

No. 637,583.

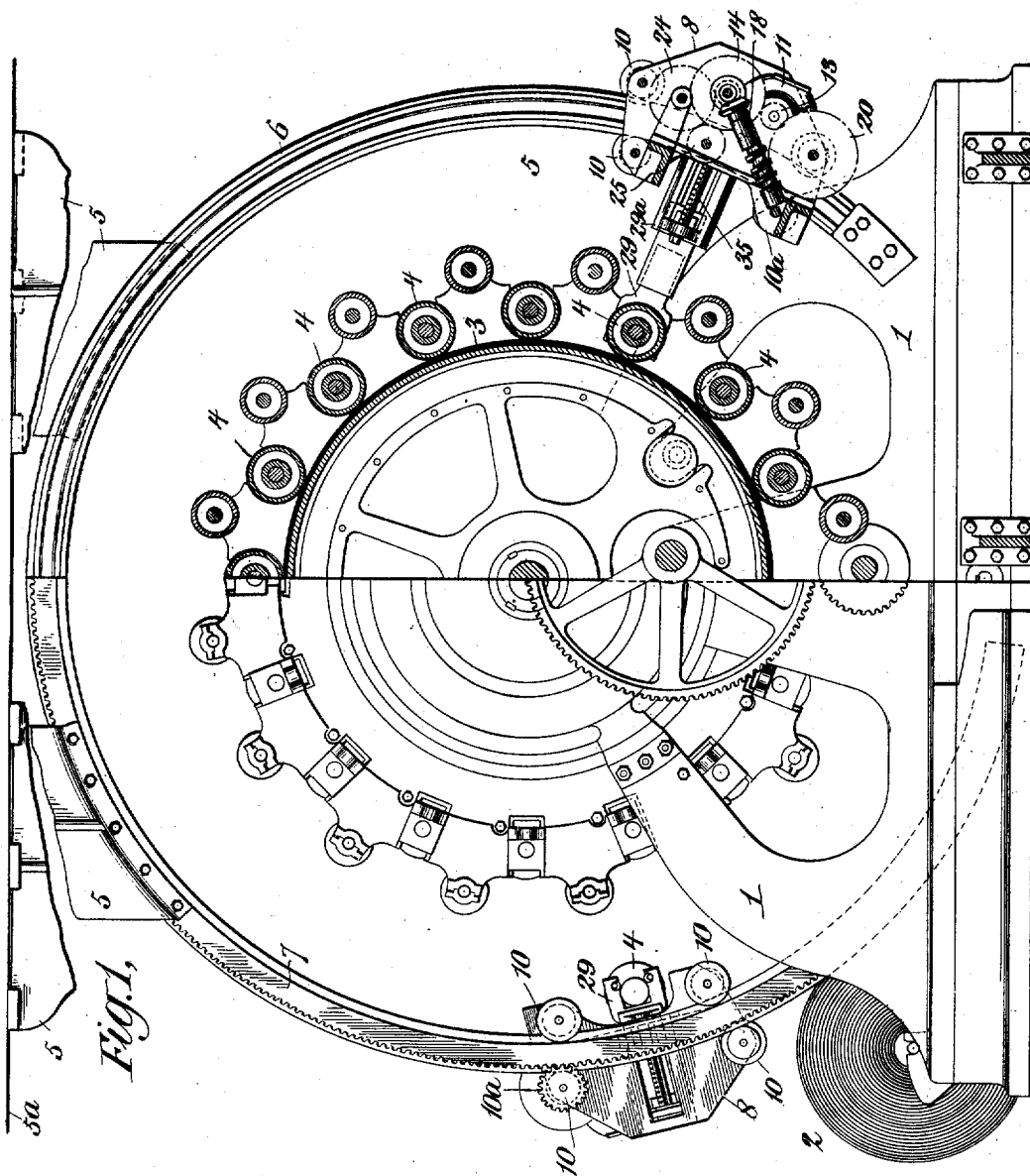
Patented Nov. 21, 1899.

E. HETT.
TUBE HANDLING DEVICE.

(Application filed Jan. 3, 1899.)

(No Model.)

9 Sheets—Sheet 1.



WITNESSES:

O. K. Hayward
Geoff. Milby

INVENTOR

Edward Hett

BY

Mittler & Kerrigan
ATTORNEYS

No. 637,583.

Patented Nov. 21, 1899.

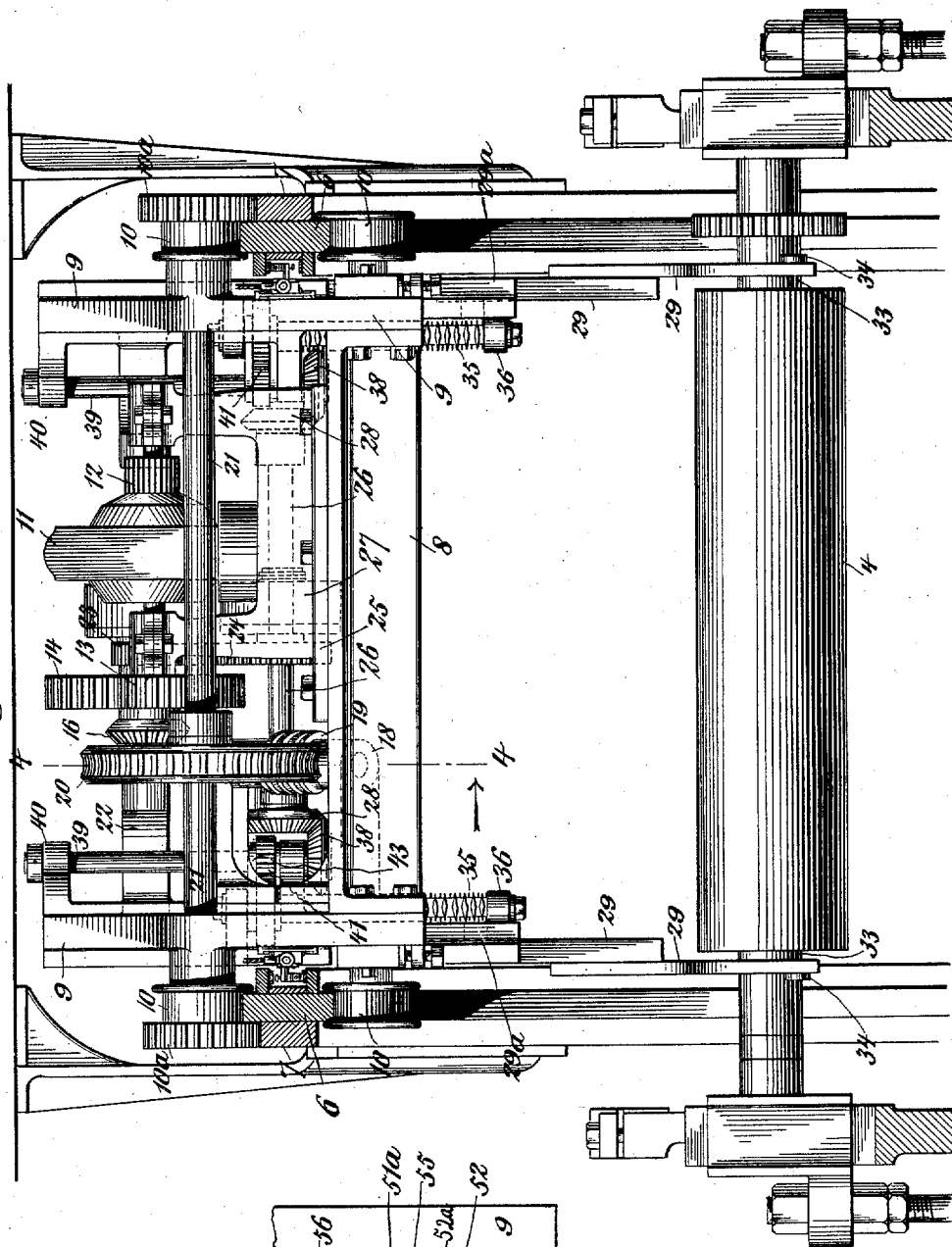
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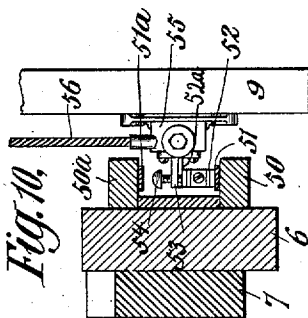
Fig. 2.



