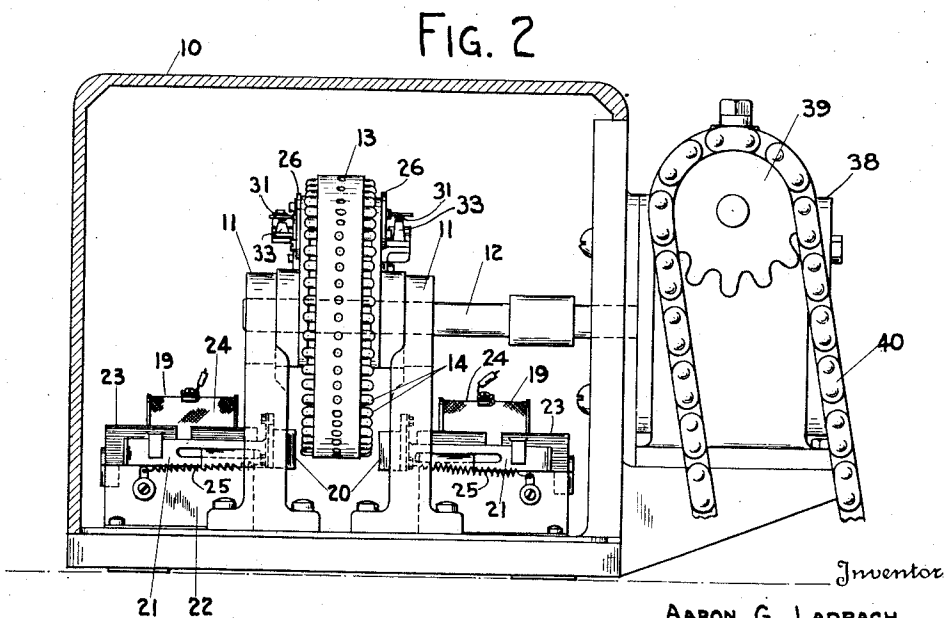
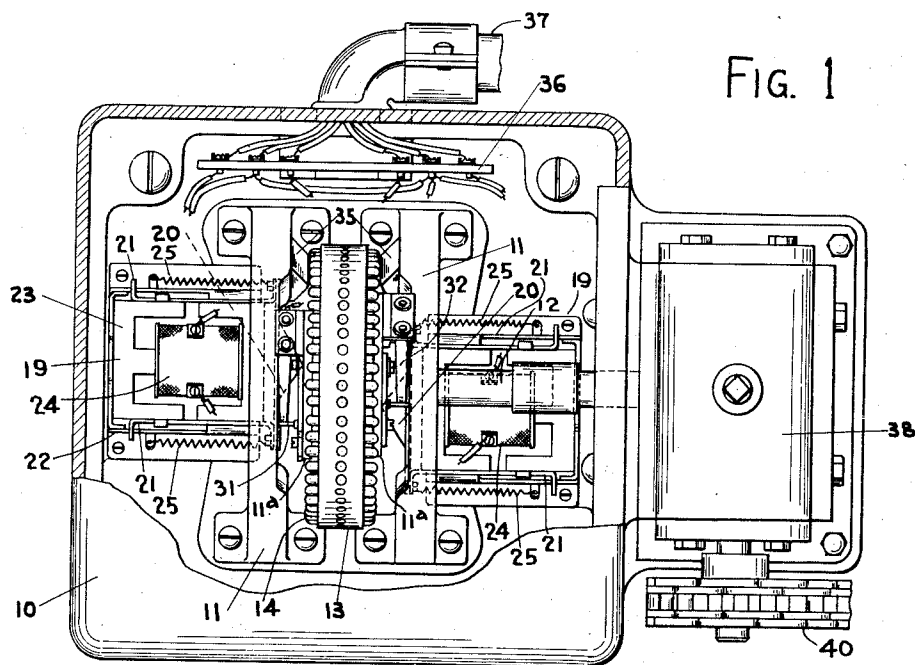


Oct. 8, 1940.

