Oct. 8, 1957 S. C. NELSON 2,809,070

GRAPPLES

Filed Feb. 28, 1955 2 Sheets-Sheet 1

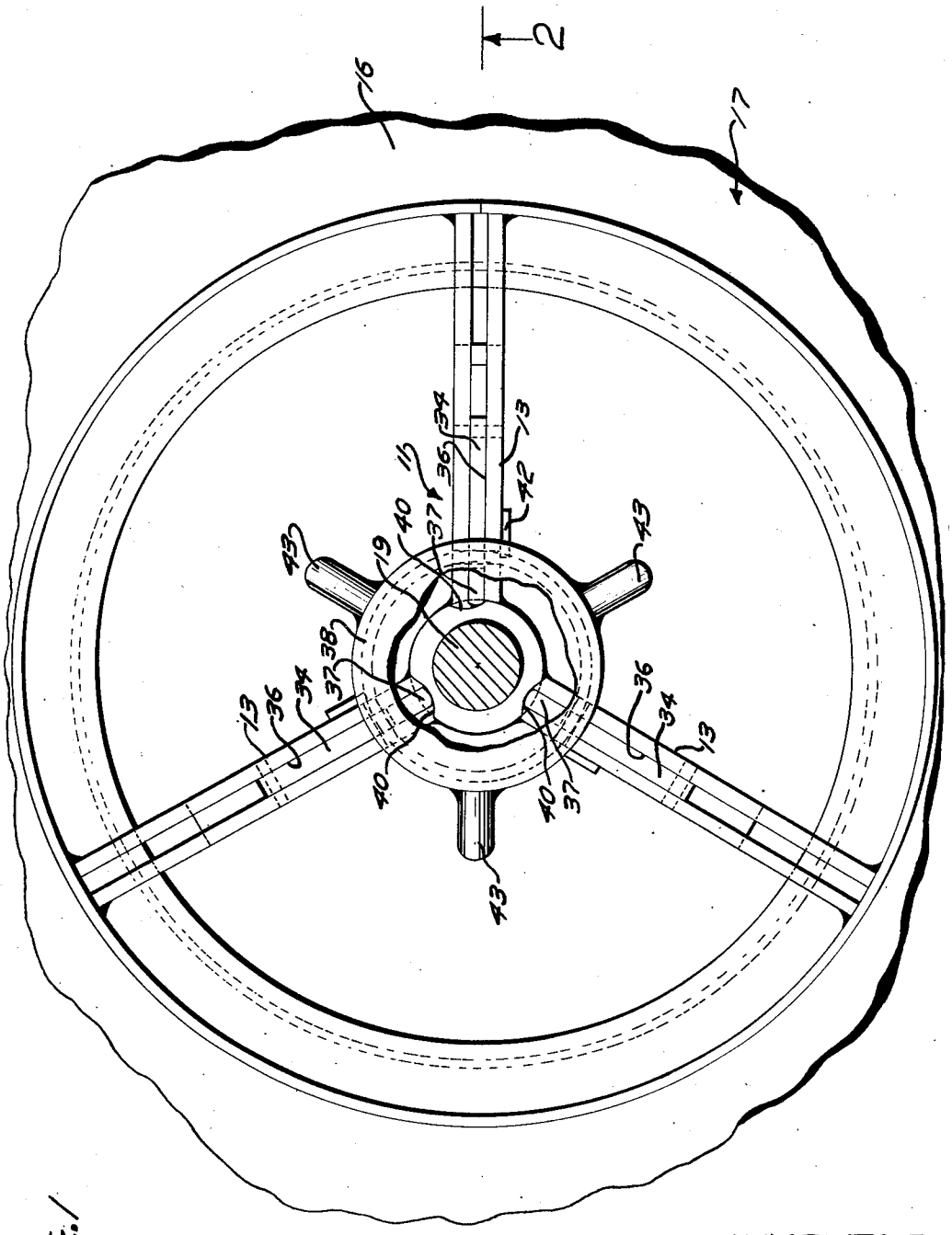


FIG. 1

INVENTOR
S.C. NELSON
BY C.B. Hamilton
ATTORNEY

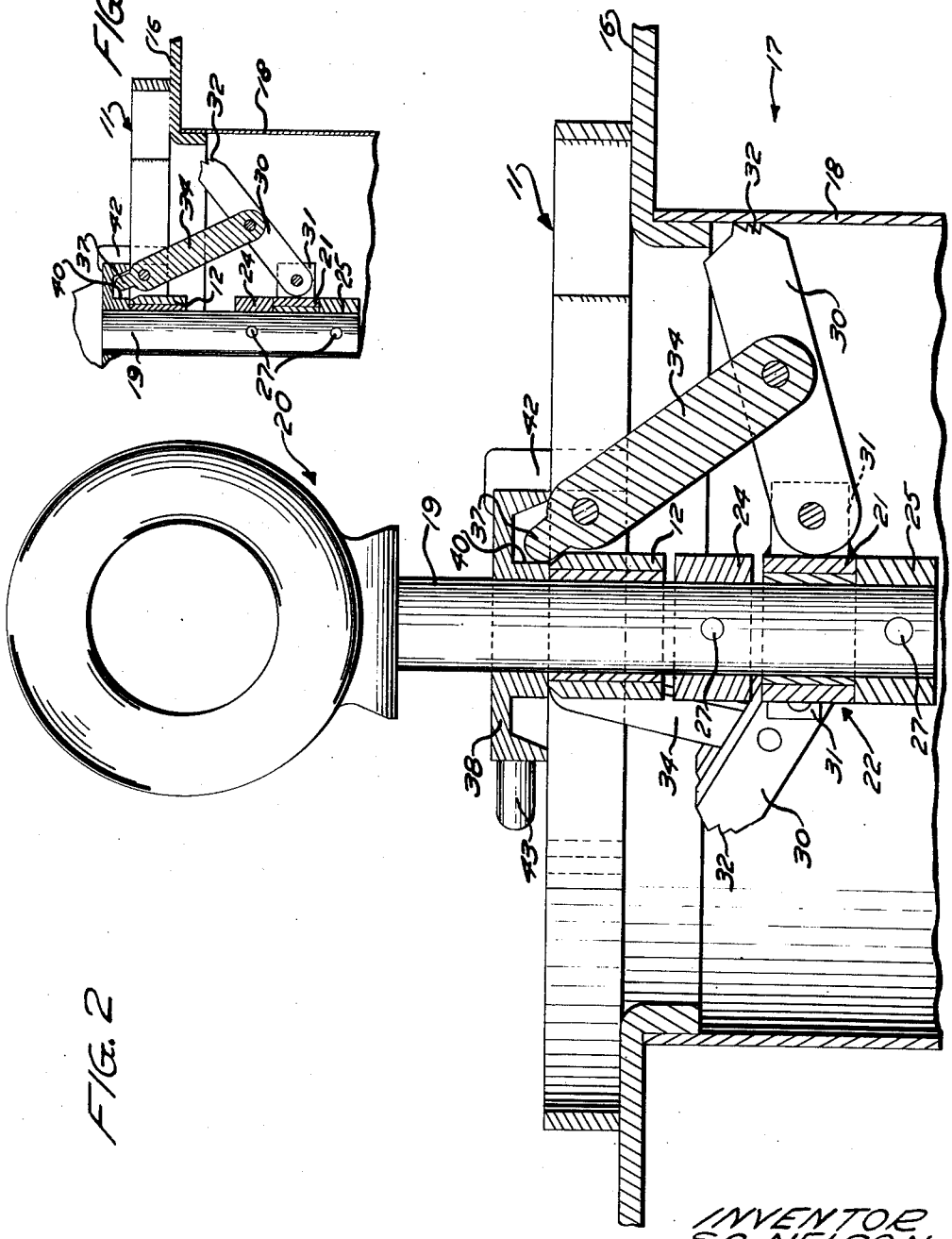
Oct. 8, 1957 S. C. NELSON 2,809,070

GRAPPLES

Filed Feb. 28, 1955 2 Sheets-Sheet 2

FIG. 3

FIG. 2



INVENTOR
S.C. NELSON
BY C.B. Hamilton
ATTORNEY

United States Patent Office 2,809,070 Patented Oct. 8, 1957

2,809,070

GRAPPLES

Stanley C. Nelson, Oak Park, Ill., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application February 28, 1955, Serial No. 491,042

6 Claims. (Cl. 294—97)

This invention relates to grapples and more particularly to an apparatus for grasping the walls of axial holes in heavy spools to lift them.

An object of this invention is to provide an improved device for engaging the walls of apertures in articles to lift the articles.

Another object of this invention is to provide an improved device having retractable members which grasp spools to lift them and which are locked in retracted position.

One embodiment of the present invention for lifting apertured articles may include a plurality of spaced toggle linkages pivoted to a spider ring slidable on an eye bolt and a collar loosely secured near the end of the eye bolt and pivoted to the toggle linkages, whereby when the eye bolt is raised, the ends of the levers are pivoted outward to grip the walls of a recess into which the device has been inserted, and a cam for engaging the linkages to lock the levers in a retracted position.

