Jan. 26, 1960 V. T. PILIPCZUK 2,922,382

CRANE INTERLOCK MECHANISM

Filed July 18, 1957 2 Sheets-Sheet 1

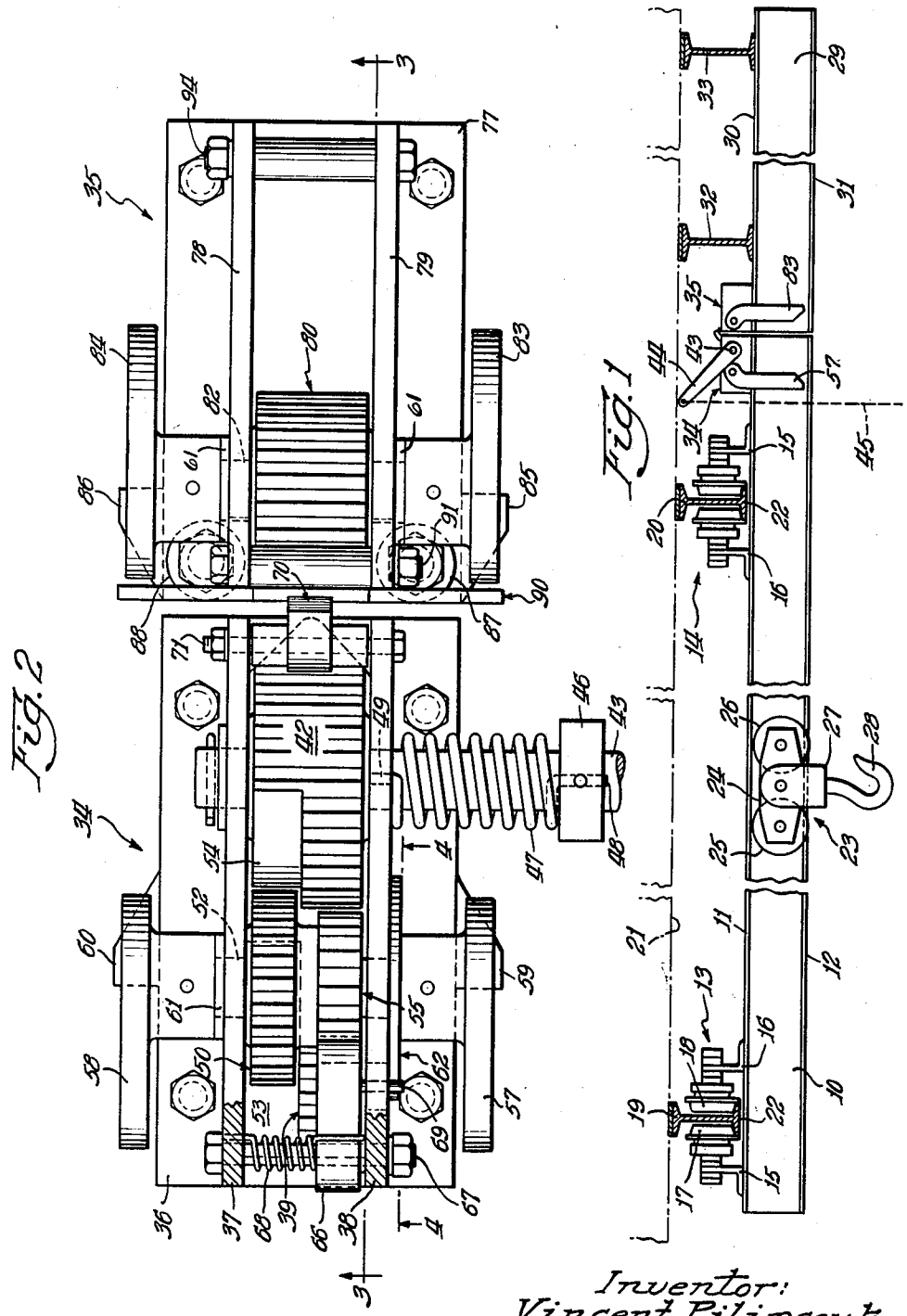


Fig. 1

Fig. 2

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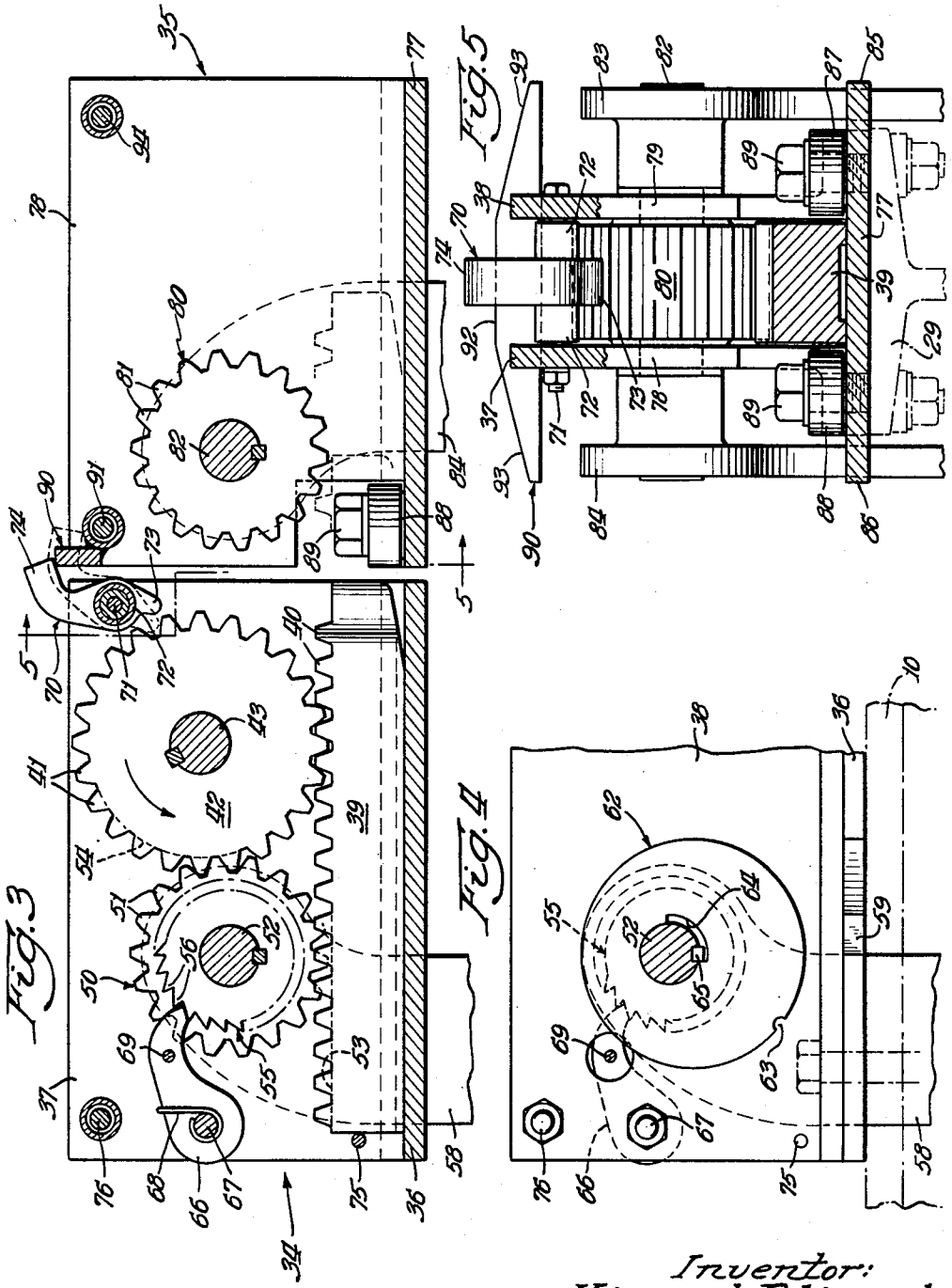


Fig. 3

Fig. 5

Fig. 4

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CRANE INTERLOCK MECHANISM

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9 Claims. (Cl. 104—98)

The invention relates to material handling devices of the type comprising a pair of relatively movable tracks or beams having a carriage movable on the tracks; and, more particularly, the invention relates to cranes of the type comprising a transverse girder or beam supported at opposite ends thereof by trolley wheels adapted to roll along overhead tracks. Still more particularly, the invention relates to mechanisms for interlocking the movable girder with a stationary beam to provide for the transfer of a carriage movably disposed on the transverse girder onto the stationary beam.

