

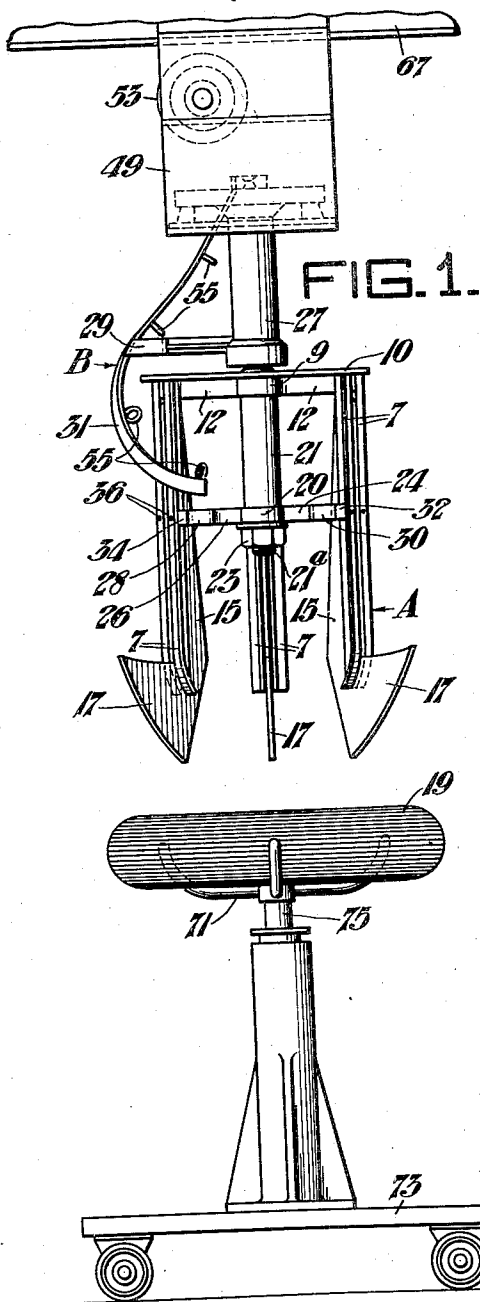
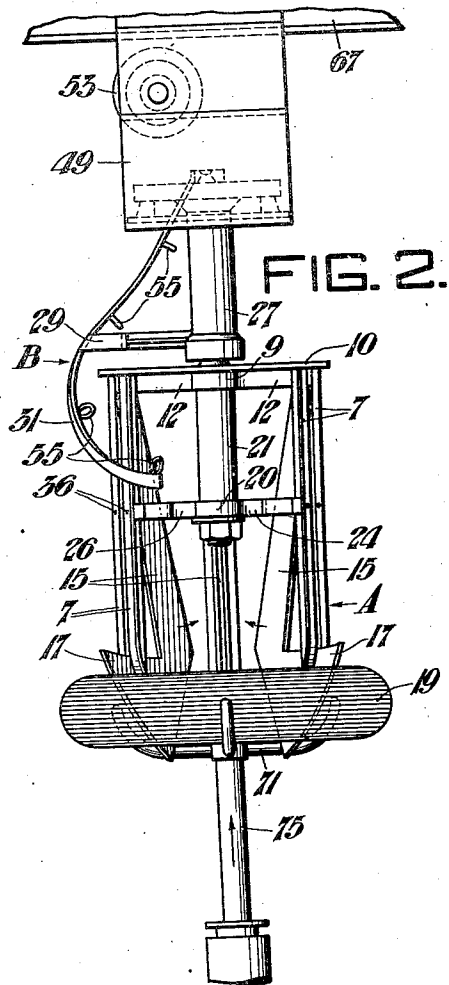
May 23, 1944.

W. O. ALDRICH  
CONTINUOUS TYPE PAYOFF REEL

2,349,689

Filed Feb. 17, 1942

3 Sheets-Sheet 1



Inventor:  
WILFRED O. ALDRICH,  
by *John E. Jackson*  
his Attorney.

May 23, 1944.