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TIME OR SPEED CONTROLLED DELAYED ACTION
RELAY FOR STRIP MATERIAL CLASSIFIERS
Filed May 19, 1939

2,217,342

3 Sheets-Sheet 1



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FIG. 3

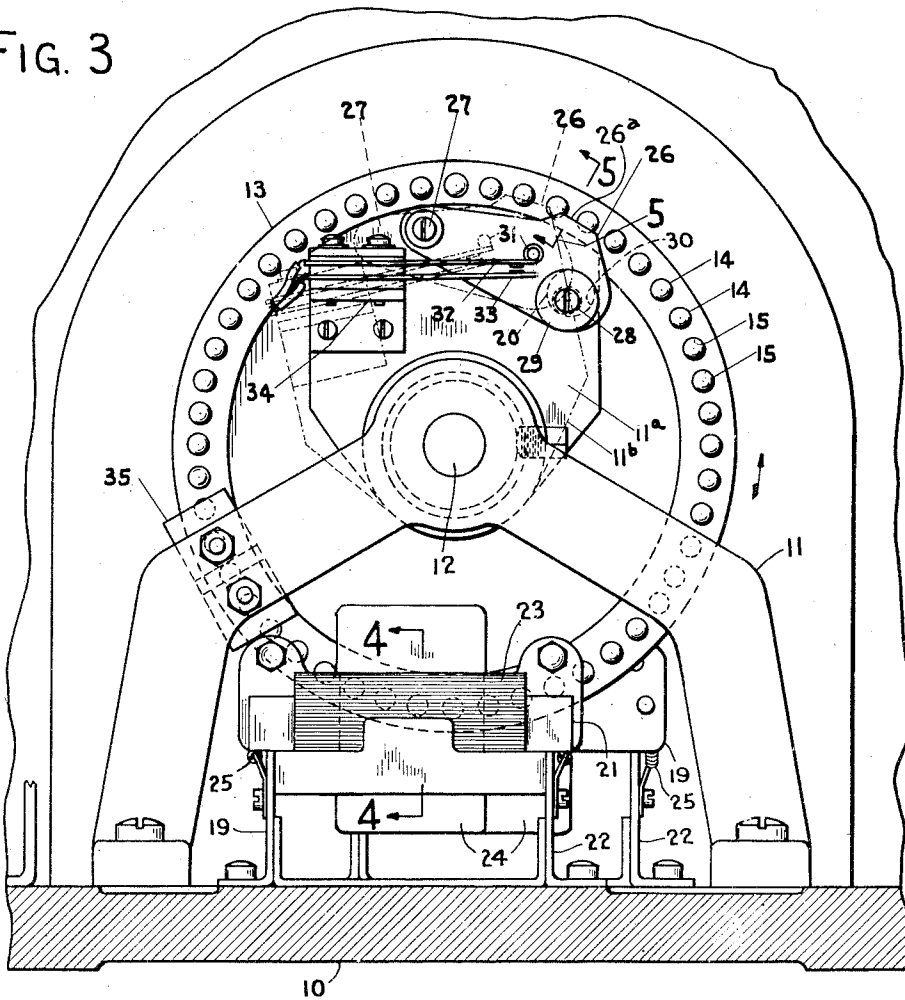


FIG. 4

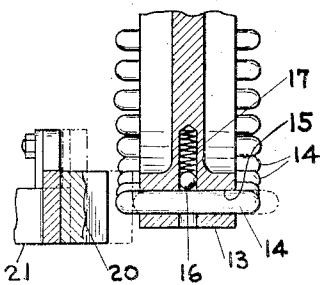
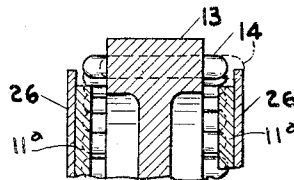