WITNESSES:

O. H. Haywood
Geo. D. Phillips

Fig. 10.



INVENTOR

Edward Hett

BY

Mitter & Kerrison
ATTORNEYS

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9 Sheets—Sheet 3.

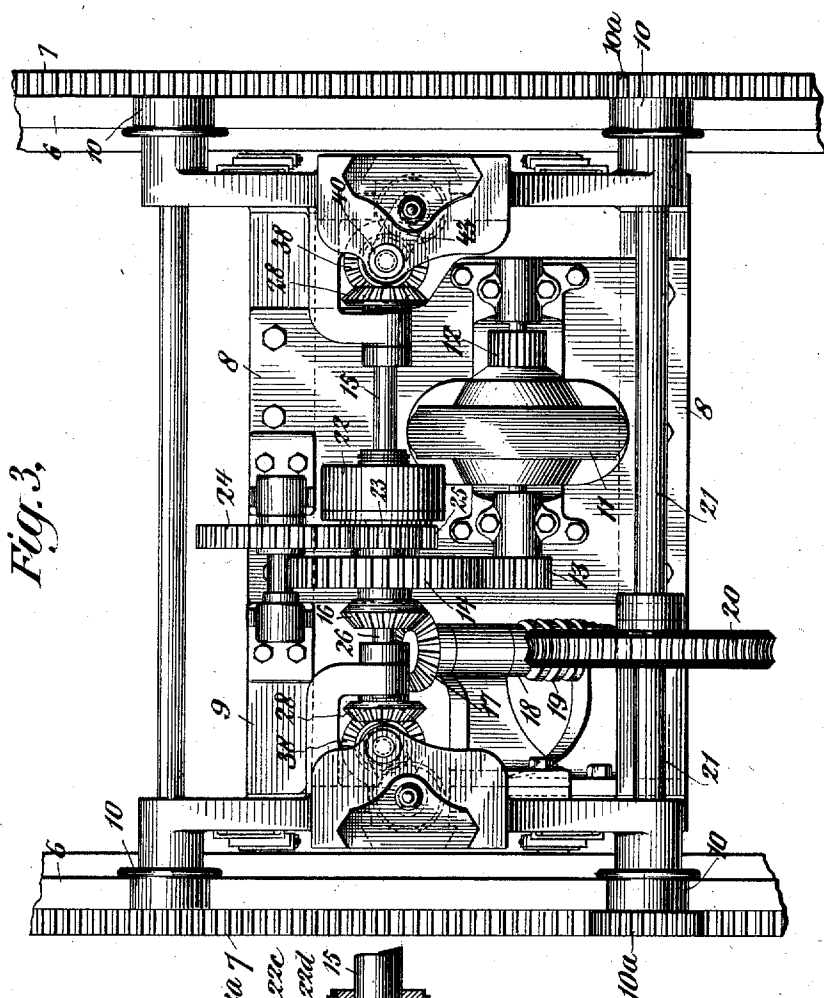
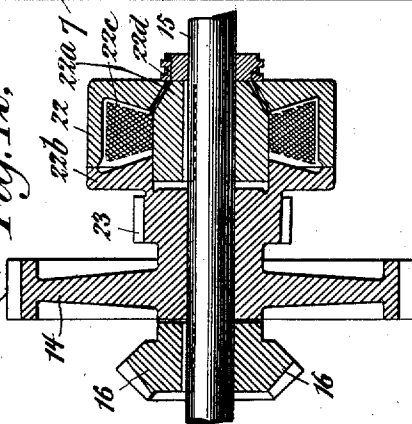


Fig. 12.



WITNESSES:

R. H. Raymond
Geo. W. Kelly

INVENTOR

Edward Hett

BY

Mitter & Kerrigan
ATTORNEYS

No. 637,583.

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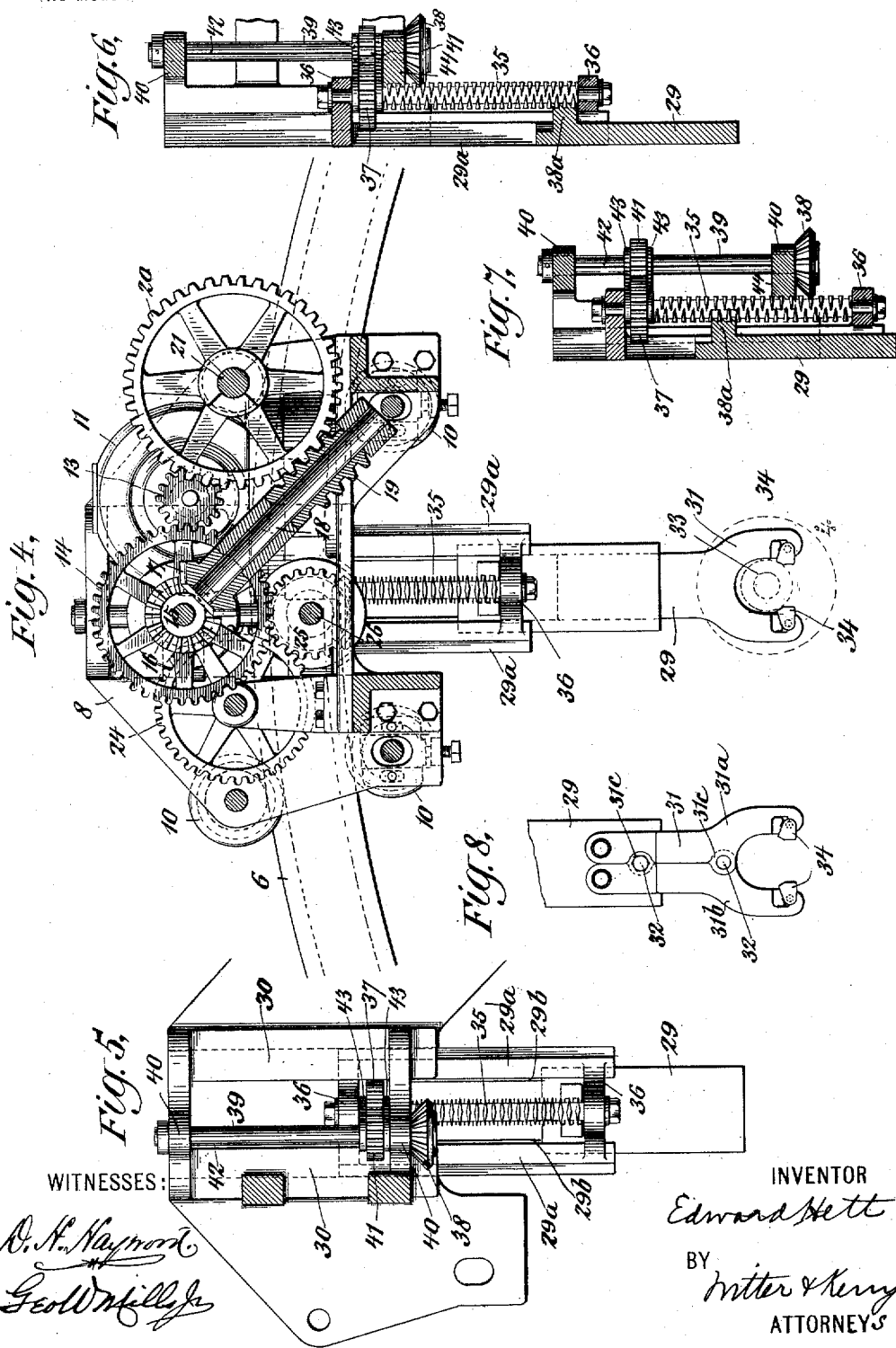
E. HETT.

