

June 1, 1943.

J. W. BRYCE

2,320,338

VERIFYING MACHINE

Filed Nov. 18, 1941

4 Sheets-Sheet 1

FIG. 1.

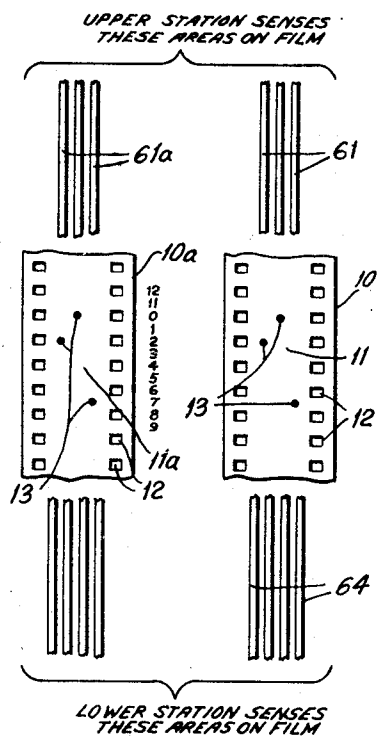
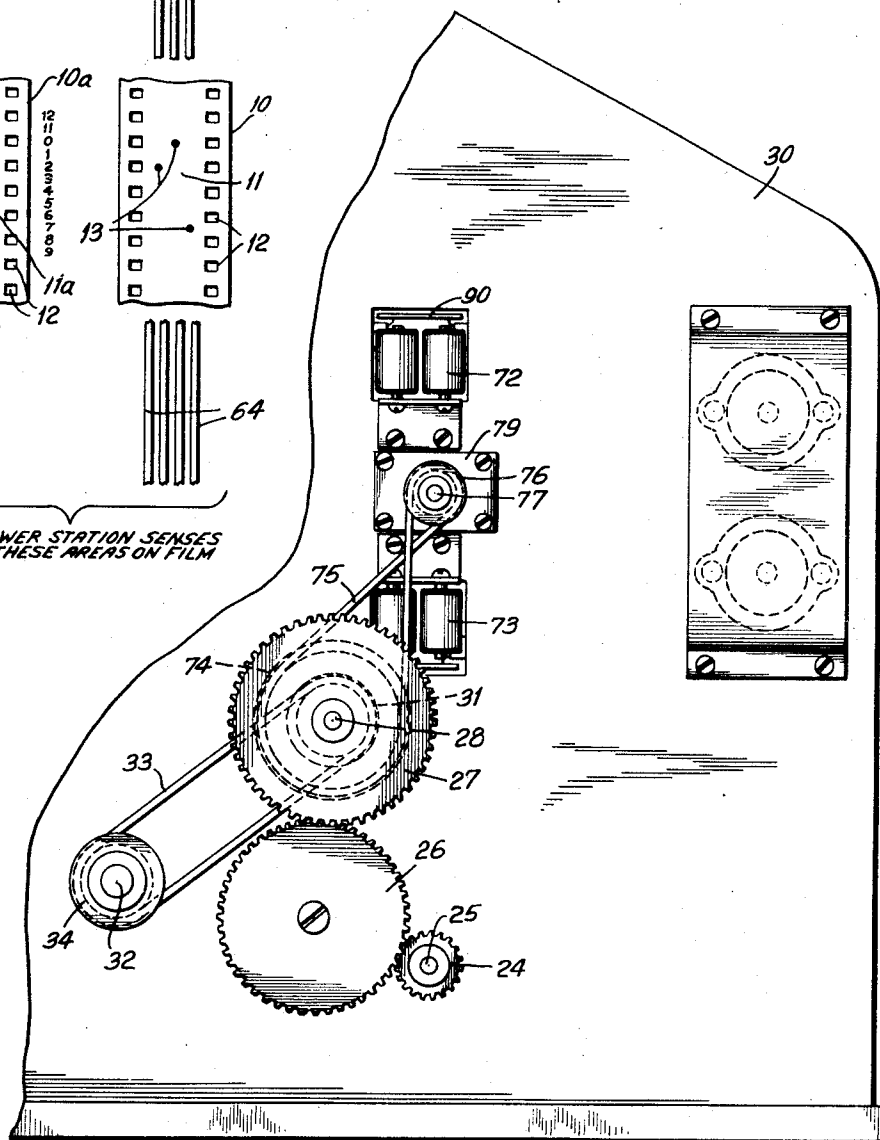


FIG. 4.



