Aug. 23, 1938. R. C. PIERCE 2,127,936

WIRE WINDING APPARATUS

Filed Nov. 29, 1935 2 Sheets-Sheet 1

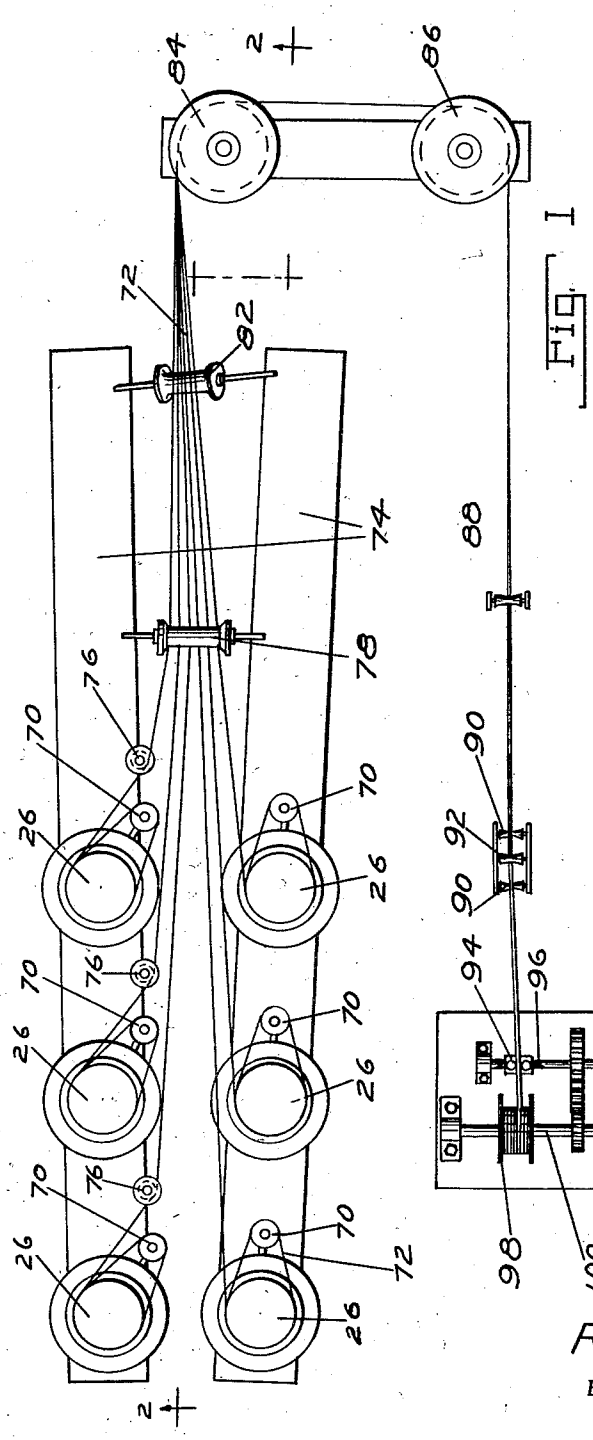


Fig. 1

