Dec. 6, 1932. F. H. SMITH ET AL 1,890,016

CABLE COMPACTING PRESS

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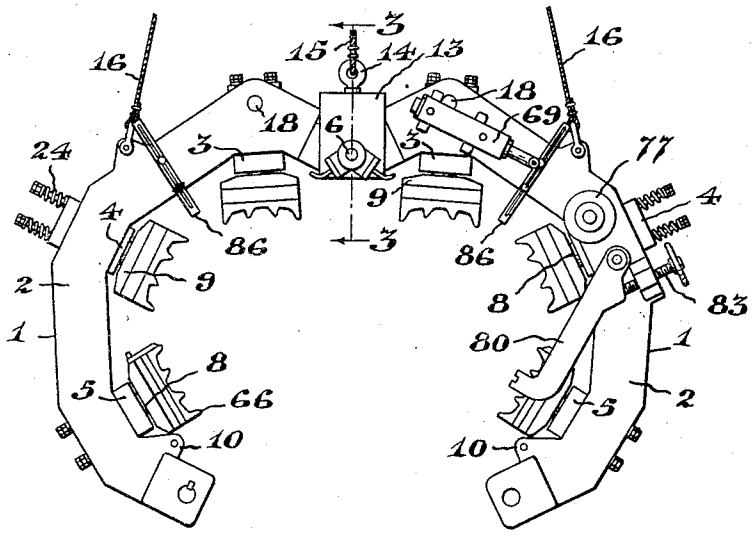


Fig. 1.

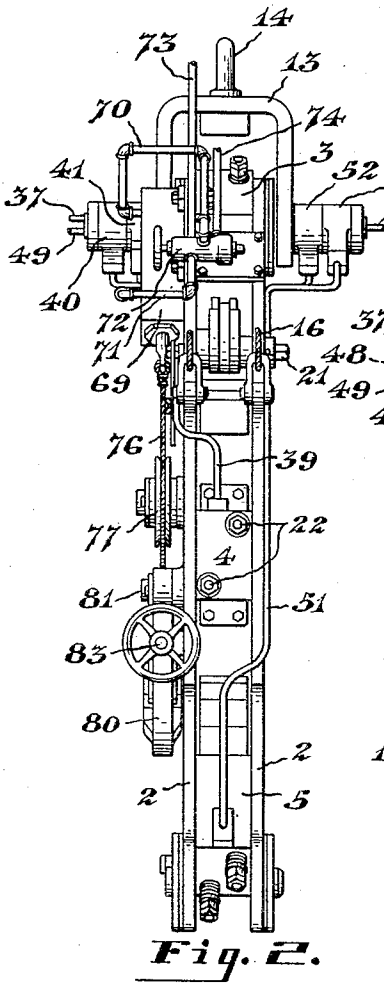


Fig. 2.

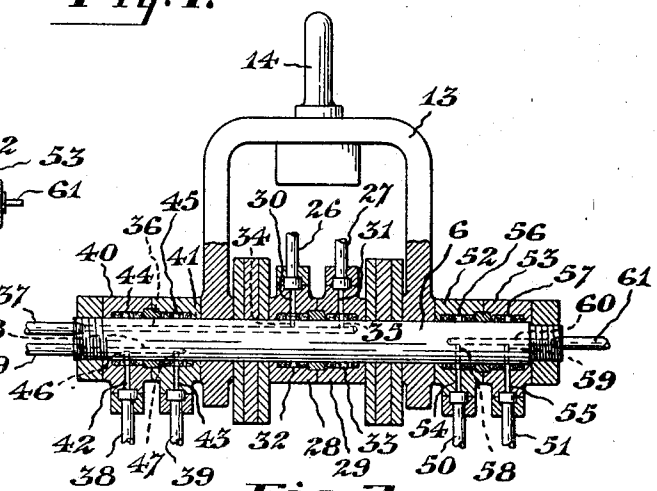


Fig. 3.

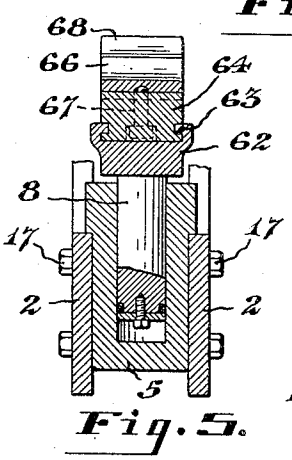


Fig. 5.

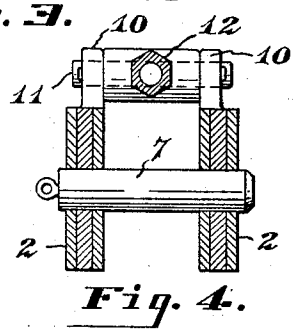


Fig. 4.

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Dec. 6, 1932. F. H. SMITH ET AL 1,890,016