It is an object of the invention to provide an improved interlock mechanism of this type having an assembly on one of the beams comprising a plunger projectable to interlock with an assembly on the other beam and with interconnecting means being provided on the two assemblies so that the plunger is prevented from projecting movement until there is substantial alignment between the two beams.

It is another object of the invention to arrange the interlocking mechanism such that it can be controlled both in locking the two beams together, or in unlocking them, by means of a single control handle or lever.

It is also an object of the invention to provide stop arms on each of the assemblies on the two beams for preventing accidental movement of the carriage off either of the beams when they are not in alignment and to provide gearing for actuating the stop arms to raise them out of carriage blocking position after the plunger has been projected from one of the assemblies into the other. More particularly, it is an object to make the plunger in the form of a rack by means of which it can be moved by the actuating lever or handle and which may cooperate with spur gearing for actuating at least one of the stop arms.

It is another object of the invention to provide a ratchet mechanism for preventing a return of the stop arms and the plunger until they have made complete movements to unblocking and interlocking positions respectively, so that once the interlocking action of the interlock mechanism has begun, the interlocking action must be completed. In this connection, it is also an object to provide releasable means for the ratchet mechanism, so that the actuating handle may be moved to the limit of its movement for the purpose of unlocking the interlocking mechanism so that all of its parts may return to their original positions with the stop arms thereafter blocking movement of the movable carriage and with the plunger being completely retracted from the assembly with which it mates.

The invention consists of the novel constructions, arrangements and devices to be hereinafter described and claimed, for carrying out the above stated objects, and such other objects as will be apparent from the following description of a preferred form of the invention, illustrated with reference to the accompanying drawings, wherein:

Fig. 1 is a side elevational view of a movable crane

together with a stationary beam with which the interlocking mechanism of the invention may be used, for the purpose of interlocking the crane and beam together to allow the transfer of a movable carriage from one to the other;

Fig. 2 is a top plan view of the interlock mechanism of the invention;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2; and

Fig. 5 is a view taken from line 5—5 of Fig. 3.

Like characters of reference designate like parts in the several views.

The interlock mechanism of the invention may be used in connection with the underhung, single girder crane illustrated in the drawing. The crane comprises a single horizontally extending I-beam girder **10** having upper and lower flanges **11** and **12**. A pair of end trucks **13** and **14** are fixed to the girder **10**. Each of the trucks **13** and **14** comprises a pair of spaced angle bars **15** and **16** fixed to the top flange **11** of the girder **10**. A pair of tread-wheels **17** are rotatably fixed with respect to the angle bar **15**, and a pair of treadwheels **18** are rotatably fixed with respect to the angle bar **16**.

The end truck **13** is suspended from a depending I-beam track **19**, and the end truck **14** is suspended from a depending I-beam track **20**. Each of the I-beams **19** and **20** is fixed to any suitable support such as to a ceiling **21**. Each of the beams **19** and **20** has a lower flange **22**, and the wheels **17** for each of the trucks **13** and **14** are positioned on one side of the flange **22** of one of the I-beams **19** and **20**, and the wheels **18** are positioned on the other side of the flange **22** of this I-beam so that the wheels **17** and **18** roll on the flanges **22**.

A load supporting trolley or carriage **23** is movably disposed on the girder **10**. The carriage **23** comprises two end plates **24** disposed on opposite sides of the girder **10**, and each end plate carries a pair of treadwheels **25** and **26**. The treadwheels carried by one of the end plates **24** rest on one side of the lower flange **12**, and the treadwheels carried by the other end plate **24** rest on the other side of the flange **12**. A yoke **27** connects the two end plates **24** together, and a hook **28** is fixed with respect to the yoke **27** for supporting any suitable load.

The carriage **23** may be moved longitudinally with respect to the girder **10** by simply applying force in one direction or the other to the carriage, so that the wheels **25** and **26** roll on the upper surfaces of the flange **12**, and the girder **10** may be moved longitudinally with respect to the I-beam tracks **19** and **20** by also applying a force in one direction or the other to the girder **10** causing the wheels **17** and **18** to roll on the upper surfaces of the flanges **22**.

