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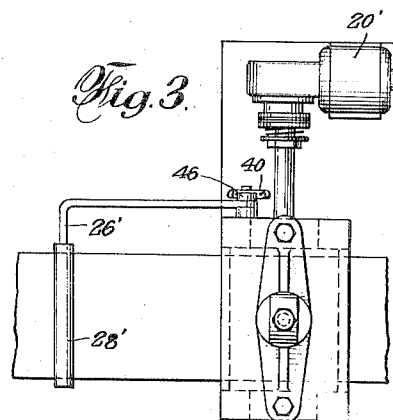
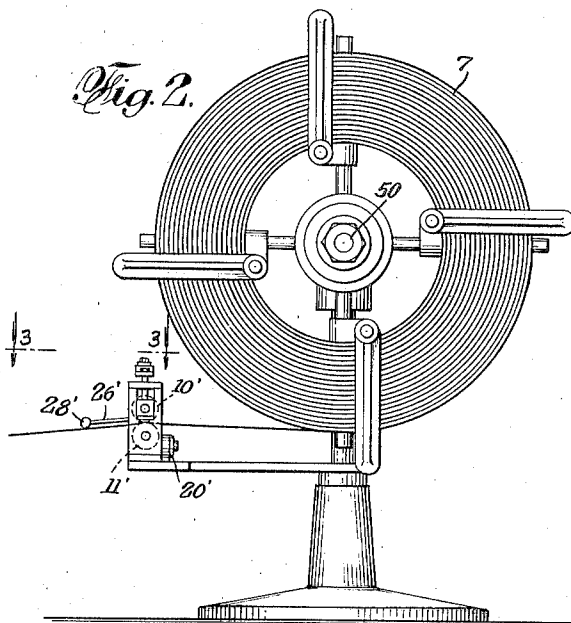
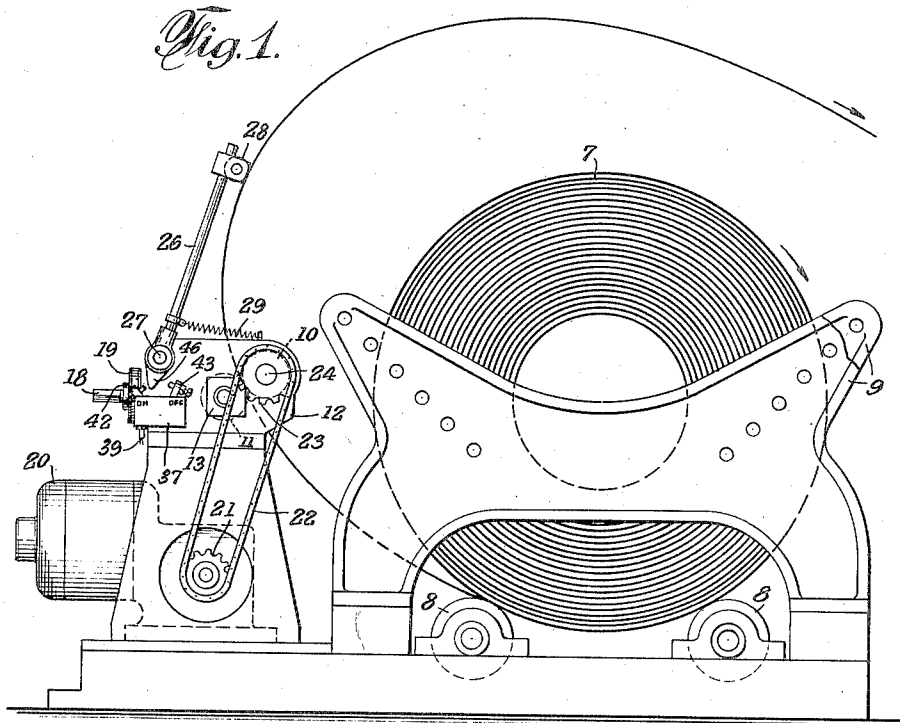
A. E. BORTON