Other objects and advantages of the invention will become apparent by reference to the following detailed description thereof and the accompanying drawings illustrating a preferred embodiment of the invention, in which—

Fig. 1 is a plan view of the grapple device positioned on a spool;

Fig. 2 is a partial sectional view taken along line 2—2 of Fig. 1 showing the levers engaging the inside walls of the axial hole in the spool; and

Fig. 3 is a partial vertical sectional view showing the toggle linkages in the retracted position.

Referring now in detail to the drawings, there is shown a supporting spider ring 11 having a central sleeve 12 and slotted arms 13 which in lifting position are supported by a head 16 of a spool 17 which is to be lifted and may be wound with a quantity of wire or cable (not shown).

A shaft portion 19 of an unthreaded eye bolt 20 extends downward through the central sleeve 12 of the supporting spider ring 11 and passes through a collar 21 within a drum 18 of the spool 17 to be lifted. The collar 21 is loosely held between rings 24 and 25 which are secured to the shaft 19 by pins 27. A plurality of levers 30 are pivoted to a plurality of lugs 31 on the collar 21, each lever 30 having a serrated end 32 for gripping the drum 18 of the spool 17.

A plurality of links 34 passing through slots 36 in the arms 13 are pivotally secured at their lower ends to the levers 30 and at the upper ends to the arms 13, whereby upward movement of the eye bolt 20 and the collar 21 moves the serrated ends 32 of the levers 30 outward to engage the drum 18 and downward movement of the eye bolt 20 retracts the levers 30 (Fig. 3).

The upper ends 37 of the links 34 extend into a cam 38 rotatable on the eye bolt 20 and having camming recesses 40. When the recesses 40 of the cam are in alignment with the upper ends 37 of the links 34 the

levers 30 can be pivoted outward to the gripping position by raising the eye bolt 20, the upper ends 37 of the links 34 moving into the recesses 40. When the eye bolt 20 is lowered the levers 30 are retracted and, when the recesses 40 in the cam 38 are not in alignment with the upper ends 37 of the links 34, they are locked in the retracted position because the cam 38 prevents inward movement of the upper ends 37 of the links 34. An inverted L-shaped retaining member 42 is secured to one of the arms 13 to maintain the cam 38 in engagement with the sleeve 12 of the supporting spider ring 11. The cam 38 has a plurality of radial pins 43 for manually rotating the cam about the eye bolt 20.

