

Sept. 1, 1953

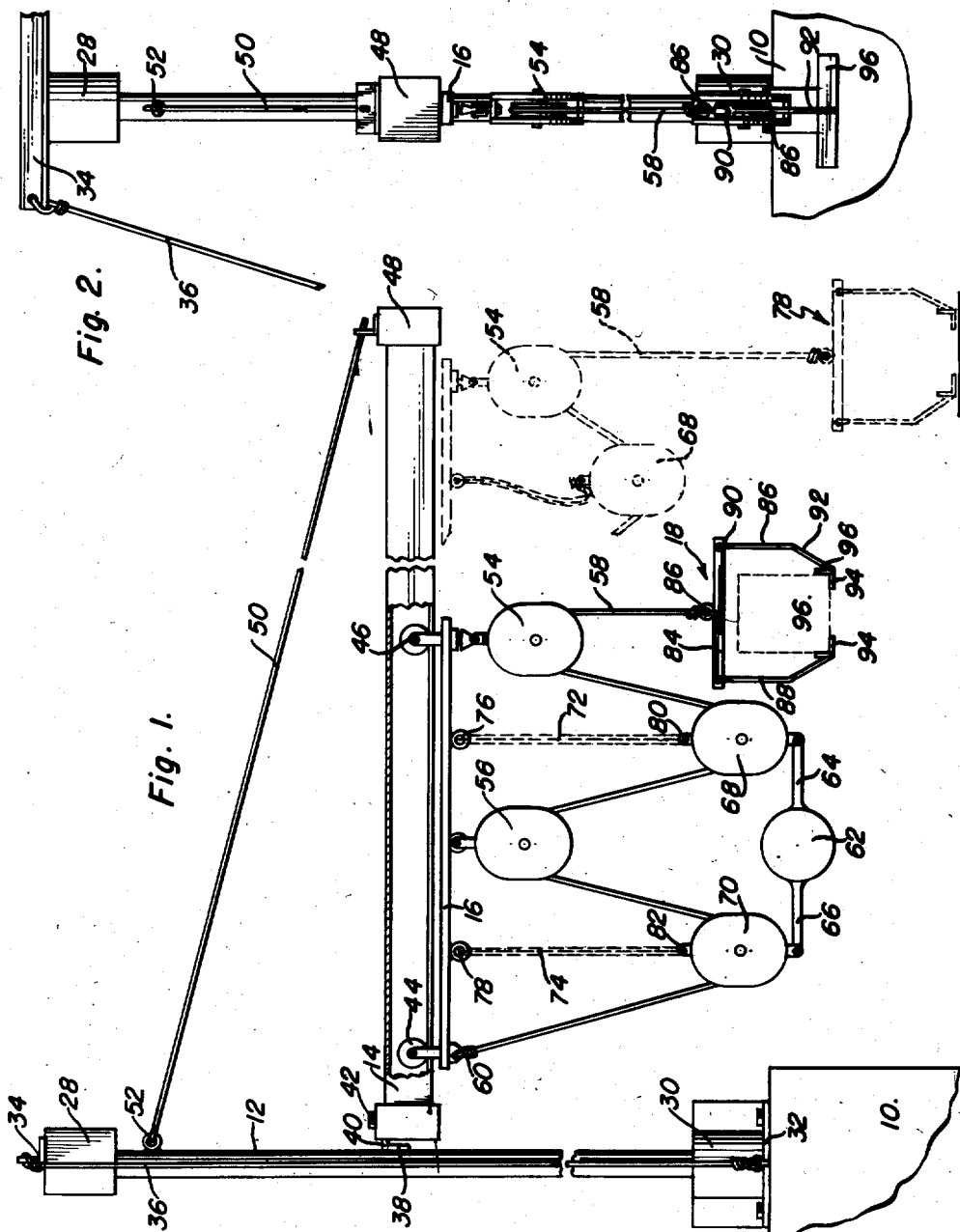
A. PALMER

2,650,718

BUILDING BLOCK HANDLING CRANE

Filed Jan. 17, 1950

2 Sheets-Sheet 1



Andrew Palmer
INVENTOR.

