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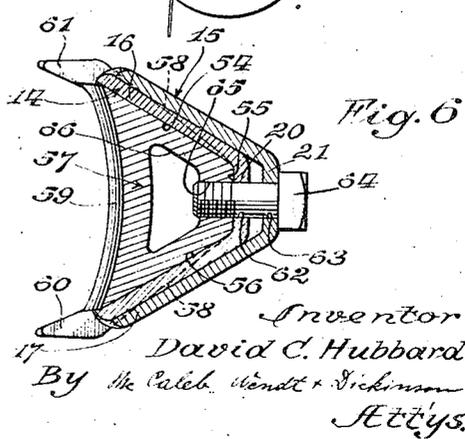
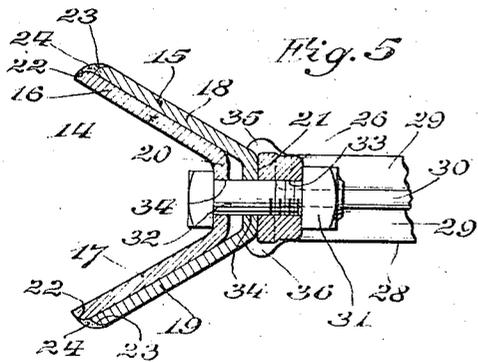
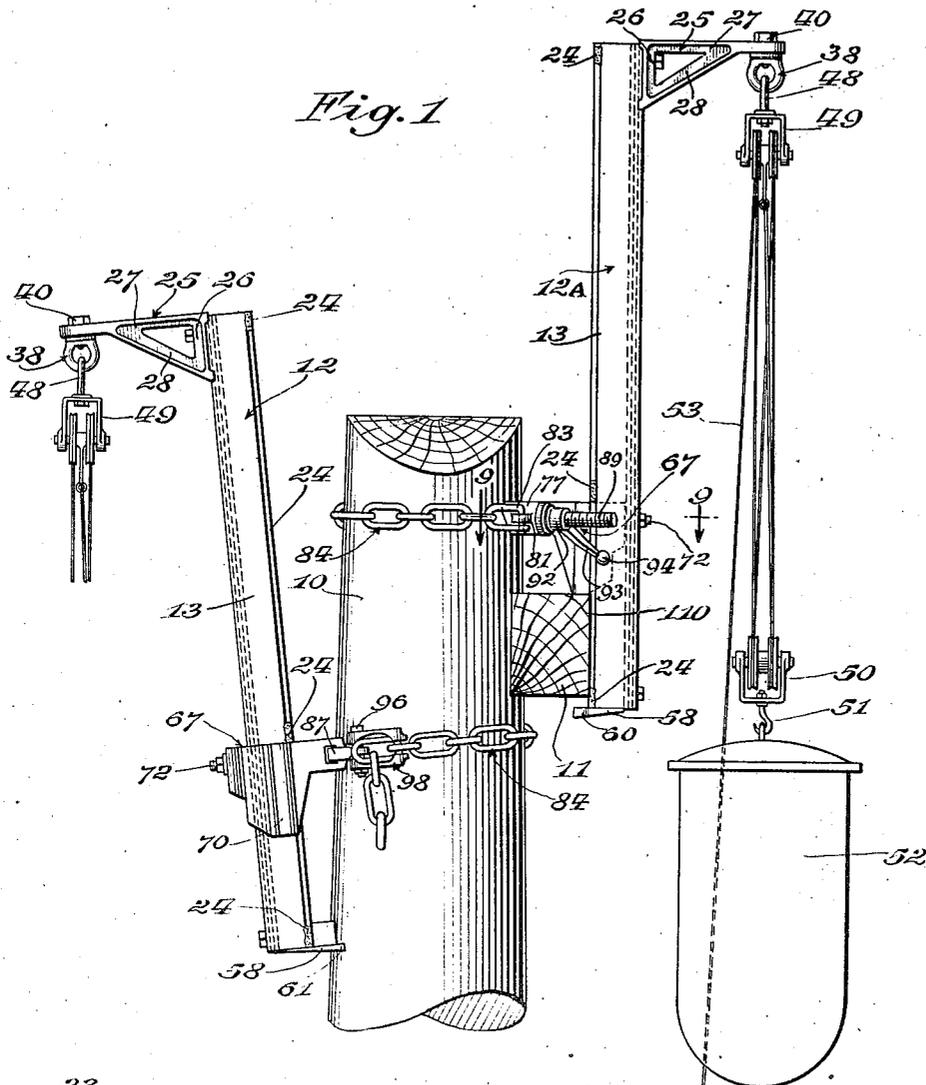
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2,309,769

