Oct. 18, 1932. W. H. SPIRE 1,883,047

MATERIAL SORTING MACHINE

Filed Sept. 14, 1931

Fig. 1

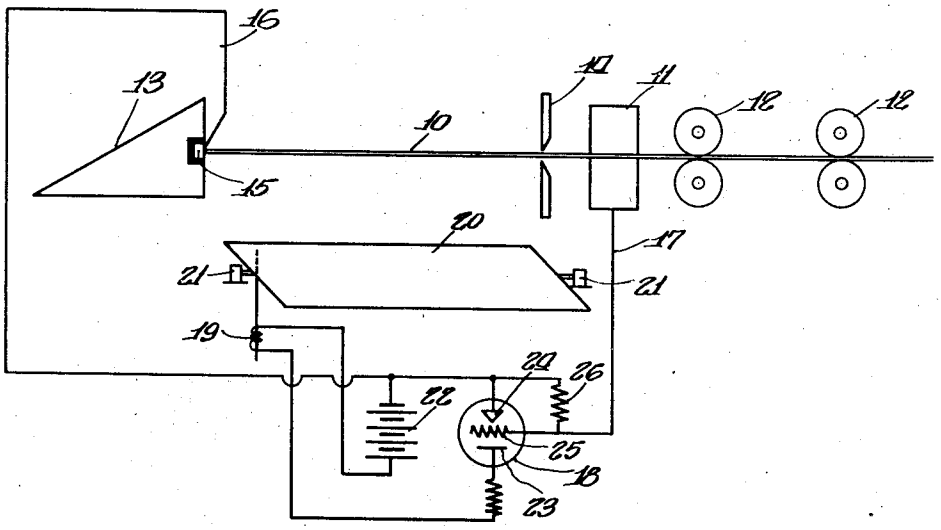
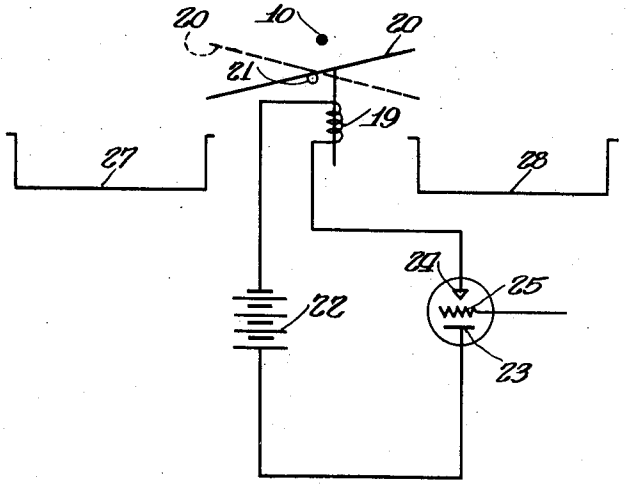


Fig. 2



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by: Charles H. Wells Attys.

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UNITED STATES PATENT OFFICE

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MATERIAL SORTING MACHINE

Application filed September 14, 1931. Serial No. 562,633.

This invention relates to an improved apparatus for automatically rejecting lengths of rod cut by power shears when the lengths are shorter than the standard length necessary in a given manufacturing process.

It is an object of my invention to provide simple means for automatically rejecting such lengths of rod cut by power shears, or the like, as are of less than the standard length desired.

It is a further object of my invention to accomplish the above-mentioned object without making use of gauging devices involving movable elements.

It is also an important object of my invention to provide length gauging means for use in connection with power shears, and the like, which may be applied to any such machine without expensive alterations in the machine.

On the drawing:—

Figure 1 shows diagrammatically the application of my invention to the gauging of rods cut by power shears.

Figure 2 shows diagrammatically a portion of the rod-rejecting means shown in Figure 1.

As shown on the drawing:—

The numeral 10 indicates a rod of metal which is fed through a die, or steadying rest, 11, by feed-rolls 12, against an abutment member 13. The rod 10 is cut by shears 14, operating in geared relation with the feed-rolls in any well-known manner.

I have applied my invention to power shears for cutting metal rod into short lengths suitable for use in the manufacture of poppet valves for internal combustion engines. Such rod is received from the steel mills in several lengths; and it usually happens that, in the operation of the shears, the last length cut by the shears from the long rod is shorter than the usual run of lengths cut, and is not long enough to engage the abutment 13. It sometimes happens that due to improper feeding of the rod by the feed rolls the shears cut the rod before enough of it has been fed through the die 11 to engage the abutment 13.