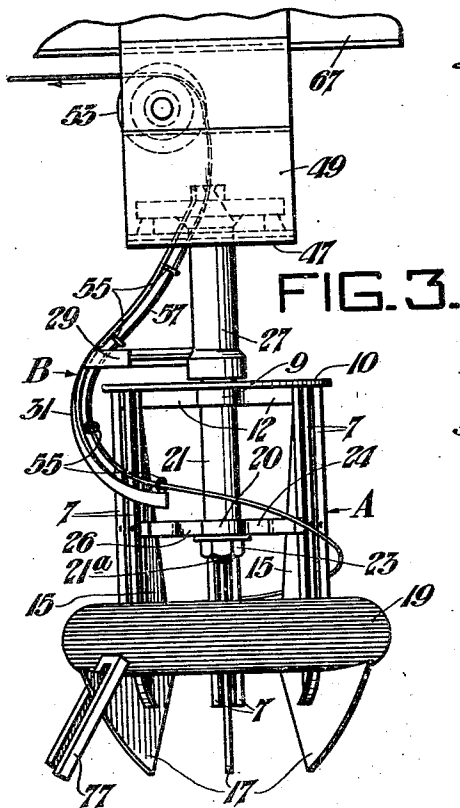
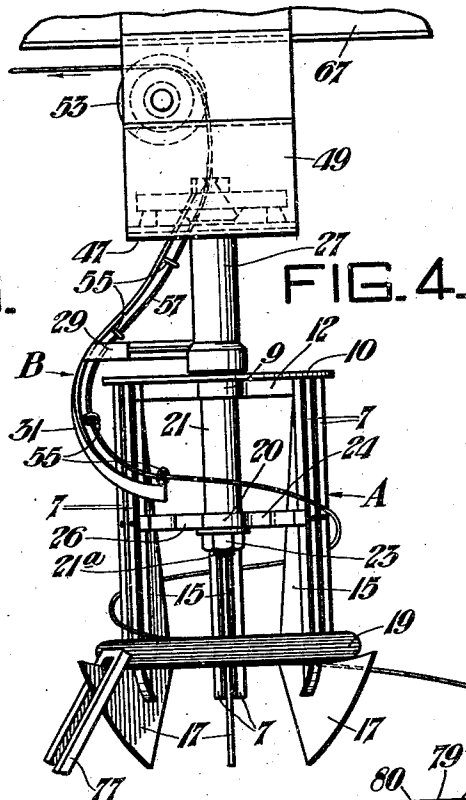
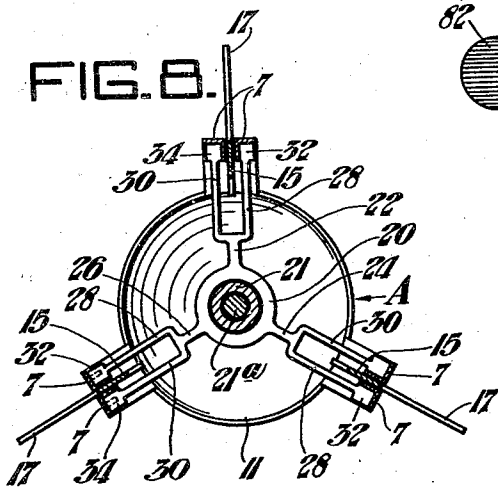
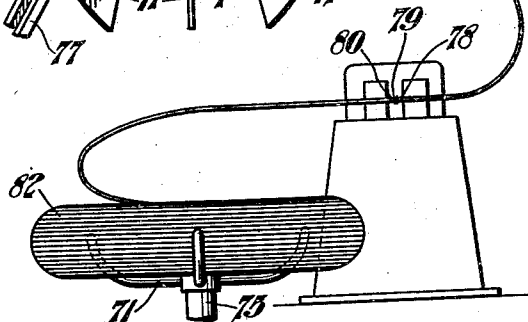
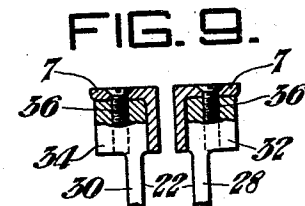
W. O. ALDRICH

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CONTINUOUS TYPE PAYOFF REEL

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3 Sheets-Sheet 2



Inventor:  
WILFRED O. ALDRICH,  
by: *John E. Jackson*  
his Attorney.