2,227,387

STOCK REEL

Filed Nov. 13, 1939

2 Sheets-Sheet 1



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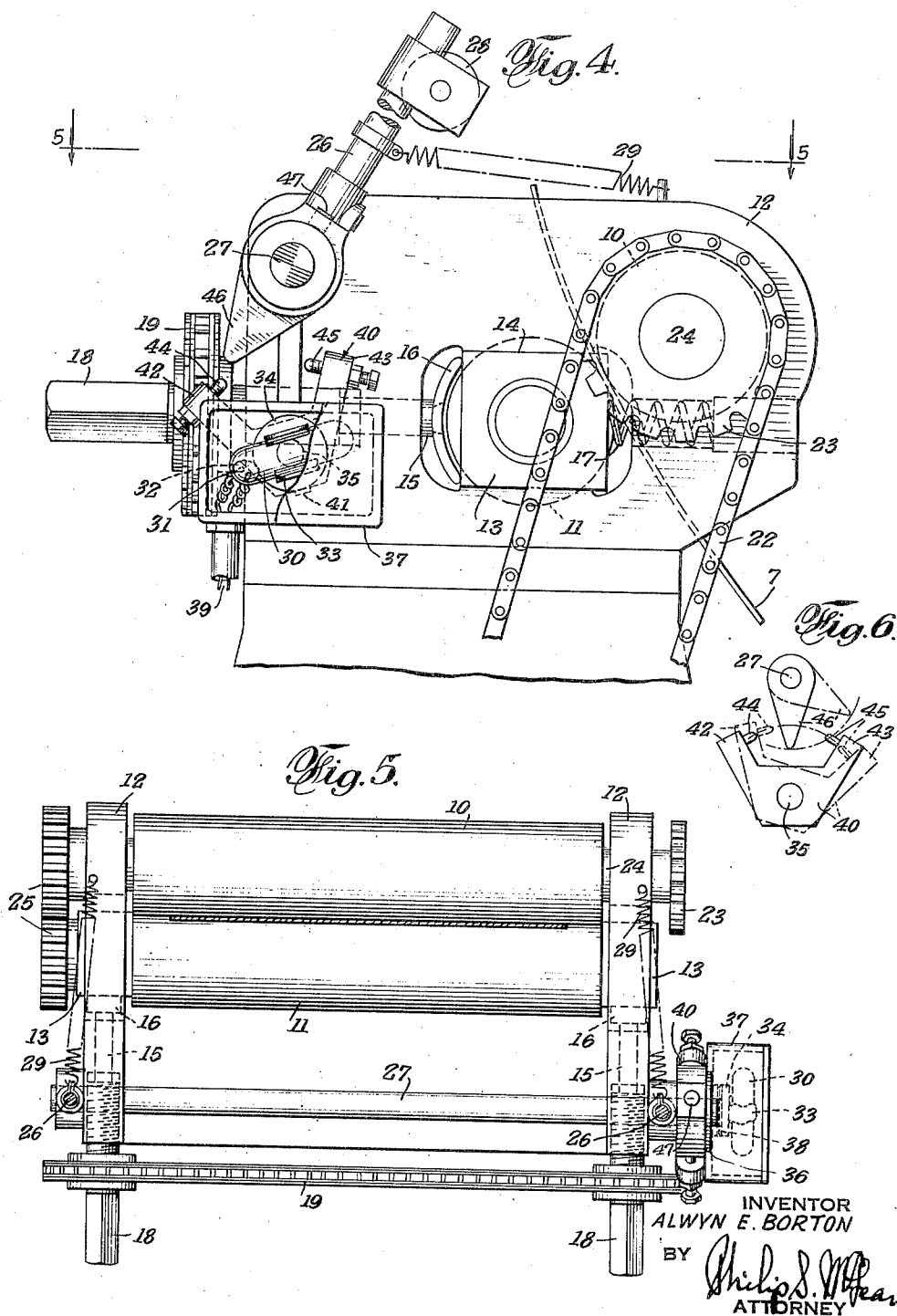
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UNITED STATES PATENT OFFICE

2,227,387

STOCK REEL

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Application November 13, 1939; Serial No. 303,954

9 Claims. (Cl. 242—55)

The invention here disclosed relates to the winding and unwinding of various kinds of strip materials.

