SELF-EXPANDING WIRE REEL


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3 Claims. (Cl. 242—110)

This invention relates to self-expanding wire reels, and more particularly to reels of this character for feeding from coils of welding wire for metal arc welding processes in which the arc is shielded by a granular solid or an inert gas.

Welding wire is supplied in two forms, layer wound and random wound, of which the layer wound wire may be obtained on flange-type spools or cardboard rims. The wire wound on spools is self-contained and does not require a reel, but wire wound on rims does require a reel. Wire wound on a rim can be held to close coil dimensions. In either case the wire unwinds from the spool or reel without any trouble.

Random wound coils cannot be held to close dimensions. For example, a designated twelve inch inside diameter coil may be held with an actual thirteen and a half inch inside diameter. This would be loose on the reel, and the entire coil would adjust itself in the direction of withdrawal, with the result that the coil grows in diameter and the outside layers move beyond the fingers usually provided on the reel. A coil in an overexpanded condition is generally scrapped, with resultant loss of time as well as material.

It is therefore the main object of the present invention to avoid the difficulties referred to above, and to provide a self-expanding wire reel to hold random wound coils of varying inside diameter.

Experience has shown that the outer layers of a random-wound coil will not grow in diameter if the inner layers are held tightly against the reel. To accomplish this result, the reel is provided with four fingers having eccentric cams to provide a two inch increase in diameter. The four fingers with their eccentrics are mounted on respective bell cranks pivoted on the respective reel spokes and are spring pressure loaded. When the fingers are turned inwardly, the smallest diameter is presented so that the coil can be loaded onto the reel. When the fingers are turned outwardly the largest diameter is presented.

For any coil diameter less than the largest, the four bell crank and finger assemblies automatically rotate counterclockwise toward the center of the reel. This action is forced by the bell crank springs and causes the outer arms of the bell cranks outwardly, which keeps the eccentrics tight against the inner layers of the wire coil. The pressure of the cam against the coil prevents the coil from adjusting itself in the direction of wire withdrawal.

Since the fingers are under pressure from the springs and are free to rotate eccentrically, inasmuch as there is direct frictional contact between the finger eccentrics and the coil, there is a tendency for the fingers to rotate clockwise and turn the eccentric to initial or smallest diameter position. To prevent this undesirable condition two pieces of thin sheet metal strip formed to the contour of the smallest diameter are mounted outside of and surrounding the eccentrics, and anchored to prevent sliding of the coil relative to the strip.

In the drawings:

Fig. 1 is a side elevation of a self-expanding wire reel according to the preferred embodiment of the present invention;

Fig. 2 is a section taken along the line 2—2 of Fig. 1;

Fig. 3 is a detail perspective view of the eccentric and its adjusting finger; and

Fig. 4 is a perspective view of the wire clamp.

The reel comprises a hub 10 journaled on a shaft 12 and having radial spokes 14. Each spoke 14 has a boss 15 intermediate its ends, in which is mounted a pivot 16. Journaled on the pivot 16 is a bell crank lever comprising an inner arm 18 and an outer arm 20. Each spoke 14 also has a fin 22 in which is mounted a bolt 24 which passes through the inner arm 18. A spring 25 surrounding the bolt between the bolt head and the arm 18, urges the arm 18 against the fin 22.

The outer end of each outer arm 20 has a boss 26 in which is secured a bolt 27. An eccentric bushing 28 is mounted on the bolt 27, and held in adjusted position by a wing nut 30. Each eccentric bushing 28 has an integral finger 31 to facilitate adjustment thereof, and also serve as a retainer for the wire on the reel.

Peripheral spring sheet metal strip 32 is formed to the smallest diameter of coil that the reel will take and are secured to opposite spokes by ears 34 passing over the pivot 16 on each side of the hub of the bell crank levers.

A quick-acting wire clamp is provided for securing the end of the wire as shown in Fig. 4. This clamp comprises a channel 35 having therein a guide pin 36, and a spring 37 secured to the opposite leg of the channel. The channel 35 is secured to one of the spokes 14 by a strap 38.

In operation, the wing nuts 30 are loosened and the fingers 31 turned inwardly to present the smallest diameter for loading the coil onto the reel. The end of the wire 39 is pressed into the channel 35, camming the spring 37 laterally. Then the fingers 31 are turned outwardly to cam the eccentrics 28 and the strips 32 into engagement with the inside diameter of the coil, and to compress the springs 25, so that the engagement of the strips 32 with the inside of the coil is under spring pressure.

We claim:

1. A wire reel for receiving a coil and comprising a hub and spokes, bell cranks pivoted on said spokes on axes parallel to the axis of said hub, springs mounted on said spokes biasing the inner arms of said bell cranks to urge the outer arms thereof to swing outwardly about their pivots, eccentrics pivotally mounted on said outer arms in adjustable relation about axes parallel to the axis of said hub which when turned inwardly present a smaller diameter for loading the coil and when turned outwardly increase the diameter to engage the inside diameter of the coil.

2. A wire reel for receiving a coil and comprising a hub and spokes, bell cranks pivoted on said spokes, springs biasing the inner arms of said bell cranks to urge the outer arms thereof to swing outwardly about their pivots, eccentrics pivotally mounted on said outer arms in adjustable relation, sheet material strip passing around the outside of said eccentrics and anchored to said spokes, said eccentrics when turned inwardly presenting a smaller diameter for loading, and when turned outwardly urging said strip into engagement with the inside diameter of the coil.

3. A wire reel for receiving a coil and comprising a
hub and spokes, bell cranks pivoted on said spokes equi-
distant from said hub, springs mounted on axes perpen-
dicular to said spokes and respectively engaging each of
said arms for biasing inner arms of said bell cranks to
urge the outer arms thereof to swing outwardly about
their pivots, eccentrics pivotally mounted on said outer
arms on axes parallel to the axis of said hub and said
eccentrics having operating fingers which when turned
inwardly position the eccentrics for smallest diameter for
loading, and when turned outwardly position the eccentrics
to engage the inside diameter of the coil.

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