

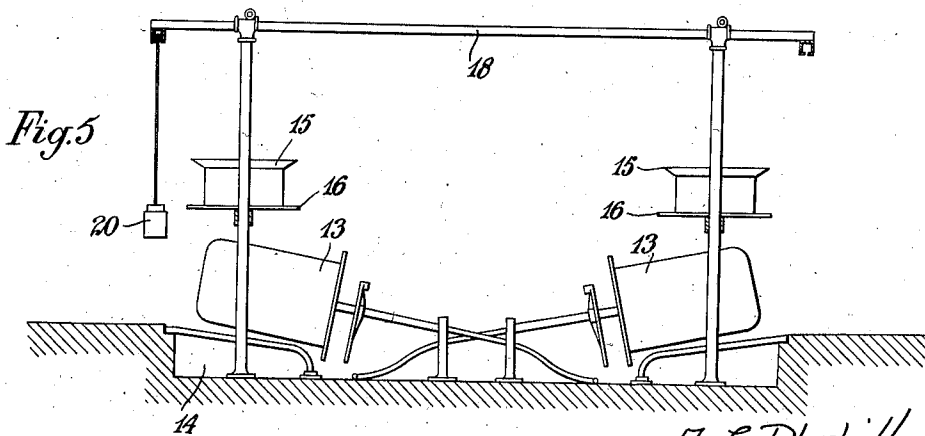
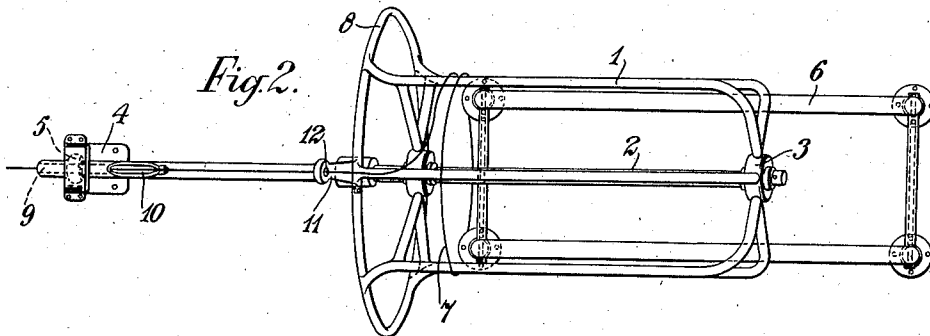
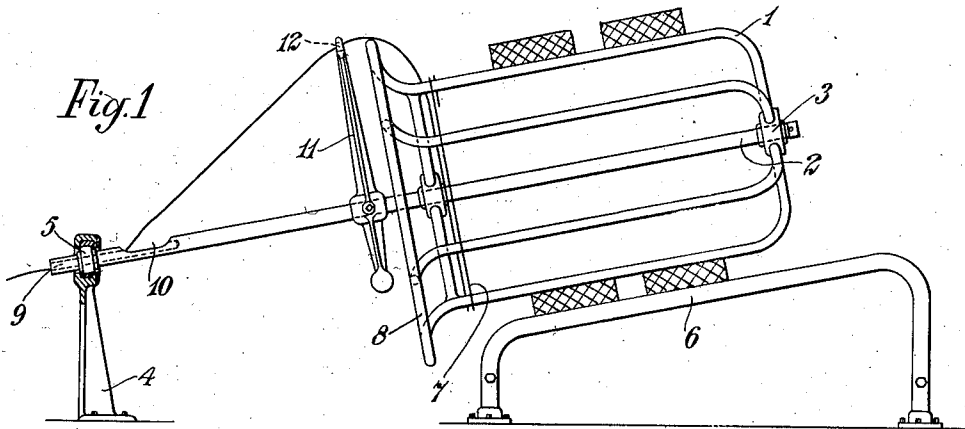
Dec. 21, 1937.