BY *Charles A. O'Brien*
and Harvey B. Jackson
Attorneys

Sept. 1, 1953

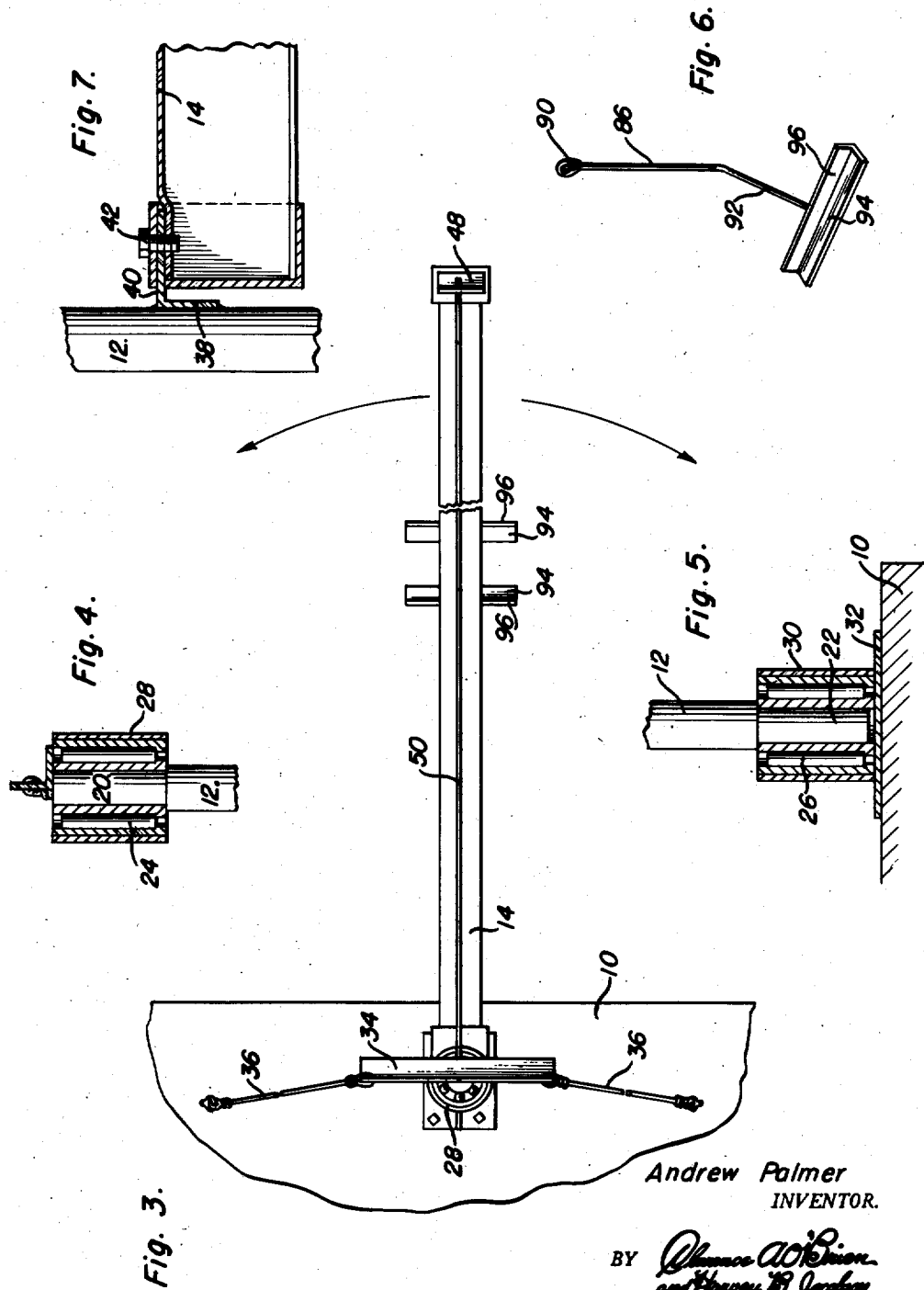
A. PALMER

2,650,718

BUILDING BLOCK HANDLING CRANE

Filed Jan. 17, 1950

2 Sheets-Sheet 2



Andrew Palmer
INVENTOR.