TUBE HANDLING DEVICE.

(Application filed Jan. 3, 1899.)

(No Model.)

9 Sheets—Sheet 4.



WITNESSES:

R. H. Hayward
Geo. W. Hill, Jr.

INVENTOR

Edward Hett

BY

Witter & Kerrigan
ATTORNEYS

No. 637,583.

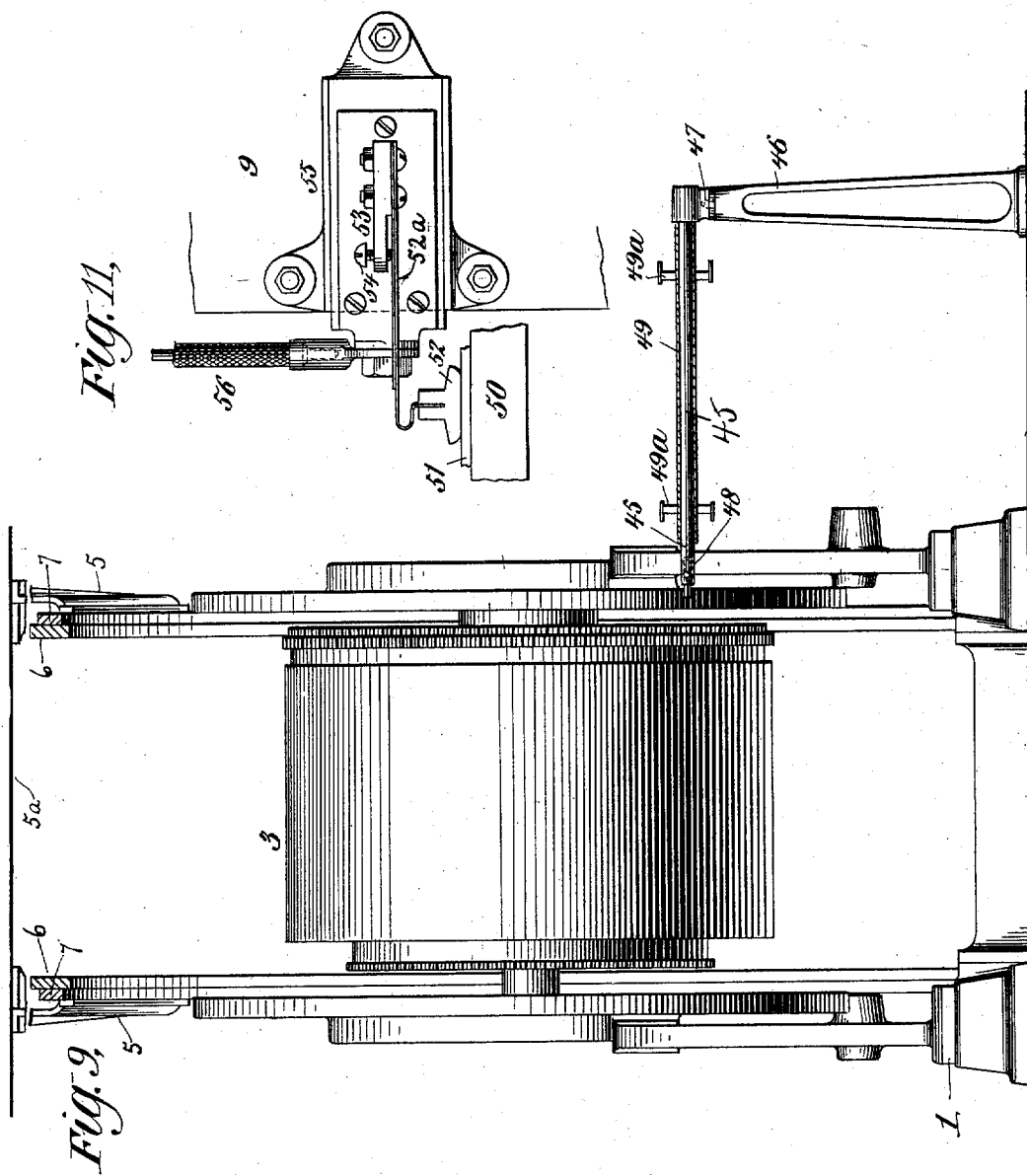
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(Application filed Jan. 3, 1899.)

(No Model.)

9 Sheets—Sheet 5.



WITNESSES:

R. H. Haywood
Geord M. Hays

INVENTOR

Edward Hett

BY

Mitter & Kempton
ATTORNEYS

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E. HETT.

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(No Model.)

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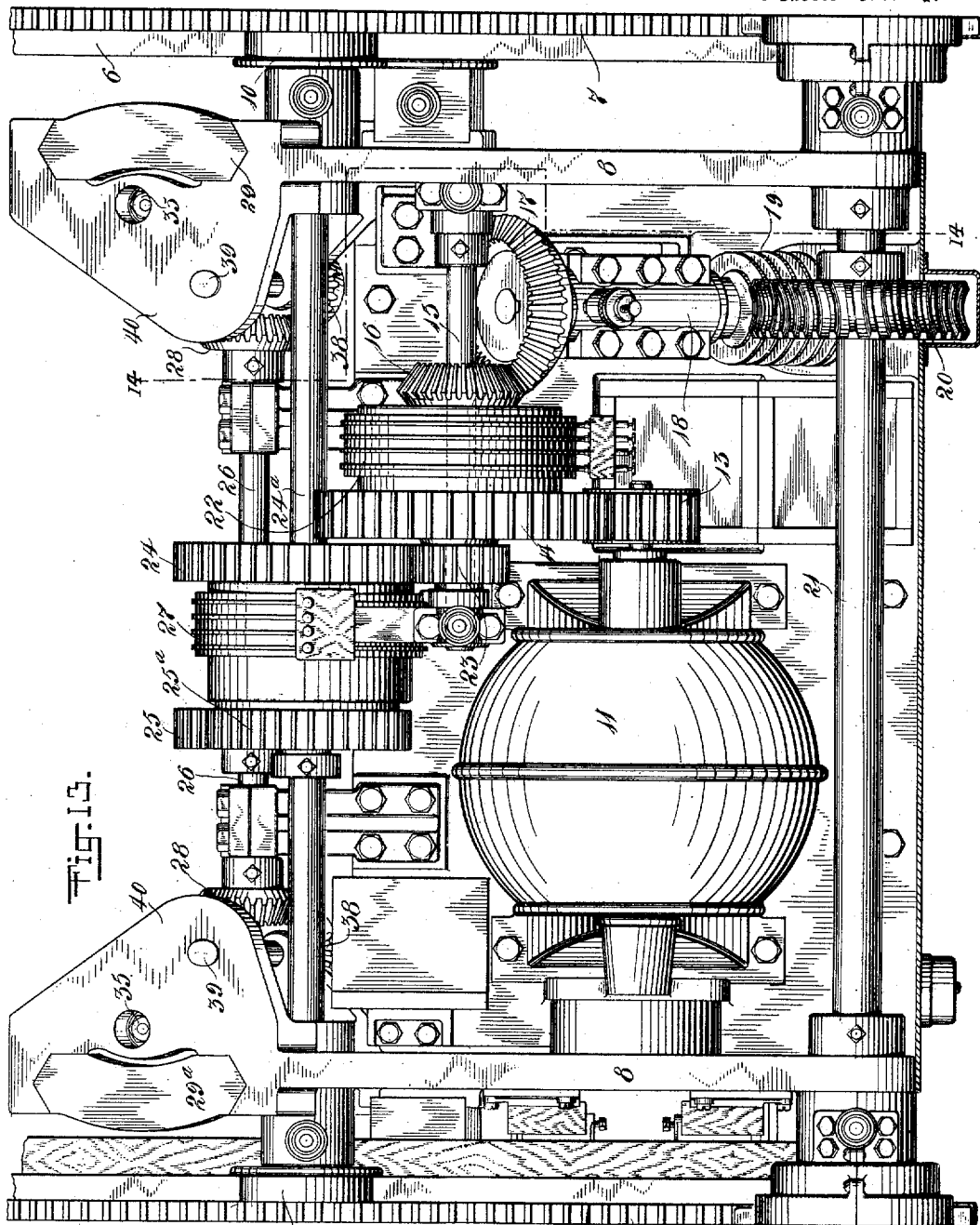