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2,102,610

METHOD AND APPARATUS FOR UNWINDING WIRE, THREAD, OR THE LIKE

Original Filed June 18, 1931 3 Sheets-Sheet 1



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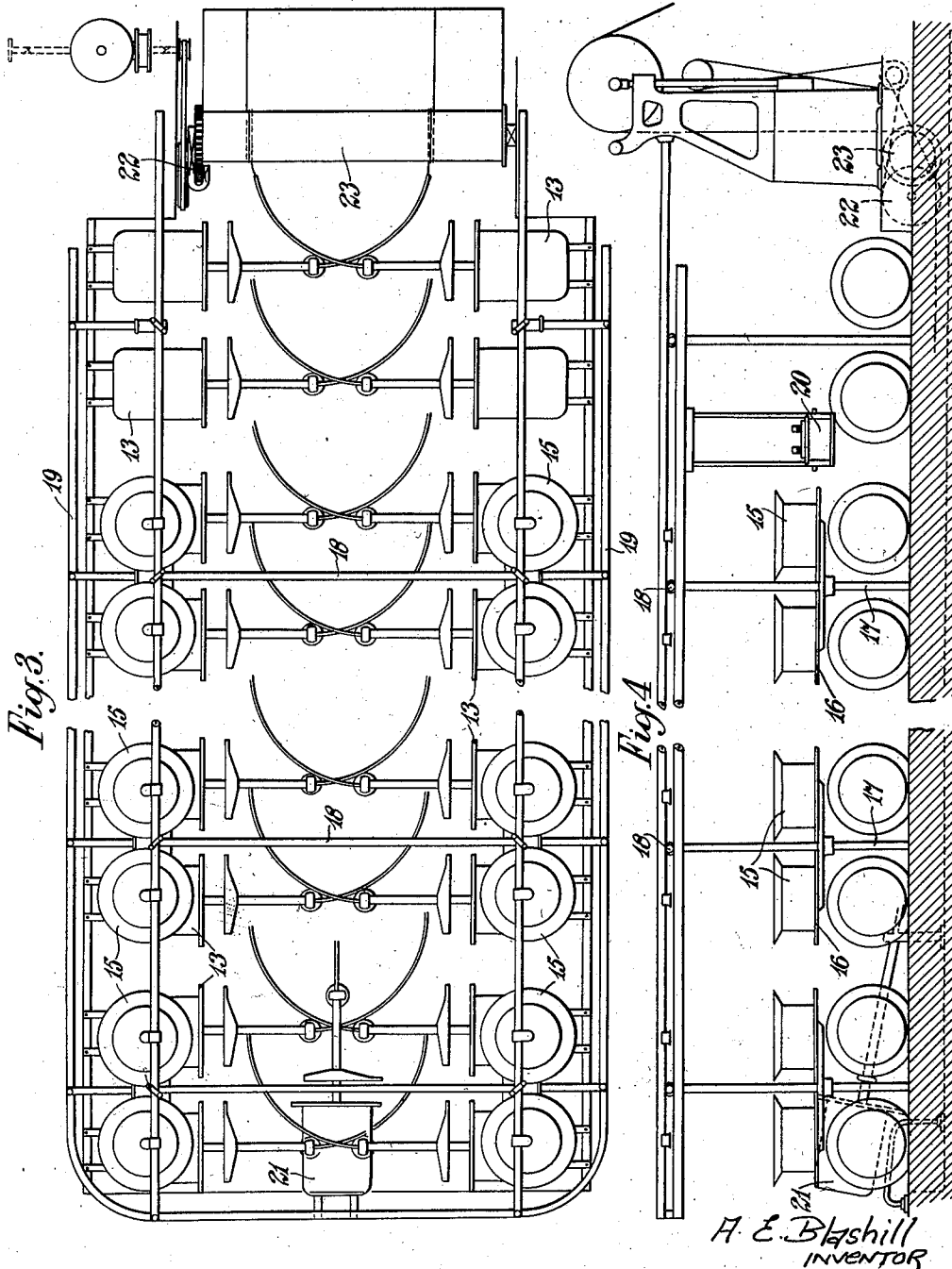
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METHOD AND APPARATUS FOR UNWINDING WIRE, THREAD, OR THE LIKE