The girder **10** which is movable on the I-beams **19** and **20** as just described may be aligned with an I-beam girder **29** which is fixed to the ceiling **21**. The I-beam **29** has upper and lower flanges **30** and **31**, and the I-beam **29** is fixed with respect to the ceiling **21** by means of a pair of spaced I-beams **32** and **33** fastened to the ceiling **21** and the flange **30**. When the girder **10** is so positioned along the I-beam tracks **19** and **20** that the girder **10** is in alignment with the I-beam **29**, the carriage **23** may be rolled onto the I-beam **29** from the girder **10**, and the device of the present invention is provided on the girder **10** and I-beam **29** for the purpose of mechanically aligning the I-beams **10** and **29** and holding them in alignment and for preventing movement of the carriage **23** off either of the I-beams **10** and **29** until such alignment has been obtained.

The crane interlock mechanism comprises two assemblies, namely, a plunger projecting assembly 34 and a plunger receiving assembly 35 mounted on adjacent ends of the I-beams 10 and 29. The assembly 34 comprises a base plate 36 fixed on the top flange 11 of the girder 10 and two side plates 37 and 38 fixed to the base plate 36. A plunger in the form of a rack 39 is slidably disposed between the side plates 37 and 38 on the upper surface of the base plate 36 and has teeth 40 on its upper face which are in mesh with the teeth 41 of a gear 42. The gear 42 is fixed on a shaft 43 which extends through the plates 37 and 38. An actuating lever 44 is fixed on one end of the shaft 43, and a rope handle 45 is provided at the free end of the lever 44. A collar 46 is fixed on the shaft 43, and a lever return spring 47 is disposed about the shaft 43 and has one end 48 fixed in the collar 46 and has its other end 49 extending into the side plate 38 to be fixed with respect thereto.

A gear 50 having teeth 51 fixed on a shaft 52 extending through the side plates 37 and 38 is adapted to mesh with the gear 42. The rack 39 has some of its teeth 40 ground away for a part of their length to provide a flat surface 53 on the top of the rack 39 so as to provide clearance with respect to the gear 50, and the gear 42 has some of its teeth 41 ground away for a portion of their length to provide a smooth outer cylindrical surface 54 on a portion of its periphery for clearing the gear 50 for a certain degree of rotation of the gear 42.

A ratchet wheel 55 having ratchet teeth 56 on its periphery is fixed on the shaft 52 on one side of the gear 50 between the side plates 37 and 38. A pair of stop arms 57 and 58 are fixed on opposite ends of the shaft 52. The stop arms 57 and 58 extend downwardly closely adjacent the edges of the upper flange 11 and are limited in their movement by outwardly projecting lug portions 59 and 60 formed on the base plate 36. A washer 61 is disposed between the side plate 37 and the arm 58, and a cam 62 is disposed between the arm 57 and the other side plate 38. The cam 62 is provided with a notch 63 on its periphery and has a lost motion connection with the shaft 52 comprising a slot 64 formed within the cam 62 and a key 65 fixed in the shaft 52 and movable in the slot 64.

A pawl 66 is swingably mounted on a stud 67 extending between the side plates 37 and 38. A spring 68 is disposed about the stud 67 and is fixed in the side plate 37 at one end and is looped about the pawl 66 at its other end so as to yieldably hold the pawl 66 in engagement with the ratchet wheel 55. A pin 69 is fixed in the pawl 66 and extends through a hole in the side plate 38 so that the cam 62 when rotated may contact and act on the pin 69.

A pawl 70 is swingably disposed on a stud 71 extending through the side plate 37 and 38. The pawl 70 is held centralized with respect to the side plates 37 and 38 by collar portions 72 and is provided with a rounded end 73 adapted to fit between adjacent teeth 41 and with a laterally extending end portion 74 by means of which the pawl 70 may be swung as will be hereinafter described. A pin 75 also extends between the plates 37 and 38 for limiting movement of the rack 39, and a stud 76 is also provided between the side plates 37 and 38 for assisting the studs 71 and 67 in holding the plates 37 and 38 properly spaced with respect to each other.