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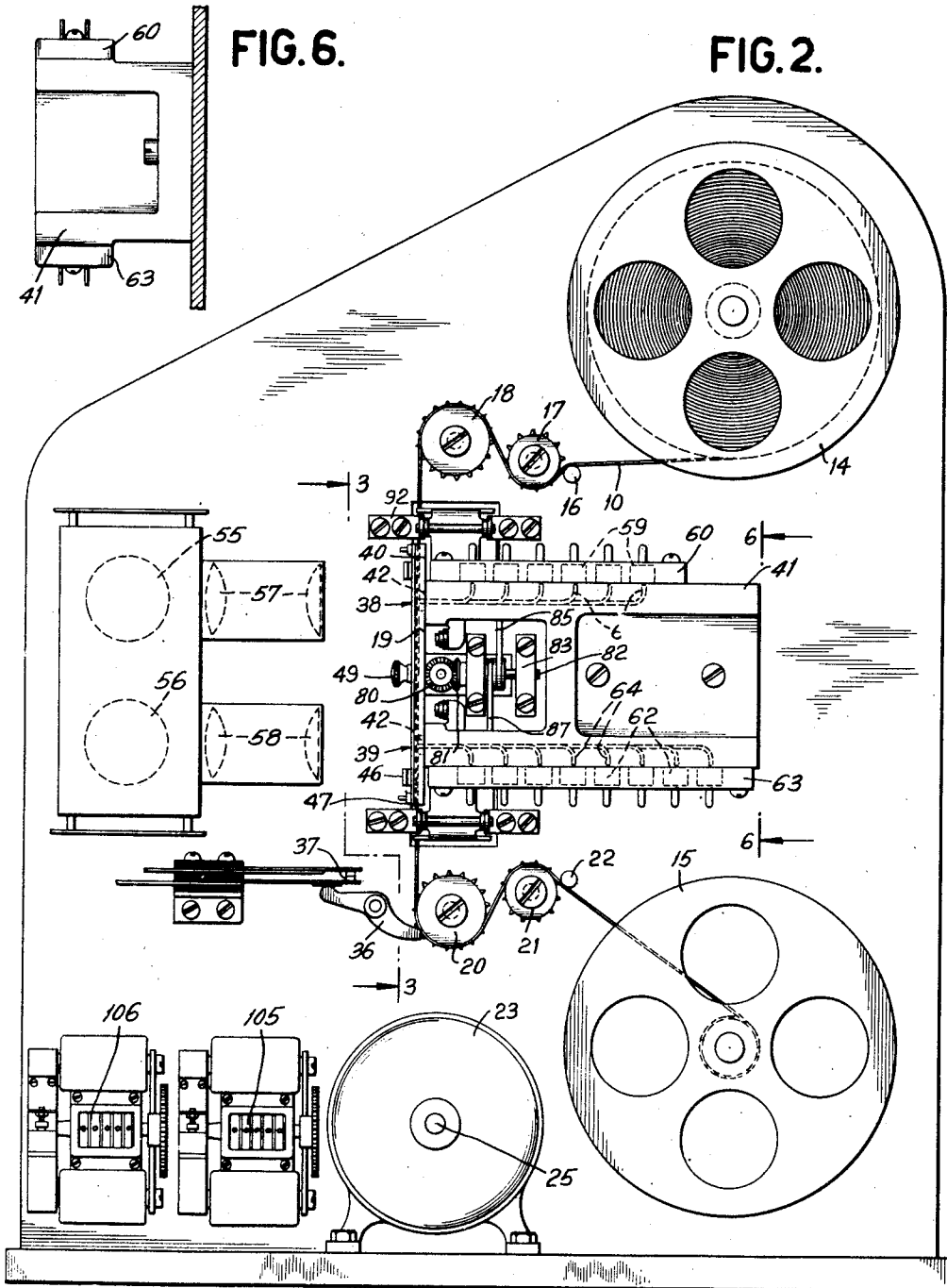
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4 Sheets-Sheet 2