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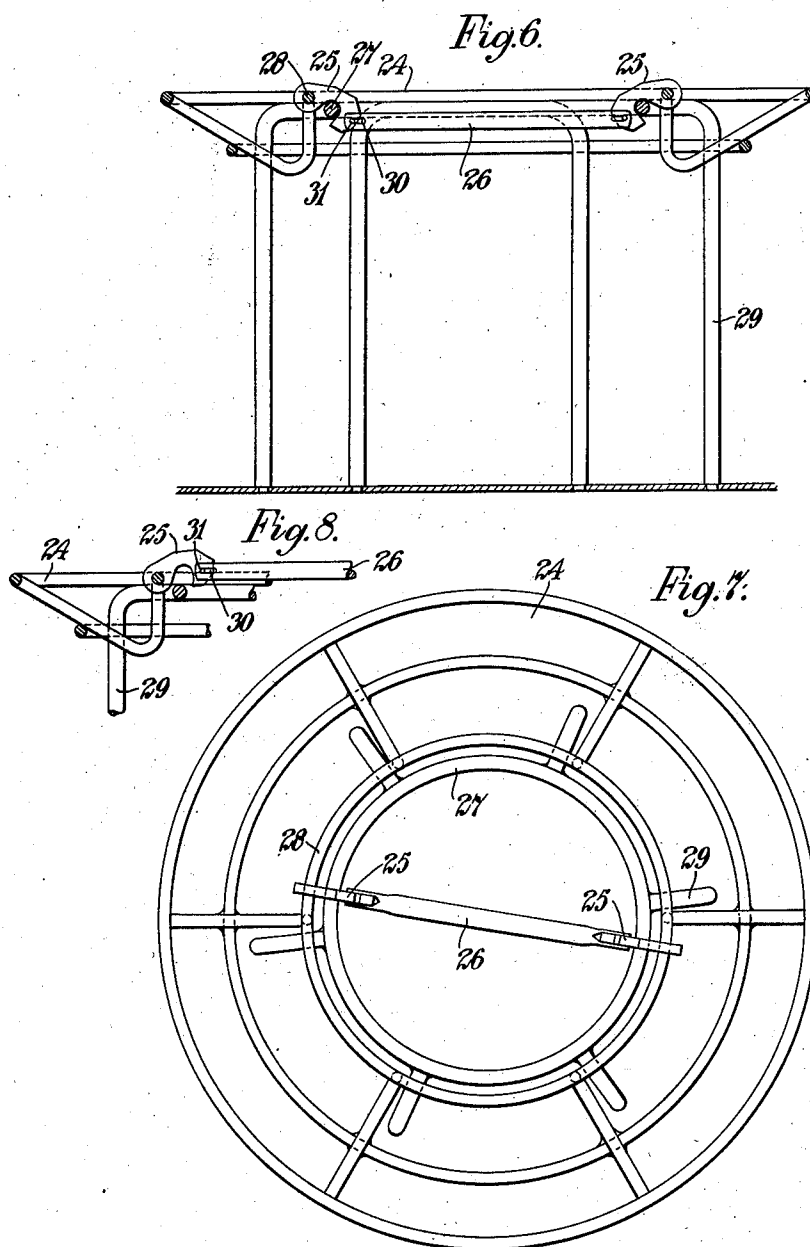
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METHOD AND APPARATUS FOR UNWINDING WIRE, THREAD, OR THE LIKE

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UNITED STATES PATENT OFFICE

2,102,610

METHOD AND APPARATUS FOR UNWINDING
WIRE, THREAD, OR THE LIKEArthur Ernest Blashill, Withington, Manchester,
EnglandOriginal application June 18, 1931, Serial No.
545,321, now Patent No. 1,996,061, dated April
2, 1935. Divided and this application January
14, 1935, Serial No. 1,794. In Great Britain
June 24, 1930

16 Claims. (Cl. 242—54)

This invention relates to the unwinding of wire, thread or the like from coils of the material and has for its object to provide improved apparatus by which wire or the like which may, for example, be subsequently fed to a machine for making fabric may be supplied from a succession of separate coils in a continuous length without interruption in the process.