A conducting plate 15 is suitably secured on the abutment 13, and insulated therefrom, to engage the end of the rod 10.

A grid-glow tube 18 of a conventional type, is connected by wires 16 and 17 to the plate 15, and to some part of the machine making contact with the rod, such as the die 11, so that when the rod 10 engages the plate 15 an increased current flows through the plate supply circuit of the tube to actuate a solenoid 19 connected to a deflecting plate or tray 20 to move said tray on its pivots 21.

The circuit diagram of the tube 18, as shown, is one of many conventional circuits employed in the application of the tube as a relay device. As shown in Figure 1, a battery is connected to the plate 23 and to the cathode 24 of the tube in series with the solenoid 19. A leakage path between the cathode 24 and the grid 25 of the tube is provided by a resistor 26, and the circuit through the die 11, rod 10, and plate 15 is in shunt with the resistor 26.

As shown in Figure 2, the plate or tray 20 is normally positioned biased to deflect the length cut by the shears into the bin 27. If the length of rod cut by the shears is too short to engage the conducting plate 15, and thereby shunt the resistor 26, it is deflected into bin 27. If it is long enough to engage the conducting plate 15 it closes the circuit shunting the resistor 26, and the solenoid 19 is thereby energized and the tray is tipped to deflect the rod into bin 28.

In the event of failure of the tube and its circuit-associated apparatus all of the lengths cut fall into bin 27.

Bin 28 may be replaced by a moving belt to carry the rods of proper length away from the machine,

It is obvious that the tube may be so connected as to activate the solenoid to tilt the tray only when a short rod is cut, but I prefer the arrangement described because failure of the tube to function properly does not mislead the operator into forwarding improper lengths to the battery of machines used to shape the rods into valves.

I have applied my invention to a standard type of rod cutting machine, and it will be obvious that this application involved no ma-

terial or expensive change in the usual structure of the machine, and that it makes it possible for a single operator to attend to a battery of such machines.

It will be understood that my invention is applicable to machines cutting other than metals, for almost any rigid material extending between the wires 16 and 17 will shunt the capacitance of the anode-grid circuit of the tube and produce a change in the plate current of the tube.

For the sake of simplicity I have shown the solenoid 19 connected directly in the plate circuit of the tube, but it will be understood that amplifier means may be interposed between the tube and the solenoid, and that the circuit arrangement may be modified to suit tubes of various characteristics without departing from the spirit of my invention.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim:—

1. In combination, power shears, an abutment member, feed rolls to feed a rod to be cut by said power shears against said abutment member, said abutment member being a terminal of an electric circuit, a member to direct a cut length of said rod towards a rod-receiving device, and electrical means responsive to engagement of said rod against said abutment to move said rod-directing member.

2. In combination, power shears, an abutment member, means to feed material to be cut by said shears against said abutment member, said abutment member being a terminal of an electric circuit, means to selectively direct material cut by the shears, and electrical means responsive to engagement of said material against said abutment to selectively actuate said material-directing means.

3. In combination, power shears, an abutment member, means to feed material to be cut by said shears against said abutment member, said abutment member being a terminal of an electric circuit, means to selectively direct material cut by said shears, and electronic tube means responsive to engagement of said material against said abutment connected to selectively actuate said material-directing means.

4. In combination, material severing means, an electrode, a second electrode, means to feed material to engage both of said electrodes, means to selectively direct the material cut by said severing means, electromagnetic means connected to said material directing means to operate said latter means, an electronic tube connected in circuit association with said electromagnetic means and with both of said electrodes responsive to engagement of said material with said electrodes to selectively actuate said material directing means through said electromagnetic means.

5. In combination, material severing means, means to selectively direct material severed, electromagnetic means to actuate said material directing means, a pair of spaced apart electrodes, an electronic tube connected in circuit association with said electrodes and said electromagnetic means, means to move said material to be severed into circuit association with said electron tube by extending said material between said electrodes, said electron tube being responsive to the circuit association of the material therewith to selectively actuate said material directing means through said electromagnetic means.

In testimony whereof I have hereunto subscribed my name at Cleveland, Cuyahoga County, Ohio.

WILLIAM H. SPIRE.