CABLE COMPACTING PRESS

Filed March 2, 1931 5 Sheets-Sheet 2

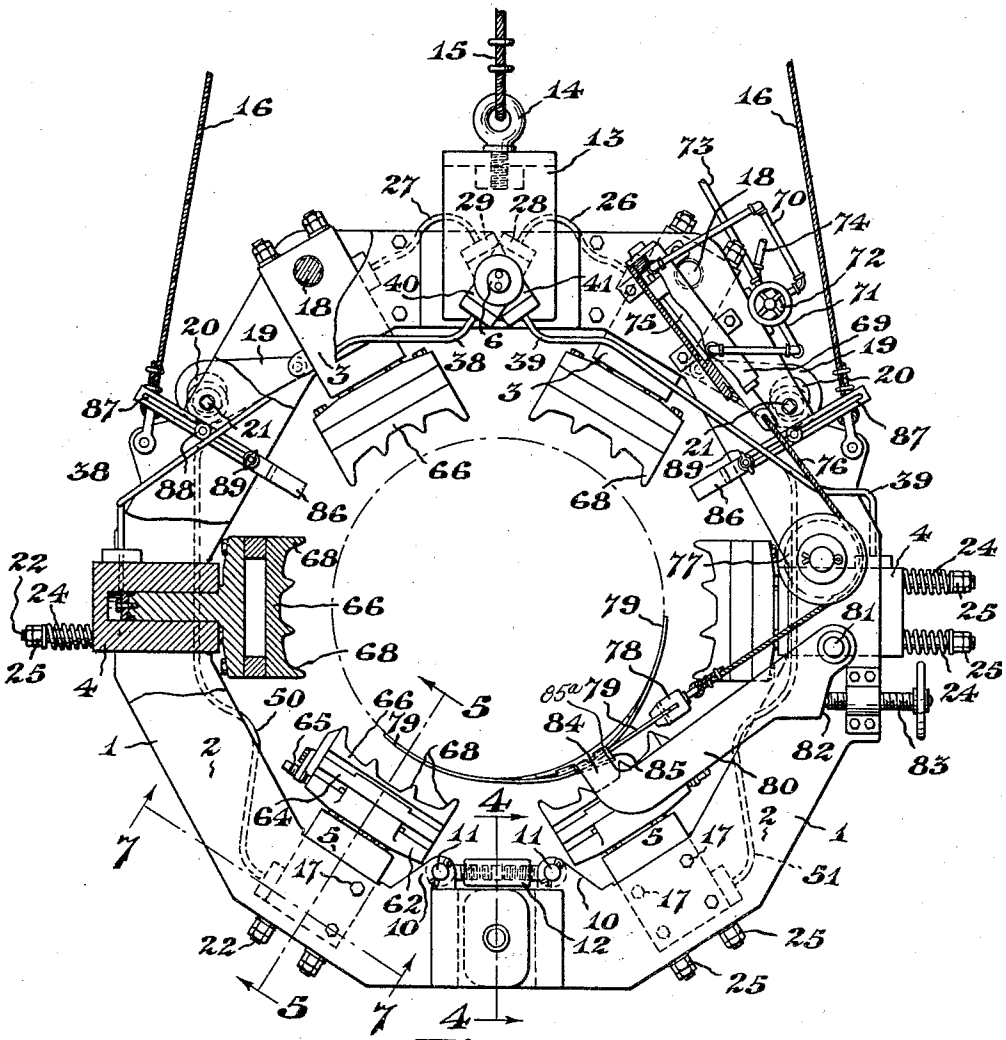


Fig. 6.

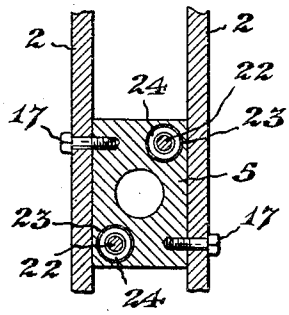


Fig 7.

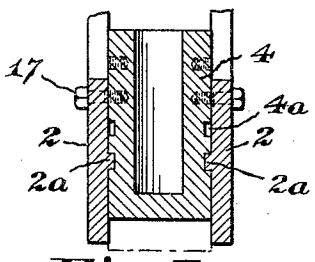


Fig. 8.

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Dec. 6, 1932. F. H. SMITH ET AL 1,890,016

CABLE COMPACTING PRESS

Filed March 2, 1931 5 Sheets-Sheet 3

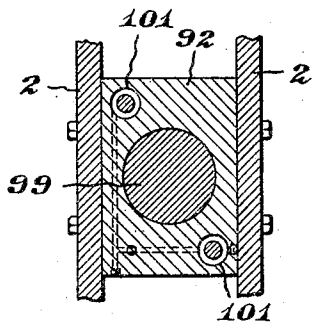


Fig. 10.

Fig. 9.

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CABLE COMPACTING PRESS

Filed March 2, 1931 5 Sheets-Sheet 4

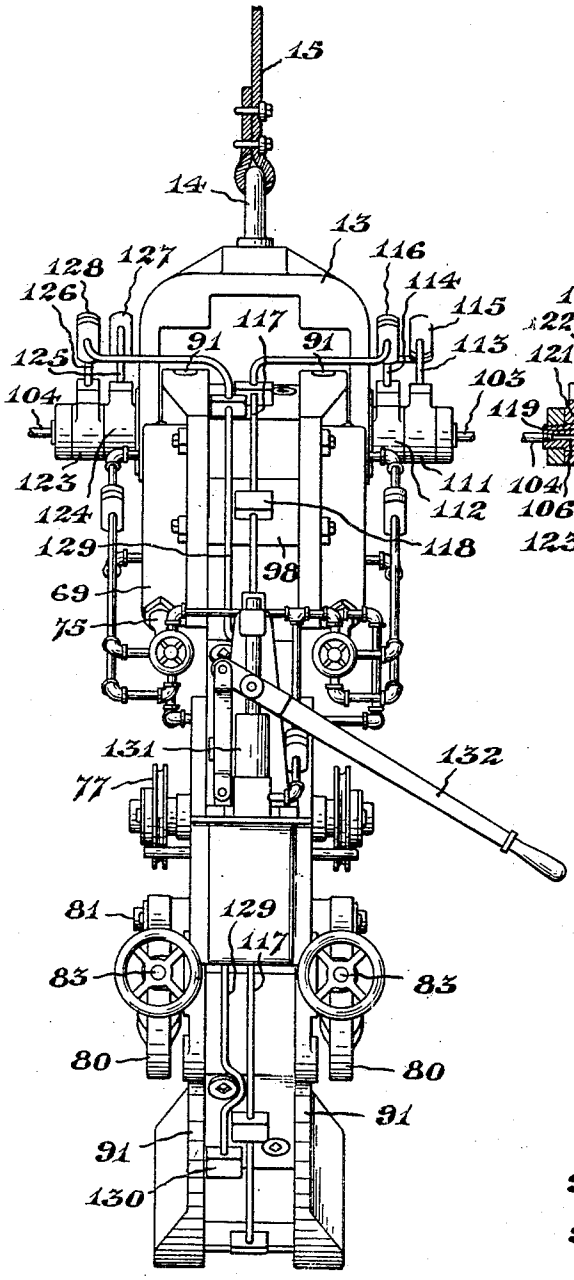


Fig. 11.