The method of unwinding wire and the apparatus for effecting such according to the present invention is particularly applicable to the wire fabric or fence making machine covered in my main application Serial No. 545,321, filed June 18th, 1931 (1,996,061 of April 2nd, 1935) the present application being divided out from said main application.

It has, hitherto, usually been necessary when supplying wire or the like in a continuous length, for example to a machine for making wire fabric, to interrupt the process at the exhaustion of each coil to allow the substitution of a new coil and the joining of the end of the wire from the exhausted coil to the end of the wire on a new coil although a previous proposal is known according to which continuous feeding of wire is effected by joining the ends of two coils of wire arranged on separate reels and taking the wire first from the coil on one reel and then from that on the other and so on.

This known practice of feeding wire from coils is open to objection, in that the operator is obliged to provide an additional coil for each coil which is being fed before this latter coil is exhausted and as several such latter coils may happen to be exhausted at the same time, which from experience has often happened to be the case, the machine fed with the wire must be stopped to give the operator sufficient time in which to deal with the replenishment of the wire supply. Further, owing to the space required around and at the front of the pairs of reels employed in accordance with this known proposal, it will be evident that so much room would be required as to render the proposal impracticable.

It is also an object of the invention to provide an improved layout or arrangement of reels for supporting coils of wire or the like particularly in connection with apparatus adapted for the production of wire fabric whereby, inter alia, the minimum of floor space may be utilized while ensuring maximum efficiency in the feeding of the wire to the requisite positions in the fabric forming machine and ready accessibility to the individual reels.

With these objects in view according to the

present invention a continuous feed of wire or the like from coils thereof is effected by supporting a coil of the wire upon a reel passing there-through, unwinding the wire from the coil from the end of the reel remote to the end thereof over which the coil was placed upon the reel and in a direction leading away from such latter end, and before completing this unwinding uniting the free end of such coil to the wire of a second coil placed upon said reel and so on for any number of coils.

The invention also provides apparatus for carrying out the above method and also other features in connection with the feeding of wire or the like as will be hereinafter specifically described and pointed out in the appended claims.

In the accompanying drawings:—

Figure 1 is a side elevation, and

Figure 2 a plan of a reel by which a continuous feeding of wire may be effected.

Figure 3 is a plan view illustrating a layout of reels in accordance with the invention as applied to a machine for producing wire fabric;

Figure 4 is a side elevation of Figure 3;

Figure 5 is an end view of Figure 3, and

Figures 6, 7 and 8 are views illustrating a particular construction of reel which may be employed in the above layout.

In carrying the invention into effect in the manner illustrated in Figures 1 and 2 the reel comprises a bell-shaped framework 1 over which are threaded the coils of wire or the like which have to be unwound. A shaft 2 journaled at the axis of the framework by bearings 3 is rotatably supported on a pedestal 4 by means of a swivel thrust bearing 5. The arrangement is such that the shaft 2 while free to rotate relatively to the pedestal 4 or to the framework 1 prevents any axial movement of the latter but permits it by the swivel action of the bearing 5 to be raised or lowered away from or towards a stationary ramp 6. The said ramp is preferably mounted in a pit or depression in the floor on which the apparatus is carried, the upper end of the ramp being on the floor level so as to facilitate the assembly of the coils of wire, two of which coils are illustrated in position on the ramp 6 in Figure 1, being indicated by the reference 7.

The inner end of the framework 1 is arranged to project beyond the ramp 6 and is flanged at 8 to form a stop. By this arrangement the coil being unwound is located axially in a position in which it clears the ramp.

The end of the shaft 2 which passes through the bearing 5 is formed with an axial bore 9

and a radial opening 10 communicating therewith while a radial arm 11 formed at its outer end with an eye 12 is secured on the shaft 2 in the same axial plane as the said opening and rotates adjacently to the flanged end 8 of the framework. In their normal operating position the shaft and reel lie at a slight inclination to the horizontal.