**May 23, 1944.**

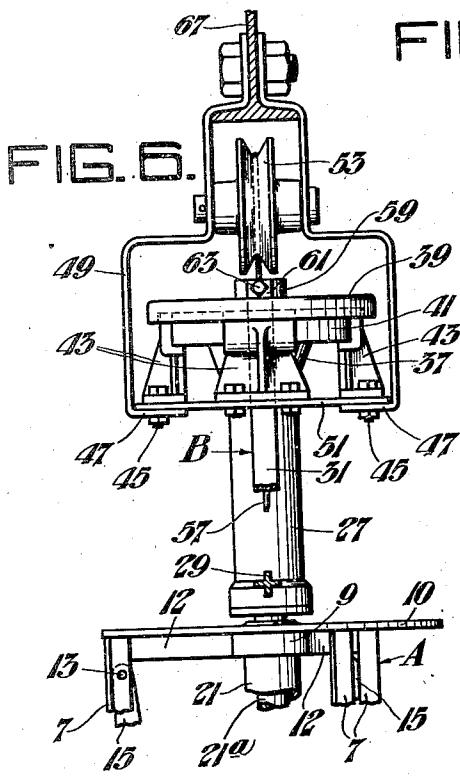
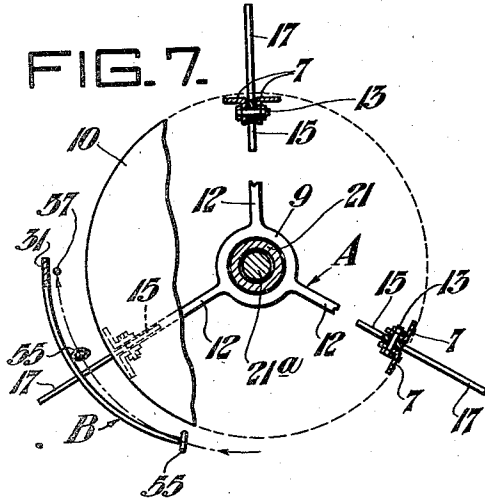
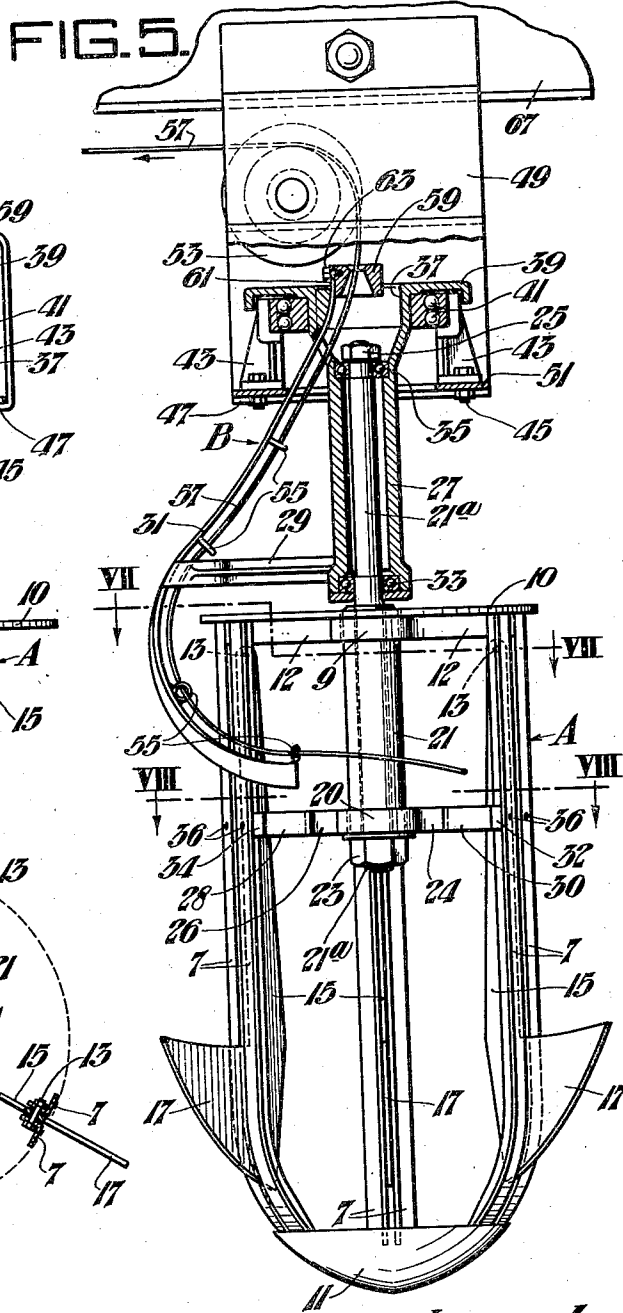
W. O. ALDRICH