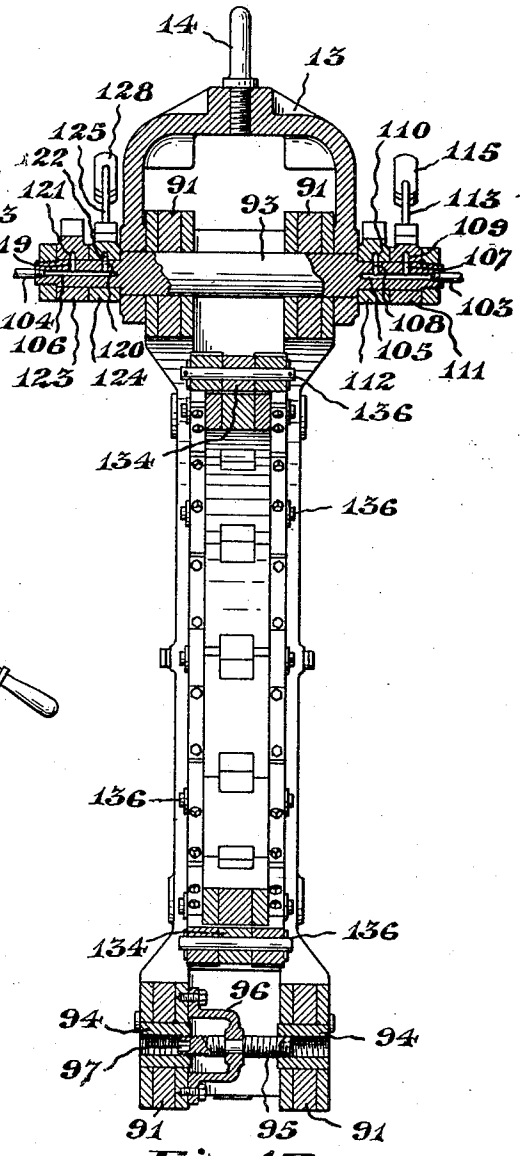


Fig. 12.

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Dec. 6, 1932. F. H. SMITH ET AL 1,890,016

CABLE COMPACTING PRESS

Filed March 2, 1931 5 Sheets-Sheet 5

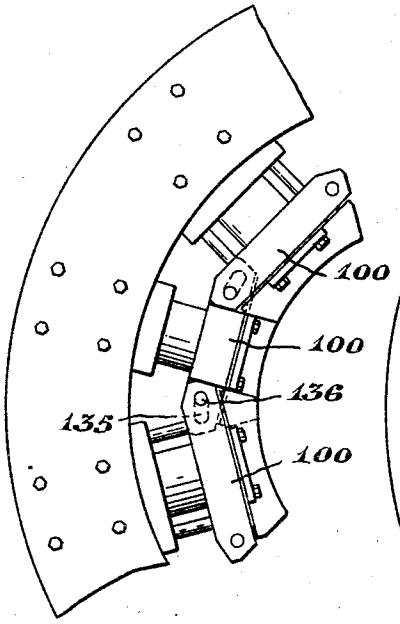


Fig. 14.

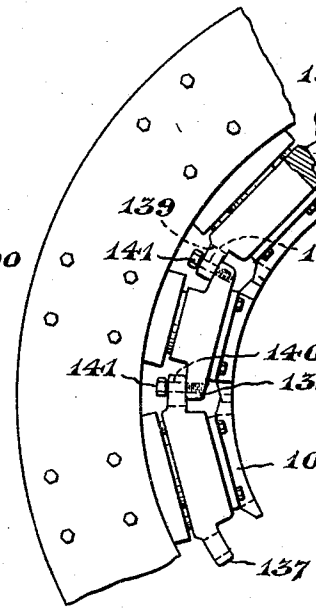


Fig. 15.

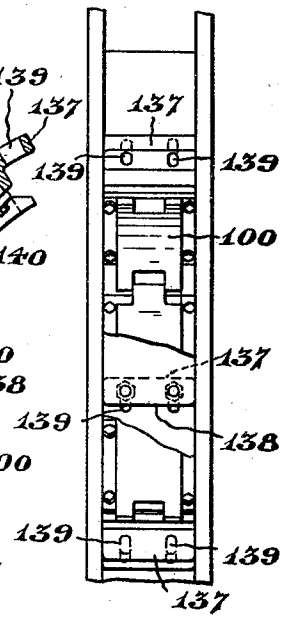


Fig. 16.

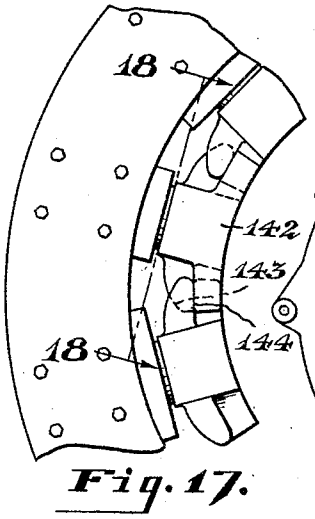


Fig. 17.