TRANSFORMER GIN

Filed Sept. 12, 1941

3 Sheets-Sheet 1



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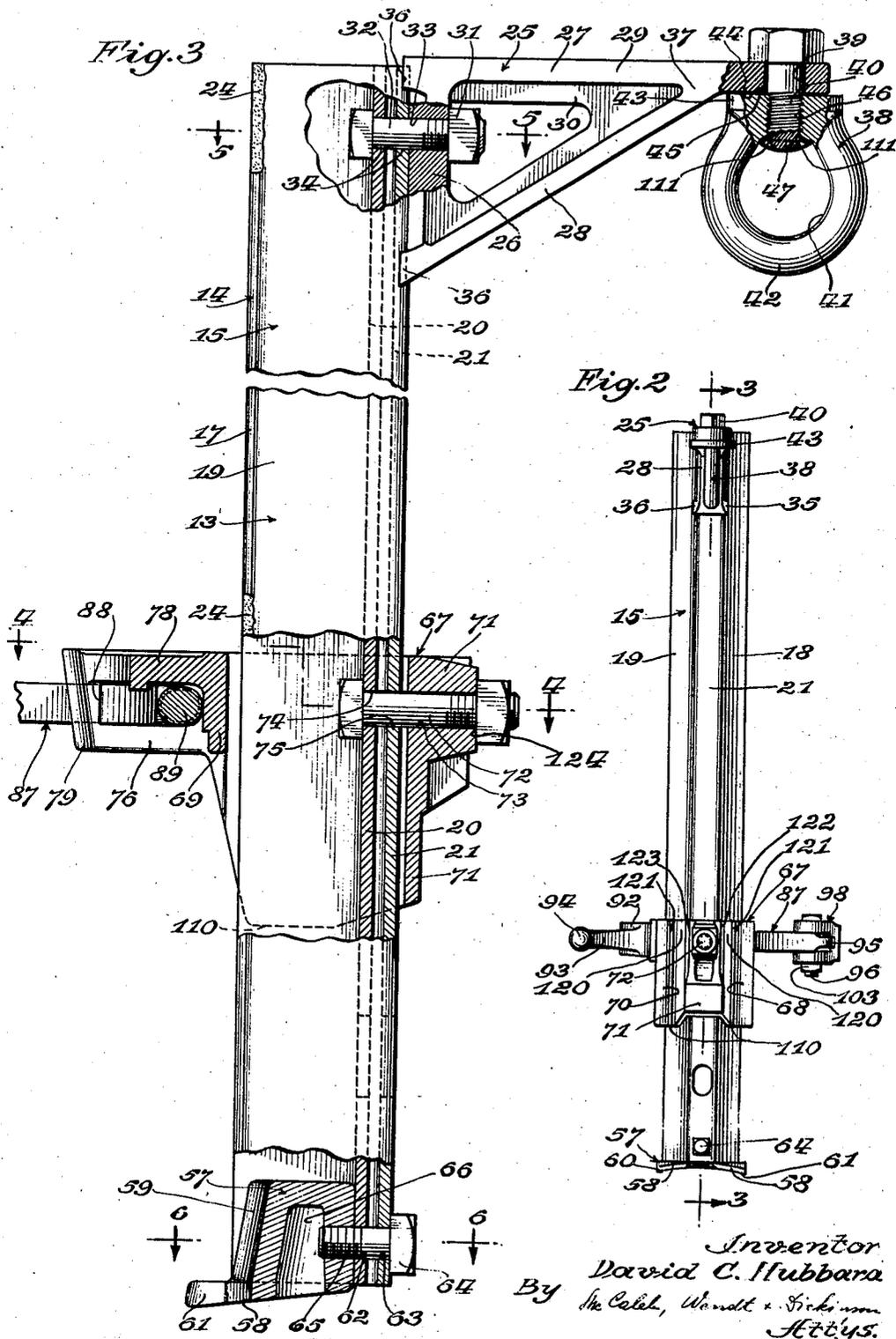
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TRANSFORMER GIN