FIG. 5



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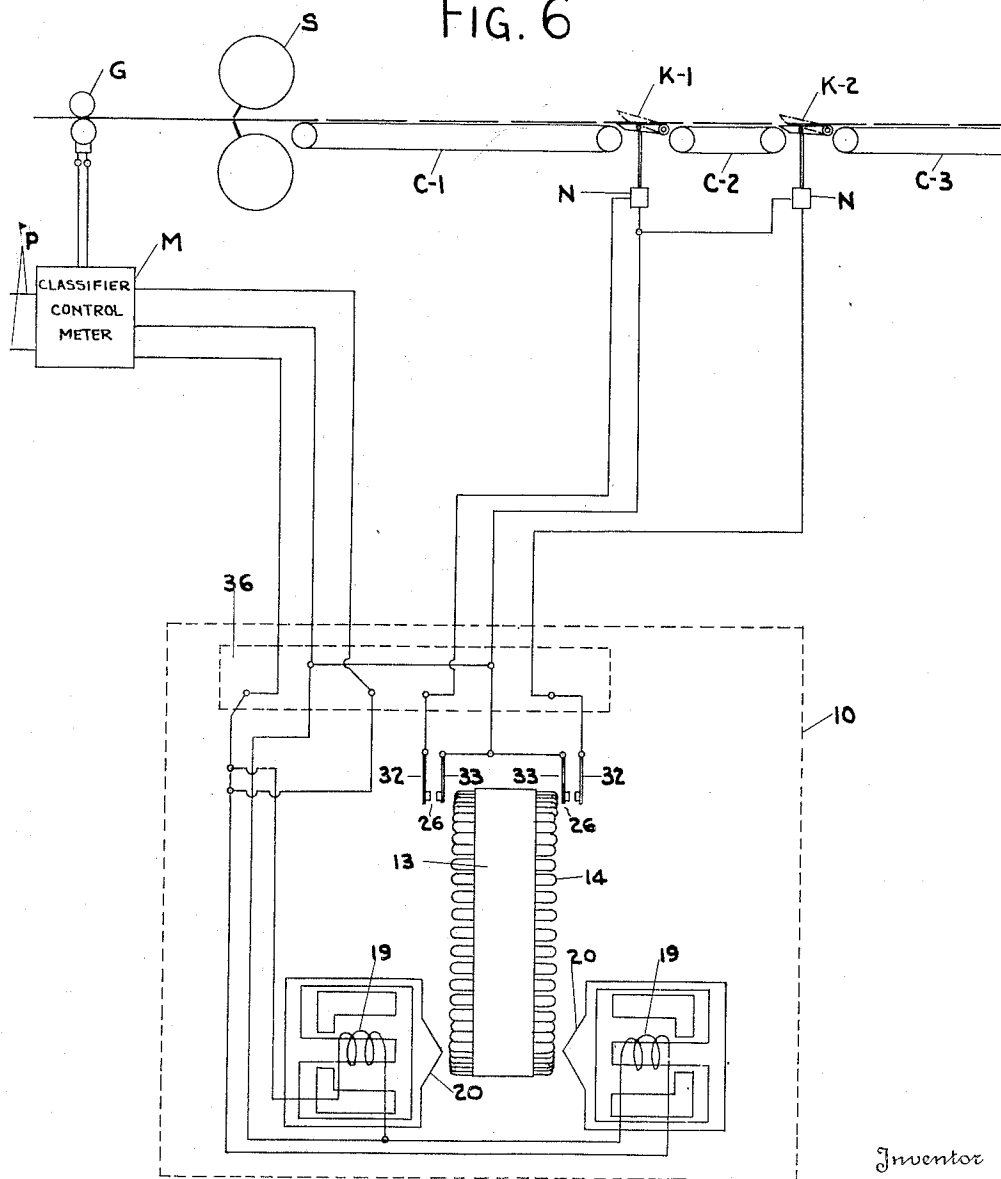
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FIG. 6



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TIME OR SPEED CONTROLLED DELAYED
ACTION RELAY FOR STRIP MATERIAL
CLASSIFIERS

Aaron G. Ladrach, Akron, Ohio

Application May 19, 1938, Serial No. 208,851

2 Claims. (Cl. 209—72)

This invention relates to time or speed controlled relays.

