July 4, 1944. F. M. LITTELL 2,352,959

COIL CATCHER FOR CRADLE REELS

Original Filed June 24, 1940 3 Sheets-Sheet 1

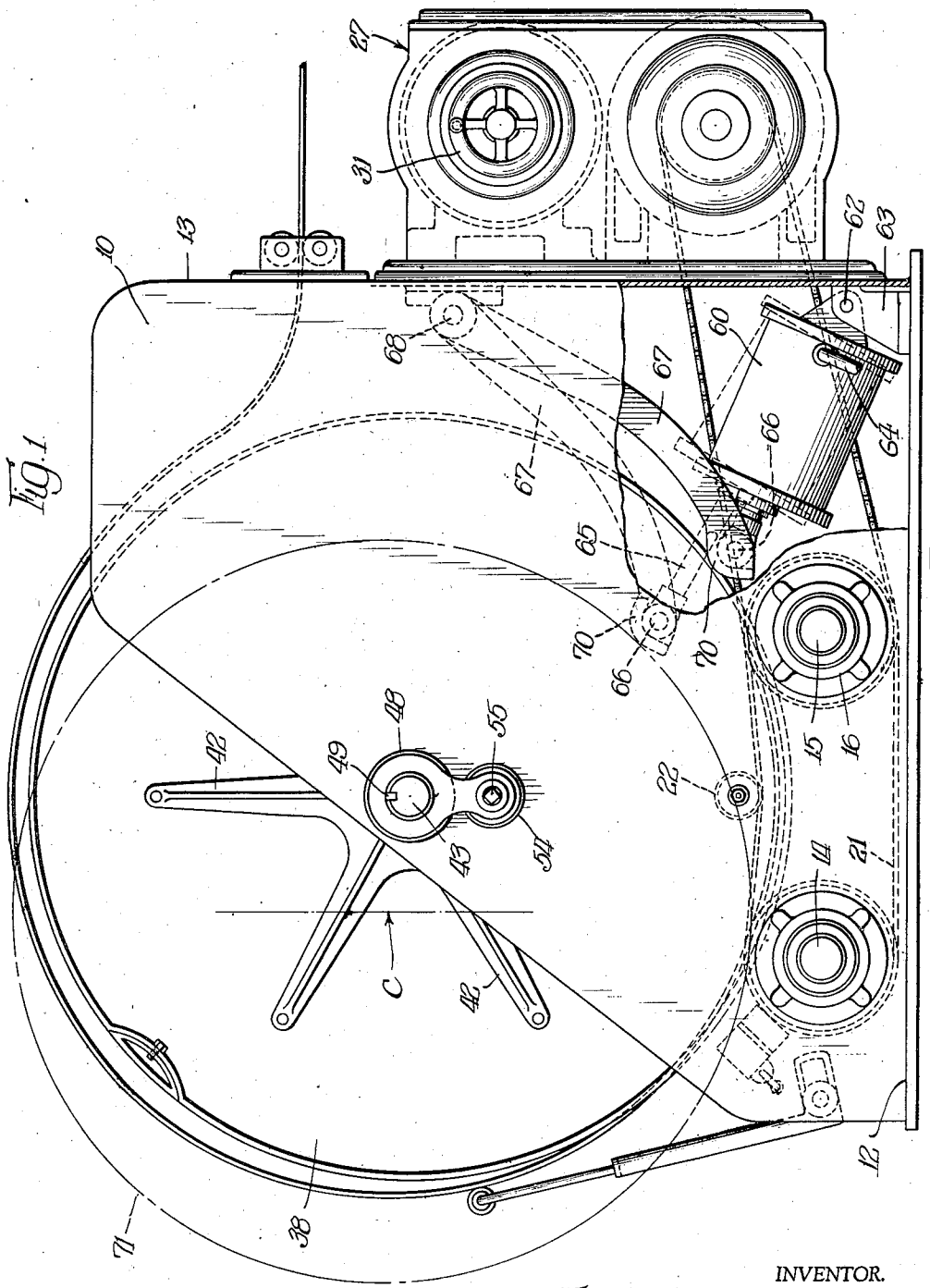


Fig. 1.