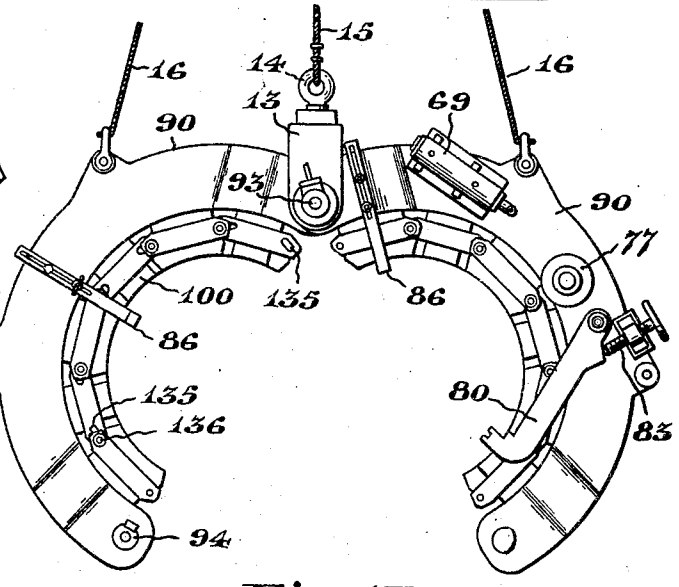


Fig. 13.

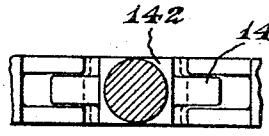


Fig. 18.

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Patented Dec. 6, 1932 1,890,016

UNITED STATES PATENT OFFICE

FRANK H. SMITH, OF HOBOKEN, NEW JERSEY, AND HENRY A. STRINGFELLOW, OF PHILADELPHIA, PENNSYLVANIA

CABLE COMPACTING PRESS

Application filed March 2, 1931. Serial No. 519,514.

This invention relates to cable compacting presses and is an improvement on the press disclosed in our copending application Serial No. 341,333, filed February 20, 1929, upon which Patent No. 1,818,435 was granted August 11, 1931, the press of the present invention being particularly designed for use in compressing a wire cable such as employed for supporting suspension bridges, the press being a press of the ring type having radially disposed hydraulic cylinders provided with radially movable pistons which have heads adapted to simultaneously engage the cable to compact the strands thereof, thereby reducing the cable to a smaller diameter and producing a cable round in cross section and of uniform diameter.

Large suspension cables as originally manufactured are commonly of hexagonal cross section and of relatively large diameter. In order to reduce the diameter of the cable and compress the strands thereof into a compact mass it has been proposed to subject the cable to pressure applied thereto by opposed hydraulic cylinders.

The present invention has for an object to provide a ring press having radially disposed cylinders for applying pressure to the cable, which is adapted to be applied to a cable after the cable has been mounted on the bridge structure, which can be quickly and easily moved along the cable to compress the cable at closely spaced points along the length thereof, which can be quickly and easily removed from the cable and applied thereto so that little time is lost in moving the press from one side to another of supporting or anchoring members through which the cable passes.

A further object of the invention is to provide a cable compacting press of the ring type which is adapted to be suspended from a suitable traveling support such as a crane mounted to move along the length of the cable, which is adapted to be opened by the hoisting means by which it is suspended so that the press can be quickly and easily released from the cable and shifted over obstacles such as the anchoring or supporting members above referred to.

A further object of the invention is to provide a ring press having cable engaging heads which are adjustable to accommodate the press to various shapes which different portions of a cable may have.

A further object is to provide means for independently controlling the delivery of pressure to certain of the pressure applying cylinders so that portions of the cable which are of abnormal shape may be uniformly compacted and brought to circular form.

A further object is to provide means for insuring uniform radial movement of the cable compacting head in the final pressing operation, so that the cable may be compressed to a uniform circular shape.

A further object of the invention is to provide means in connection with the cable compacting press for quickly applying bands to a cable extending through the press to firmly hold the cable to the reduced diameter to which it has been compressed by the press.

With the above and other objects in view the invention may be said to comprise the cable compacting press as illustrated in the accompanying drawings, hereinafter described, and particularly as set forth in the appended claims, together with such variations and modifications thereof as will be apparent to one skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings forming a part of this specification, in which:

Fig. 1 is a front elevation of a press embodying the invention, showing the press in open position;

Fig. 2 is a side elevation of the press shown in Fig. 1;

Fig. 3 is a section taken on the line indicated at 3—3 in Fig. 1;

Fig. 4 is a section taken on the line indicated at 4—4 in Fig. 6;

Fig. 5 is a section taken on the line indicated at 5—5 in Fig. 6;

Fig. 6 is a front elevation of the press in closed position with a portion broken away to show one of the cylinders in axial section;

Fig. 7 is a section taken on the line indicated at 7—7 in Fig. 6;

Fig. 8 is a radial section showing mounting for the pressure applying cylinders by which the cylinders may be adjusted radially;

Fig. 9 is a front elevation partially broken away to show parts in section showing a modification of the press which is designed particularly for performing the final cable shrinking operation;

Fig. 10 is a section taken on the line indicated at 10—10 in Fig. 9;

Fig. 11 is a side elevation of the press shown in Fig. 9;

Fig. 12 is a section taken on the line indicated at 12—12 of Fig. 9;

Fig. 13 is a front elevation of the press shown in Fig. 9 in open position;

Fig. 14 is a fragmentary detail view showing the pin and slot connection between adjacent cable engaging heads;

Fig. 15 is a detail view showing a portion of the press in front elevation, in which a modified form of connection between the cable engaging heads is provided;

Fig. 16 is an interior elevation of the cable engaging head shown in Fig. 15;

Fig. 17 is a fragmentary detail view showing another form of interlocking connection between the cable engaging heads;

Fig. 18 is a section taken on the line indicated at line 18—18 in Fig. 17.