In the operation of the apparatus, a coil of wire is first placed and then passed over the outer, and smaller, end of the framework 1 which constitutes a reel by which it is roughly centered. The outer end of the reel is supported by the ramp either directly or indirectly by other coils placed in position upon the reel and resting upon the ramp as is clearly illustrated in Figure 1. The free end of the coil is threaded through the eye 12, the opening 10 and the bore 9. From thence it is drawn as required for use as, for example, by a wire fabric machine. As the wire is drawn off the coil the bight or portion between the coil and the opening 10 travels round and round the stationary coil. As it does so it engages the arm 11 at the eye 12 and carries this arm around with it thereby turning the shaft 2 and maintaining the opening 10 substantially opposite the point at which the wire is unwound from the coil. Without the provision of the arm 11 the unwinding wire would wrap itself around the shaft 2, the latter being required to maintain the axial position of the reel and coils carried thereby.

It is intended, while the unwinding of one coil is in progress, that one or more further coils should be placed on the reel adjacent the coil which is being unwound and that the starting and finishing ends of each coil should be welded or otherwise joined together so that wire may be fed from the reel in a continuous length. It is evident that the object of the invention, that is the uninterrupted supply of a continuous length of wire or the like, is thus achieved.

By arranging that a coil shall be stationary during unwinding it is made possible to join the ends of successive coils without interrupting the process while the other features of the apparatus enable the coil to be placed in position at any time ready for unwinding without interfering with the continuous unwinding of the coil already in position.

Figures 3, 4 and 5 illustrate an arrangement of reels particularly suitable for the supplying of the different wires to a machine adapted to produce wire fabric of the kind described in my said main application Serial No. 545,321. Referring to these figures, the reels for supporting the line wires of the fabric are indicated at 13 and are arranged in pairs in either side of a pit 14 formed in the floor of the workshop or other place where the wire fabric producing machine is installed while the reels for supporting the staple wires are indicated at 15 and are arranged in pairs immediately above the pairs of reels for the line wires, the latter reels being arranged with their axes horizontal and preferably downwardly inclined, and the reels for the staple wires having their axes vertically disposed. The reels 13 may be of the same construction as those illustrated in Figures 1 and 2 so that a continuous feeding therefrom of the line wires may be carried out in the same way as has already been described with reference to Figures 1 and 2.

The reels for supporting the staple wires may be arranged to be supported upon brackets 16 carried by vertical supports 17 arranged around

the pit 14 and said supports are connected by transverse bars 18 at the ends of which a frame 19 is connected which serves to support welding apparatus 20 which is adapted for movement along the said frame. The welding mechanism is employed for welding together the ends of the line and staple wires (i. e. the ends of the wires of the used coils with those of the new coils). The welding mechanism is also employed to weld together the ends of the stay wire which is arranged to be supported by a reel 21 which is located at the other end of the pit, the stay wire being led from its reel to a capstan mechanism 22 which operates to feed the stay wire to the mechanism employed for feeding such wire to the machine in which the wire fabric is to be formed, being, for example, the superposed chain mechanism described in my said main application.

The line wires are led away from their respective reels through tubular guides and are arranged around a capstan drum 23 from which these wires are fed into the wire fabric producing machine.

The reels for the staple wires may be of the form illustrated in Figures 6 to 8 and comprise skeleton covers 24 which prevent the coils of wire from flying out of their reels and are adapted automatically to lock themselves in position when they are lowered on to the framework of their respective reels and automatically unlock themselves from the said framework when they are lifted by the operation of locking means 25 consequent upon the lifting of the movable covers by handles 26 provided thereon.

Each of the said reels comprises a ring 27 at the top over which the said locking means (which consist of diametrically opposed dogs pivoted to an inner ring 28 on the cover) engage consequent upon the cover being lowered on to the reel body 29, the said handle 26 being provided with slots 30 in which pins 31 on the inner ends of the said pivoted dogs engage and which pins are free to move within said slots to permit of the locking end of the dogs moving into and out of locking engagement with the ring 27 on the body of the reel.