BY *Almon A. O'Brien*
and *Harvey B. Jackson*
Attorneys

UNITED STATES PATENT OFFICE

2,650,718

BUILDING BLOCK HANDLING CRANE

Andrew Palmer, Quakertown, Pa.

Application January 17, 1950, Serial No. 138,967

8 Claims. (Cl. 212-56)

1

This invention comprises novel and useful improvements in a building block handling crane, and more specifically pertains to an improved crane which is specifically adapted to facilitate the lifting and transporting of building blocks from a block mold to a suitable place of storage or loading.

The principal object of this invention is to provide an improved crane for facilitating the lifting and transporting of heavy objects for short distances.

A further important object of the invention is to provide an improved crane having an improved and effective grapple to facilitate the application of the same to articles to be lifted, to securely support such articles during lifting and to readily release the articles when the same have been deposited at the desired location.

Still another important object of the invention is providing an improved crane having a carriage movable along a horizontal track which is horizontally rotatable about a vertical axis, together with improved means for adjustably attaching the grapple to the carriage, together with counterbalance mechanism for facilitating the use of the grapple for lifting, transporting and unloading objects.

Yet another important object of the invention is to provide an improved crane in accordance with the preceding objects together with an improved and highly effective counterbalancing mechanism to facilitate the action and operation of the crane.

These, together with various ancillary features and objects of the invention which will later become apparent as the following description proceeds, are attained by the present invention, a preferred embodiment of which has been illustrated by way of example only in the accompanying drawings, wherein:

Figure 1 is a side elevational view, parts thereof being broken away and shown in section, of a suitable embodiment of the invention in accordance with the principles thereof, the same indicating in full lines the crane in loaded position for transporting an article, and in dotted lines indicating the unloading position for depositing the lifted article;

Figure 2 is a fragmentary end elevational view taken from the right end of Figure 1;

Figure 3 is a top plan view, parts being broken away, of the arrangement of Figure 1;

Figure 4 is a fragmentary vertical transverse sectional view through the upper end of the vertical standard and its journal bearing of the crane;

2

Figure 5 is a view similar to Figure 4 but through the supporting or lower end of the vertical standard and its journal bearing;

Figure 6 is a perspective view of one of the arm and jaw elements of the grapple forming a part of this invention; and

Figure 7 is a fragmentary vertical sectional view through the mounting structure for attaching the horizontal track of the crane to the vertical supporting standard thereof.

Referring now more specifically to the accompanying drawings wherein like numerals designate similar parts throughout the various views, attention is directed first to Figures 1-3 wherein there is disclosed at 10 any suitable supporting base or the like adapted to mount and support the crane forming the subject of this invention. This crane conveniently comprises a vertical support standard 12 which may be of a tubular or of steel rod construction as desired, which standard is journaled and supported at its upper and lower ends for horizontal turning movement about its vertical axis. The horizontally extending frame 14 is fixedly secured to and mounted upon the vertical standard 12 and extends laterally therefrom to constitute a trackway upon which a carriage 16 is movably mounted, this carriage supporting a grapple, indicated generally by the numeral 18, together with a counterbalancing mechanism for the grapple.

Referring now more specifically to Figures 4 and 5, it will be seen that the vertical standard 12 is provided with diametrically reduced upper and lower extremities 20 and 22 upon which are seated anti-friction bearing assemblies, indicated generally by the numerals 24 and 26, these bearing assemblies being in turn received in cages 28 and 30. The cage 30 rests upon a base or support plate 32 which is in turn attached in any desired manner to the foundation or support 10.

As shown in Figures 2 and 3, the cage 28 has an angle iron head plate 34 welded or otherwise rigidly attached thereto and extending across or transverse the upper end thereof, and suitable guy wires or the like 36 are secured to the head plate 34 and are anchored in the foundation or footing 10, as illustrated in Figures 1 and 3, and in a manner well understood by those skilled in the art.