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3 Sheets-Sheet 2



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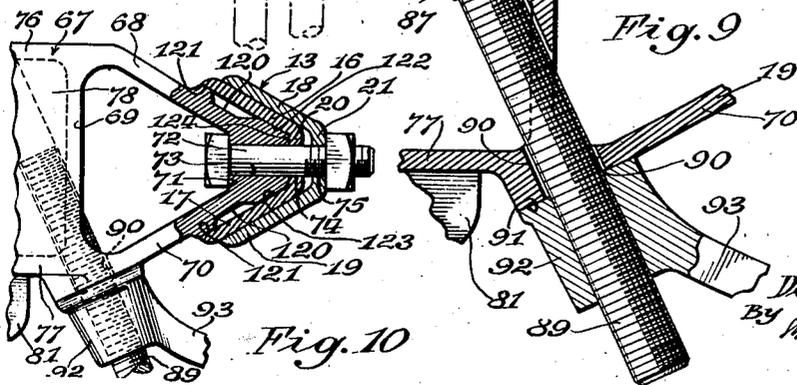
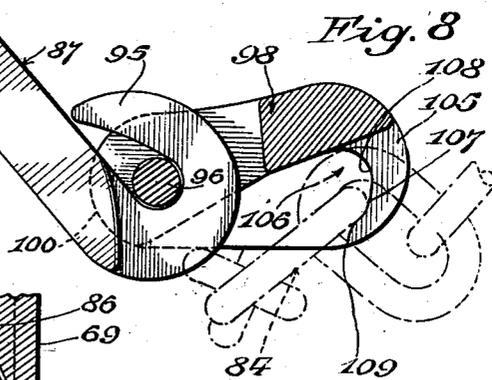
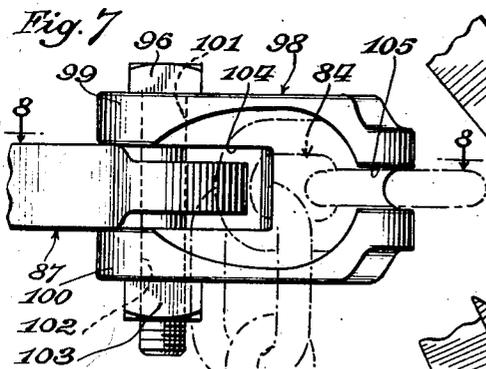
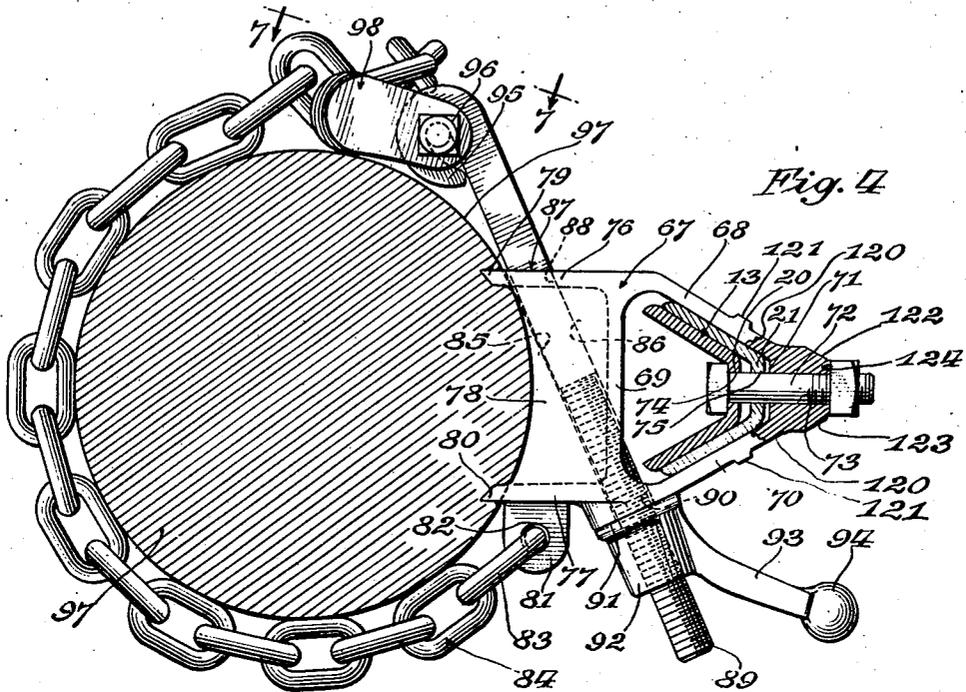
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TRANSFORMER GIN