The cover is held by the handle when placing it upon, or removing it from, the body of the reel so that in the former case the inner ends of the dogs are held out of the way of the ring 27 until the handle is moved downwards relatively to the remainder of the cover so as to urge the dogs over this ring whereas in the latter case the handle is moved upwards relatively to the cover at the commencement of the lifting operation so that the dogs are moved clear of the ring 27, leaving the cover free to be removed from the body.

It is to be understood that the invention is not limited to the above details but is capable of modification in accordance with any particular requirements or practical conditions it may be desired to fulfill.

It is also to be understood that while the apparatus has been described with particular reference to the unwinding of coils of wire it is not to be so limited but may be employed with equal effect for the unwinding of coils of rope, thread, string or any other material with like properties.

It will be appreciated from the foregoing description that the invention provides a method of and apparatus for feeding wire which obviates the necessity of stopping the feed of the wire in order to provide for a replenishment thereof, see-

ing that the operator can place a number of coils required on each reel at will so that he is able, even when the feed of the wire is taking place rapidly, not only to keep pace with the wire consumption but also to assist in carrying out other operations attendant upon the use of the wire feeding mechanism. For example, the invention has particular application to the feeding of wire strands for use in the manufacture of wire fabric and with the present invention the operator is enabled to assist in removing the finished rolls of fabric from the machine in addition to attending to the replenishment of the wire supply thereto. In short, the features of the invention consisting in feeding coils of wire to a single reel over its rear end in sufficient number to provide an ample reserve supply of wire, welding the wires of each coil together and feeding the wire continuously from the front end of the same reel provide a really ideal working proposition.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. Apparatus for supplying wire from coils thereof comprising a stationary reel having one end unobstructed so that the coils may be placed upon the reel from that end, the reel passing through each coil, a rotatable shaft extending beyond the opposite end of the reel adapted to restrain the reel from axial movement, said shaft being coaxial with the reel and being journaled at one end in the said reel and at its outer end in a stationary part of the apparatus, the arrangement being such as will prevent axial movement of the reel towards the said stationary part.

2. Apparatus as claimed in claim 1 wherein the said shaft is journaled in the said stationary part by means of a swivel bearing so as to permit of angular or swivelling movement of the shaft axis.

3. Apparatus as claimed in claim 2 having a ramp associated therewith for facilitating assembly of each coil of wire upon the reel, said ramp being disposed with its upper end at the floor level and the reel being downwardly inclined from the receiving end thereof.

4. Apparatus for uninterruptedly feeding a strand of wire consisting of a stationary reel having one end thereof constantly open, a rotatable shaft journaled axially within the reel, said shaft and reel being secured against axial movement, and a ramp arranged to receive and support successive coils of wire through the centre of which the reel passes with its lower side resting upon said coils.

5. A reel adapted to receive a coil of wire at one end thereof, means adapted to support the reel while a strand of wire is drawn from the coil over the opposite end of the reel, a rotary shaft journaled axially within the reel and projecting from the said opposite end of the latter, and a fixed bearing at the end of said projecting portion of the shaft adapted to secure the shaft and reel against axial movement, said shaft being provided adjacent to the reel side of the fixed bearing with a radial opening leading to an axial bore through the said bearing which serve to guide the wire in its withdrawal from the reel.

6. A reel according to claim 5 comprising between the reel and fixed bearing a radial arm on said shaft having an opening in its outer end through which the wire from the coil is led to the opening and bore in said shaft and bearing respectively.

7. The method of maintaining a totally non-

stop flow or feed of a strand of wire or the like of unlimited length beginning from one end of the wire in a non-rotating coil thereof in which the other or free end of wire in said coil may be joined at will to the end selected as the leading end of wire in a succeeding coil on the same reel, and so on as the coils are successively fed and in which also the coils are fed and the strand of wire drawn away from them all in one and the same direction only and substantially on the line of an axis common to each and all of the fed coils, the successive coils being fed on to the end of the reel remote from the end thereof from which the wire is withdrawn.

8. Method of maintaining a non-stop feed of wire or the like in coiled form which consists in unwinding the wire from one face of the coil mounted upon a non-rotating reel and, while it is unwinding or before it is completely unwound, mounting a further coil upon the same non-rotating reel and uniting the free end of the first coil to the wire of the second coil and continuing the unwinding from the corresponding face of the second coil and so on continuously for any number of coils.