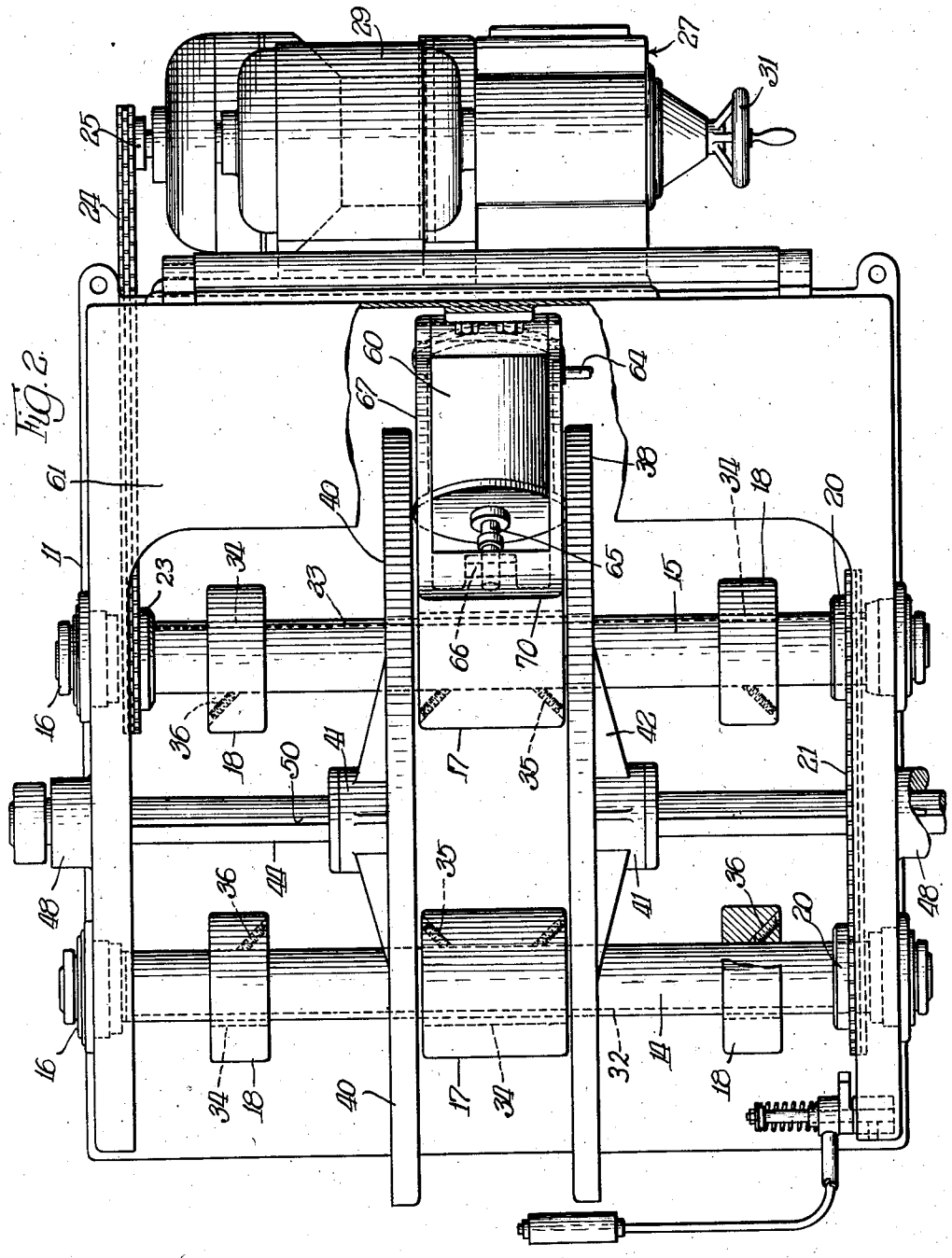
INVENTOR.
Frederick M. Littell
BY
Williamson Hufley Cushman & Dwight
Attys.