FIG. 13.

WITNESSES:

Geoff. Mills Jr.
Sidney Inkum.

INVENTOR

Edward Hett

BY

Mittler & Kenyon
ATTORNEYS

No. 637,583.

Patented Nov. 21, 1899.

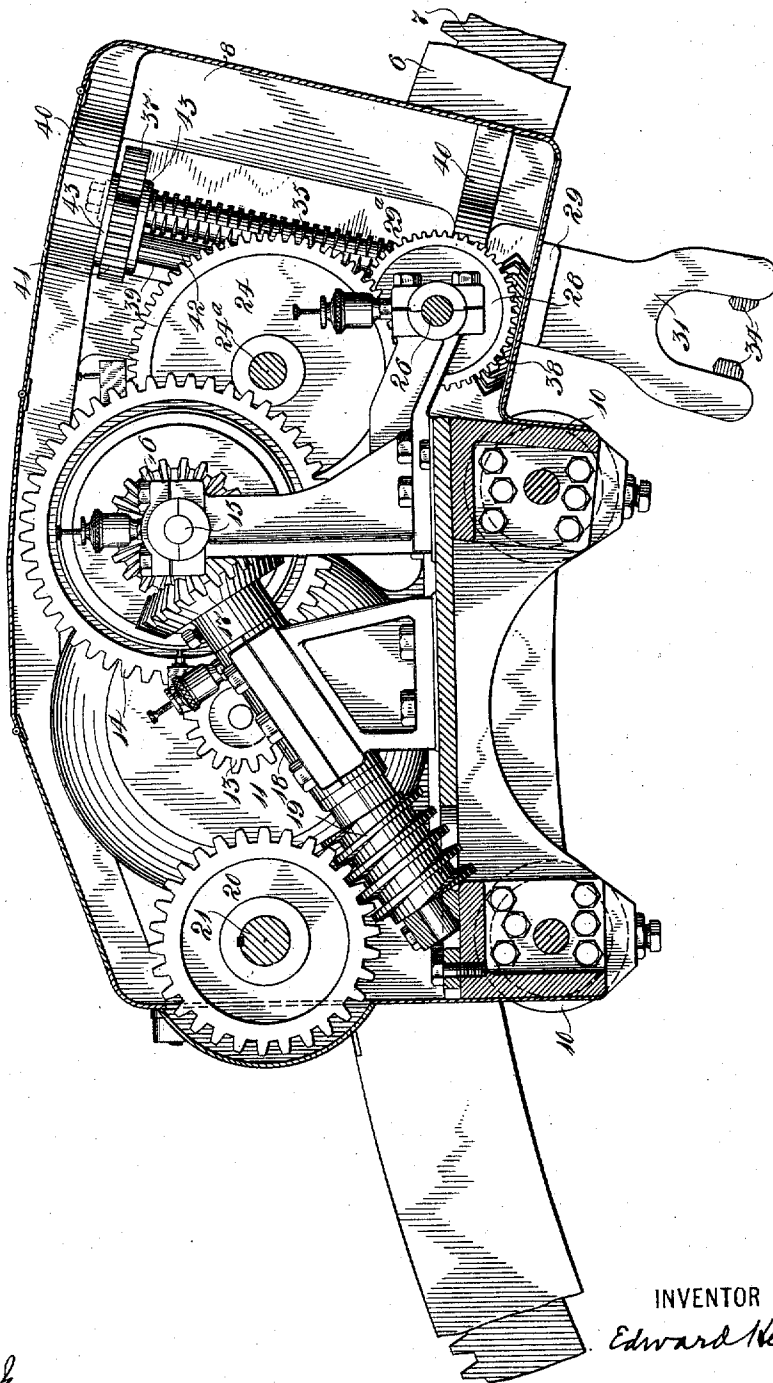
E. HETT.
TUBE HANDLING DEVICE.

(Application filed Jan. 3, 1899.)

(No Model.)

9 Sheets—Sheet 7.

Fig. 14.



WITNESSES:

Geordie Willy
Sidney Mann

INVENTOR

Edward Hett

BY

Witter & Kerrison
ATTORNEYS

No. 637,583.

Patented Nov. 21, 1899.

E. HETT.

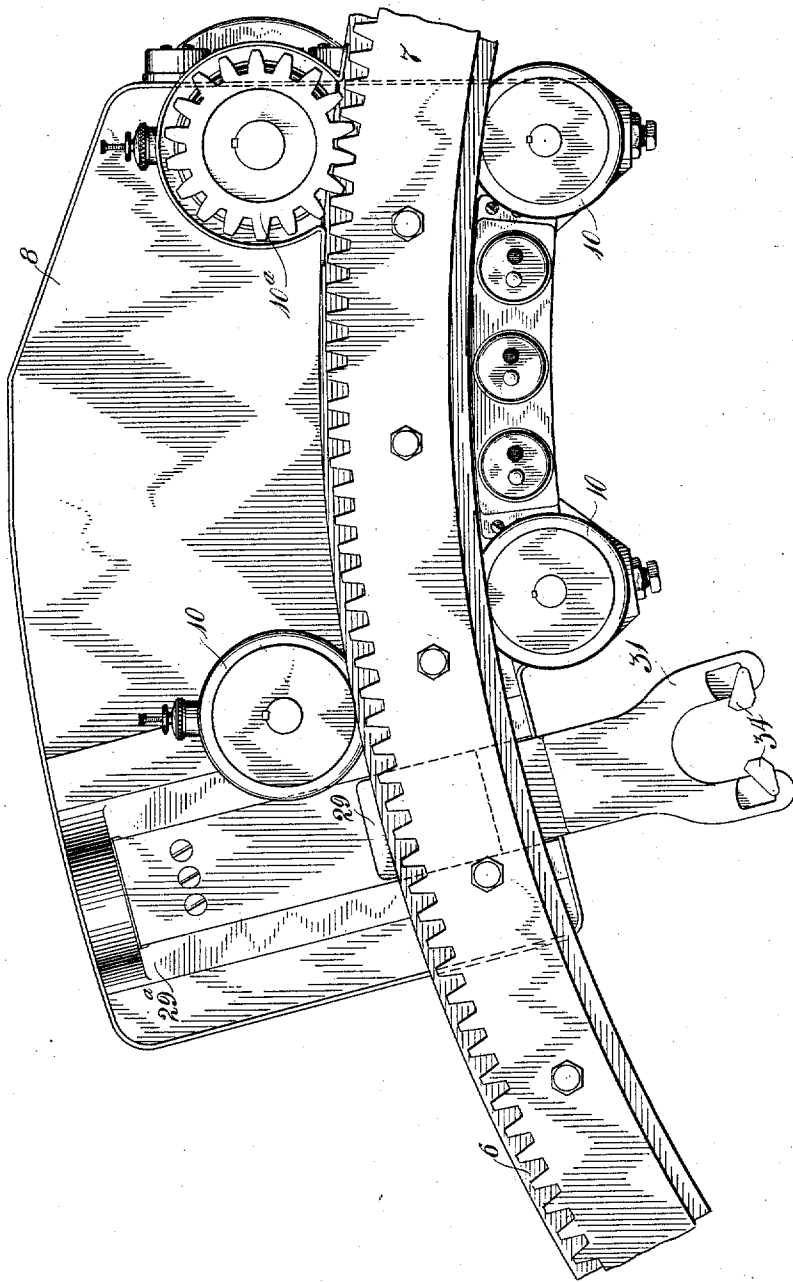
TUBE HANDLING DEVICE.