In compacting large suspension cables there is a considerable reduction in the diameter of the cable, and it has been found preferable to subject the cable first to a preliminary compacting operation by means of one ring press to reduce the diameter and make the cable substantially round, and to then subject the cable to the final compacting operation by means of a second ring press of somewhat heavier construction and having a greater number of compression cylinders. For example, in one instance the original diameter of the cable was approximately 43 inches which was reduced by the preliminary compactor to about a 38 inch diameter and by the final compactor to approximately a 36 inch diameter. In the accompanying drawings, two embodiments of the invention are illustrated, one being a six-cylinder press suitable for the preliminary compacting operation, and the other a twelve-cylinder press suitable for the final compacting operation.

A press suitable for the preliminary compacting operation is illustrated in Figs. 1 to 8 of the drawings, and, as best shown in Figs. 1 and 6 of the drawings, the annular frame of the press is of hexagonal form and is composed of two substantially identical sections 1, each composed of side plates 2 which provide a housing for the pressure applying cylinders. Each section 1 has three cylinders, 3, 4, and 5, mounted between the side plates thereof at the corners of the hexagonal ring, the cylinders being equi-angularly spaced to apply pressure to the cable at substantially equi-angularly spaced points. The sections 1 of the annular cylinder supporting frame have adjoining ends connected by a pivot 6 and at their opposite ends are provided with interfitting apertured portions adapted to receive a suitable locking pin 7 which connects the annular frame around the cable to be compacted and holds the sections against separation.

Cylinders 3, 4 and 5 have radially movable pistons 8 mounted therein which have laterally elongated cable engaging heads 9 at their inner ends.

In some instances it is desirable to adjust the detachably connected ends of the frame section, and to permit this to be done the adjoining ends of the side plates 2 of the ring sections are provided with inwardly projecting ears 10 which provide bearings for a transverse pin 11 on each section and the pins 11 of the two sections are connected by a turnbuckle 12. The pins 11 are detachably mounted so that the turnbuckle can be readily removed when it is desired to separate the sections.

The annular press frame or cylinder supporting ring is suspended by means of a clevis 13 which straddles the interfitting ends of the sections 1 and receives the ends of the pivot 6. The clevis 13 is provided at the top thereof with eye bolt 14 to which is attached a suspension cable 15. Auxiliary suspension cables 16 are connected to the sections 1 outwardly of the pivot 6 so that the sections can be swung apart by applying tension to the cables 16 to permit the press to be lifted clear of the cable. When the press is being used to compact the cable the press is shifted along the cable after each compressing operation and pressure is applied to the cable at points along the length thereof which are sufficiently close together to compact the cable to a uniform diameter throughout the length thereof. When the compacting operation is performed on a cable which has been mounted on the bridge structure, it is necessary to frequently disengage the press from the cable in order to pass obstructions such as supporting or anchoring members through which the cable passes.

The present invention is adapted to be suspended from a traveling support such as a crane which moves along the length of the cable, and the hoisting connections provide means for quickly and easily detaching the press from the cable on one side of an obstruction and reassembling the press on the cable on the opposite side of the obstruction.

Suspension cables are, prior to the compacting operation, substantially hexagonal in form and there may be considerable variation in the shape of the cables at different points along its length. In order to enable the pressure applying heads 9 to effectively

engage the cable at points where the cable is distorted, means is provided for relatively adjusting the pressure applying heads. The cylinders 3 and 4 of each of the sections are rigidly secured between the side plates 2 by means of bolts 17, the cylinders 3, however, are adjustable and are pivotally connected adjacent their outer ends to the side plates by means of pivot pins 18. Cylinders 3 are adjusted and held against rocking movements in their adjusted positions by means of links 19 which are pivotally connected at their inner ends to the sides of the cylinders 3 inwardly of the pivots. The outer ends of the links 19 are mounted on eccentrics 20 which are carried by shafts 21 journaled in the side plates 2 and provided with squared ends which are adapted to be engaged by a suitable tool to turn the eccentric to adjust the links and the cylinder attached thereto. By pivotally adjusting the cylinders 3 the cable adjusting shoes carried by the pistons of the cylinders 3 can be positioned for effective engagement with corners of the cable at points where the cable is distorted from its normal shape. Each cable engaging head 9 has a pair of pullback rods 22 attached thereto which extend through bores 23 formed in the cylinder blocks on opposite sides thereof and on each rod there is mounted a pullback spring 24 which bears at its outer end on a nut 25 at the outer end of the rod and exerts an outward pressure tending to shift the piston to its outermost position.

In order further to control the preliminary compacting operation the cylinders are connected in pairs by means of separate pressure connections permitting independent operation of each pair of cylinders, so that where there is considerable distortion of the cable, the cable can be brought to a more nearly round shape prior to the simultaneous application of pressure to all of the cylinders.

Fluid under pressure for operating the cylinders of the press is preferably delivered through suitable conduits such as hose lines from a pumping apparatus mounted independently of the press, and the pressure lines leading to the various cylinders are connected through the pivot 6 of the cylinder supporting annulus. Liquid for operating the cylinders 3 is delivered through pipes 26 and 27 which are attached at one end to the cylinders and at the other to collars 28 and 29 which are rotatably mounted on the pin 6 between the side plates 2 of the annular fame. The collars 28 and 29 have radial passages 30 and 31 which communicate with the pipes 26 and 27 and with annular grooves 32 and 33 on the interior of the collars which are in constant communication with radial ports 34 and 35 in the pin 6 which lead to a longitudinal passage 36 which extends to one end of the pin and communicates at said end with a pipe 37 which is attached to the end of the hinge pin and leads to the pumping apparatus.

Cylinders 4 which are mounted midway between the ends of the sections 1 are connected by pipes 38 and 39 to collars 40 and 41 rotatably mounted on one end of the hinge pin 6. Collars 40 and 41 are provided with radial passages 42 and 43 which communicate with the pipes 38 and 39 and with internal grooves 44 and 45 formed in the collars which are in constant communication with radial ports 46 and 47 in the pin 6 which lead to a longitudinal passage 48 which extends to one end of the pin and communicates with a pipe 49 attached to said end of the pin and leading to the pumping apparatus.

