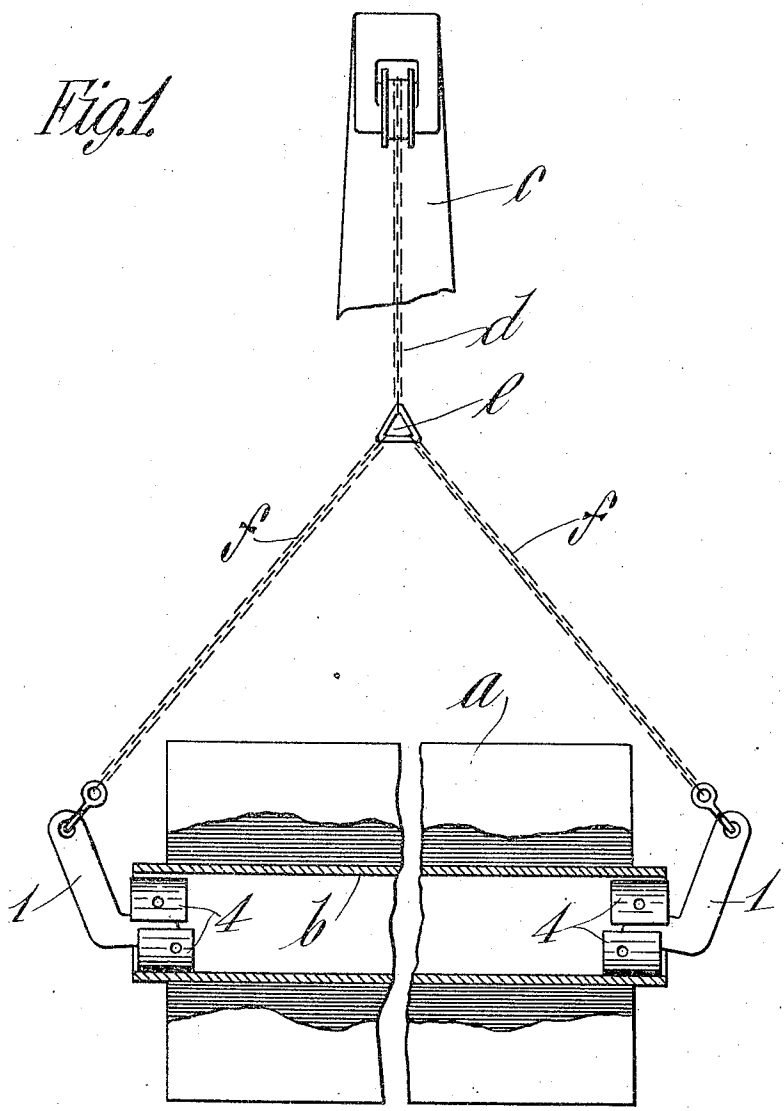
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1,203,586.

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2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 2.

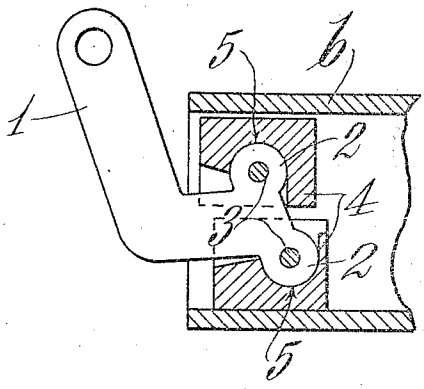


Fig. 3.

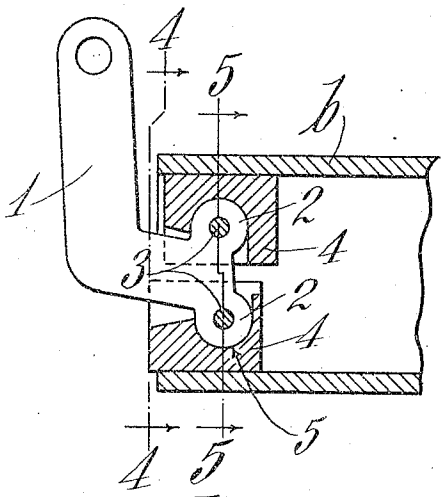


Fig. 4.