(Application filed Jan. 3, 1899.)

(No Model.)

9 Sheets—Sheet 8.

Fig. 15.



WITNESSES:

Geo. W. Kelly Jr.
Sidney Mann.

INVENTOR

Edward Hett

BY

Mitter & Kenyon
ATTORNEYS

No. 637,583.

Patented Nov. 21, 1899.

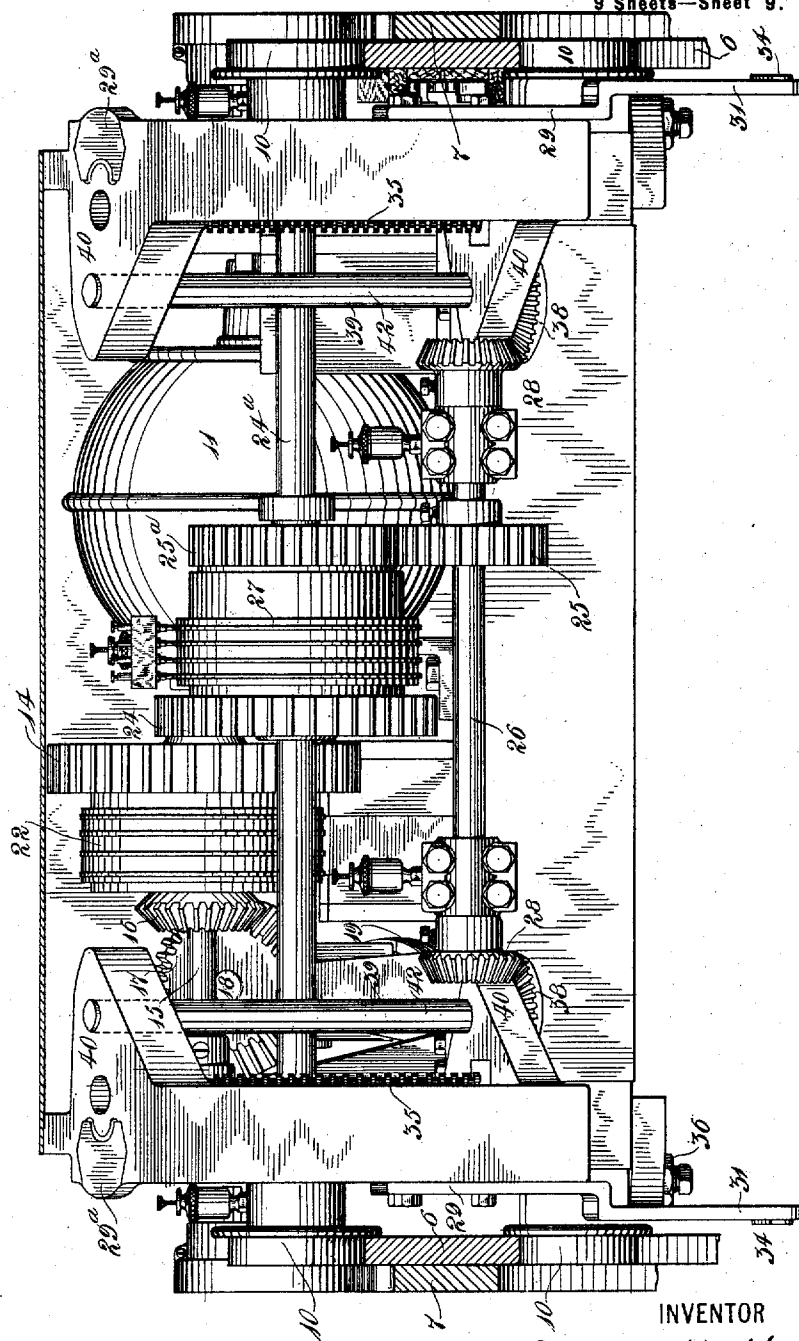
E. HETT.
TUBE HANDLING DEVICE.

(Application filed Jan. 3, 1899.)

(No Model.)

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Fig. 16.



WITNESSES:

Geoff. Killip
Sidney Brown

INVENTOR

Edward Hett

BY

Mitter & Kenyon
ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD HETT, OF NEW YORK, N. Y.

TUBE-HANDLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 637,583, dated November 21, 1899.

Application filed January 3, 1899. Serial No. 700,924. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HETT, a citizen of the United States, and a resident of New York, (New Dorp,) in the county of Richmond, State of New York, have invented certain new and useful Improvements in Tube-Handling Devices, of which the following is a specification.

This invention has reference to printing and transfer presses, and particularly to devices for handling printing-cylinders or printing tubes or surfaces in connection with such presses.

The invention has for its object the rapid, ready, and convenient handling of such printing cylinders, tubes, or surfaces or supports therefor, particularly in connection with their introduction into and removal from operative position in the press.

The invention consists of the novel devices herein shown and claimed.

My invention is shown in the accompanying drawings in connection with a multicolor-press, in which the printing-tubes are thin hollow external shells carried by form-cylinders, and the form-cylinders are more substantial, but hollow shells carried by shafts, the printing-tubes being removable from the form-cylinders and the form-cylinders being removable from the shafts, although obviously it can be used with any printing and transfer presses in which printing cylinders, tubes, or surfaces of any kind or supports therefor are employed.

In the accompanying drawings, which form a part hereof, and which show the preferred form of my improved device and in which the same reference characters in the different figures refer to corresponding parts, Figure 1 is a side view of an apparatus embodying my invention. Fig. 2 is an end view of the carriage for carrying the hoisting-arms with a printing-tube, form-cylinder, and shaft in position preparatory to being raised. Fig. 3 is a plan view of the carriage. Fig. 4 is a vertical section on lines 4-4 of Fig. 2, looking in the direction indicated by the arrow. Figs. 5, 6, 7, and 8 show details of the hoisting mechanism. Fig. 9 is a rear elevation of a press embodying my invention, with the carriage, printing-tubes, and other parts, however, omitted, and showing the standard at

the side for removing or inserting the printing-tubes. Fig. 10 is a vertical transverse section through the rails, showing the electrical connections with the carriage; and Fig. 11 is a side elevation of the same. Fig. 12 is a vertical horizontal section through the magnetic clutch on shaft 15. Figs. 13, 14, 15, and 16 are views of a modified form of my improved device, Fig. 13 being a plan, Fig. 14 a vertical section on the lines 14-14, Fig. 15, and Fig. 16 being a side view, and Fig. 16 a rear view, of the same.