**2,349,689**

CONTINUOUS TYPE PAYOFF REEL

Filed Feb. 17, 1942

3 Sheets-Sheet 3



Inventor:  
WILFRED O. ALDRICH;  
by: *John E. Jackson*  
his Attorney.

## UNITED STATES PATENT OFFICE

2,349,689

## CONTINUOUS TYPE PAYOFF REEL

Wilfred O. Aldrich, Lakewood, Ohio, assignor to  
The American Steel & Wire Company of New  
Jersey, a corporation of New Jersey

Application February 17, 1942, Serial No. 431,302

13 Claims. (Cl. 242-128)

The present invention provides an improved apparatus for continuously supplying wire to various processing treatments, such as galvanizing, tinning, or annealing, the apparatus being designed to supply the wire smoothly and free from kinks, twists, or other distortions.

In wire processing, such as those mentioned above, and also in the production of wire products, such as wire fencing and other wire products, considerable time may be lost by the processing equipment being shut down during replenishing of bundles of wire thereto, thus resulting in low machine efficiency. In accordance with heretofore practice, the actual machine shutdown time has been approximately 30% to 50% of the operating time, and from approximately 60% to 80% of the machine down time was caused by replenishment of bundles of the wire being processed. For operation of the machines, one of the requisite requirements for a continuous supply of wire is that the last end of the preceding bundle must be welded to the first end of a successive bundle in order for there to be a continuous supply of wire for processing thereof.

One of the objects of the present invention is to provide an improved type of continuous payoff reel, which permits the above-mentioned welding of the bundles and thereby eliminates the period of shutdowns caused by the necessity of restringing the processing equipment for each bundle of wire used.

A further object of the invention is to provide such a payoff reel which can be located readily and from which the wire is drawn free from kinks or other distortions.

Other objects of the invention will become apparent as the description proceeds, and the features of novelty will be pointed out particularly in the appended claims.

The invention will be understood more clearly by reference to the accompanying drawings in which:

Fig. 1 is an elevational view of one form of the reel in unloaded condition, but with a bundle of wire in position to be lifted onto the reel.

Fig. 2 is a view similar to Fig. 1, but showing the reel with a bundle of wire partly positioned thereon.

Fig. 3 represents a fully loaded reel, with wire from the bundle ready to be used at a remote processing station.

Fig. 4 is a view similar to the foregoing, showing the wire of one bundle almost unwound, with a succeeding bundle of wire having its lead end

in the process of being welded to the last end of the previous bundle for continuous operation.

Fig. 5 is a sectional elevation of a modified form of hanger-reel, showing details of its construction, the view being on an enlarged scale to show features of construction, which features are similar in principle to the construction of Figs. 1 to 4, inclusive.

Fig. 6 is an elevation of the suspension portion of the apparatus taken at right angles to Fig. 5.

Fig. 7 is a sectional plan view taken on the line VII-VII of Fig. 5.

Fig. 8 is a sectional plan taken on the line VIII-VIII of Fig. 5.

Fig. 9 is a fragmentary enlarged view of a pair of yoke members shown in Fig. 8.

Referring more particularly to the drawings, reference character A designates a hanger or reel which is adapted to be suspended vertically and to receive a coil or bundle of wire which is fed to the processing machine by means of feeding means B.

The reel A comprises pairs of fixed arms 7, which are secured to, and depend from, arms 12 of a top spider 9 beneath a top plate 10, which arms may be secured at their bottom ends by a cup-shaped holder 11, Figs. 5 and 8, and between which pairs of arms are hung swinging arms 15, which are hung freely on pivot shafts 13 which are mounted in the opposite fixed arms of each pair thereof. Three of these arms are illustrated, although the specific number thereof is not critical, and each one of the swing arms is provided with an outwardly extending lug or fin 17 which is cam-surfaced, each lug flaring outwardly from its bottom to its top, so that the bottom is almost pointed and the top is a web of sufficient width to hold a bundle of wire 19 positioned on the reel.