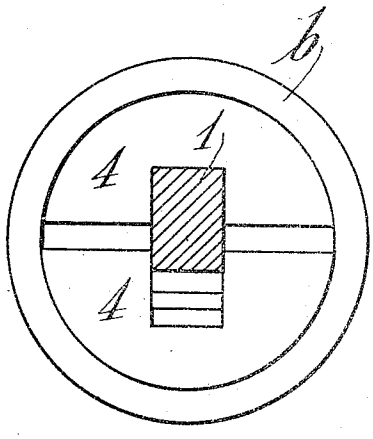
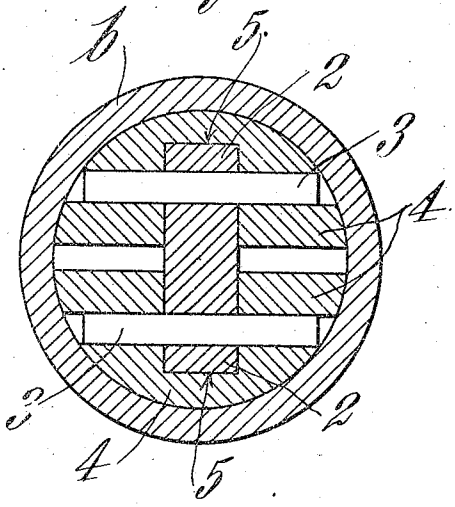


Fig. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL E. COWLES, OF WORONOCO, MASSACHUSETTS.

LIFTING DEVICE.

1,203,586. Specification of Letters Patent. Patented Nov. 7, 1916.

Application filed September 11, 1915. Serial No. 50,159.

To all whom it may concern:

Be it known that I, SAMUEL E. COWLES, a citizen of the United States of America, and residing at Woronoco, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Lifting Devices, of which the following is a specification.

This invention relates to a device for lifting rolls of paper or other heavy units and particularly to the means for binding the lifting mechanism to the load.

The invention is characterized by a pair of expansible and contractible jaws both of which are pivoted on a connecting lever and independently operable by the movement of the latter to be expanded and contracted to and from holding position for the load.

The objects of the invention will appear more particularly in the following detailed description of one preferred form and the annexed claims which point out the scope of the invention.

The preferred embodiment of the invention is shown in a mechanism for lifting rolls of paper by engagement with the core on which the paper is wound.

In the drawings—Figure 1 is an elevational view, partly in section, showing the application of the invention in lifting a roll of paper; Fig. 2 is a sectional elevation of the core lifter shown in contracted position in a tubular core; Fig. 3 is a view similar to Fig. 2 but showing the core lifter in expanded position; Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 3 and looking in the direction of the arrows; and Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig 3 and looking in the direction of the arrows.

Referring to the drawings and particularly to Fig. 1: *a* represents a roll of paper wound upon a tubular core *b* which latter is arranged to be connected by the core lifters to hoisting devices. The latter are shown in conventional form only and comprise a suitable crane *c* which is provided with suitable lifting devices not shown. A hoisting chain *d* for the crane has secured thereto at the point *e* a pair of short chains *f* which are provided with hooks at their lower ends to engage the core lifters as indicated in Fig. 1. The core lifter itself is best shown in Figs. 2 to 5 to which particular reference is made. A lever arm 1, formed with an eye at its upper end to receive one of the chains *f* is bent at its lower end, as shown in Figs. 2 and 3, and provided with opposed segmental projections 2. Pivoted to the latter at 3 are semi-cylindrical plugs or jaws 4 which, as best shown in Figs. 4 and 5, are spaced from one another and are substantially of the same radius as the core *b*. The segmental portions 2 have finished arc-shaped surfaces 5, which bear in correspondingly finished recesses in the plugs 4, as clearly shown in Figs. 2 and 3, whereby all strain is removed from the pivot pins 3. These plugs 4 are also cut away, as shown in Figs. 2 and 3, to permit a certain extent of movement of the arm 1 relatively to the plugs 4.