In operation the device is placed on a spool 17 to be lifted with the eye bolt 20 in its lowermost position in the spider ring 11, the levers 30 thus being retracted (Fig. 3). The cam is then rotated until the recesses 40 are in alignment with the upper ends 37 of the links 34, this action unlocking the links whereby the levers 30 can be pivoted outward to grip the drum 18. The eye bolt 20 is then moved upward through the supporting spider ring 11 to pivot the levers 30 outward to bring the serrated ends 32 of the levers 30 firmly into gripping action with the drum 18. Further movement of the eye bolt 20 upward will lift the spool 17 for movement to a desired location.

When the spool 17 is positioned in a desired location the eye bolt 20 is moved downward to retract the levers 30 from the gripping position. The cam 38 is then rotated until the recesses 40 are not in alignment with the upper ends 37 of the links 34, thus locking the levers 30 in the retracted position whereby the operator can lift the device from the spool 17.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of this invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A device for lifting apertured articles, comprising a plurality of levers for engaging the walls of the aperture to lift the article, a member positioned above the aperture in the article for supporting the levers, a shaft extending downward through an opening in the supporting member into the aperture in the article, means on the shaft and secured to the levers for actuating the levers into operative position when the shaft is raised through the supporting member, a plurality of links pivotally secured to the levers and the supporting member to pivot the levers outward to grip the walls of the aperture in the article when the shaft is raised, and a cam on the shaft for engaging the links to lock the levers in a retracted position.

2. A device for lifting spools having central apertures, comprising a spider ring supported on the spool above the central aperture therein, a shaft extending downward through the spider ring into the central aperture of the spool, a spider mounted on the lower end of the shaft, a plurality of levers pivoted at one end to the spider, a plurality of links pivoted to the spider ring and to the levers whereby the levers are pivoted outward to engage and grip the wall of the aperture in the spool when the shaft is raised to move the spider upward toward the spider ring, and an annular member mounted on the shaft above the spider ring and having cam surfaces for engaging the links to lock the levers in a retracted position.

3. In a device for lifting articles having apertures, support means, an element mounted on the support means, means secured to the element for engaging the

walls of the aperture in the article to be lifted when the element is raised, said engaging means being moved to an inoperative position when the element is lowered, means on the element for locking the said engaging means in inoperative position for insertion into the aperture in the article, and means carried by the support means for actuating the locking means to release the engaging means in the aperture, said engaging means being urged by the weight of the article into tighter engagement with the walls of said aperture when the article is lifted.

4. A device for lifting apertured articles, comprising support means, a plurality of levers on the support means for engaging and gripping the walls of the aperture to lift the article, linkage means on the support means for supporting the levers, an element on the support means for moving the levers into engagement with the walls of the aperture in the article when said element is raised, and means on the element for locking the levers in a retracted position.

5. A device for lifting apertured articles, comprising support means, a plurality of levers on the support means for engaging the walls of the aperture to lift the article, a plurality of links depending from the support means and secured to the levers, a shaft mounted on the support means, means on the shaft secured to the levers for actuating them into inoperative position when the shaft is raised, and means on the shaft for engaging the links to lock the levers in a retracted position.

6. A device for lifting spools, comprising a plurality of levers for engaging the walls of an axial opening in the spool to lift said spool, a spider ring positioned over the axial opening for supporting the levers, a shaft on an eye bolt extending downward through the spider ring and into the opening in the spool, a collar loosely held on the lower end of the shaft, a plurality of lugs secured to the collar and pivoted to the levers, a plurality of links pivoted to the levers and to the spider ring for moving the levers outward to engage the walls of the opening in the spool when the shaft is raised through the spider ring, and a cam on the shaft of the eye bolt for engaging the links to lock the levers in a retracted position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,317,500	Holmquist	Sept. 30, 1919
1,443,853	Stephens	Jan. 30, 1923
1,477,687	Brown	Dec. 18, 1923
1,529,553	Sebring	Mar. 10, 1925
1,534,039	Tippet	Apr. 21, 1925
1,734,360	Bittman	Nov. 5, 1929