Objects of the invention particularly are to provide practical and reliable apparatus for automatically winding or unwinding strip material at a desired rate, such as to suit the action of a press or some such associated machine, or in accordance with special conditions such as to stop and start operations, as an associated machine is stopped or started.

Further special objects of the invention are to provide practical and reliable apparatus for the purposes mentioned, which will be particularly sensitive and accurate in action and adapted to safely handle light and flimsy stock as well as heavy grades of material.

The foregoing and other desirable objects are attained by the novel features of construction, combinations and relations of parts hereinafter described, illustrated in the accompanying drawings and broadly covered in the claims.

The drawings illustrate several different forms of the invention and the structure may be further modified, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 is a side elevation of the invention as embodied in an automatic reel of the cradle type.

Fig. 2 is a side view showing the invention incorporated in a stock reel of the spindle type.

Fig. 3 is an enlarged broken plan view of the parts on substantially the plane 3—3 of Fig. 2.

Fig. 4 is an enlarged broken side elevation of the strip feed rolls and control mechanism illustrated in Fig. 1.

Fig. 5 is a broken part sectional plan as on the plane 5—5, Fig. 4.

Fig. 6 is a diagrammatic view of the rocker mechanism.

In the first form of the invention, illustrated in Figs. 1, 4 and 5, the stock is in the form of an open coil of strip material 7, rotatably supported on rolls 8, between side guides 9.

Unwinding of the strip material is effected by rolls 10, 11, Figs. 4 and 5, the first being shown as journaled in the framing 12, and the second as journaled in blocks 13, slidable in guides 14, for adjustments to suit the thickness of material and pressure to be applied to the stock.

Adjustment of the stock gripping rolls is effected in the illustration by parallel screws 15, mounted in the framing and carrying at their inner ends bowed pressure springs 16, bearing against the journal blocks 13. At the opposite

sides, these journal blocks are engaged by helical springs 17, which thrust the blocks outwardly as and when the pressure screws are released. The latter are shown as having squared heads 18, at their outer ends for engagement by a wrench 5 or adjusting crank and the two screws are shown as coupled together by sprocket chain connections 19, so that adjustment of either screw will effect a corresponding adjustment of the other screw.

The stock gripping rolls 10, 11, are operated in the illustration, from a motor 20, Fig. 1, which through suitable reduction gearing drives a pinion 21, connected by a chain 22, with a pinion 23, on the outer end of shaft 24, of the upper roll 10. The lower roll 11, is shown driven from the upper roll by gearing 25, Fig. 5.

As shown in Figs. 1 and 4, the stock gripping and feeding rolls 10, 11, are set one slightly above the other, so as to take the stock from the outside of the coil on an upward slant more or less tangential to the curvature of the coil riding on the supporting rolls 8.

Control of unwinding operations is accomplished in the illustration by means of swinging arms 26, fixed on a rock shaft 27, and carrying a roll 28, engaging the coil of stock advanced by the feed rolls. These rock arms may be weighted, counterbalanced or provided with springs such as indicated at 29, to swing them over toward the stock and to hold the roll 28, engaged with the stock at the desired pressure.

The actual control for the motor is shown as a mercury switch in the form of a tube 30, containing terminals 31, and a mercury contactor 32, said tube being held in a clip 33, carried by a head 34, at the end of a rock shaft 35, journaled in a bearing hub 36, projecting from the back of a switch box 37. Spring washers 38, between the back of the switch mounting head 34, and adjacent bearing surface, serve to frictionally hold this rock shaft and consequently the mercury switch which it carries, in the on and off circuit positions. Wiring extending from the switch to the motor is indicated generally at 39.