In operation, when a core lifter is to be inserted in the end of the core *b*, the arm 1 is moved to shift the blocks relatively to one another and bring them into the position shown in Fig. 2. When so positioned, the blocks are at a minimum distance from one another and will slip freely into the end of the tubular core *b*. Now, when the chains *f* attached to the arms 1 are tightened, the latter are moved inwardly toward one another, which expands the plugs 4 to grip the core *b*. With one block 4 as a center, the other block is moved in an arc and forced away from the first block toggle fashion against the core *b*. Thus, it will be evident that the greater the pull on the arms 1, the harder are the plugs or jaws 4 forced against the core. After the roll *a* has been lifted and the chains *f* loosened, the arms 1 may be knocked outwardly from one another whereby the plugs may be contracted and withdrawn from the core.

One of the more important advantages of the invention is the small amount of space necessary for safely gripping the load. In each device, the jaws 4 are so pivoted tha the line joining the pivots 3 is never quite perpendicular to the axis of the core (see Fig. 3). Thus, the heavier the weight on the core the greater is the binding force of jaws 4 in the lifting operation. Thus, the invention provides a simple and efficient lifter which is quickly and conveniently applicable in crowded spaces to attach hoisting mechanism to a tubular core or like openings.

It is recognized that various modifications may be made in the single embodiment of

the invention described without departing from the scope of the invention which is pointed out in the annexed claims.

What I claim is—

1. A core lifter for hollow cores, comprising, in combination, two oppositely arranged segmental plugs, and a link connecting the plugs and movable with respect thereto, said link having a part extending without the core for lifting purposes, said plugs arranged to freely fit within a core and to be directly spread apart by movement of said link and forced against the walls of the core with a toggle action.

2. A core lifter for hollow cores, comprising, in combination, two oppositely arranged segmental plugs, and a link pivotally connecting the latter having an arm extending without the core for lifting purposes, said link arranged normally in inclined relation to the axes of said plugs, whereby the latter are drawn together to permit free insertion in the end of a core, said arm arranged when moved to force said link toward normal relation with the axes of said plugs, whereby the latter are expanded against the interior walls of said core to grip the same with a toggle force.

3. A core lifter for hollow cores, comprising, in combination, split plug elements arranged to freely fit within the core, a link normally tilted with respect to said elements, and pivot pins connecting said link and elements, said link having a part extending without the core for lifting purposes, said link arranged when said part is lifted to move toward a normal position with relation to said plug elements and to separate and expand them against the walls of the core, said link formed with arc-shaped bearing surfaces arranged to fit in corresponding surfaces formed in the plugs, whereby strain on the latter is transferred directly to the link without the intermediary of the pivot pins.

4. A tackle mechanism for lifting heavy loads, comprising, a pair of expansible plug elements arranged to freely enter axially alined openings in opposite ends of a load, levers associated with said plug elements and constructed to expand the latter against the interior surfaces of said openings to grip the load with a distributed pressure, and means to connect said levers, said means arranged to be lifted at a point intermediate said levers to simultaneously actuate the latter and equally grip each end of the load.

5. A lifting device, comprising, two oppositely arranged segmental plugs each having an arc-shaped interior recess, an operating lever provided at one end with a spacing and connecting portion for said plugs and movable with respect thereto, the ends of said spacing portion being provided with corresponding bearing surfaces for the walls of the arc-shaped recesses, all constructed and arranged so that the lever may move to space the plugs as desired and the force transmitted from the lever to the plugs may bind the latter against the interior surfaces of a load to be lifted.

6. A lifting device, comprising, a bent lever having one arm adapted to be inserted in an opening in the load to be lifted and another arm adapted to extend outside the load for lifting purposes, and jaws separately pivoted to said first named arm and arranged to be separated from one another by a direct lever action to grip the interior walls of said opening with a toggle action when the last-named arm is lifted.

SAMUEL E. COWLES.