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,309,769

TRANSFORMER GIN

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6 Claims. (Cl. 248—231)

The present invention relates to transformer gins, and is particularly concerned with the provision of an improved gin for use in hoisting transformers to the top of transmission line poles so that the transformer can be secured to the pole in any desired position.

One of the objects of the invention is the provision of a transformer gin of the class described which is light so that it requires a minimum amount of steel, but it is also sturdy and so constructed that it is adapted to lift very heavy weights without any possibility of breakage of its parts.

Another object of the invention is the provision of an improved transformer gin of the class described which is adapted to be secured on a pole so firmly that there is no possibility of an accident or of the securing means coming loose during the lifting of a transformer.

Another object of the invention is the provision of an improved transformer gin of the class described which is adapted to be attached to a line pole at any desired point and also adapted to be attached to the pole and the cross arm so that it is best located when the transformer is to hang from the cross arm.

Another object of the invention is the provision of an improved transformer gin which is simple, capable of economical manufacture and sale, light, and sturdy.

Another object of the invention is the provision of a tool or device of the class described, adapted to be used in connection with an adjacent line pole for lifting all sorts of devices, such as, for example, loading or unloading a pole from a vehicle.

Another object of the invention is the provision of a device of the class described which is adapted to be secured very firmly to the pole, but in which the securement or removal can be effected very quickly so that time and labor are saved by the use of the device.

Another object of the invention is the provision of an improved device of the class described, which has provision for preventing the twisting of the ropes of the block which is used for lifting the transformer or other article.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the three sheets of drawings accompanying this specification,

Fig. 1 is an elevational view showing two of

the transformer gins attached to a line pole in different ways;

Fig. 2 is a front elevational view of the transformer gin apart from the pole;

Fig. 3 is a side elevational view of the transformer gin, partially broken away, to show vertical sections of the structure at important points;

Fig. 4 is a horizontal sectional view on a larger scale, taken on a plane at right angles to the pole and passing through the axis of the securing bolt 12.

Fig. 5 is a horizontal sectional view, taken on the plane of the line 5—5 of Fig. 3, looking in the direction of the arrows;

Fig. 6 is a horizontal sectional view, taken on the plane of the line 6—6 of Fig. 3, looking in the direction of the arrows;

Fig. 7 is a fragmentary elevational view of the chain locking means, taken on the plane of the line 7—7 of Fig. 4;

Fig. 8 is a fragmentary sectional view, taken on the plane of the line 8—8 of Fig. 7;

Fig. 9 is a fragmentary sectional view, taken on the plane of the line 9—9 of Fig. 1.

Fig. 10 is a fragmentary top plan view, shown in partial section, the section being on the plane of the line 9—9 of Fig. 1.

Referring to Fig. 1, 10 indicates a line pole which is provided with a cross arm 11, and which is used to illustrate the application of the two devices 12 and 12A embodying the invention.

The transformer gins 12 and 12A are identical in construction, but illustrate different points of application of the gin to a pole. The gin which is indicated by the numeral 12, for example, preferably consists of an upwardly extending beam or column 13, which is formed of one or more steel bars of standard cross section 14, 15. For example, the bars 14, 15 are preferably of substantially V shaped cross section, the two angular sides 16, 17, and 18, 19 being in each instance joined by a flat yoke 20 or 21.

The width of the side flanges 18, 19 is preferably slightly less than that of the side flanges 16 and 17 so that when the V bars are nested the yoke 20 is spaced slightly from the yoke 21, and the rounded edges 22, 23 are close enough to each other to be welded together at 24.

These bars are preferably welded together at both edges, at a plurality of points 24, equally spaced from each other from the bottom to the top of the beam, as indicated by the numerals in Fig. 1.