The lowermost cylinders 5 are connected by pipes 50 and 51 to collars 52 and 53 which are rotatably mounted on the opposite end of the pin 6. Collars 52 and 53 have radial passages 54 and 55 which communicate with the pipes 50 and 51 and with internal grooves 56 and 57, which form annular chambers around the pin 6, which are in constant communication with radial ports 58 and 59 leading to a longitudinal passage 60 in the pin, which extends to one end of the pin and communicates at said end with a pipe 61, which leads to the pumping apparatus. The separate pipe lines leading to the cylinders may be controlled by suitable valves to deliver liquid under pressure when desired or to permit the liquid to flow from the cylinders as the pistons are moved outwardly by the pullback springs 24. As clearly shown in Figs. 1 and 6, the cylinders 4 are positioned at a greater distance from the axis of the press than the cylinders 3 and 5 so that the press is adapted to be placed over a portion of the cable which has been distorted to elliptical cross-section. When necessary the space between the pressure applying heads 9 operated by the cylinders 4 may be increased by adjusting the turnbuckle 12.

In order further to facilitate the compacting of distorted portions of a cable, pressure applying heads carried by the pistons mounted in the cylinders 5 are made laterally adjustable. As shown in Figs. 5 and 6, the piston has an integral shoe supporting head 62 provided with a way 63 in the outer face thereof in which is slidably mounted a shoe 64 which may be adjusted toward or away from a pressure applying head by means of an adjusting screw 65. The shoe 64 carries a face plate 66 secured thereto by means of bolts 67. All of the pressure applying heads are provided with projecting ribs 68 which are adapted to receive strands of the cable between them to prevent the cable strands from slipping with respect to the pressure applying heads during compacting operations.

In compacting portions of the cable which have not been distorted, pressure may be applied simultaneously to the cylinders to compress the cable to a smaller diameter, and to change the form of the cable from hexagonal to round. When the press is applied to portions of the cable which have been distorted the long diameter of the cable is positioned between the cylinders 4 and, when necessary to accommodate the cable, the sections of the supporting annulus may be spread somewhat by adjusting the turnbuckle 12. The upper cylinders 3 are then adjusted to properly position the heads thereof for engagement with corners of the hexagonal cable and the shoes 62 operated by the lower cylinders 5 may be adjusted laterally to properly position them for engagement with the corners of the cable on the lower side thereof.

Where there is considerable distortion of the cable it may be advisable to first operate the cylinders 4 to bring the cable to a form more nearly round before pressure is applied to the cylinders 3 and 5, and in some cases it may be desirable to operate either the upper or the lower cylinders independently before pressure is applied simultaneously to all of the cylinders.

In order to adapt the press of the present invention to operate on cables of different diameters the pressure applying cylinders may be so mounted between the side plates of the annulus that they may be adjusted radially. As shown in Fig. 8, the cylinders 4 may be provided with spaced transverse grooves 4^a on opposite sides thereof which receive ribs 2^a formed integrally with the side plates 2. By engaging different grooves 4^a of the cylinders with the ribs 2^a the cylinders may be radially adjusted.

In order to hold the cable to the form to which it has been compacted by the press, it is necessary to band the cable at intervals along the length thereof, and in order to facilitate the banding operation, means is provided on the press for applying a band to the cable immediately adjacent the press while the cable is clamped by the press.

As best shown in Fig. 6 of the drawings, a jack cylinder 69 is mounted on one of the side plates 2 of the press annulus and this cylinder is provided with pressure connections in the form of pipes 70 and 71 connected to opposite ends of the cylinder and extending to a control valve 72 which controls communication between the pipes 70 and 71 and supply and exhaust pipes 73 and 74. The cylinder 69 is provided with a piston 75 to which is connected a pull cable 76 which extends over a sheave 77 carried by the side plate on which the cylinder is mounted and the free end of the cable 76 carries a gripper 78 which is adapted to grip an end of a band 79 encircling the cable. The end of the band opposite that engaged by the gripper 78 is held by an anchoring arm 80 which is connected at its outer end to the side plate of the press annulus adjacent the sheave 77 by means of a pivot 81. Adjacent the pivot the arm 80 has a shoulder 82 which is engaged by a screw 83 which may be operated manually to adjust the inner end of the arm toward the periphery of the cable held in the press. The inner end of the arm 80 has an inwardly extending forked portion 84 which is adapted to straddle a wedge shape clamping sleeve 85 and a saddle 85^a which provide an anchor for one end of the band 79 and a guide for the opposite end to which the pull is applied. The saddle 85^a is held by shoulders engaging with the forked end 84 of the anchoring arm when tension is applied to the band 79. When the band is assembled as shown in Fig. 6, with one end anchored to the clamping sleeve 85 and the other passing through the sleeve, it may be drawn very tightly against the periphery of the cable by hydraulic pressure acting on the piston 75, and after the band is drawn tight against the cable it may be clamped in place on the cable by driving a wedge into the large end of the clamping sleeve 85.

In order to assist in properly positioning the band on the cable, radially adjustable guide bars 86 are mounted on the frame sections, the guide bars 86 being provided with longitudinal slots 87 which receive pins 88 secured to the side plate 2. The guide bars 86 may be moved radially into engagement with the periphery of the cable and in applying the band 79 the band may be positioned against the faces of the guide bars, which may be held in adjusted position by means of wing nuts 89 on the guide pins 88.

In Figs. 9 to 13 of the drawings, there is shown a press of slightly different construction which is suitable for performing the final compacting operation on a suspension cable. On this press the supporting annulus is of circular form composed of two semicircular sections 90 each composed of side plates 91 which are attached to opposite side faces of cylinder blocks 92. At the top of the annulus the sections 90 are connected by a pivot pin 93.