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Fig. 2.



INVENTOR.
Frederick M Littell,
BY
Williamson Hubley Brown & Knight
attys.

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COIL CATCHER FOR CRADLE REELS

Original Filed June 24, 1940 3 Sheets-Sheet 3

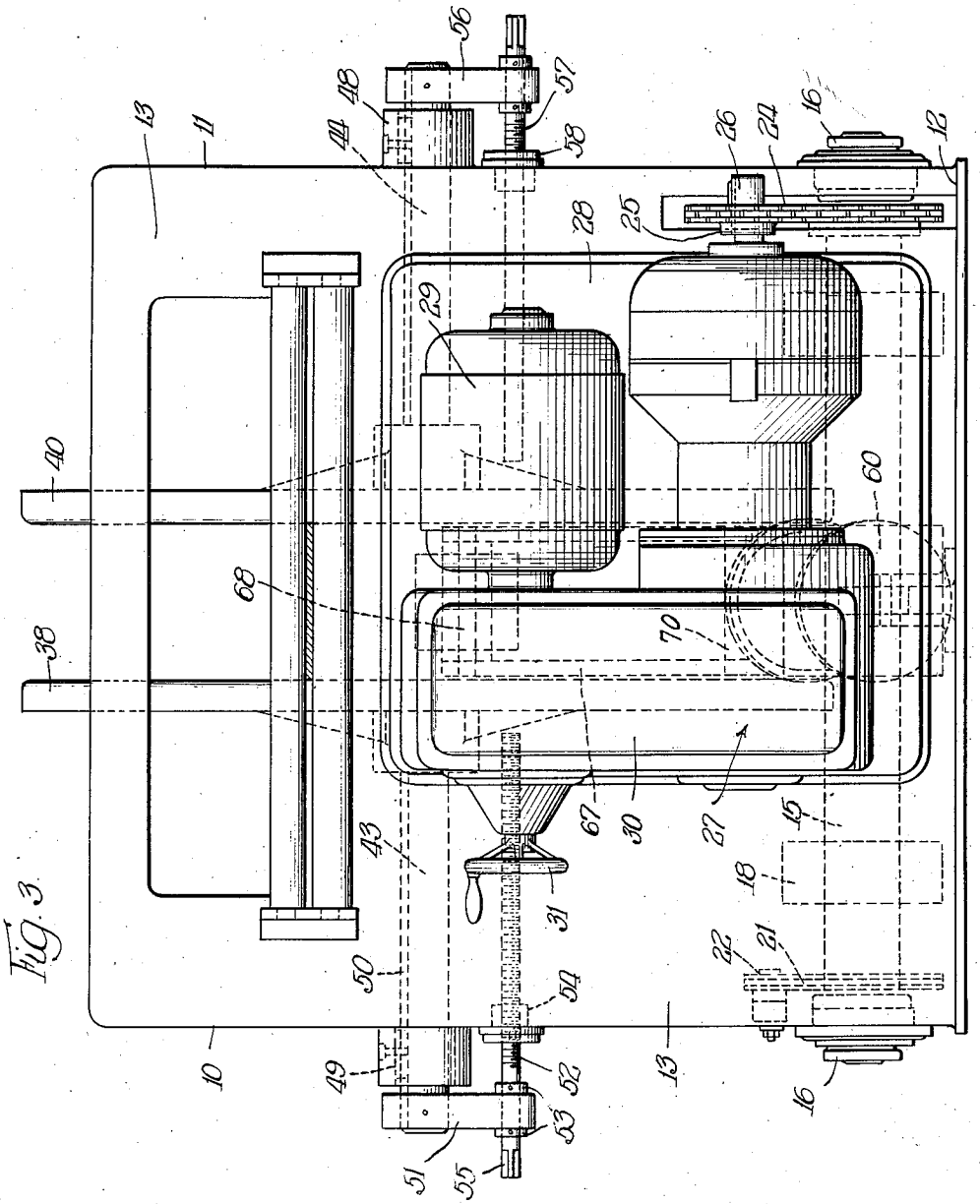


Fig. 3.