The flat yokes 20, 21 provide a firm bearing for engaging the bolts which secure other fixtures

to the beam, and they also provide a flat bearing for securement of the overhanging arm 25, which is secured to the upper and outer end of the beam 13. This overhanging arm may comprise a cast metal member, the structure of which is best illustrated in Figs. 3 and 5. It may be provided with a vertical portion 26, a horizontal portion 27, and a diagonal bracing portion 28 integrally joined together to form a triangle.

All three of these portions may be of substantially T shape in cross section, having outwardly extending ribs 29 at each side and an inwardly extending web 30, except that the vertical portion 26 preferably has its web thickened beneath the nut 31 of the screw bolt 32, to provide a better bearing surface for the nut and a better body for the bore 33, which passes the bolt 32.

The two yokes 20, 21 (Fig. 5) of the beam are provided with registering apertures 34 for passing the bolt 32, the head of which engages the inner flat surface of the yoke 20. The vertical portion 26 of the arm 25 is preferably of sufficient width to embrace the outer surface of the yoke 21 (Fig. 5), and is also preferably provided with rearwardly extending lugs 35, 36 on each side of the yoke 21, engaging outside the side flanges 18, 19.

From another point of view, the lugs 35, 36 might be regarded as rearward extensions of the upper portion 27 and the diagonal portion 28 of the arm 25. These lugs engage the opposite sides of the beam and prevent any teetering or turning of the arm relative to the beam so that it can be secured tightly in place by a single bolt 32.

The diagonal bracing portion 28 joins the horizontal portion 27 of the arm 25 at a point 37 inwardly of the end of the arm, and the horizontal portion 27 may be thickened and extended to provide a means for support of a swivel eye 38. This end portion of the arm 25 is provided with a vertically extending bore 39 for receiving the screw bolt 40. The eye may consist of a drop forged steel member having a substantially circular eye aperture 41 formed by a curved portion 42, which itself is preferably circular in cross section.

This curved portion is joined to a flat bearing flange portion 43 at the top, which has an upper flat surface 44 for engaging the lower flat surface 45 on the end portion of the arm 25. A threaded bore 46 is provided in the upper part of the swivel eye 38 for receiving the threaded portion of the screw bolt 40.

The screw bolt 40 is preferably of such length that when the head is resting on top of the arm 25 and its end is threaded into the bore 45 and there is sufficient tolerance so that the swivel eye turns freely with the bolt in the bore 39, the lower end of the bolt may be riveted over at 47 to make sure that these parts will never separate and never bind.

The bolt may then be provided with one or more punched deformations 111, which so deform the threads that the riveted end of the bolt cannot rotate in the swivel eye. There is no danger of the threads of the bolt taking up the clearance which is desired.

The swivel eye 38 is used for receiving the hook 48 of the upper pulley 49 of a pulley block. The swivel eye turns freely to permit the ropes of the pulley block to be kept untwisted and to permit the operator to pull on the block from any direction.

Referring to Fig. 1, the pulley block may be of any standard construction, having a lower pul-

ley 50 provided with a hook 51 for supporting a transformer 52 by means of a rope 53. At its lower end the beam 13 is preferably provided with a pole-engaging fixture, which is best illustrated in Figs. 1, 3, and 6. This pole-engaging fixture may consist of a cast metal member which is provided with beam-engaging surfaces 54, 55, 56 complementary in shape and size to the inside of the innermost bar flanges 16, 17 and 20.

At its lower end this fixture 57 is provided with a laterally projecting flange 58 at each side, which may engage under the ends of the bars 14, 15 of which the beam is made. This flange helps to transfer the weight from the beam to the fixture 57.

The inner surface of the pole-engaging fixture 57 may be curved at 59, but it is provided at each end with an integral prong 60, 61, the prongs being equal in length and similar in shape and extending at substantially right angles to the yoke 21 or 29 of the beam.

The prongs 60, 61 extend in such a direction that they are adapted to engage in the line pole, and they are spaced from each other in such manner that they engage the opposite sides of the line pole. The curvature 59 in the fixture provides sufficient clearance so that the prongs may be driven into the line pole when the gin is secured to the pole as shown at the left in Fig. 1.

The fixture 57 is secured to the lower end of the beam by providing the yokes 20, 21 of the beam with a pair of registering apertures 62, 63 for receiving a screw bolt 64.