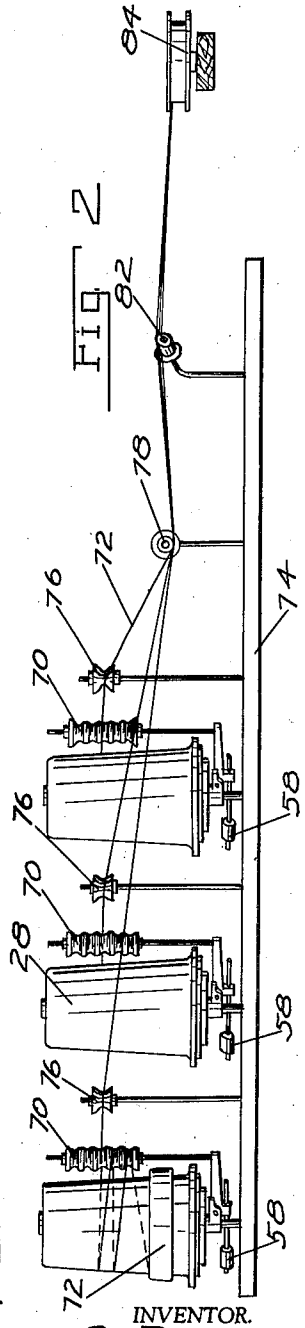


Fig. 2

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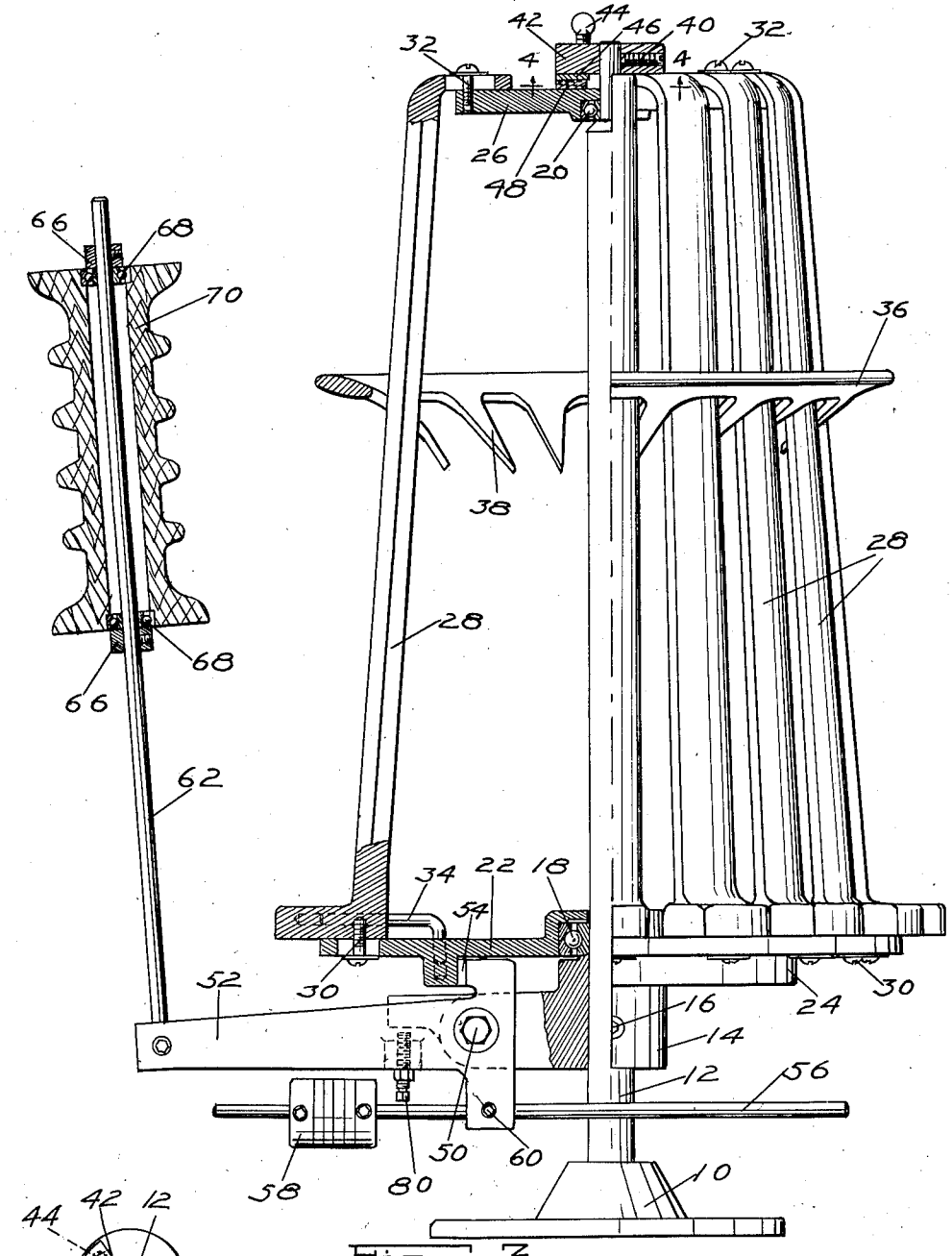