INVENTOR.
Frederick M. Littell,
BY
Wilkinson, Huxley, Byron & Knight
Attys.

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2,352,959

COIL CATCHER FOR CRADLE REELS

Frederick M. Littell, Detroit, Mich., assignor to F. J. Littell Machine Company, Chicago, Ill., a corporation of Illinois

Original application June 24, 1940, Serial No. 341,989, now Patent No. 2,323,477, dated July 6, 1943. Divided and this application July 14, 1941, Serial No. 402,321

2 Claims. (Cl. 242—78)

The invention relates to cradle reels having spaced rotating shaft members for supporting a coil of material to be fed therefrom to a punch press or the like and the primary object of the invention is to provide improved means for protecting the coil against damage in the operation of depositing the coil onto the said supporting shaft members.

This application is a division of my Patent No. 2,323,477 granted July 6, 1943 and entitled Cradle reels and a more specific object resides in the provision of a coil catcher of novel design for protecting the supporting shafts of the reel and for also protecting the outer turns of the coil stock particularly in the case of large heavy coils during the operation of rolling the same onto the reel from the rear of the structure.

In the illustrated embodiment the coil includes circumferentially spaced rotating shafts having rolls thereon for directly contacting the outer turn of material on the coil. In the past the coil has been rolled over the rear shaft and allowed to drop into place, being thereupon supported by both shafts. When the coil drops into place the impact of the same with the front shaft has been the cause of considerable damage not only to the outer convolutions of relatively thin material on the coil but also to the front shaft of the reel. The coil catcher of the invention is located toward the front of the reel opposite the open rear end of the same and in operative position the coil catcher will function to balance the coil on the rear shaft. Upon release thereof the heavy coil will thus be deposited in a manner preventing rapid descent and which will eliminate excessive impact with the front shaft and also damage that would otherwise result.

Another object is to provide a coil catcher for the purposes described that can be actuated pneumatically or hydraulically.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the invention, and wherein like reference characters are used to designate like parts—

Figure 1 is a side elevational view of a cradle type reel embodying the improvements of the invention;

Fig. 2 is a top plan view with parts being shown in section of the reel of Figure 1 particularly illustrating the improved coil catcher in associated relation therewith; and

Figure 3 is a front elevational view of the cradle reel shown in Figure 1.

Referring to the drawings, the frame for the present reel consists of side members 10 and 11 suitably supported on a base 12 and connected along the vertical front edges thereof by the front frame member 13. The rear of the frame is open and a coil of strip material is rolled onto the supporting shafts 14 and 15 through said rear opening. Each shaft, as best shown in Figure 2, is suitably journalled in the side members 10 and 11 by roller bearing units 16. Each shaft carries a plurality of supporting rolls 17 and 18, the rolls 17 being located substantially centrally of each shaft, and the rolls 18, which are somewhat narrow in width, being normally positioned outwardly on the respective shafts toward the side members 10 and 11.

Adjacent the bearing units 16, mounted in the side frame 10, each shaft 14 and 15 is provided with a sprocket 20 so that the shafts may be operatively connected by the chain 21 having associated therewith an idler sprocket 22 for keeping the correct tension on the chain. Shaft 15 also carries a sprocket 23 which is located adjacent the side member 11 and the driving chain 24 which passes around this sprocket also passes around sprocket 25 fixed to the shaft 26 of a motor drive unit indicated in its entirety by numeral 27, suitably mounted by means of a base 28 on the front frame member 13 of the machine. Said motor drive unit includes an electric motor 29, Figure 3, and variable driving means enclosed within housing 30 whereby the shaft 26 is constantly driven during operation of the motor but at variable speeds, depending on the adjustment of the variable drive means which is effected by rotation of handle 31. Both supporting shafts 14 and 15 are therefore driven in unison and at the particular speed required for feeding the strip material from the coil, thereby reducing the stopping and starting of the motor 28 to a minimum.