The fixture has a threaded bore 65 registering with the apertures 62, 63, and the screw bolt has its threaded end driven home in the bore 65 until the fixture is drawn tightly into the beam. Since its flat sides engage the flat inner surface of the flanges 16 and 17 of the yoke 20, there is no possibility of the fixture 57 rotating, and one bolt is sufficient to secure it tightly to the beam.

In order to save material this fixture 57 may be made hollow at 66, giving it a substantially trapezoidal shape, with a curved wall toward the pole.

The gin is provided intermediate its ends, and preferably near the lower end, with a securing fixture 67, best shown in Figs. 1, 3, and 4. This securing fixture may comprise a cast metal member which is adapted to embrace the beam 13 by means of the three flanges 68, 69, and 70, and a yoke 71. The flanges 68 and 70 and the yoke 71 have flat inner surfaces substantially complementary to the outer flat surfaces of the beam 13.

The yoke portion 71 is preferably thickened to provide sufficient body for supporting the bolt 72, which is located in a bore 73, and also passes through the registering apertures 74, 75 in the yokes 20, 21 of the beam.

When the bolt 72 has its nut driven home, this fixture draws the beam into tight engagement with the flanges 68 and 70 so that the fixture is firmly secured to the beam. The point of securement of the fixture is preferably such that it is spaced from the pole-engaging fixture 57 and also so that the prongs 60, 61 may be located below the cross arm 11 when the securing fixture 67 is located above the cross arm in the position shown at the right hand of Fig. 1. Thus the prongs 60, 61 do not interfere with the attachment of the device to the pole and cross arm.

The beam-engaging flanges 68, 70 and transverse flange 69 are preferably provided with nar-

row extension flanges 76, 77, which may be joined by a horizontal web 78. The extension flanges 76 and 77 are provided with what may be called chisel-shaped extensions or prongs 79, 80 adapted to engage in the wood of the pole, and the web 78 is curved so that it will not strike the pole except when the prongs 79, 80 are engaged in the wood of the pole.

The extension flange 77 is preferably provided on its outside with a chain securing lug 81, comprising an integral flange having a transverse bore 82 for receiving the end link 83 of a galvanized steel chain 84.

The chain 84 is of sufficient length so that it will embrace any pole or tree or other member with which the gin is intended to be used.

The web 78 is preferably provided with a diagonally extending guide groove, the walls 85, 86 of which are adapted to guide the rectangular shank 87 of a screw bolt. The screw bolt 87 is slidably mounted in the groove between walls 85, 86 and passes through the diagonal and rectangular aperture 88 in the flange 76.

The threaded end 89 of the bolt 87 passes through a diagonal aperture which is located substantially at the corner of the flanges 69 and 77, and the bolt emerges from the fixture at the bore 90, where the fixture has an external flat thrust surface 91.

The threaded end of the bolt has a nut 92, provided with a laterally projecting arm 93, having a ball 94 at the end for engagement with the hand. At its opposite end the bolt 87 is formed with an eye 95 for receiving a screw bolt 96. The bolt 87 extends diagonally of the fixture 67, and is so arranged that it is substantially tangential with respect to the periphery of the pole 97, the curved part of the eye 95 being turned inwardly.

The eye 95 and bolt 96 support a chain lock 98, which may consist of a cast metal or a drop forged member, having a pair of parallel flanges 99 and 100 spaced sufficiently to receive the eye 95. The flanges 99 and 100 have a pair of registering apertures 101, 102, and the screw bolt 96 passes through these apertures and through the eye 95, and is secured by a nut 103.

The flanges 99, 100 are spaced by a groove 104 sufficiently to receive the eye 95 and permit pivotal movement, and the main body of the chain lock 98 is provided at its opposite end with a horizontally extending groove 105 of sufficient width to receive one of the chain links when it is moved edgewise into the groove 105.

In addition to the groove 105, the chain lock 98 is provided with a curved recess 106 of sufficient width and curved laterally to fit the end of one of the chain links, as seen in connection with the chain link indicated at 84 in Fig. 7.