The general purpose of the invention is to provide an improved time or speed controlled relay whereby one or more mechanisms, as for example, sheet steel classifiers arranged along a production line may be operated a determinate interval after the operation of one or more other mechanisms, as for example, a thickness gauge provided with means for manifesting off-gauge, either heavy or light, sheet steel passing along said production line.

The foregoing and other purposes of the invention are attained in the device illustrated in the accompanying drawings and described below. It is to be understood that the invention is not limited to the specific form thereof shown and described.

Of the accompanying drawings:

Figure 1 is a plan view, partly broken away, of a relay embodying the invention.

Figure 2 is a sectional front elevation thereof.

Figure 3 is an enlarged sectional end elevation thereof.

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

Figure 5 is a section on line 5—5 of Figure 3, and

Figure 6 is a diagrammatic view showing a typical installation of the relay in a sheet steel production line.

Referring to Figures 1 to 5 of the drawings, the numeral 10 designates a suitable housing in which may be mounted brackets 11, 11 in which is journaled shaft 12 on which is secured a time or speed controlled relay drum 13.

Arranged about the periphery of drum 13 is a series of axially slidable pins 14, 14 which are mounted therein as best shown in Figure 4 in axial bores 15, 15, the pins being substantially longer than the width of the drum for a purpose which will appear and preferably being frictionally held in any positions, to which they are adjusted therein as by means of balls 16 retained in radial bores 17 inwardly of the pins 14 and urged against the pins by springs 18. The projecting ends of pins 14 preferably are rounded as shown.

Associated with drum 13 are one or more devices 19, 19 for modifying the axial positions of pins 14. These devices may be identical and each may comprise a plunger 20 of wedge-shape arranged to be thrust axially against the projecting ends of pins 14. Where more than one such plunger is used, the plungers 20 may be mounted at opposite sides of the drum, as shown. Preferably the plungers are off-set from each other

(Figure 1), so that one cannot oppose the other in moving a pin 14.

Each plunger 20 is carried by slides 21, 21 mounted on supports 22, 22 and connected to a movable armature 23 operable axially toward drum 13 by a solenoid 24, springs 25; 25 being provided for retracting plungers 20 upon de-energization of the solenoids 24. Actuation of a solenoid 24 will cause plunger 20 to adjust a pin 14, as shown in Figure 4, or a succession of pins.

There is also associated with the drum 13 one or more devices to be actuated by an adjusted pin or pins. These may comprise control switches shown at 26, 26. These switches may be pivoted at 27, 27 and may be guided in their movements by retaining screws 28 and washers 29, the screws 28 being extended through comparatively large openings 30 in switch 26. The control switches 26 are so set respecting the sides of the drum as to be engaged and depressed by pins 14 20 which have been adjusted by plungers 20 (see Figures 3 and 5). The engaged portions 26^a, 26^a are of such width as to be engaged by any succeeding adjusted pin before a leading adjusted pin has passed out of engagement with the 25 switch.

Switches 26 carry pins 31 adapted to engage the upper of two flexible spring contact members 32 and 33 to depress the same into effective electrical contact with each other, the contact member being adapted to return switches 26 to their normal positions after passage of an adjusted pin 14. Contact members 32 and 33 are suitably mounted in insulated relation in mountings 34. The switch units are mounted on brackets 11^a, 11^a angularly adjustable about shaft 12 and adapted to be secured by screws 11^b in various positions of adjustment about drum 13 respecting plungers 20 to vary the delayed action of the relay.

In order to return pins 14 to central positions out of position to actuate switches 26 and to positions from which they may again be adjusted by plungers 20, cams 35, 35 are provided for engaging the rounded ends of projecting pins and pushing the pins back to their normal positions.

A panel for electrical connections may be provided in the housing 10, as shown at 36, to which leads may be extended from a suitable leads conduit 37. The leads are connected to solenoids and to switches as will be described with reference to Figure 6.