Referring to the specific forms of apparatus shown in the drawings, 1 indicates the frame of a multicolor-printing press capable of simultaneously printing fifteen different colors—such, for instance, as is shown in my application, serially numbered 518,015, filed July 19, 1894—of which 2 is the web, 3 the drum, and 4, 4 several printing tubes or surfaces in position in the press. Each printing-tube has in the usual way its group of inking and dampening devices, which may in any proper manner be swung out of the way of the printing-tube, form-cylinder, and shaft, enabling the same to be moved outward radially from their mountings in the press. As these devices, however, form no part of my invention they are not shown and will not be further described. In practice the printing-tube in the multicolor-press in connection with which my improved devices are shown is a thin hollow external shell carried by the form-cylinder, and the form-cylinder is a more substantial but hollow shell carried by a shaft, the printing-tube being removable from the form-cylinder.

Secured to the ceiling 5^a are supports 5 for the circular rails 6, the supports and rails being suitably fastened together, as by bolts, as shown.

7 7 are plates provided with gear-teeth and secured to the rails 6.

8 is a carriage adapted to move upon rails 6 and provided with hoisting mechanism, as hereinafter described.

9 9 form the framework of the carriage. The carriage is provided with four axles and eight wheels 10 10. One set of these wheels 10^a have gear-teeth adapted to mesh with the teeth of plates 7. The eight wheels of the carriage are flanged and snugly fit the flanges

of the rails 6 6 and enable the carriage 8 to grip the rails 6 6 so firmly and snugly that it will always present the hoisting-arms 29 radially toward the press in whatever position the carriage 8 may chance to be on the rails 6, whereby the raising and lowering of the hoisting-arms 29 will always be a radial motion from or toward the center of the axis of the press in all positions of the carriage and irrespective of the weight carried by the hoisting-arms. Motion upon circular rails 6 6 is imparted to the carriage 8, and hoisting-arms 29 are moved inward or outward by means of electric motor 11, acting through the following-described mechanism: Electric motor 11 and commutator 12 may be of any usual construction and may be supplied with current in the manner to be presently described or in any well-known manner.

13 is a gear-wheel mounted upon the same shaft upon which the motor is mounted. It meshes with the teeth of large gear-wheel 14, which, together with gear-wheel 23, to which wheel it is fixedly secured, is loosely mounted upon shaft 15.

16 is a beveled gear-wheel also mounted upon shaft 15 and meshing with a similarly-beveled gear-wheel 17 upon worm-shaft 18. This latter shaft has a worm 19, which meshes with worm-wheel 20 upon shaft 21.

21 is the axle of carriage 8, which carries the toothed wheels 10^a.

22 is a clutch for throwing shaft 15 into connection with gear-wheels 14 and 23, so as to cause the shaft to revolve with wheels 14 and 23. A clutch of any suitable kind may be employed for this purpose; but I prefer and have shown in the drawings a magnetic clutch the construction and operation of which are as follows: The clutch 22 is composed of two parts, one part 22^a, secured to the shaft 15 by feather and spline, so as to revolve with the shaft and be capable of slight longitudinal motion thereon, the other part 22^b integral with gear-wheels 14 and 23 and with them mounted loosely upon shaft 15. The parts 22^a and 22^b of the clutch are made of soft iron. Movable part 22^a is wound with wire 22^c in the usual way and is provided with commutator 22^d. Wires for carrying a current connect with the latter in any suitable way and the circuit is controlled in any well-known suitable manner. When the circuit is closed, the two parts of the clutch will by frictional contact cause shaft 15 and bevel gear-wheel 16 to rotate with gear-wheel 14, thus driving carriage 8 along rails 6 into any desired position. Gear-wheel 23 meshes with gear-wheel 24, mounted in bearings in the framework of carriage 8. Wheel 24 meshes with gear-wheel 25, loosely mounted upon shaft 26. Shaft 26 has at each end a beveled gear-wheel 28.

27 is a clutch which may be of any ordinary construction for connecting gear-wheel 25 with shaft 26 to cause them to rotate together. As preferred and as shown in the drawings,

it is magnetic and is constructed, arranged, and combined with its shaft 26 and with gear-wheel 25, just as is magnetic clutch 22 with its shaft 15 and gear-wheels 14 and 23, and operates just as does clutch 22, with reference to its shaft and gear-wheels, to cause shaft 26 to rotate with gear-wheel 25 when the circuit is closed and to remain at rest when the circuit is opened. The clutch and its parts will accordingly not be further described.

Beveled gear-wheels 28 mesh with beveled gear-wheels 38, mounted upon shafts 39 for the purpose of raising or lowering hoisting-arm 29. This is done by means of the following-described mechanism.

29 29 29^a 29^a are hoisting-arms for raising or lowering the tube, form-cylinders, and shaft. These hoisting-arms consist each of two parts 29 and 29^a, which are movable relatively upon each other. As shown, arm 29 moves up and down in grooves 29^b in arms 29^a. Arms 29^a move up and down in grooves 30 in the framework of carriage 8, as shown in Fig. 5. The entire hoisting-arms are thus adapted to move up and down in grooves 30 of the carriage and at the same time parts 29 move up and down in grooves in parts 29^a. Arms 29 are forked at their lower end and carry movable spring-pressed supporting eccentrics 34, which furnish a secure and adjustable seat for the ends of the permanent shaft which supports the tubular form-cylinder. Fork 31 of arm 29 at the left of the press is composed of two parts 31^a and 31^b, each part pivoted at its upper end and adapted to swing outward to permit the end of the shaft to be grasped and removed or to be inserted. These parts have overlapping collars 31^c, through which pins 32 are passed when a shaft is being held to lock the two parts together.

33 represents the ends of the shaft. 35 is a right and left hand screw-shaft mounted loosely in bearings 36 of arms 29^a.

37 is a gear-wheel upon screw-shaft 35. It meshes with gear-wheel 41 upon shaft 39, the latter being mounted in bearings 40 40 in the framework of carriage 8. Rotary motion is imparted to shaft 39 by means of beveled gear-wheel 38. Gear-wheel 41 is adapted to move up and down upon shaft 39; but by means of feather and spline 42 it rotates with shaft 39. Links 43 43, loosely secured to shaft 39, so as to move up and down thereon, but secured to screw-shaft 35 in such a way as not to move up or down thereon, compel gear-wheel 41 to move upward and downward with gear-wheel 37.

44 is a half of a right-hand nut forming part of bearing 40 of shaft 39 and acting against screw-shaft 35.

38^a is a half of a left-hand nut forming part of arm 29 and also acting against screw-shaft 35.

The rotary motion in one direction imparted to beveled gear 38 by beveled gear 28 causes

shaft 39 and gear-wheel 41 to revolve. The latter rotates gear-wheel 37 and with it screw-shaft 35. As screw-shaft 35 turns the stationary half of right-hand nut 44 forces screw-shaft 35 and hoisting-arm 29^a to rise, carrying up with them, by means of link 43, the gear-wheel 41. At the same time the left-hand half-nut 38^a forces arm 29 to rise relatively to screw-shaft 35 and arm 29^a. By this movement both parts of the hoisting-arms 29 29^a 29^a and all their connections rise relatively to the framework of carriage 8; but arms 29 and their connections, including any printing-tube, form-cylinder, and shaft that they may be carrying, rise twice as fast as arms 29^a. Fig. 6 represents the various parts in their lowest position, and Fig. 7 the position they assume when the upward movement is nearly completed.