A sleeve 21 of a mounting bar 21a projects centrally through the plate 10 and well into the interior of the reel to receive a spider 20 having arms 22, 24, and 26 extending radially thereof, each of the arms having a pair of branches, such as indicated at 28, 30, which have enlarged heads 32, 34 for reinforcing the fixed arms 7 of the reel, which are secured to the heads 32 and 34 by screws 36. The swinging arms 15 swing freely between these heads, or brackets, 32 and 34. A nut 23 is threaded onto the inner end of the bar 21a and bears against the underside of the spider casting 20.

The sleeve 21 may be hollow, and projects outwardly to a substantial extent beyond the plate

10, the outer end of the bar 21a being capped by a nut 25.

The outer portion of the bar 21a is enclosed by a revolving sleeve-shaft 27, which carries a projecting bracket arm 29 to which is mounted an eccentric planetary arm 31 of the feeding mechanism B.

The shaft 27 is provided with bearings 33 and 35 between its inner wall and the bar 21a, the inner wall of shaft 27 being recessed suitably to seat the bearings. The nut 25 also serves as a retaining member for the top bearing 35.

Shaft 27 is a casting which is cast with one end of the shaft flaring outwardly at 37 into a bell-shaped opening, and then into the flanged portion 39, which receives a self-aligning bearing 41, this being held in place by retaining means 43 bolted by bolts 45 to a flange 47 in a hanger 49 which encloses the end of the shaft assembly described above. This hanger 49 is bolted to flange 47 by bolt 48, and to a plate 51 which substantially closes the bottom of the frame, but which has a hole therethrough for the passage of the shaft 27.

The hanger 49 serves also as a mounting for a sheave 53 over which wire from the bundle on the reel is passed on its way to the processing machine.

It has been said above herein that the planetary arm 31 is a part of the wire feeding means. The arm 31 is provided with a series of spaced loop carriers 55 through which the wire, indicated at 57, is threaded. The feeding means are completed by a block 59 which is mounted on the planetary arm 31 adjacent to the upper end 61 thereof, the mounting being effected by a bolt 63. The block 59 extends into the bell-mouth of the shaft 24 and has a conical opening therethrough, the apex hole being on the vertical axis of the block, and is at the center of rotation of the arm 31; and the sheave 53 is positioned so as to be tangent to the center line of this hole. Therefore, the wire 57 does not become disengaged from the sheave 53 as the arm 31 revolves around the reel.

The entire apparatus is suspended suitably, such as, for instance, from a beam 67 by a hanger 49.

In operation, suppose, for example, two 300 lb. bundles of wire are welded together on a cradle 71 on a loader truck 73. The truck and loaded cradle then are taken to a position beneath the empty payoff reel A, as will be seen from Fig. 1. The bundle of wire 19 is placed on the reel A by raising the cradle 71 by means of hydraulic piston 75.

In the modified form of the reel as shown in Figs. 5, 6, 7, and 8, and which is the preferred form, the cup-shaped or conical nose 11 of the reel enters the central hole of the bundle of wire, and guides the bundle onto the hooks or fins 17, as the cradle 71 continues to be raised. The cam contour of the hooks 17 forces the swinging arms 15 inwardly, thereby allowing the bundle to be seated on the hooks or fins 17, which then return by gravity to their natural supporting position. The cradle then is lowered and the bundle rests on the supports 17, and a brake 77 (Figs. 3 and 4) is inserted to prevent rotation of the entire reel. The top end of the bundle then is threaded through the loops 55 on the arm 31, thence over sheave 53 and then to the processing machine which then is started. Tension on the

strand of wire 57 as it is pulled by the machine through the loops 55 causes the arm 31 and its mounting assembly to turn, so that the arm 31 revolves around the reel A, paying off the wire from the bundle as the arm revolves.