Shaft 12 is arranged to be driven through a suitable reduction 38 by a sprocket 39 which may be driven by a chain 40, in turn driven in synchronism with work conveyors, time-control 55

mechanisms or other time or speed controlling devices relating the delayed action of the present device to the delayed operations desired to be performed on the work.

5 As shown in Figure 6, the present device may be associated with a gauge and classifier control meter and with classifiers in a steel sheet production unit, the delayed action relay to be driven in synchronism with the speed at which the work
10 is advanced. The continuous gauge G of any type producing variations in an electrical circuit corresponding to gauge variations is electrically connected to the classifier control meter M of a known type to which power may be supplied by
15 power lines P and from which leads may be extended to solenoids 19, 19 through panel 36 in casing 10, the meter M and solenoids being so connected that one solenoid is actuated on passage of light stock and the other is actuated
20 on passage of heavy stock, neither being actuated when "on gauge" stock within allowable variations is passing through the gauge.

From the gauge G, the stock may pass between shearing rollers S, the cut sheets being received
25 on conveyor C—1 and passing to a classifier K—1, then to another conveyor C—2 and then to a classifier K—2 and then to a third conveyor C—3. Classifiers K—1 and K—2 may be of a known type operable by solenoids N, N, which may be respectively connected as shown to contact members 32,
30 33 of switches 26, 26 through panel 36.

As will be apparent from the foregoing, when light stock, with movement of which rotation of drum 13 is synchronized, causes one solenoid 19
35 to be energized, it causes its plunger 20 to be moved axially against pins 14 in drum 13 shoving one or more pins axially out of its normal alignment (see Figure 4) whereby when that pin, or pins, rotates from the point actuated by plunger
40 20 to the switch 26 on the opposite side of the drum it, or they, will engage and depress switch 26 (Figure 5) and establish and maintain contact to a solenoid N operating a light-sheet classifier, such as K—2. When heavy stock causes
45 the classifier control meter to energize the other solenoid 19, its plunger 20 pushes one or more pins 14 out of line in the opposite direction and these at a determinate later interval will similarly operate the other switch 26 resulting in actuation of classifier K—1.

50 As shown in Figure 3, the drum 13 is driven counter-clockwise, the pins 14 being normally aligned by cams 35 being adjusted out of line by plungers 20, as described, such adjusted pins turning to points where they actuate one or the
55 other of switches 26 and then being realigned

as the drum carries the pins between cams 35.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

5 1. The combination with means for continuously feeding strip material, and means at one point respecting the feeding means for continuously determining the condition of said strip material, of means at another point respecting
10 the feeding means for segregating off-condition material from material meeting predetermined specifications, and means for controlling said segregating means, said controlling means comprising a member driven in synchronism with
15 said feeding means and having thereon a plurality of closely-spaced shiftable elements, means at one point respecting said driven member and operable into the path of said elements on said
20 driven member when off-condition material passes said first point along the feeding means, said elements and said element-operating means being so constructed and arranged that the elements will be shifted in succession on said driven
25 member so long as the off-condition obtains, said element-operating means being normally maintained out of the path of said elements, means at another point respecting said driven member and arranged in the path of shifted elements and operable by said shifted elements and continuously maintained in operation so long as a succession of shifted elements pass for operating
30 said segregating means, said element-operating means and the segregator-operating means being so arranged respecting the driven element as to time operation of the segregating means with passing of the tested strip material through the segregating means to segregate the off-condition material, and means for continuously returning
40 the shifted elements to their normal positions on the driven member prior to their re-passage of the element-operating means.

2. The combination as set forth in claim 1, said elements extending from opposite sides of said driven member and being shiftable in opposite
45 directions, and element-operating means being arranged at opposite sides of said driven member to be shifted into the path of said elements, said element-operating means being responsive to different off-conditions of said strip material, and segregator-operating means likewise at each
50 side of said driven element, the segregating means being operable for segregating strip material of different off-conditions.

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