The lower ends of the sections are adapted to be detachably connected by means of a suitable locking device. As shown in Fig. 12 the locking device may consist of a pair of tubular locking pins 94 which are internally threaded for engagement with opposite ends of a screw 95 which is provided with oppositely inclined threads at its opposite ends. The central portion of the screw 95 is rotatably mounted and held against longitudinal movement in a bracket 96 which is fixed to one of the sections 90 and the opposite ends of the screw 95 are provided with sockets 97 in which a suitable tool may be inserted to turn the screw to simultaneously move the

locking pins 94 inwardly or outwardly thereon. When the tubular pins 24 are shifted to their innermost positions, their outer ends lie within the side plates of the section of the annulus opposite that to which the bracket 96 is attached, so that the sections are released and free to swing to open position.

Each of the cylinder blocks 92 has a cylinder 98 therein, and in these cylinders are mounted pistons 99 which carry cable engaging shoes 100 at their inner ends. The cylinders are placed sufficiently close together to enable the laterally elongated shoes 100 to engage the cable substantially throughout the periphery thereof, so that a uniform compacting pressure is exerted throughout the circumference of the cable. Alternate cylinder blocks are provided with pullback cylinders 101 in which are mounted pistons 102 which are attached to the heads 100, the pullback cylinders being preferably arranged in pairs with the cylinders of each pair at opposite corners of a cylinder block so as to obtain a balanced pull on the pistons, and to hold the main pistons against turning movement.

This press operates upon a cable which has been made substantially round by the preliminary compacting operation, and pressure is supplied simultaneously to all of the cylinders 98 to actuate the pistons simultaneously. Pressure is also supplied simultaneously to the pullback cylinders 101 in order to move the pistons outwardly away from the cable in unison.

The liquid under pressure for operating the cylinders is preferably supplied from a pump mounted independently of the press. The liquid for operating the main cylinders is supplied from the pumping apparatus through a pipe 103 attached to one end of the pivot pin 93 and the liquid for operating the pullback cylinders is supplied through a pipe 104 attached to the opposite end of the pivot pin, the opposite ends of the pivot pin being provided with axial passages 105 and 106 communicating with the pipes 103 and 104. At one end thereof, the pivot pin is provided with radial ports 107 and 108 which establish communication between the axial passage 105 and internal grooves 109 and 110 formed on the interior of collars 111 and 112 which are rotatably mounted on the end of the pivot pin. The collars 111 and 112 have pipes 113 and 114 attached thereto through which liquid is delivered from chambers formed by the internal grooves 109 and 110. Pipes 113 and 114 are short pipes connected by detachable couplings 115 and 116 with pipe lines 117 which are mounted on the sections 90 of the press annulus and extend throughout the length of these sections centrally over the outer ends of the cylinder blocks 92. Fittings 118 are provided at the outer ends of the cylinder blocks through which communication is established between the pipe lines 117 and the cylinders 98.

The axial passage 106 at the opposite end of the pivot pin 93 has radial ports 119 and 120 which communicate with internal grooves 121 and 122 formed on the interior of collars 123 and 124, which are rotatably mounted on the end of the pivot pin. The collars 123 and 124 have attached thereto short pipes 125 and 126 which are connected by detachable couplings 127 and 128 with pipe lines 129 on the opposite sections of the press annulus. The pipe lines 129 communicate with each of the pullback cylinders 101 through fittings 130 attached to the cylinder blocks so that pressure is supplied simultaneously to the pullback cylinders. Pipe lines 103 and 104 will be controlled by suitable valves as well understood in the art, so that when pressure is applied to the main cylinders 98 liquid will be forced from the pullback cylinders through the pipe lines 129, pipes 125 and 126, collars 123 and 124 through the pipe 104, and when pressure is applied to the pullback cylinders 101 liquid will be forced by the pistons 99 through the pipe lines 117, pipes 113 and 114, collars 111 and 112 through the pipe 103.

The presses shown in Figs. 9 to 13 are provided with band applying devices which are the same as that shown in connection with the modification first described, and since these devices require no further description, they are designated by the same reference numerals as in Figs. 1 to 8. As shown in Fig. 10, two band applying devices are employed, one on each side of the press, so that bands may be applied to the cable on opposite sides of the press before the press is released. As shown in Figs. 9 and 10 a hand operated pump 131 may be mounted directly on one of the sections 90 for supplying pressure to the jack cylinders 75, and this pump may be operated by a hand lever 132.

In order to keep the cable round as it is being compressed, means is provided for so interconnecting the pressure applying shoes 100 that the shoes are caused to have simultaneous radial movements. As shown in Figs. 9 and 13, the adjoining ends of the shoes are provided one with a tongue 134 and the other with a recess in which the tongue fits, and each of the tongues is provided with an elongated slot 135 which receives a transverse pin 136 carried by the member provided with the recess which extends across the recess and through the slot 135 of the tongue. The pin and slot connection between adjacent heads positively holds the heads against relative radial movement, but permits the heads to move together telescopically as the circumference of the cable engaged by the heads is reduced.

Figs. 15 and 16 of the drawings show an-

other means of connecting the pressure applying shoes for simultaneous radial movement, the shoes in this case being provided at the ends thereof with overlapping tongues 137 and 138, the outermost tongue 137 being provided with elongated slot 139 which receives pins 140 which are secured to the tongues 138 and extend radially through the slots 139. The outer ends of the pins 140 are provided with heads 141 which prevent the tongues 137 from moving radially outwardly away from the tongue 138. The slots 139 permit relative sliding movement between the tongues 137 and 138 to allow relative lateral movement between the shoes as the shoes are moved inwardly toward the axis of the press and outwardly away from the axis.

Figs. 17 and 18 show still another interlocking connection between the pressure applying shoes. In this modification, the heads 142 are provided with telescopically interfitting projections 143 and 144 which permit lateral sliding movements but which interlock to prevent relative radial movement of the heads.