On the outer end of the switch rock shaft 35, a yoke 40, is adjustably secured at 41, said yoke having upwardly projecting divergent arms 42, 43, in which are adjustably mounted the abutment screws 44, 45, positioned for alternate engagement by the swinging control finger 46, projecting downwardly from the rock shaft 27. The switch actuating finger 46, is adjustably secured at 47, on the rock shaft 27, and the abutments 44, 45, on the switch rocker are so set that the

switch will be rocked to the closed circuit position shown in Fig. 4, to start the motor when the loop of material leaving the cradle has been reduced to a certain extent and be rocked in the reverse direction to open the circuit and stop the motor when the loop of slack material increases to a predetermined extent.

As shown in the detail view, Fig. 6, the control finger 46, and abutment screws 44, 45, rock on intersecting arcs 48, 49, and the extent of overlap is such that the finger traveling in one direction can engage, depress and swing on past one abutment screw. The control finger is thus enabled to clear itself of any restraint from the switch rocker. The tilting of the switch in one direction, as to the right in Fig. 6, by depression of the rocker abutment 45, brings the other abutment 44, up into the range of the control finger, so that the latter in its return movement, while clearing the depressed abutment 45, will fully engage the raised abutment 44, and by depressing the latter, rock the switch fully in the opposite direction.

The spring washers 38, yieldingly hold the switch in the position to which it has been rocked, so that it will stay in the position to which it has been shifted, whether that be the off or the on circuit condition and remain there until the control finger swings back sufficiently to rock it over into the reverse position. The body of mercury has the desirable effect, once the tilting movement is started, of assisting in such motion and actually carrying the rocker a slight distance beyond the movement imparted by the control finger, to lower the last engaged abutment just enough to prevent the control finger from scraping over the end of such abutment in its return movement.

The removable mounting of the mercury tube in the supporting clip 33 enables this tube being readily reversed end-for-end so as to effect the desired on or off circuit condition in the tilted position in either direction.

Figs. 2 and 3 illustrate an adaptation of the invention to reels of the spindle type, where the coil of material is supported at the center on a spindle structure 50. In this particular illustration, the detector roll 28' rests on the stretch of material advanced by the feed rolls 10', 11' and the parts are adjusted so that with a certain amount of slack the roll will lower to rock the switch to the circuit open position and as the loop of advanced material decreases to a predetermined extent, the switch will be rocked back into the closed circuit position.

Because of the disconnection which is automatically effected between the control finger and switch rocker, after the switch has been actuated one way or the other, the detector mechanism is unhampered or free of restraining influence such as might be imposed by switch mechanism and hence can bear very lightly on the stock and be very sensitive in its action. The mechanism, on the other hand, is quite simple and of a substantial character, so as to be reliable and not likely to get out of order. Also, it is readily applicable to various types of machines and may be used equally as well for either winding or unwinding purposes. Associated with a press, stock straightener, or other mechanism, the invention serves a safety purpose, automatically stopping the feed when the consuming mechanism stops and starting again when the associated machine starts. The invention is adapted to the handling of all kinds of strip

stock, whether it be in the nature of wire, flat strip or other cross-sectional shapes. The invention is applicable to other forms of strip advancing means than those shown, for instance, to the type of stock reel covered in Borton Patent 2,097,142, in which the spindle carrying the coil of material is driven by belt from a motor and in which event, the swinging control arm is positioned to engage in a slack loop of material taken off from or winding on the outside of the reel. The switch box enclosing the mercury switch and supporting the switch rocker, forms a complete assembly which can be readily handled and mounted on a machine as a single unit.