The assembly 35 comprises a base plate 77 fixed on the upper flange 30 of the I-beam 29 on the end of the I-beam and two side plates 78 and 79 fixed to the base plate. A gear 80 having teeth 81 is fixed on a shaft 82 extending through the side plates 78 and 79. Two stop arms 83 and 84 similar to the stop arms 57 and 58 are fixed on the shaft 82 and are held properly spaced with respect to the side plates 78 and 79 by washers 61, so that the side arms clear the edges of the flange 30 by

only a slight margin. The base plate 77 is provided with outwardly extending lug portions 85 and 86 for limiting rotative movement of the arms 83 and 84.

A pair of bearings 87 and 88 are fixed on the base plate 77 by means of studs 89, and the bearings 87 and 88 are so spaced that the rack 39 may pass between them. The end of the rack 39 is tapered to facilitate its entrance between the bearings 87 and 88, as shown.

A cam 90 is disposed in recesses in the forward edges of the side plates 78 and 79 and is held fixed by a stud 91 extending between the side plates 78 and 79. The cam 90 is provided with a relatively high edge 92 and with slanted top edges 93. A stud 94 in addition to the stud 91 functions to hold the plates 78 and 79 properly spaced.

It will be apparent that the assembly 34 is fixed on the upper surface of the I-beam 10 adjacent its end and the assembly 35 is fixed on the adjacent end of the I-beam 29; and there is only a slight clearance, such as, for example, approximately a quarter inch, between the plates 37 and 38 of the assembly 34 and the plates 78 and 79 of the assembly 35 when the I-beams 10 and 29 are aligned with each other. The arms 57 and 58 and the arms 83 and 84 are respectively closely spaced to the edges of the flanges 11 and 30, and these arms are in the path of movement of the carriage 23 when the arms 57, 58, 83 and 84 extend vertically downwardly.

In operation, when it is desired to transfer the carriage 23, together with any load held suspended by the hook 28, from the crane to the fixed I-beam 29, the girder 10 is moved longitudinally of the I-beam tracks 19 and 20 with the rollers 17 and 18 of the end trucks 13 and 14 rolling on the lower flanges 22 of the I-beams 19 and 20 until the girder 10 is in substantial alignment with the I-beam 29. Prior to such alignment, the parts of the assembly 34 are in their positions as illustrated, and the arms 57, 58, 83 and 84 extend vertically downwardly in abutting contact with the stops 59, 60, 85 and 86, respectively. The arms 57, 58, 83 and 84 are only slightly spaced from the sides of the upper flanges 11 and 30, and the arms 57 and 58 effectively block movement of the carriage 23 off the end of the girder 10. If, prior to such alignment of the beams 10 and 29, the lever 44 has manual force applied to it from the handle 45 tending to turn the shaft 43 in the counterclockwise direction as seen in Fig. 3, the pawl 70 and particularly its rounded end 73 prevents such movement of the shaft 43 since the rounded pawl end 73 fits between teeth 41 of the gear 42 fixed on the shaft 43.

As the girder 10 is moved into alignment with the I-beam 29, the lever end 74 of the pawl 70 moves over one of the slanted top edges 93 of the cam 90 and onto the high part 92 of the cam 90. The pawl 70 is thus rotated about the stud 71 so that the rounded end 73 is moved out of engagement with teeth 41 of the gear 42, and the gear 42 is then free to rotate in the counterclockwise direction. Under these conditions, when the lever 44 is rotated by manual effort applied to the handle 45, the gear 42 due to its meshing relationship with the plunger or rack 39, moves the plunger 39 outwardly to the right as seen in Fig. 3, so that the plunger 39 passes between the bearings 87 and 88 of the assembly 35. The end of the plunger 39 is tapered, and it may contact and ride over one or the other of the bearings 87 and 88 and cam the beams 10 and 29 into substantially perfect alignment, assuming the beams are initially slightly misaligned when the plunger 39 is projected.

Due to the cut out portion 53 provided on the rack 39, this movement of the rack of itself has no effect on the gear 50, and due to the cut out portion 54 of the gear 42, initial movement of the gear 42 likewise has no effect on the gear 50. Continued movement of the lever 44 causes additional rotation of the gear 42 fixed on the shaft 43 and moves the rack 39 completely between the rollers 87 and 88 so as to effectively fix the girder

10 against movement relative to the assembly 35 and the fixed beam 29. It will be apparent that such movement of these parts is against the action of the spring 47 encircling the shaft 43.

