Dec. 4, 1945. J. KRAMER 2,390,157

WIRE PAY-OFF REEL

Filed June 26, 1944

FIG. 1.

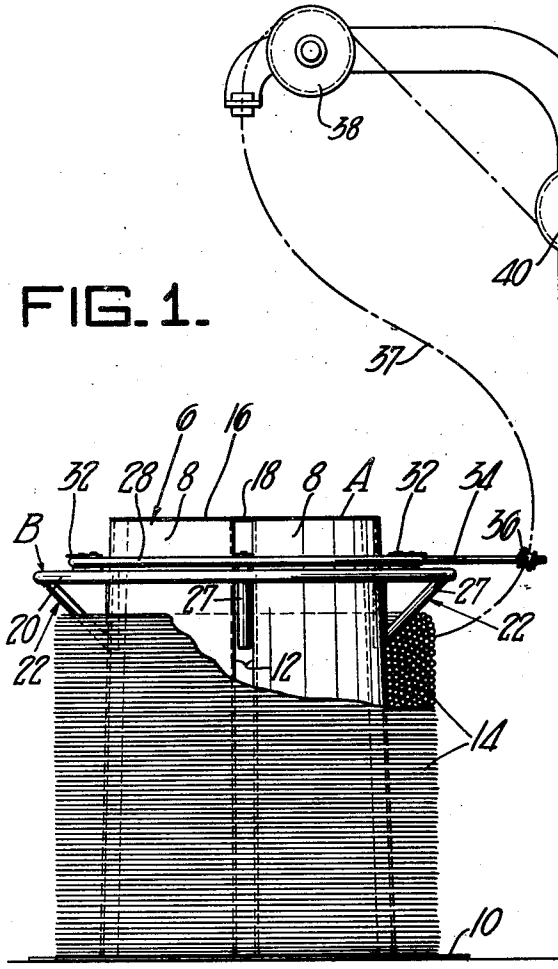


FIG. 3.

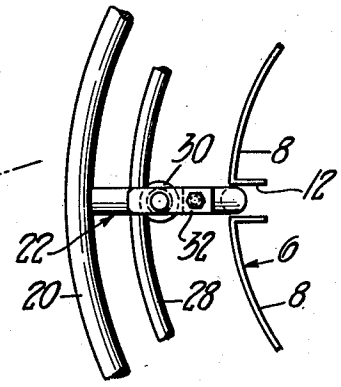


FIG. 4.

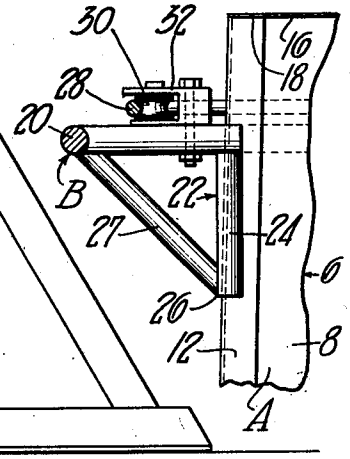
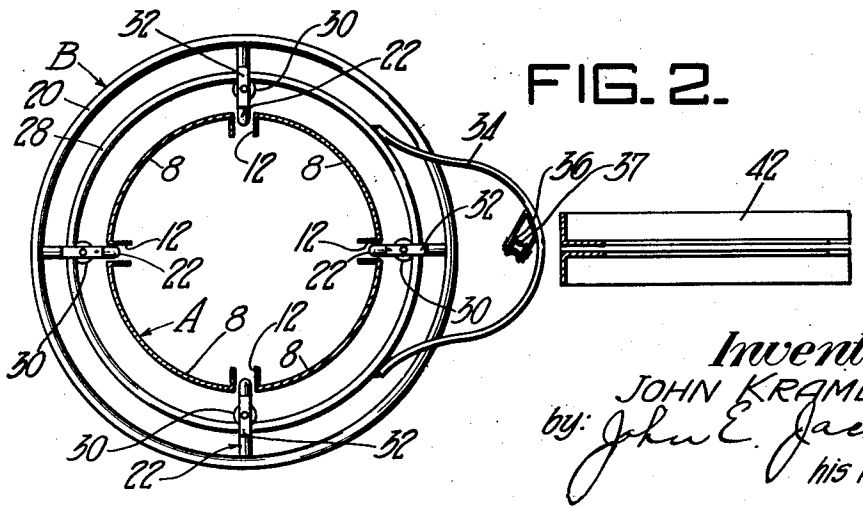


FIG. 2.



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WIRE PAY-OFF REEL

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3 Claims. (Cl. 242—128)

In accordance with the present invention, there are provided certain improvements in a pay-off reel for metal wire, which is particularly advantageous where the wire is fed at high speeds from a bundle of wire, to wire-processing instrumentalities, such as, for example, in the case of high speed rewinding machines where loosely coiled bundles of wire are rewound onto reels.

In such rewinding operations, it has been attempted to mount the loosely coiled bundles of wire to be rewound on revolving reels. However, such revolving reels are unsuccessful for this particular purpose, because it is necessary to apply a brake to the reel to prevent the reel from traveling at a faster rate of speed than the processing machine, and even when suitably braked, snarls in the wire occur very frequently because of the freedom with which the convolutions of the coil are allowed to remove themselves from the top of the bundle.

The present invention has for one of its objects the provision of an improved pay-off reel which will receive and support a coiled bundle of wire, the improved reel embodying a construction wherein the top convolutions of the bundle are restrained continuously as the wire is paid off from the bundle, this wire being unwound smoothly from the bundle under a controlled tension which provides uniformly smooth unwinding of the wire from the bundle and delivers the wire free from kinks and snarls to the processing machine.