The recess 106 receives a chain link in transverse position so that the end surface 107 of that chain link engages the curved inner surface 108 to retain the chain in the lock. The surface 109 of the recess 106 curves backwardly to a point at 109 sufficiently so that the ridge 109 is rearward of the engaging part 107 of the link 84. Thus there is no danger of the link 84 escaping from the chain lock when a tension is placed on the chain. The balance of the chain, indicated in dotted lines in Fig. 8, hangs loosely from the chain lock.

The use and operation of the transformer gin is as follows: When the gin is to be applied to a pole above the cross arm, the bolt 72 is loosened and removed, and the beam 13 is slid out of the

aperture in the fixture 67. The beam is then applied with the surfaces of its inner flanges 16, 17 engaging the back side of the fixture 67, which is suitably shaped for this purpose, and the bolt is again inserted through the beam and the fixture 67 and tightened.

For this purpose it will be evident that, although the outside of the fixture 67 is relieved at 120 (Fig. 4) there is provided a vertically extending rib with a flat outer surface at 121 on each side and additional flat surfaces in the same plane at 122, 123.

The back edge or face of the fixture 67 is flat at 124 and of a size adapted to fit on the inside of the beam 13. Thus a single bolt is also adapted to secure the fixture 67 in front of the beam so that the fixture 67 has a greater width in front of the beam. The width of the fixture in this case is sufficient to traverse the cross arm, and the lower part of the fixture 67 is permitted to rest on the cross arm, while the curved surface on the web 78 engages the side of the pole above the cross arm.

The gin is then applied to the pole as follows:

The nut 92 is backed off until it approaches the end of the bolt so that there are plenty of threads to take up tension, and the chain is passed around the pole, and the links which are closest to the chain lock are inserted in the chain lock, in the manner shown in Figs. 7 and 8.

Then the nut 92 is tightened by means of its handle 93, 94 until the prongs 79, 80 are drawn into the pole, and the gin is firmly secured on the pole by means of the chain 84.

In this case the weight of the gin is borne partly by the cross arm 11, and the lower flat surface 110 of the fixture 67 engaging the flat top of the cross arm aids in preventing the tipping or teetering of the gin on the pole. The beam 13 then extends in substantially vertical position, as the flanges 76, 77 and web 78 are preferably made of sufficient width to traverse the cross arm.

In other words, the structure of the fixture is wide enough between the beam and the prongs 79, 80 so that the beam can be located beyond the cross arms when the prongs engage the pole.

The beam 13 is preferably kept in substantially vertical position whenever it is attached to a pole in order that it may be adapted to lift a maximum weight for its size and strength. In such case the beam acts more like a column than it does a cantilever, and its effective strength is accordingly increased as it approaches the vertical position.

The transformer 52 may be hung on the blocks which extend downwardly from the swivel eye 38; and the transformer having already been provided with cross arm hooks, it may be lifted, swung over, and placed on the cross arm, with the hooks on either side of the pole. In this connection it should be noted that the length of the gin is preferably such that it is longer than the combined length of the swivel eye, block and tackle, hook, and parts of the transformer which are above the transformer brackets, so that the transformer can be lifted well above the place where it needs to be lifted to be placed on the cross arm.

In order to release the gin from the pole it is only necessary to back off the screw 92 a short distance, when the chain will be loose enough to have its link 84 moved out beyond the hooked surface 109 of the chain lock 98.

When the gin is to be used for securement to a pole and not in connection with the cross arm, it

is applied as shown at the left of Fig. 1, and the two lower prongs 60, 61 are adapted to engage the pole. The two upper prongs 79, 80 are also adapted to engage the pole, and the chain is secured about the pole and fastened in the chain lock in the same manner previously described.

When the nut 92 is driven home, tensioning the chain, the prongs 60, 61 and 79, 80 are driven into the pole and find firm securement for preventing the tilting of the gin through their engagement in the wood of the pole.

The chain extending about the pole is a very certain and satisfactory and powerful mode of securing the gin to the pole, as there is no possibility of the chain being released from the chain lock 98 as long as tension is applied by means of the bolt 87 and nut 92.

The gin has a four point engagement with the pole, in addition to the curved surfaces on the web 78 and the curved surface 59 on the fixture 57. Although the gin extends at a slight angle in this case, as shown in Fig. 1 at the left, it is still approximately in vertical position and attains a maximum effective strength for its size and section.

The present gin may be used not only for lifting transformers, but for lifting poles for other equipment, and it is perfectly safe and certain in its attachment to the pole and to the block and tackle.