After a predetermined movement of the lever 44 and gear 42, the teeth 41 at the end of the cut out portion 54 on the gear 42 begin to mesh with the teeth 51 on the gear 50, and continued rotation of the gear 42 by the lever 44, which is in the counterclockwise direction as seen in Fig. 3, causes a rotation of the gear 51 in the opposite direction. The stop arms 57 and 58 are fixed on the shaft 52 which is, in turn, fixed within the gear 51, and the stop arms 57 and 58 are thus swung upwardly out of the path of movement of the carriage 23. At the same time that the teeth 41 of the gear 42 begin to intermesh with the teeth 51 of the gear 50 to begin the swinging movement of the stop arms 57 and 58, the end tooth 40 on the rack 39 intermeshes between teeth 81 of the gear 80, and the continued rotation of the gear 42 that causes the arms 57 and 58 to be moved out of the path of movement of the carriage 23 likewise causes a corresponding movement of the stop arms 83 and 84 through the intermeshing rack 39 and the gear 80. When the stop arms 57, 58, 83 and 84 are all out of the path of movement of the carriage 23, the carriage 23 can be moved from the girder 10 onto the stationary I-beam 29 with the rollers 25 and 26 rolling over the upper surfaces of the flange 12 of the girder 10 onto the upper surfaces of the flange 31 of the I-beam 29. During this movement of the carriage 23, the rack 39 projected between the bearings 87 and 88 locks the girder 10 and I-beam 29 in alignment.

The ratchet wheel 55 is fixed on the shaft 52 along with the gear 50, and the pawl 66 ratchets over the ratchet teeth 56 as the arms 57 and 58 rotate upwardly out of stopping relationship with respect to the carriage 23. The pawl 66 as it engages different ones of the ratchet teeth 56 prevents a return movement of the gear 50 in the counterclockwise direction until the lever 44 has been swung more than sufficiently to move the arms 57 and 58 (and also the arms 83 and 84 which move with the arms 57 and 58 due to the gears 50 and 80 and the rack 39 interconnecting them) to completely clear the carriage 23. Thus the lever 44 may be swung sufficiently to cause sufficient swinging movement of the arms 57, 58, 83 and 84 to allow the carriage 23 to be moved from the girder 10 to the I-beam 29, and the pawl 66 co-acting with the ratchet wheel 55 prevents a return movement of the arms 57, 58, 83 and 84 even though the handle 45 is released by the operator.

When the transfer of the carriage 23 from the girder 10 to the I-beam 29 has been completed, the lever 44 is pulled still farther downwardly to rotate the shafts 43 and 52 and gears 42 and 50 an additional amount. The cam 62 has a lost motion connection with the shaft 52, and the cam 62 turns along with the shaft 52. Upon this additional rotation of the gear 50 and shaft 52, the cam 62 acts through the pin 69 on the pawl 66 and moves the pawl 66 against the action of the spring 68 out of mesh with the ratchet wheel 55. At this time, the pin 69 has moved within the notch 63 of the pawl 62. Under these conditions, when the handle 45 is released by the operator, the spring 47 returns the lever 44 and thus the rack 39, the gears 42, 50 and 80 and the stop arms 57, 58, 83 and 84 to their original positions, and during these return movements of the parts until they reach their original positions, the pin 69 on the pawl 66 remains in the notch 63 of the cam 62 so that the pawl 66 is held out of engagement with the ratchet wheel 55 and the pawl 66 does not prevent these return movements. When the parts are close to their original positions, the key 65 abuts one end of the notch 64 and moves the cam 62 in a counterclockwise direction as seen in Fig. 4 so that the pin 69 moves out of the notch 63 and the pawl 66 returns to its original position under the action of the spring 68, preventing counterclockwise rotation of the shaft 52 and gear 50. With the carriage 23 on the I-beam 29, the stop arms 83 and 84 prevent movement of the carriage 23 off the I-beam 29 until the girder 10 is again aligned with the I-beam 29 and the rack 39 is again projected between the bearings 87 and 88 to interconnect the assemblies 34 and 35 as has been described. When the I-beams 10 and 29 are out of alignment and the arms 57, 58, 83 and 84 extend vertically downwardly, it will be apparent that the stop portions 59, 60, 85 and 86 respectively cooperate with these arms to stop the movement thereof so that the arms positively prevent movement of the carriage 23 off either of the I-beams 10 and 29 depending on which of these I-beams the carriage is positioned.