As the amount of wire on the reel A becomes depleted from the bundle 19, say, for example, after about 400 to 500 lbs. of wire have been used by the processing machine in order to replenish wire on the reel, two more 300 lb. bundles are welded together and placed in the loader cradle. The loader then is positioned with the cradle beneath the reel. The last end 78 of the bundle 19 on the payoff reel is welded to the top end 80 of the bundle 82 on the loader, as is indicated at 79 on Fig. 4, and the cradle then is raised. The bundle in the cradle forces inwardly the swinging bundle supports 17 and releases the brake 77, thereby allowing the remainder of the bundle on the payoff reel to rest on the bundle in the loader cradle. The cradle continues to lift, thereby raising the bundle sufficiently to release the swinging arm supports which swing, by gravity, into their natural supporting position. The cradle then is lowered leaving the entire bundle supported on the payoff reel. The brake then is inserted, completing the reloading operation.

As the bundle is lifted onto the supports 17, the conical member 11 acts as an entry nose, it entering the hole in the center of the bundle of wire and guiding the convolutions of the wire onto the supports 17. The member 11 also assures the proper guidance of any bundle onto the swinging supports 17, preventing thereby the points of these supports entering the bundle of wire between the turns of the strand of the wire if the bundle should happen to be loosely wound, which possibility tends to make the form of the device illustrated in Figs. 1 to 4, inclusive, somewhat less desirable than the other modification shown on the drawings.

It will be seen, therefore, that the device of the present invention provides a simple carrying and unwinding mechanism for coils of wire, which mechanism greatly facilitates joining together the ends of successive bundles of wire to provide a continuous supply thereof, without requiring shutdown of the equipment for reloading.

I claim:

1. Mechanism for holding and unwinding loose bundles of wire or the like, comprising, in combination, holding mechanism for the said loose bundle comprising means shiftable from normal holding position into loading position responsive to placing the loose bundle on the holding mechanism, the said means being self-returning into holding position when the bundle is loaded on the holding mechanism, carrying means for the loose bundle of wire mounted on the shiftable means, and wire-dispensing instrumentalities associated with the carrying means for receiving wire from the said loose bundle, the said wire-dispensing means being revolvable around the holding means responsive to paying off wire from the bundle thereof, for unwinding the said wire from the bundle.

2. Mechanism for holding and unwinding loose bundles of wire or the like, comprising, in combination, holding mechanism for receiving and holding the said loose bundle, the said holding mechanism comprising suspended arms depressi-

ble relative to each other responsively to placement of a loose bundle of wire on the holding mechanism, the said arms returning to holding position when the bundle is placed thereon, wire-dispensing means associated with the holding mechanism for receiving wire therefrom, and mounting instrumentalities for the dispensing means allowing the dispensing means to revolve about the holding mechanism responsively to wire being pulled from the bundle.

3. Mechanism for dispensing a strand of material from a loose coil or bundle thereof which comprises, in combination, supporting means, a plurality of coil-receiving members held by the said supporting means, the said members being adapted to be pressed inwardly towards one another responsively to loading of a loose bundle thereon and to return to their original position upon completion of the loading, means on the said members for retaining the bundle on the said members, and means for unwinding the strand of material from the bundle responsively to sufficient pull being exerted thereon to cause the unwinding means to revolve around the members thereby following the convolutions of the bundle to pay off the strand from the bundle being unwound.

4. Mechanism for unwinding material from a loose coil thereof, comprising, in combination, a hanger, a frame suspended from the hanger and adapted to receive the coil, the said frame comprising freely vertically fixed arms and freely suspended arms adapted to be maintained by gravity in substantially vertical position while being adapted to be pushed inwardly towards each other as the said loose coil is positioned thereon, and guide members for the coil on the said arms, the guide members defining retaining lugs for holding the coil during unwinding.

5. Mechanism for unwinding material from a loose coil thereof, which comprises, in combination, supporting means, a plurality of fixed and movable coil-receiving members held by the supporting means, cam-shaped guide means on the said movable members adapted to guide the coil thereon while pressing the said movable coil-receiving members inwardly towards one another responsively to loading movement of the coil along the guide means and to return to their original position upon completion of the loading of the coil, the said guide means retaining the coil in loaded position on the coil-receiving members during unwinding of the coil.

6. Mechanism for unwinding material from a loose coil thereof, which comprises, in combination, supporting means, a plurality of fixed and movable coil-receiving members held by the supporting means, and guide means for the coil for guiding the coil to the said members during loading movement of the coil, the said guide means being adapted to retain the coil in loaded position during unwinding thereof.