9. Apparatus for supplying wire from coils thereof comprising a stationary reel having one end unobstructed so that the coils may be placed upon the reel from that end, the reel passing through the coils, and means for guiding the wire from the reel into longitudinal motion away from the opposite end of the reel and along a path substantially coaxial with the coils, said reel supporting each coil of wire against axial movement at the withdrawal end of the reel.

10. Apparatus for supplying a strand of wire from a coil thereof comprising a non-rotating reel having its axis disposed substantially horizontally so that a coil of wire may be placed upon the reel from one end thereof and the strand drawn off the reel from the opposite end, means preventing axial movement of the reel and means beneath the reel adapted to form a support for the coil thereon, and the reel within the coil.

11. Apparatus according to claim 10 wherein the said support comprises spaced guides which extend beyond the end of the reel from which the coil is fed so that they may serve to center the coil with respect to the reel.

12. Apparatus for supplying wire from coils thereof comprising a stationary reel having one end unobstructed so that the coils may be placed thereon, the reel passing through the coils, means for guiding the wire as it is being unwound from the opposite end of the reel and a ramp for facilitating the assembly of a coil of wire upon the reel, said ramp being disposed with its upper end substantially at the floor level and the said reel being disposed adjacently to the ramp, the end of the reel remote from the coil-receiving end projecting beyond the ramp so that a coil in unwinding position thereon may be clear of the ramp when being unwound.

13. Apparatus for supplying wire from coils thereof comprising a stationary reel having one end unobstructed so that the coils may be placed thereon, the reel passing through the coils, means for guiding the wire as it is being unwound from the opposite end of the reel, a rotatable shaft adapted to restrain the reel from axial movement, a radial arm mounted on the said shaft to rotate therewith, said shaft having an axial bore through which the wire passes after being unwound from the coil, and said shaft having a radial opening communicating with the said bore

through which opening the wire passes after being unwound from the coil, said radial arm being formed with an eye at its outer end through which the wire passes after being unwound from the coil, the said eye and the said opening being in the same axial plane.

14. Apparatus for supplying wire from coils thereof comprising a stationary reel having one end unobstructed so that the coils may be placed thereon, the reel passing through the coils, means for guiding the wire as it is being unwound from the opposite end of the reel, a rotatable shaft adapted to restrain the reel from axial movement, said shaft being arranged coaxial with the reel, and said shaft having an axial bore through which the wire passes after being unwound from the coil and also having a radial opening communicating with the said bore through which opening the wire passes after being unwound from the coil, a radial arm mounted on the said shaft to rotate therewith, said arm having an eye at its outer end through which the wire passes after being unwound from the coil, the said eye and the said radial opening being in the same axial plane, and the said radial arm being disposed adjacently to the end of the reel at which the latter is prevented from axial movement in a direction away from the end of the reel over which a coil of wire is placed upon the reel, the said

radial opening being disposed adjacently to a bearing at which the said shaft is journaled in a stationary part of the apparatus.

15. Apparatus for supplying wire from coils thereof comprising a stationary reel having one end unobstructed so that the coils may be placed thereon, the reel passing through the coils, means for guiding the wire as it is being unwound from the opposite end of the reel, a ramp associated with said reel and upon which ramp the coils of wire are supported in substantially vertical planes, the coils being free to slide forwards on the ramp on to said reel and the said reel being supported at its unobstructed end by a coil of wire upon the reel bearing upon said ramp.

16. A reel adapted to receive a coil of wire at one end thereof, means adapted to support the reel while a strand of wire is drawn from the coil over the opposite end of the reel, a guide positioned in line with the axis of the reel and through which guide the wire is withdrawn from the coil, a rotary shaft journaled axially within the reel and projecting from the said opposite end of the latter and a fixed bearing at the end of said projecting portion of the shaft adapted to secure the shaft and reel against axial movement.

ARTHUR ERNEST BLASELL.