It will thus be seen that the vertical standard is firmly secured at its upper and lower ends and is journaled for rotation about its vertical axis for a purpose which will be later apparent. As shown in Figure 7, the vertical standard 12 has welded or otherwise rigidly secured to its surface intermediate the ends thereof a support bracket

3

consisting of an angle iron member having a vertically disposed flange 38 which is welded or otherwise attached to the vertical standard and a horizontal flange member 40 extending laterally from the standard. A hollow steel beam which may conveniently comprise a barn rail or other well known structural element is indicated at 14, the same being rigidly secured to the flange 40 as by a bolt or the like 42. The horizontal rail 14 constitutes a trackway which, being rigidly attached to the vertical standard 12, is rotatable in a horizontal plane therewith.

The carriage 16 may constitute a suitable platform, supporting frame or the like, and is supported by means of rollers 44 and 46, attached to the ends of the carriage and which ride in the trackway of the barn rail 14.

The outer end of the trackway or barn rail 14 is provided with a suitable cap or supporting bracket 48 and a suitable tie rod 50 is attached to the standard 12 adjacent the upper end of the same, as by an eye bolt connection 52, and is adjustably connected to the supporting cap 48 as by a screw-threaded connection or the like as desired.

Depending from its outermost extremity, the carriage 16 is provided with a supporting pulley block 54 and a similar depending pulley block is provided at 56 intermediate the ends of the carriage. The grapple assembly 18 to be hereinafter more fully described is secured to one end of the cable 58, which is then entrained over the pulley 54, over the pulley 56, and has its other extremity connected, as at 60, to the end of the carriage 16 which is nearest to the vertical standard 12. The flexible cable, together with the pulley 54, constitutes a support by means of which the grapple assembly 18 is carried by and mounted upon the carriage 16 for movement therewith, and is vertically adjusted with respect to the carriage as set forth hereinafter. A counterbalancing mechanism is provided to substantially offset the weight of the grapple assembly 18 when the latter is loaded, whereby the loaded grapple may be easily raised or lowered as desired and transported or moved along the trackway. This counterbalancing assembly preferably comprises a suitable counterbalance or counterweight 62 having support arms 64 and 66, to the ends of which are connected travelling pulley blocks 68 and 70 which are entrained over the cable 58 between the pulleys 54 and 56 and between the pulley 56 and the cable fastening 60.

Suitable chains 72 and 74 are attached to the carriage 16, as by eye bolts 76 and 78, and are likewise secured to the travelling pulleys 68 and 70, as at 80 and 82.

The support and counterbalance mechanism is all carried by the carriage 16 and is movable along the trackway therewith.

Referring now more specifically to the grapple assembly construction, it will be seen that the latter comprises a transverse support bar 84 which is attached, as at 86, intermediate its extremities to the end of the support cable 58. At its extremities, the transverse bar 84 has pivotally attached thereto a pair of support arms 86 and 88, these support arms being of identical construction, and one of them being indicated in Figure 6. As shown, the support arm 86 or 88 is provided with an eye or similar attaching means at its upper end, as at 90, for attachment to the transverse support bar 84. Adjacent its lower end, the support arms are angulated towards each other, as at 92, and are welded or

4

otherwise rigidly secured to the mid-portion of a pair of complementary angle iron members forming jaws, these members having horizontal flanges 94 and vertical flanges 96. The angle iron jaws of the grapple are adapted to receive a building block or the block 96 therebetween, this block being supported upon the flanges 94 and between the flanges 96 of the pair of complementary jaws, so that the block may be firmly and securely supported, may be readily raised or lowered, and may be moved transversely by means of the supporting carriage.

From the foregoing, the construction and operation of the device will now be readily understood. The support 10 of the crane is preferably positioned closely adjacent a building block molding machine, or similar device with which it is desired to use this particular crane. With the carriage 16 moved to its inward position closely adjacent the vertical standard 12, the grapple assembly 18 may be forced downwardly until the same may be clamped upon and receive a building block 96 between the jaws of the same. The counterbalance weight 62 in the travelling pulleys 68 and 70 will largely balance the weight of the block 96, whereby the latter may be readily raised or lowered to the desired height, and will be retained at that height, the chains 72 and 74 limiting the downward travel of the counterweight mechanism, whereupon the elevated block may be moved with the carriage 16 along the length of the race of the trackway to the desired location, the crane being pivoted about its vertical axis as necessary, whereupon the grapple may be lowered as shown in dotted lines in Figure 1, and the block released. The counterweights will again raise the grapple, whereupon the carriage may be moved inwardly and the crane repositioned for the next load.