7. Mechanism for unwinding material from a coil thereof, which comprises, in combination, supporting means, a plurality of fixed and movable coil-receiving members held by the supporting means, and guide means for the coil for guiding the coil to the said members during loading movement of the coil, the said guide means extending from the movable coil-receiving members and defining means for retaining the coil when loaded, the guide means causing the movable coil-receiving members to move inwardly towards each other during loading movement of

the coil, while allowing the said members to return to substantially normal position when the coil is loaded thereon.

8. Mechanism for unwinding wire or the like from a loose coil thereof, which comprises, in combination, supporting means, a frame carried by the supporting means comprising swingably suspended arms for receiving the loose coil or bundle to be unwound, cam-shaped lugs on the said arms for guiding and holding the said loose coil or bundle, the said lugs causing the arms to swing inwardly during mounting movement of the said loose coil or bundle, the said arms moving to substantially normal position when the said loose coil or bundle is positioned on the lugs, a planetary unwinding arm for receiving wire from the coil, and mounting means for the arm rotatably mounted on the supporting means for enabling the arm to revolve around the frame as wire is pulled from the coil.

9. Mechanism for unwinding wire or the like from a coil thereof, which comprises a hanger, a sleeve mounted in the hanger, a suspension bar mounted in the sleeve, a frame carried by the suspension bar, including a plurality of swingable arms for receiving the coil to be unwound, cam-shaped lugs on the said arms for guiding and holding the coil, the said lugs causing the arms to swing inwardly during mounting movement of the coil, the said arms returning to at least substantially normal position when the coil is positioned on the lugs, bearings for rotatably mounting the sleeve, a planetary unwinding arm for receiving wire from the coil, means mounting the arm on the sleeve, whereby, when wire is withdrawn from the coil, the arm is caused to revolve around the frame for evenly distributing wire from the coil, and a pulley for carrying the wire, the said pulley being mounted on the hanger and being positioned substantially directly above the center of rotation of the arm.

10. Mechanism for unwinding wire or the like from a loose coil or bundle thereof, which comprises, in combination, a hanger, a frame suspended from the hanger and adapted to receive the coil, the said frame comprising fixed arms and freely suspended arms adapted to be maintained by gravity in substantially vertical position, the said freely suspended arms being adapted to be pushed inwardly towards each other as the loose coil is positioned thereon, guide members for the loose coil on the said arms, the guide members defining retaining lugs for holding the said loose coil during unwinding, and means on the frame for entering the said loose coil and suitably spacing the coil for reception thereof on the guide members.

11. Mechanism for unwinding wire or the like from a coil thereof, which comprises, in combination, a hanger, mounting means on the hanger, a frame carried by the mounting means for receiving the coil, the said frame comprising fixed arms and freely suspended arms adapted to be maintained by gravity in substantially vertical position while being adapted to be pushed inwardly towards each other as the coil is positioned thereon, guide members for the coil on the said arms, the guide members defining retaining lugs for holding the coil during unwinding, and a conical-shaped end member for the frame adapted to enter the coil and suitably spacing the coil for reception on the guide members, the fixed arms of the frame being secured to the end member.

12. Mechanism for unwinding wire or the like

from a loose coil thereof, which comprises, in combination, a hanger, a frame suspended from the hanger and adapted to receive the said loose coil, the said frame comprising fixed arms and freely suspended arms adapted to be maintained by gravity in substantially vertical position while being adapted to be pushed inwardly towards each other as the said loose coil is positioned thereon, guide members for the said loose coil on the said arms, the guide members defining retaining lugs for holding the said loose coil during unwinding, and planetary carrier means for receiving wire from the coil for an even supplying thereof, the carrier means being adapted to revolve around the frame as wire is pulled from the coil.

13. Mechanism for unwinding material from a

loose coil thereof, which comprises, in combination, supporting means, a plurality of coil-receiving members carried by the supporting means, guide means for the said loose coil for guiding the coil to the said members during loading movement of the coil, the said guide means being adapted to retain the said loose coil in loaded position during unwinding thereof, means for receiving material from the said loose coil, the said means being a planetary unwinding arm for unwinding a continuous strand of material from the coil, and mounting instrumentalities for the said arm enabling it to revolve around the coil-receiving members incident to the said material being unwound from the said loose coil.

WILFRED O. ALDRICH.