Fig. 3

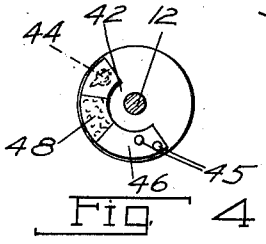


Fig. 4

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2,127,936

WIRE WINDING APPARATUS

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Application November 29, 1935, Serial No. 52,065

4 Claims. (Cl. 242—25)

This invention relates to wire handling apparatus and more particularly to swifts from which wire may be unwound at a substantially uniform tension.

One of the objects of the invention is to provide wire handling apparatus in which the wire is always maintained under constant tension.

Another object of the invention is to provide a swift in which the wire is always held properly in place and tangling thereof is prevented. According to one desirable arrangement a presser ring is provided resting on top of the wire on the swift.

The above and other objects and features of the invention, including various novel combinations and desirable constructions, will be apparent from the following description of the illustrative embodiment shown in the accompanying drawings, in which:

Figure 1 is a top plan view of the complete apparatus;

Figure 2 is a section on the line 2—2 of Figure 1, showing the swifts in side elevation;

Figure 3 is a view of one of the swifts, the part to the right of the axis being in side elevation and the part to the left being in vertical section; and

Figure 4 is a detail section on the line 4—4 of Figure 3.

Each of the swifts, illustrated in detail in Figures 3 and 4, comprises a base 10 supporting a fixed vertical spindle 12 on which there is mounted a bracket 14 held by means such as a setscrew 16. The spindle 12 is shown provided with lower and upper ball bearings 18 and 20, the bearing 18 resting on the top of the bracket 14 and the spindle 12 having its upper end reduced in diameter to form a shoulder supporting the bearing 20.

The rotatble body of the swift comprises a base 22 mounted on the bearing 18 and formed with a lower flange 24 provided with a cylindrical brake drum surface, and an upper plate 26 mounted on the bearing 20. An annular series of uprights 28 is adjustably secured to the base 22 and the plate 26 at their opposite ends, for example by means such as screws 30 passing through radial slots in the base 22 and screws 32 passing through radial slots in the bent upper ends of the uprights 28. Right-angle pins 34, seated at their ends in vertical and horizontal holes in the base 22 and the bottoms of the uprights 28 respectively, may be provided to serve as guides in adjusting the uprights.

The uprights 28 converge toward the top of the swift, giving the rotatable swift body a conical shape. A presser ring or weight 36, provided with internally projecting fingers 38, is provided to hold the wire wound on the lower part of the uprights 28, and form an adjustable upper flange for the swift. The diameter of the ring, between the ends of opposite fingers 38, is slightly greater than that of the plate 26, so that the ring may be slipped over that plate and lowered onto the wire wound on the swift, with the fingers 38 between the uprights 28. As shown in Figure 3, the inwardly-projecting fingers 38 are inclined downwardly to form, in effect, a fillet between the ring 36 and the uprights 28, thereby insuring that the wire cannot work in between the ring and the body of the swift.

The upper end of the spindle has secured thereto, by means such as a setscrew 40, a block 42 through which is adjustably threaded a thrust screw 44 engaging a spring brake block 46 secured to the block 42 by rivets 45 and faced with friction lining 48 engaging the upper face of the plate 26. This gives a predetermined adjustable minimum resistance to the turning of the swift, and a corresponding minimum tension on the wire being unwound therefrom.

The bracket 14 carries a pivot 50 on which is fulcrumed a three-arm bellcrank lever 52. The lever 52 has an upwardly-extending arm carrying a suitable brake 54 engageable with the flange or brake drum 24, a downwardly-extending arm in which is adjustably slidable lengthwise a rod 56 carrying a weight 58 and adapted to be clamped in adjusted position by means such as a setscrew 60, and a horizontal arm extending beyond the periphery of the swift body and having rigidly mounted at its end a vertical spindle 62 extending upwardly alongside the swift body. The weight 58 (shown adjustably secured to the rod 56 by setscrews 64) forms a means yieldingly urging the brake 54 against the drum 24.