What is claimed is:

1. In an automatic reel, the combination of strip feeding means, including a motor, a movable feeler positioned to engage strip material advanced by said strip feeding means, a rocking control finger actuated by said feeler, a rocking motor controlling switch element, a rocker for actuating the same, spaced abutments carried by said rocker for engagement by said swinging control finger, said control finger and spaced abutments being mounted for rocking movement on intersecting arcs and said rocker having movement in opposite directions sufficient to enable one abutment to be moved by said finger to a position clear of the same and said abutments being so related to said finger that the swinging of said rocker in one direction to free one abutment of said finger will carry the other abutment into position to be engaged and actuated by said finger in swinging movement of the latter in the opposite direction.

2. In an automatic reel, the combination of strip advancing means including a motor, a tilting mercury switch for controlling said motor, a rocker on which said mercury switch is mounted, spaced abutments on said rocker, a swinging arm positioned for engagement by the stock advanced by said strip advancing means and a control finger actuated by said swinging arm on an arc intersecting the arc of movement described by the spaced abutments of said switch rocker.

3. In an automatic reel, the combination of strip advancing means including a motor, a tilting mercury switch for controlling said motor, a rocker on which said mercury switch is mounted, spaced abutments on said rocker, a swinging arm positioned for engagement by the stock advanced by said strip advancing means and a control finger actuated by said swinging arm on an arc intersecting the arc of movement described by the spaced abutments of said switch rocker, said spaced abutments comprising screw members adjustable to enable said control finger to swing over and beyond said abutments in travel in opposite directions.

4. In an automatic reel, the combination of strip advancing means including a motor, a tilting mercury switch for controlling said motor, a rocker on which said mercury switch is mounted, spaced abutments on said rocker, a swinging arm positioned for engagement by the stock advanced by said strip advancing means, a control finger actuated by said swinging arm on an arc intersecting the arc of movement described by the spaced abutments of said switch rocker and means for releasably retaining said switch rocker in the positions to which it is tilted in opposite directions.

5. In an automatic reel, the combination of strip advancing means including a motor, a tilting mercury switch for controlling said motor, a

rocker on which said mercury switch is mounted, spaced abutments on said rocker, a swinging arm positioned for engagement by the stock advanced by said strip advancing means, a control finger actuated by said swinging arm on an arc intersecting the arc of movement described by the spaced abutments of said switch rocker and spring means for yieldingly retaining said switch rocker tilted in opposite directions.

6. In an automatic reel, the combination of strip advancing means including a motor, a tilting mercury switch for controlling said motor, a rocker on which said mercury switch is mounted, spaced abutments on said rocker, a swinging arm positioned for engagement by the stock advanced by said strip advancing means, a control finger actuated by said swinging arm on an arc intersecting the arc of movement described by the spaced abutments of said switch rocker and a switch box enclosing said mercury switch and provided with a bearing for said rocker.

7. In an automatic reel, the combination of strip advancing means including a motor, a movable switch element for controlling said motor, a rocker for operating said movable switch element, spaced abutments on said rocker, a swinging arm positioned for engagement by the stock advanced by said strip advancing means, a control finger actuated by said swinging arm on an arc intersecting the arc of movement described by the

spaced abutments of said switch rocker, said spaced abutments being relatively adjustable on said rocker to enable positioning of the same for the control finger to engage and swing free of said abutments.

8. In an automatic reel, the combination of strip advancing means, including strip feeding rolls and a motor for driving the same, a switch for controlling said motor, a rocker for actuating said switch, spaced abutments carried by said rocker, a control finger mounted to swing between and beyond said spaced abutments and a strip engaging arm connected to operate said control finger.

9. In an automatic reel, the combination of strip advancing means, including strip feeding rolls and a motor for driving the same, a switch for controlling said motor, a rocker for actuating said switch, spaced abutments carried by said rocker, a control finger mounted to swing between and beyond said spaced abutments and a strip engaging arm connected to operate said control finger said spaced abutments being relatively adjustable on said rocker sufficiently to enable positioning of the same so that said control finger after engaging said abutments at predetermined points in the arc of travel may then swing free of the same.

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