It should be particularly noted that the compound pulley assembly of the pulley blocks 70, 56, 68 and 54 permits the grapple to be lowered for a considerable distance below the level of the counterbalance weight 62, thereby greatly facilitating the use of the device for lifting or lowering objects into pits or to lower elevations than the lowermost level assumed by the counterbalance weight.

From the foregoing, the construction and operation of the device together with its many advantages will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not desired to limit the invention to the exact construction shown and described, but all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

Having thus disclosed and described the invention, what is claimed as new is as follows:

1. A crane comprising a vertical standard rotatable about its vertical axis, a horizontal track mounted on said standard, a carriage mounted on said track for horizontal movement, a grapple, support means supporting said grapple from said carriage for vertical adjustment, said support means including counterbalance mechanism for said grapple, said support means comprising a pulley mounted on said carriage, a cable terminally secured to said carriage and to said grapple and entrained over said pulley, said counterbalance mechanism being connected to said cable

5

between said pulley and the end connected to said carriage.

2. A crane comprising a vertical standard rotatable about its vertical axis, a horizontal track mounted on said standard, a carriage mounted on said track for horizontal movement, a grapple, support means supporting said grapple from said carriage for vertical adjustment, said support means including counterbalance mechanism for said grapple, said support means including a support pulley secured to the end of said carriage remote from said standard, a cable entrained over said support pulley and terminally secured to said grapple and to the end of said carriage adjacent said standard, said counterbalance mechanism being attached to said cable between said support pulley and the cable end connected to the carriage.

3. The combination of claim 2 wherein said counterbalance mechanism comprises a counterweight, pulleys connecting said counterweight to said cable.

4. The combination of claim 2 wherein said counterbalance comprises a counterweight, spaced travelling pulleys connecting said counterweight to said cable, a fixed pulley carried by said carriage and supporting said cable between said travelling pulleys.

5. The combination of claim 2 wherein said counterbalance comprises a counterweight, spaced travelling pulleys connecting said counterweight to said cable, a fixed pulley carried by said carriage and supporting said cable between said travelling pulleys, chains connected to each of said travelling pulleys and to said carriage.

6. A crane comprising a standard, a laterally extending track mounted on said standard, a carriage mounted on said track for movement therealong, a grapple, support means supporting said grapple from said carriage, said support means including counterbalance mechanism for said grapple, said support mechanism including

6

a support pulley secured to one end of said carriage, a cable entrained over said support pulley and terminally secured to said grapple and to the opposite end of said carriage, said counterbalance mechanism being attached to said cable between said support pulley and the cable and connected to the carriage.

7. The combination of claim 6, wherein said counterbalance mechanism comprises a counterweight, a plurality of spaced pulleys connecting said counterweight to said cable, a pulley carried by said carriage and supporting said cable between said spaced pulleys.

8. In a crane having a track, a carriage mounted on said track, a grapple and supporting means for said grapple, said supporting means comprising a support pulley secured to one end of said carriage, a cable entrained over said support pulley and terminally secured to said grapple and to the opposite end of said carriage, a counterweight, a pair of pulleys connecting said counterweight to said cable between said support pulley and the cable end connected to the carriage, a pulley carried by the carriage and supporting said cable between said pair of pulleys.

ANDREW PALMER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
70,455	Morris	Nov. 5, 1867
329,219	Samuel	Oct. 27, 1885
845,733	Fitz	Feb. 26, 1907
1,023,006	Carriker	Apr. 6, 1912
1,615,115	Durham	Jan. 18, 1927
1,720,240	Saborsky	July 9, 1929
2,198,652	Cullen et al.	Apr. 30, 1940
2,275,074	Carr	Mar. 3, 1942
2,518,776	Hampton	Aug. 15, 1950
2,520,238	Culp	Aug. 29, 1950