The interlock mechanism advantageously is strong but yet light in weight. The interlock mechanism is operated by the single lever arm 44, and the crane operator may thus have use of at least one hand for other purposes. The pawl 66 operating in conjunction with the ratchet wheel 55 holds the stop arms 57, 58, 83 and 84 in upraised position, even though the operator may completely release the handle 45, and the operator may thus be completely free at this time to move the carriage 23 or to shift the load on the hook 28, etc. A complete release of the arms 57, 58, 83 and 84 back to their original positions is obtained simply by an additional pull on the handle 45. The interlock mechanism does not have any protrusion, such as actuating fingers, that can be broken off by incorrect usage of the interlock mechanism. In this connection, the pawl 70 is actuated by the high portion 92 of the cam 90, and until the pawl 70 is completely actuated, any movement at all of the lever 44 by means of the handle 45 is prevented due to the action of the pawl portion 73 co-acting with the gear 42.

I wish it to be understood that the invention is not to be limited to the specific constructions and arrangements shown and described, except only insofar as the claims may be so limited, as it will be apparent to those skilled in the art that changes may be made without departing from the principles of the invention. In particular, I wish it to be understood that although I have referred to and described a crane in connection with my improved interlock mechanism, the interlock mechanism can be used in connection with other material handling devices using a pair of relatively movable tracks with a carriage adapted to move on the tracks, such as, so-called monorail systems, etc.

I claim:

1. In interlock mechanism, a pair of relatively movable tracks adapted to carry a trolley movable thereon, a plunger projectably mounted on a first one of said tracks, abutment means carried by the second one of said tracks and adapted to co-act with said plunger for holding said tracks in alignment for the transfer of the trolley from one track to the other, a rack gear formed on said plunger, a drive gear rotatably carried by said first track and meshing with said track for moving said plunger to co-act with said abutment means, a movable pawl lockable with the teeth on one of said gears for preventing projection of said plunger, and a cam carried by said second track and moving said pawl out of locking position when said tracks are moved into alignment to thereafter allow projection of said pawl.

2. In interlock mechanism, a pair of relatively movable tracks adapted to carry a trolley movable thereon, a trolley stop arm rotatably carried by a first one of said tracks and rotatable about a horizontal axis transverse of said first track from a position blocking movement of the trolley to a position permitting such movement, first means mounted on said first one of said tracks including a movable lock element for holding said stop arm in its trolley blocking position, and a second means including a cam carried by the second one of said tracks, said lock element being actuated by said cam when said tracks are

moved into alignment to render the lock element ineffective.

3. In interlock mechanism, a pair of relatively movable tracks adapted to carry a trolley movable thereon, a plunger projectably mounted on a first one of said tracks, abutment means carried by the second one of said tracks and adapted to co-act with said plunger for holding said tracks in alignment for the transfer of the trolley from one track to the other, a trolley stop arm carried by each of said tracks and movable from a trolley blocking position to a position permitting movement of the trolley off the end of the track, gearing interconnecting said plunger and said stop arms for retracting said stop arms to permit movement of said trolley from one of said tracks onto the other when said plunger is projected, a locking pawl carried by one of said tracks for immobilizing said gearing and preventing projection of said plunger when said tracks are not in alignment, and a cam carried by the other of said tracks adapted to actuate said pawl when said tracks are brought into alignment to release and mobilize said gearing.

4. In interlock mechanism, a track adapted to carry a trolley movable thereon, a trolley stop arm rotatably carried by said track and movable from a position blocking movement of the trolley along the track to a position permitting such movement, a one way engaging mechanism engageable with said trolley stop arm for allowing movement of said stop arm from its blocking position to its unblocking position but preventing movement in the opposite direction, and means for rendering said one way mechanism ineffective so that said stop arm may be returned from its position allowing movement of the trolley to its trolley blocking position.

5. In interlock mechanism, a track adapted to carry a trolley movable thereon, a stop arm rotatably carried by said track and movable from a first position blocking movement of said trolley to a second position permitting such movement, a one way engaging mechanism connected with said stop arm for permitting movement of said stop arm from its trolley blocking position to its said second position but preventing movement of the stop arm in the opposite direction, and means energized by movement of said stop arm beyond its said second position for rendering said one way engaging mechanism inoperative so that said stop arm can return to its trolley blocking position.