By a reversal of the motor motion in the opposite direction is given (when clutch 27 is energized) to the various parts through shaft 26, beveled gear-wheels 28 and 38, and screw-shaft 35, and thus arms 29^a and 29 are lowered, arms 29 moving downward twice as rapidly as do arms 29^a. By these means printing-tubes, form-cylinders, and shafts can be rapidly and easily removed and replaced. In a multicolor-press two movable carriages operated by two gangs of men can be employed, as shown in Fig. 5, and the work of removing the printing-tubes or form-cylinders from the press or of placing them in it can thus be further expedited. Quickness and despatch in doing such work is important in multicolor-presses. My improved device has also the advantage that it occupies a comparatively small space, and this is generally an important item, especially with multicolor-printing presses. Another advantage is that by my improved device a printing-tube cylinder can be removed from any part of the press.

In Figs. 10 and 11 is shown one method of making electrical connection with the motor on carriage 8. 50 is a strip of wood fastened to the side of each circular rail 6 and forming an insulated support for the electric conductor 51, which is a metallic strip of copper running the entire length of the circular rails. 52 is a shoe or brush adapted to slide upon strip 51 and secured upon the end of a spring-arm 52^a, secured to bracket 55, the latter being bolted to framework 9 of carriage 8. 53 is an arm also secured to bracket 55 and carrying a set-screw 54, adapted to press upon spring-arm 52^a, and thus regulate the pressure between shoe 52 and strip 51. Bracket 55 is electrically connected with electric motor 11 in any suitable manner. 56 is a cord connected in any suitable manner to a lever or switch, (not shown,) so that the operator by turning the lever can separate shoe 52 from strip 51 or can bring them together. The shoes 52 upon opposite sides of the press and their connections and operating-levers are so arranged and are so connected with

the dynamo that only one shoe shall be in contact with its copper strip at the same time and the current goes through the motor from one of the shoes in a direction the reverse of that from the other shoe.

Any means can be employed for securing the printing-tube, form-cylinder, or shaft to the hoisting-arms and for inserting them therein or removing them therefrom—for instance, such as are shown in my applications known as Serial No. 552,641, filed June 13, 1895, and renewed July 12, 1898, Serial No. 685,764, and Serial No. 578,841, filed February 11, 1896, and renewed July 12, 1898, and Serial No. 685,766. I show in the drawings, however, and will now proceed to describe the form of apparatus which I prefer to use for this purpose.

45 is a receiving-shaft. It is mounted on a standard or frame 46 at the proper height to be exactly opposite permanent shaft 33, upon which the form-cylinder and printing-tube are mounted when the shaft is in its raised position and so that when the two shafts are united end to end they will form one straight shaft. Receiving-shaft 45 is preferably pivotally mounted in standard 46, its mountings turning upon pivot 47, seated in the top of the standard. It also has suitable clutch mechanism 48, adapting it to be firmly clutched to the permanent shaft 33 at one end of the same. In the drawings the receiving-shaft 45 is represented as carrying a printing-tube holder 49, snugly fitting receiving-shaft 45, so as to be readily slipped on and off the same, and carrying two printing-tube holders 49^a, one near each end, adapted to receive and hold a printing-tube. The printing-tube holder is preferably made longer than the printing-tube, the extension at each end furnishing handles convenient for handling the whole when the printing-tube is on it. Standard 46 may, if desired, be movable—as, for instance, it may be mounted on a railway or upon wheels. Receiving-shaft 45 may be in any suitable way counterbalanced upon standard 46 and may be variably counterbalanced to meet varying conditions of load. Again, receiving-shaft 45 need not necessarily or in all cases be pivotally mounted, although I prefer that construction. It should be so mounted, however, as to be clutched with the permanent shaft 33 in one of the positions of the latter under the action of the hoisting apparatus and to be removable or unclutchable therefrom, according to the operation desired. If it were desired to remove a form-cylinder from the permanent shaft 33, the printing-tube holder 49 would be slipped from receiving-shaft 45, the latter would be then coupled up with the permanent shaft, and the entire form-cylinder be slipped along the composite shaft 33 45 until it rested entirely on shaft 45. The operation of removing from the press printing-tubes or form-cylinders, such as are shown in the drawings, or of placing them in position thereon is as follows:

If it is desired, for example, to remove a printing-tube from the press, the current is turned on to energize electric motor 11 in such a way and magnetic clutch 22 is energized in such a way that carriage 8 will be driven along rails 6 in the proper direction until hoisting-arms 29 are in radial line with the ends of permanent shaft 33, which carries the printing-tube in question. Then magnetic clutch 27 is energized so as to move hoisting-arms 29 radially toward the permanent shaft, pins 32 having been first withdrawn from left fork 31 and its two parts 31^a and 31^b having been swung apart. Forks 31 then grasp both ends of permanent shaft 33, the parts of the left fork are secured in position, electric motor 11 is reversed, and clutch 27 is energized, whereupon hoisting-arms 29 are radially raised, bringing up with them permanent shaft 33 and its form-cylinder and printing-tube. Clutch 22 is then energized, causing carriage 8 to move along rails 6 until permanent shaft 33 is opposite to and directly in line with receiving-shaft 45. These two shafts are then secured together by locking device 48, the parts 31^a and 31^b of left fork 31 are swung apart, and the printing-tube is then slipped along the composite shaft 33 45 until it rests entirely upon printing-tube holder 49 upon receiving-shaft 45. The two shafts are then disconnected, receiving-shaft 45 is swung around, and the printing-tube is then removed upon tube-holder 49 from standard 46. The same steps, but in the reverse order, are pursued in placing a printing-tube in position upon the press. Two standards 46 can at the same time be employed upon the same press—for example, one at the front and the other at the rear of the same side of the press. Where solid printing-cylinders are used or the printing-surfaces are not hollow tubes or shells, the receiving-shafts are of course unnecessary, and any suitable means may be employed for bringing the printing cylinders or surfaces to or removing them from the carriage or the hoisting-arms thereof, or they may be brought or removed by hand.

In Figs. 13, 14, 15, and 16 I have shown a slightly-modified form of my improved device. I have found that in multicolor-presses where a great many printing-cylinders are used it is sometimes impossible to run the rails down far enough on the sides to enable the hoisting-arms of the carriage constructed as above described to reach the shafts of the printing-cylinders in such part of the press. In such cases in order to enable the hoisting-arms to reach the shaft of the last printing-cylinder I arrange the hoisting-arms at one end of the carriage, as clearly shown in Figs. 14 and 15. The other parts of the carriage and the driving mechanism are, with one or two slight exceptions, substantially the same as those shown in the other figures of the drawings in this case. These changes are as follows: On account of the shifting of the hoisting-arms

from the middle of the carriage to one end I have found it of advantage to interpose between gear-wheels 24 and 25 an additional gear-wheel 25^a, mounted upon the same shaft as that carrying gear-wheel 24, electric clutch 27 being interposed between gear 24 and gear-wheel 25^a. As shown in Figs. 13 to 16, these two gear-wheels and the clutch are mounted on the shaft which forms one of the axles of the carriage. The gear-wheels 24 and 25^a and the two parts of electric clutch 27 are all loosely mounted upon the axle. When electric clutch 27 is energized, all of these parts are locked together and all rotated together loosely upon the axle. The operation of the parts shown in Figs. 13 to 16, inclusive, is the same as that described for the mechanism of the other figures of the drawings. By the use of the worm 19 and worm-wheel 20 as a part of the connecting mechanism between the motor and the wheels of the carriage the carriage is securely locked in any position upon the rails where it may stop.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a press, hoisting-arms consisting of two parts movable upon each other, means for operating the hoisting-arms and means for moving the two parts thereof relatively to each other, whereby printing cylinders, tubes or surfaces or supports therefor may be placed in or be removed from, the press, substantially as set forth.