The invention will be understood more readily from a consideration of the accompanying drawing, in which

Figure 1 is a side elevation of the improved reel mechanism of the present invention, the view showing, fragmentarily, a coiled bundle of wire placed thereon;

Figure 2 is a plan view of the mechanism of Figure 1;

Figure 3 is a fragmentary plan view of a portion of the mechanism of Figures 1 and 2;

Figure 4 is a fragmentary side elevation of the parts shown in Figure 3.

Referring more particularly to the drawing, the improved reel mechanism includes the reel unit A comprising the reel body 6, and a ring unit B which will be described hereinafter. The reel body 6 is composed of a plurality of segments 8, which when assembled together and mounted suitably, as by welding, on base plate 10, define open slotted portions 12 between the segments. The segments are slightly tapered as shown, so that the assembly of segments forms a truncated cone for receiving a coiled bundle 14 of wire to be unwound by a rewinding, or other processing, machine. The assembled segments 8 are welded, or otherwise suitably secured, to a top plate 16, which is slotted, as indicated at 18, to correspond to the open slots 12 between the segments 8.

Cooperating with the aforesaid reel assembly is the unit B composed of a ring 20 which is mounted on triangular brackets 22 adapted to ride in the open slots 12 along one side 24 of these brackets, a corner 26 and an upwardly sloping side 27 of the said brackets being adapted to engage the top convolutions of the coiled bundle 14 of the wire, and continuously restrain such against uncontrolled movement. The brackets 22 hold the ring 20 substantially horizontally, and as the wire is payed off from the bundle 14, the ring 20 follows continuously the convolutions of the wire, so that the top of the bundle is continuously engaged by the brackets 22 and the top convolutions of the bundle 14 are maintained continuously tight under the weight of the resulting ring assembly.

This ring assembly also includes a revolving planetary ring 28, which runs in rollers 30 mounted in brackets 32 carried by the fixed ring 20. A bracket arm 34 projects from this revolving ring 28 and carries a flyer roller 36 over which passes the strand of wire 37 from the bundle 14, the leading end of wire from the bundle having been threaded over this flyer roller 36 and thence around sheaves 38 and 40 in the pay-off stand 42 and thus into a wire drawing machine or rewinding mechanism or any other wire-processing machine (not shown).

The tension created on the wire by the pull from the processing machine causes the ring 28 to revolve around the assembled segments 8, thus causing convolutions of wire to be pulled off the top of the wire bundle. The weight of the ring assembly resting on top of the wire bundle 14 causes a uniform pressure to be exerted on the topmost convolutions of wire in the bundle, thus preventing snarls from forming during the wire payoff. As the bundle of wire becomes smaller, the ring assembly or unit continues to ride on top of the bundle because of its free positioning in open slots 12, thus creating a uniform tension in the wire regardless of the amount of wire previously drawn from the original full-size bundle, and will continue to function in this manner until the very last convolution of wire is removed from the reel.

The tapering configuration of the reel enables

ready placement of a bundle of wire thereon, as well as guiding the sliding brackets of the ring assembly into continuous intimate contact with the bundle of wire on the reel, while the upward slope of the side 27 of the triangular brackets tends to maintain the turns or convolutions of the bundle of wire continuously under compression during unwinding thereof, thereby restraining the wire from kinking or snarling during unwinding.

I claim:

1. A pay-off reel for supplying wire from a coiled bundle thereof to wire-processing instrumentalities, which comprises in combination a reel unit for receiving the coiled bundle of wire, a ring unit adapted to encircle the reel unit and to bear upon the coiled bundle mounted thereon, the said unit including a pressure ring adapted to exert compressional restraining force upon the bundle of wire on the reel unit and a rotatable ring having feed means for the wire mounted thereon, the said rotatable ring being mounted on the pressure ring and being operable responsively to tension imparted to the wire by the wire-processing instrumentalities, rotation of the rotatable ring unwinding wire from the coiled bundle as required by the wire-processing instrumentalities, and means associated with the pressure ring for continuously exerting a restraining compression force on the bundle of wire.

2. A reel adapted to receive a coiled bundle of wire for supplying wire from the said coiled bundle to wire-processing instrumentalities which comprises, in combination, an upwardly tapered reel body adapted to receive the coiled bundle of wire, a ring unit adapted to be mounted on the reel body, the ring unit including a pressure ring, triangular brackets for mounting the pressure ring along one side of the triangular brackets, and a rotatable planetary ring mounted on the pressure ring, the reel body being provided with spaced open grooves for receiving a second side of the triangular brackets and defining guide tracks for the brackets and rings whereby the ring unit may follow gravitationally the decreasing bundle of wire as wire is withdrawn therefrom, and means for feeding wire from the bundle to the wire-processing instrumentalities, the said triangular brackets having an upwardly sloping side in continuous engagement with the bundle of wire, thereby restraining the wire against uncontrolled movement during the unwinding.

3. A reel adapted to receive a coiled bundle of wire for supplying wire from the said coiled bundle to wire-processing instrumentalities which comprises, in combination, an assembly of upwardly tapering segments defining a reel body for receiving the bundle of wire, an open groove between adjoining segments, a ring unit mounted on the reel body and including supporting means slidably mounted in the said grooves whereby the ring unit may rest upon the bundle of wire positioned on the reel body and follow along down the reel body in continuous engagement with the coiled bundle as the wire is unwound therefrom, planetary unwinding means for the wire mounted on the ring unit and adapted to unwind wire from the bundle and to supply the said wire to the wire-processing instrumentalities responsively to predetermined tension imparted to the wire by the wire drawing instrumentalities, and means on the ring unit for continuously exerting a compressional force on the bundle of wire being unwound.

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