There is no danger of the tackle becoming twisted and no danger of the gin tilting, when properly applied. It can be applied to a pole very quickly.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a transformer gin, the combination of a column member adapted to extend substantially longitudinally of a line pole, said column member comprising a pair of structural steel members nested and welded together, said structural steel members each having a pair of diagonally extending flanges joined by a substantially flat yoke, means carried by one end of said column for attachment of a load, and prolonged means carried by the other end of said column for engagement in the wood of a pole, and a metal securing fixture carried intermediate the ends of said column, having a chain secured to one side thereof and adapted to extend about a pole having means for engaging the other end of said chain and tightening the chain about the pole.

2. In a transformer gin, the combination of a column member adapted to extend substantially longitudinally of a line pole, said column member comprising a pair of structural steel members nested and welded together, said structural steel members each having a pair of diagonally extending flanges joined by a substantially flat yoke, means carried by one end of said column for attachment of a load, and pronged means carried by the other end of said column for engagement in the wood of a pole, and a metal securing fixture carried intermediate the ends of said column, having a chain secured to one side thereof and adapted to extend about a pole having means for engaging the other end of said

chain and tightening the chain about the pole, said means at the lower end of said column comprising a cast metal member having engaging surfaces complementary to the inside of the diagonal flanges of said column, and threaded means for securing said cast metal member to said column.

3. A transformer gin comprising an elongated beam adapted to extend longitudinally of a pole, said beam being provided at one end with means for attachment of a hoist and being provided at its other end with means for fixedly engaging a pole, a fixture for attachment to the beam intermediate its ends, said fixture being provided with an aperture having surfaces complementary to the shape of the beam for engagement with the beam in one position, and said fixture having surfaces on its rear side for complementary engagement with surfaces on the front of said beam whereby the beam may be attached in another position to the fixture, with the fixture projecting far enough to traverse a cross arm when the beam is extending longitudinally of the pole.

4. In a transformer gin, the combination of a cast metal fixture of substantially triangular form, having a pair of spaced prongs adapted to engage in a telephone pole, with a securing chain having one end secured to said fixture, a threaded bolt, said bolt extending substantially tangentially of the pole, and having a threaded member with a radially projecting lever for tightening of the chain, the other end of said chain being secured in a pivoted locking member carried by said bolt, said pivoted locking member having two slots at an angle to each other for receiving two of the links of said chain, and an upwardly extending column carried by said fixture, said column having at its upper end a fixed arm for supporting a transformer and at its lower end prong means for engaging the side of the pole.

5. In a transformer gin, the combination of a cast metal fixture of substantially triangular form, having a pair of spaced prongs adapted to engage in a telephone pole, with a securing chain having one end secured to said fixture, a threaded bolt, said bolt extending substantially tangentially of the pole, and having a threaded member with a radially projecting lever for tightening of the chain, the other end of said chain being secured in a pivoted locking member carried by said bolt, said pivoted locking member having two slots at an angle to each other for receiving two of the links of said chain, and an upwardly extending column carried by said fixture, said column having at its upper end a fixed arm for supporting a transformer and at its lower end prong means for engaging the side of the pole, said column having a pair of flanges extending at the same angle to each other as the sides of said triangular fixture, and said column having a yoke between said flanges engaging a complementary part of said fixture.

6. In a transformer gin, the combination of a cast metal fixture of substantially triangular form, having a pair of spaced prongs adapted to engage in a telephone pole, with a securing chain having one end secured to said fixture, a threaded bolt, said bolt extending substantially tangentially of the pole, and having a threaded member with a radially projecting lever for tightening of the chain, the other end of said chain being secured in a pivoted locking member carried by said bolt, said pivoted locking

member having two slots at an angle to each other for receiving two of the links of said chain, and an upwardly extending column carried by said fixture, said column having at its upper end a fixed arm for supporting a transformer and at its lower end prong means for engaging the side of the pole, said column having a pair of flanges extending at the same angle to each

5 other as the sides of said triangular fixture, and said column having a yoke between said flanges engaging a complementary part of said fixture, said column being disposed in a triangular aperture in said fixture for the purpose of maintaining the column in more nearly vertical position when the gin is used on the side of a pole.

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