2. In a press, hoisting-arms consisting of two parts movable upon each other, means for operating the hoisting-arms, a screw-shaft carried by one of the movable parts and adapted to be rotated in either direction and a nut upon the other movable part engaging with said screw-shaft to cause the two parts of the hoisting-arms to move relatively to each other, whereby printing cylinders, tubes or surfaces or supports therefor may be placed in or removed from, the press, substantially as set forth.

3. In a press, hoisting-arms, consisting of two parts movable upon each other, a right and left handed screw-shaft carried by one of the said parts and adapted to be rotated in either direction, a nut upon the framework of the carriage adapted to engage with said screw-shaft to raise or lower the hoisting-arms when the screw is rotated, a nut carried by the other part of the hoisting-arm, threaded oppositely to that of the said first nut, and adapted also to engage with the said right and left handed screw-shaft to cause the movable parts of the hoisting-arms to move relatively to each other when the screw-shaft is rotated, and means for rotating the right and left handed screw-shaft in either direction, whereby printing cylinders, tubes or surfaces or supports therefor may be placed in or be removed from, the press, substantially as set forth.

4. In a press, the combination with a carriage, rails upon which it is mounted and

means for moving the carriage upon the rails, of hoisting-arms carried by the carriage and consisting of two parts movable upon each other and movable relatively to the carriage, means for operating the hoisting-arms and means for moving the two parts thereof relatively to the carriage and also relatively to each other, whereby printing cylinders, tubes or surfaces or supports therefor may be placed in or be removed from, the press, substantially as set forth.

5. In a press, the combination with a carriage, rails upon which it is mounted and means for moving the carriage upon the rails, of hoisting-arms carried by the carriage and consisting of two parts movable upon each other, means for operating the hoisting-arms, a screw-shaft carried by one of the movable parts and adapted to be rotated in either direction, and a nut upon the other movable part engaging with said screw-shaft to cause the two parts of the hoisting-arms to be moved relatively to each other, whereby printing cylinders, tubes or surfaces or supports therefor may be placed in or be removed from, the press, substantially as set forth.

6. In a press, the combination with a carriage, rails upon which it is mounted and means for moving the carriage upon the rails, of hoisting-arms carried by the carriage and consisting of two parts movable upon each other, a right and left handed screw-shaft carried by one of the said parts and adapted to be rotated in either direction, a nut upon the framework of the carriage adapted to engage with said screw-shaft to raise or lower the hoisting-arms when the screw-shaft is rotated, a nut carried by the other part of the hoisting-arms, threaded oppositely to that of the said first nut and adapted to engage with the right and left handed screw-shaft to cause the said movable parts to be moved relatively to each other when the screw is rotated, and means for rotating the right and left handed screw in either direction, whereby printing cylinders, tubes or surfaces or supports therefor may be placed in or be removed from, the press, substantially as set forth.

7. In a press, the combination with a carriage, rails upon which it is mounted and means for moving the carriage upon the rails, of hoisting-arms, consisting of two parts movable upon each other, a right and left handed screw-shaft mounted loosely in bearings in one of said parts and adapted to be rotated in either direction, a gear-wheel mounted upon said screw-shaft, another gear-wheel, meshing with said first-mentioned gear-wheel, loosely mounted on and secured by feather and spline to a shaft upon said carriage and adapted to turn with said shaft but movable lengthwise upon said shaft, links connecting said gear-wheels together whereby they are caused to move together, means for rotating said shaft in either direction, a right-handed nut secured to the carriage and adapted to act against the screw-shaft, whereby the lat-

ter will be raised or lowered when the screw-shaft is rotated, a left-handed nut secured to the other of said movable parts of the hoisting-arms and adapted to act also against said screw-shaft, whereby the said two movable parts will be moved relatively to each other when the screw is rotated, substantially as set forth.

8. In a press, the combination with circular rails, having a rack, a carriage adapted to run thereon, an axle thereof provided with toothed wheels meshing with said rack, hoisting-arms and an electric motor for operating the carriage and hoisting-arms, of a train of gearing, connecting with a gear-wheel on the shaft of the motor, and a clutch adapted to transmit the motion of the motor to the said axle of the carriage, whereby the carriage may be moved upon the circular rails to any desired position, and another train of gearing, connecting with the electric motor and a clutch adapted to transmit the motion of the electric motor to the hoisting-arms, whereby the latter may be raised or lowered, substantially as set forth.

9. In a press, the combination with circular rails having a rack and a carriage adapted to run thereon, an axle thereof provided with toothed wheels, hoisting-arms and an electric motor for operating the carriage and hoisting-arms, of a train of gearing, connecting with a gear-wheel on the shaft of the motor, including a worm and worm-wheel, and a clutch adapted to transmit the motion of the motor to the said axle of the carriage, whereby the carriage may be moved upon the circular rails to any desired position, and another train of gearing, connecting with the electric motor and a clutch adapted to transmit the motion of the electric motor to the hoisting-arms, whereby the latter may be raised or lowered, substantially as set forth.

10. In a press, the combination with circular rails, having a rack, a carriage adapted to run thereon, an axle thereof provided with toothed wheels meshing with said rack, an electric motor mounted upon the carriage to drive the latter along the rails, and connecting-gearing between the shaft of the motor and the said axle of the carriage, of a conductor consisting of a metallic strip running the length of the rails and insulated therefrom and connected electrically at one end with a source of electricity, a metallic shoe secured to the carriage and adapted to slide upon the metallic strip or to be removed therefrom, means for making or breaking contact between the shoe and the rail and electrical connection between the shoe and the electric motor, whereby a current may be supplied to the latter, substantially as set forth.

11. In a press, the combination with circular rails, having a rack, a carriage adapted to run thereon, an axle thereof provided with toothed wheels meshing with said rack, an electric motor mounted upon the carriage to drive the latter along the rails, and connect-

ing-gearing between the shaft of the motor and the said axle of the carriage, of conductors, one for each rail, each consisting of a metallic strip running the length of the rails and insulated therefrom and connected electrically at one end with a source of electricity, a metallic shoe upon each side of the carriage adapted to slide upon the metallic strip upon the rail on that side of the press, or to be removed therefrom, means for making or breaking contact between the shoe and the rails and electrical connections between the shoe and the electric motor, whereby an electric current may be supplied to the motor, substantially as set forth.

12. In a press, the combination of a movable carriage, rails upon which it is adapted to move, a motor, connecting mechanism between the motor and the wheels of the carriage adapted to impart motion to the carriage, a worm and worm-wheel forming part of said connecting mechanism, whereby the carriage

may be moved along the rails and will be locked in position wherever stopped, substantially as set forth.

13. A hoisting-arm for removing printing cylinders or tubes or supports therefor from a press or for inserting them therein, composed of two parts forming a fork pivoted to the arm and adapted, when unlocked from each other, to be swung outward to permit the removal of a printing cylinder, tube or support therefor from the hoisting-arms, overlapping collars on said parts of the fork, and pins adapted to pass through the collars to lock the parts of the fork together, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD HETT.

Witnesses:

G. W. DONALDSON,
EDWIN SEGER.