The spindle 62 has means, such as blocks 66 secured thereto by setscrews or the like, holding antifriction ball bearings 68 for the opposite ends of a guide roller 70. The roller 70 is grooved to guide a wire passed thereover at various points in its length.

As appears in Figures 1 and 2, a number (e. g. six) of the above-described swifts, each carrying a coil of wire 72, are mounted on a suitable base 74. The wire from each swift is wound (preferably twice) around the upper part of the uprights 28 and the guide roller 70, and thence (over suitable guiding rollers 76 where needed)

to and below a single horizontal guide roller 78 which maintains the wires spaced as desired, in such a manner that they cannot interfere with each other.

It will be noted that tension on the wires rocks the levers 52 slightly against the resistance of the weights 58, releasing the brakes 54 sufficiently to permit the swift bodies to turn against the resistance of the drags of the upper and lower brakes 48 and 54. This action operates automatically to keep a uniform tension on each wire. A setscrew 80 carried by each lever 52 is set to engage a projection of the bracket 14 when the desired minimum braking is attained.

The wires next pass over an inclined guide roller 82, which directs them as a band of adjacent but non-interfering wires to and over rollers 84 and 86 rotatable on vertical axes, whence they pass (directed by one or more roller guides 88 shown as changing the plane of the wire band from vertical to horizontal) over two rollers 90 and under an intermediate roller 92, which three rollers serve to hold the band of wires with a fixed resistance.

The band of wires is then directed by a reversing carriage 94 operated by the usual double worm 96, to be wound upon a spool or the like 98 mounted on a shaft 100. The shaft 100 is shown geared to the worm 96 and as driven by a pulley mechanism 102 operated by a belt (not shown), or it may be motor driven.

It will be noted that the wires are under tension as they leave the swifts, that they pass under roller 78 under tension, then they pass over the inclined roller 82 under tension, they are still under tension in passing over rollers 88, 90, and 92, and they are finally wound, with the wires still individually tensioned, as a flat band of wires on the spool 98. It will thus be noted that the continuous individual tensioning of the wires aids in controlling them and preventing them from interfering with one another.

The change of the plane of the band of wires from horizontal to vertical and back to horizontal not only permits the building of a compact apparatus since the winding mechanism 94—102 may be placed beside the swifts, but also (by the placing of rollers 82 and 88) aids in controlling the wires.

While one illustrative apparatus has been described in detail, it is not my intention to limit the scope of the invention to that particular apparatus, or otherwise than by the terms of the appended claims.

I claim:

1. A swift comprising a base formed on its lower face with a cylindrical braking flange, a plurality of uprights secured in an annular series about the periphery of the base and which converge upwardly to form a generally conical body upon which wire or the like may be wound, a plate paralleling the base and securing the upper ends of the uprights together, a spindle rotatably engaging the base and said plate, friction means carried by the upper end of the spindle and engaging said plate, and a ring having a series of inwardly-projecting fingers the inner ends of which are spaced apart slightly more than the diameter of said plate and which project between said uprights when the ring is below said plate.

2. A swift comprising a base, a plurality of uprights secured in an annular series about the periphery of the base and which converge upwardly to form a generally conical body upon which wire or the like may be wound, a plate paralleling the base and securing the upper ends of the uprights together, a spindle rotatably engaging the base and said plate, and a ring having a series of inwardly-projecting fingers the inner ends of which are spaced apart slightly more than the diameter of said plate and which project between said uprights when the ring is below said plate.

3. A swift comprising a base carrying an annular series of uprights spaced about its periphery, and a ring encircling said uprights and having fingers projecting between said uprights.

4. A swift comprising a base carrying an annular series of uprights spaced about its periphery and which converge upwardly to form a generally conical body, and a ring encircling said uprights and having fingers projecting between said uprights, said fingers being inclined toward the center of said base.

ROBERT C. PIERCE.