6. In interlock mechanism, a pair of relatively movable tracks adapted to carry a trolley movable thereon, a plunger projectably mounted on a first one of said tracks, abutment means carried by the second one of said tracks and adapted to co-act with said plunger for holding said tracks in alignment for the transfer of the trolley from one track to the other, a pair of trolley stop arms each rotatably carried by one of said tracks and each movable from a first trolley blocking position preventing movement of the trolley off the end of the track to a second position permitting such movement, rack teeth carried by said plunger, gearing interconnecting sair rack teeth and said stop arms so that said stop arms are rotated by movement of said plunger after said plunger has co-acted with said abutment means for holding the tracks aligned, a ratchet and pawl device effective on said gearing for holding said stop arms from movement back to their trolley blocking positions after they are rotated from such positions, and means rendered effective by movement of said stop arms beyond their said second positions for rendering said pawl ineffective with respect to said ratchet allowing return of said stop arms to their trolley blocking positions.

7. In interlock mechanism, a pair of relatively movable tracks adapted to carry a trolley movable thereon, a plunger projectably mounted on a first one of said tracks, abutment means carried by the second one of said tracks and adapted to co-act with said plunger for holding said tracks in alignment for the transfer of the trolley from one track to the other, a rack carried by said plunger, a pair of trolley stop arms each carried by one of said tracks and movable from a first position blocking trolley travel off the end of the track to a second position permitting such travel, a driving gear in mesh with said rack, a handle connected with said driving gear for rotating the gear so as to project said plunger, a spring yieldably returning said driving gear and plunger to their original positions, a gear carried by said stop arm on said second track and co-acting with said rack for rotating said last named stop arm out of its trolley blocking position on continued movement of said plunger with respect to said abutment means, a gear adapted to mesh with said driving gear and connected with said trolley stop arm on said first track so that said last named trolley stop arm is rotated out of trolley blocking position along with the other of said stop arms, a pawl and ratchet mechanism effective on one of said stop arms for holding the stop arms from movement back to their trolley blocking positions once they are moved out of these positions, and a cam movable with said last named stop arm for moving said pawl out of engagement with said ratchet to permit a returning movement of said stop arms towards their original trolley blocking positions, said cam having a lost motion connection with respect to said last named stop arm so that said pawl is held out of engagement with said ratchet to permit the complete return of said stop arms to their original positions before said pawl is re-engaged with said ratchet.

8. In interlock mechanism, a track adapted to carry a trolley movable thereon, a trolley stop arm rotatably carried by said track and rotatable about a horizontal axis transverse to said track and movable from a depending position blocking movement of the trolley along the track to an upraised position permitting such movement, a one-way engaging device engageable with said trolley stop arm for allowing movement of said stop arm from its depending position to its upraised position and preventing movement from its upraised position toward its depending position, and means for rendering said one-way device inactive so that said stop arm may be returned from its upraised position to its depending position.

9. In interlock mechanism, a track adapted to carry a trolley movable thereon, a trolley stop rotatably carried by said track and movable from a trolley blocking position to a position permitting movement of the trolley, a handle drivingly connected with said trolley stop for so moving the stop on movement of the handle from a first to a second position, a one-way engaging mechanism engageable with said trolley stop for allowing movement of a said stop from its blocking position to its unblocking position but preventing movement in the opposite direction, and means under the control of said handle for rendering said one-way mechanism ineffective when the handle is moved to an overtravel position beyond said second position so that said stop may be returned to its trolley blocking position from its other position.

References Cited in the file of this patent

UNITED STATES PATENTS

809,482	Whittemore	Jan. 9, 1906
967,869	Fitzgerald	Aug. 16, 1910
1,053,667	Steedman	Feb. 18, 1913
1,553,439	Goldberg	Sept. 15, 1925
1,592,815	Harris	July 13, 1926
1,643,642	Phillips	Sept. 27, 1927
2,276,272	Harris et al.	Mar. 17, 1942
2,411,218	Mappin	Nov. 19, 1946
2,471,513	Bogle	May 31, 1949
2,642,814	Anjeskey	June 23, 1953