After each final compacting operation the cable is banded on opposite sides of the press prior to the release of the press so that the cable is firmly held to the diameter which it has been compacted by the press.

Both of the presses herein disclosed may be quickly and easily shifted along the length of the cable to the successive points along the length of the cable at which the compacting pressure is to be applied. After each compressing operation, bands can be quickly applied to the cable before releasing the press to hold the cable against expansion after the pressure is released. Each of the two presses shown may be quickly and easily shifted past obstructions such as supporting or anchoring members through which the cable passes, so that the time required for compacting a cable is materially reduced.

When the locking means is released the press annulus may be opened by relieving the tension on the hoist cable 15 and applying tension to the hoist cables 16, and when the annulus is opened it may be lifted clear of the cable or lowered to a position straddling the cable, and the annulus may be closed over the cable by lowering the press with the sections spread apart until the sections straddle the cable and then applying a pull on the cable 15 while releasing the pull on the cables 16.

It will be apparent that the present invention provides a press of compact and rugged construction which may be easily handled by a simple hoisting mechanism.

It will further be apparent that the present invention provides means capable of compacting portions of a cable which have been considerably distorted and which will form the cable to a uniform size and circular cross section.

Furthermore, it is to be understood that the particular form of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

What we claim is:

1. A cable compacting press comprising an annulus composed of arcuate sections pivotally connected end to end, releasable locking means for securing an end of one section to the abutting end of another section when the annulus is closed, a series of fluid pressure cylinders carried by said annulus, said cylinders having radially disposed pistons provided with cable engaging heads at their inner ends, means for simultaneously supplying pressure to said cylinders to impart radial inward movement to said pistons, and means carried by said annulus for tightening a band on the cable.

2. A cable compacting press comprising an annulus composed of arcuate sections pivotally connected end to end, releasable locking means for securing an end of one section to the abutting end of another section when the annulus is closed, a series of fluid pressure cylinders carried by said annulus, said cylinders having radially disposed pistons provided with cable engaging heads at their inner ends, means for simultaneously supplying pressure to said cylinders to impart radial inward movement to said pistons, and means carried by said annulus for tightening a band on the cable comprising an anchoring member and a hydraulically actuated puller for engagement with opposite ends of a band encircling the cable.

3. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders each having a cable engaging head at its inner end, means for supplying fluid under pressure to said cylinders, releasable locking means for securing the free ends of the sections together, and means carried by one of said sections for drawing a band into tight engagement with the cable.

4. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders each having a cable engaging head at its inner end and means for supplying fluid under pressure to said cylinders, re-

leasable locking means for securing the free ends of the sections together, and band applying means mounted on said ring comprising an anchoring member engageable with one end of a band encircling the cable, and a hydraulically actuated puller for engagement with the opposite end of the band.

5. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders each having a cable engaging head at its inner end and means for supplying fluid under pressure to said cylinders, releasable locking means for securing the free ends of the sections together, and band applying means mounted on said ring comprising an anchoring member engageable with one end of the band encircling the cable, a combined band anchoring and guiding arm adjustably connected to said ring, a hydraulic cylinder mounted on the ring having a movable piston, means for supplying pressure to said cylinder to actuate said piston and means connected to said piston provided with means for engagement with an end of a band encircling the cable for pulling the band into tight engagement with the cable.

6. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders each having a cable engaging head at its inner end and means for supplying fluid under pressure to said cylinders, releasable locking means for securing the free ends of the sections together, and band applying means mounted on said annulus comprising an anchoring member engageable with one end of a band encircling the cable, an arm pivotally connected to one of said sections, said arm having an end portion and providing an anchor for one end of said band and a guide for the opposite end of the band, and a hydraulically actuated puller mounted on the annulus adapted to apply tension to the latter end of the band.

7. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable means for securing the opposite ends of the sections together, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders each having a cable engaging head at its inner end, and means including a plurality of independent pressure supply lines for operating certain of said cylinders independently of the others.

8. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable means for securing the opposite ends of the sections together, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders each having a cable engaging head at its inner end, and means for independently actuating the cylinders of each section including a separate pressure line connected to each of the cylinders.

9. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable locking means for securing the free ends of the sections together, a plurality of fluid pressure cylinders carried by each section, each cylinder having a radially disposed piston provided with a cable engaging head at its inner end, certain of said cylinders being pivotally mounted on the annulus, and means for adjusting the latter cylinders about their pivots.

10. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable locking means for securing the free ends of the sections together, a plurality of fluid pressure cylinders carried by each section, each cylinder having a radially disposed piston provided with a cable engaging head at its inner end, certain of said cable engaging heads being mounted for lateral adjustment on the pistons.

11. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable locking means for securing the free ends of the sections together, a plurality of fluid pressure cylinders carried by each section, radially disposed pistons in said cylinders, each having a cable engaging head at its inner end, means connecting said cable engaging heads for simultaneous radial movement, pullback cylinders having pistons connected to certain of said heads and means for simultaneously supplying pressure to the main cylinders and for simultaneously applying pressure to the pullback cylinders.

12. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable locking means for securing the free ends of the sections together, a plurality of fluid pressure cylinders carried by each section, and radially disposed pistons in said cylinders provided with cable engaging heads at their inner ends, said heads having integral end portions which interfit telescopically to hold said heads against relative radial movements.

13. A cable compacting press comprising an annulus composed of two substantially semicircular sections, a pivot connecting an end of one section to an end of the other, releasable locking means for securing the free ends of the sections together, a plurality of fluid pressure cylinders carried by each section, and radially disposed pistons in said cylinders provided with cable engaging heads at their inner ends, said heads having telescopically interfitting integral tongues which hold the heads against relative radial movements.

In testimony whereof we affix our signatures.

FRANK H. SMITH.
HENRY A. STRINGFELLOW.