Each supporting shaft is provided with a longitudinal groove identified by numeral 32 with respect to shaft 14 and 33 for shaft 15, the groove extending from end to end of its particular shaft, and by means of a key 34 of conventional construction each supporting roll is non-rotatably held on its shaft although movement in a direction longitudinally of the shaft is permitted by said groove. The center supporting rolls 17 are locked in adjusted position by set screws 35

and each supporting roll 18 is likewise locked in adjusted position on its respective shaft by set screw 36.

For centering the coil of stock within the present reel and to also protect the side edges thereof against damage during feeding operations rotary guide plates 38 and 40 are provided, each being suitably supported by means of hub portions 41 on an axially adjustable shaft which accordingly mounts the rotary guide plates for adjustment toward and from each other. The hub portions 41 are each secured to their respective guide plates by the radially extending fingers 42 and said hub portions contain bearing units for journalling the guide plates. With respect to the plate 38 the hub portion 41 rotatably journals the same on the axially adjustable shaft 43. In a like manner the hub portion 41 journals the guide plate 40 on the end of shaft 44. It will be observed by reference to Figure 3 that the rotary guide plates are of fairly large diameter and that the plates accordingly depend below the supporting rolls 17 and 18. This is desirable since it assures that the entire side area of the coil supported within the reel will be in contact with a rotary guide plate.

Shafts 43 and 44 extend through hubs 48 formed integral with and projecting from the outside surface of side frames 10 and 11. Although each shaft 43 and 44 is adjustable in an axial direction, rotation of the shaft is prevented by the key 49 having location within each hub and fitting within a key-way slot 50 extending the length of each shaft. The end of shaft 43, projecting beyond its hub 48, has fixed thereto a depending arm 51. The lower end of the arm is apertured for receiving the operating rod 52 which is held against endwise movement with respect to the arm by collars 53, which, however, permit rotation of said rod. The rod is threaded for a greater portion of its length and said end has threaded engagement with the stationary nut 54 suitably mounted in and secured to the side member 10 of the frame. The rod 52 is adapted to be rotated by the operator for which reason the projecting end has a square formation 55 for receiving a handle or the like, and as a result of said rotation the rod will be caused to travel axially and to impart similar movement to the shaft 43 and thus to the rotary guide plate 38. In a similar manner shaft 44 is provided with a depending arm 56 with which is associated the operating rod 57, likewise threaded for the greater portion of its length and which threaded portion passes through the stationary nut 58. Rotation of rod 57 will cause axial movement of the same with respect to the side member 11 and similar movement will be imparted to shaft 44 and to the rotary guide plate 40.

Each rotary guide plate is accordingly adjustable in an axial direction for accommodating coils of different widths and the supporting rolls 18 can also be varied in position on their respective shafts in order to provide the additional support for relatively wide coils. Irrespective of the width of the particular coil of stock supported by the present reel the same will be guided by the rotary discs and automatically centered on the reel. The said rotary discs in contacting the side edges of the coil protect the same against damage such as curling. It will be observed that although shafts 43 and 44 are held against rotation, nevertheless the guide plates 38 and 40 are mounted by the hubs 41 so as to have free rotation and means are provided in the form of operating rods 52 and 57 for adjusting the plates in an axial direction for effectively holding the same in adjusted position.

There is associated with the present reel a coil catcher of novel design comprising an air cylinder 60 located below the diagonal and plate 61 and pivotally mounted at 62 to a bracket 63 located adjacent the base 12 and the front wall 13 of the reel. The cylinder has connection with a source of air supply by pipe 64 and when air is admitted to the cylinder movement is imparted to the piston rod 65. The outer end of the piston rod has pivotal connection as at 66 with the arm 67 supported for swinging movement as at 68 from the front wall 13 of the reel. At the connection 66 of the swinging arm with the piston rod the said arm provides a member 70 providing a contact surface for engagement with the periphery of the coil. As a result of the pivotal connection of the arm 67 with the frame and the pivotal support for the air cylinder 61 it will be observed that the said member 70 is directed forwardly and upwardly when air is admitted to the cylinder. In accordance with the invention the construction is such that member 70 will contact the periphery of the coil and maintain the same in balanced relation on the rear shaft 14. When supported and balanced in this manner the center of the mass of the coil is located at C, Figure 1, which point is positioned on a vertical line slightly to the right of shaft 14. This locates the mass of the coil between the two supporting points and accordingly the coil will maintain its position, being mostly supported by shaft 14, which position is indicated by the dotted lines 71, Figure 1.

The coil can now be gradually lowered onto the shaft 15, which operation only requires that the air be allowed to exit from cylinder 60. As air issues from the cylinder the piston rod 65 will travel downwardly in an angular direction toward the base of the front wall and the member 70 will therefore move downward in a similar direction. In the lowermost position of member 70 the coil will come to rest on shafts 14 and 15 and member 70 will have moved entirely out of contact with the periphery of the coil. The air cylinder makes it possible for heavy coils to be located on the reel without damage to the periphery of the coil or to the outer turns adjacent the periphery. In most plants the coils are rolled down an incline onto the reel from the rear. In the present reel the air cylinder is actuated preceding this operation and the member 70 acts as a catcher for the coil, preventing a rapid descent onto the forward shaft 15 which heretofore has been the cause of serious damage to the outer turns of metal on the coil. The present coil catcher also prevents damage to the supporting rolls and shafts of the reel since the heavy coils are prevented from contacting the front shaft 15 with excessive impact such as would be the case if the coil catcher were not present. The position of member 70 when located upwardly and forwardly, as in dotted lines in Figure 1, is important since the coil when supported by shaft 14 and said member 70 is balanced and the coil will maintain this position, allowing the operator to gradually lower the same in place when desired.

The pressure cylinder of the coil catcher may be operated pneumatically or hydraulically. In accordance with the invention the said cylinder is located adjacent the front wall in opposed relation to the open rear end of the frame. When

the coil catcher, or more particularly the member **70**, is operatively located, it will be understood that the coil of stock material will be supported by said member in balanced relation on the rear shaft with substantially the entire weight of the coil being taken by the rear shaft. Upon release of the member **70** the same will move downwardly and inwardly toward the front wall. The weight of the coil produces this movement and the action results in the depositing of the coil onto the front shaft so that both shafts thereupon support the coil. Therefore in normal position the coil catcher is substantially circumferentially disposed but when rendered operative the same is located above the front shaft and in spaced relation therewith. The resiliency which the pressure cylinder provides is important in the operation of the present apparatus. When the heavy coil contacts the member **70** the same moves inwardly to a limited extent against the pressure in the cylinder until a balancing of the pressure with the weight against member **70** is reached. This yielding action of the coil catcher is effective in preventing damage to the material of the coil.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. The combination with a cradle reel having an open rear end and including a front wall, side walls and spaced front and rear shafts journalled by said side walls, of a coil catcher for said reel comprising a pressure cylinder pivotally connected at one end to said reel and having its opposite end extending upwardly toward the rear of the reel, a piston rod projecting from said opposite end of the cylinder and actuated thereby into an operative position to locate the extending end of the piston rod in spaced relation over said front shaft, guiding means for the rod including an arm pivotally secured to the reel and depending downward for pivotal connection with the extending end of said rod, and said piston rod when in extended position having operation to yieldingly arrest the movement of a coil rolling onto said reel through the open rear end and which coil is thereupon supported by said piston rod in balanced relation on the rear shaft.

2. The combination with a cradle reel having an open rear end and including a front wall, side walls and spaced front and rear shafts journalled by said side walls, of a coil catcher for said reel comprising a pressure cylinder pivotally connected to the front wall and extending diagonally upward toward the open rear end, a projecting piston rod provided by said cylinder and actuated thereby into an operative position to locate the extending end of the piston rod in spaced relation over said front shaft, an arm pivotally supported from the front wall and depending downward for pivotal connection with the extending end of said piston rod whereby the rod is guided in its movement, said piston rod when operatively positioned providing a yielding stop member for a coil to thus support the coil in balanced relation on the rear shaft, and said piston rod when the pressure of the cylinder is released depositing said coil onto both shafts in a manner preventing damage to the outside turns of said coil.

FREDERICK M. LITTELL.