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VERIFYING MACHINE

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4 Sheets-Sheet 3

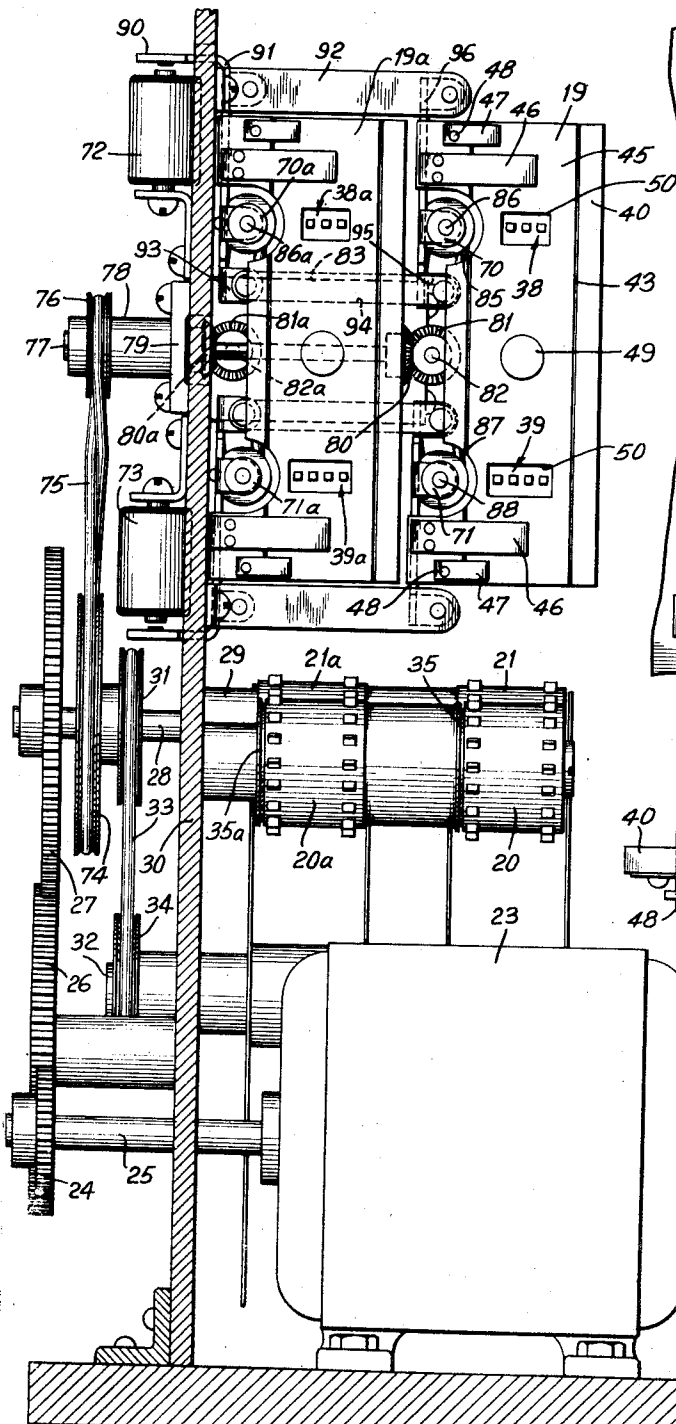


FIG. 3.

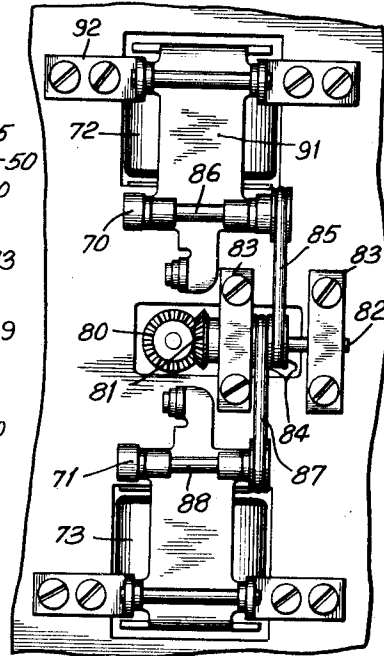


FIG. 7.

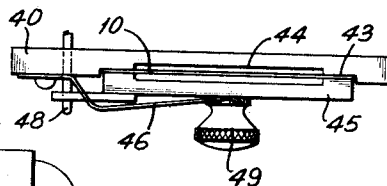


FIG. 5.

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4 Sheets-Sheet 4

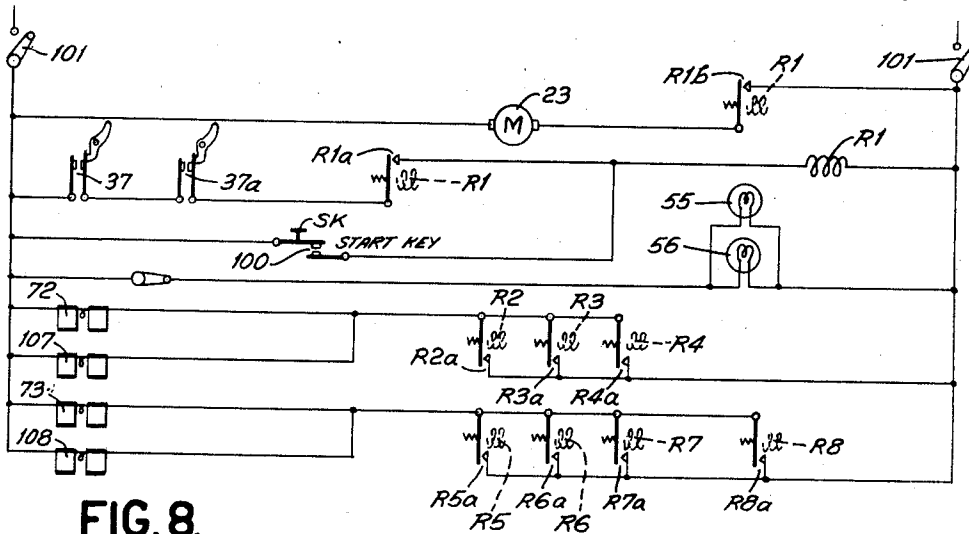
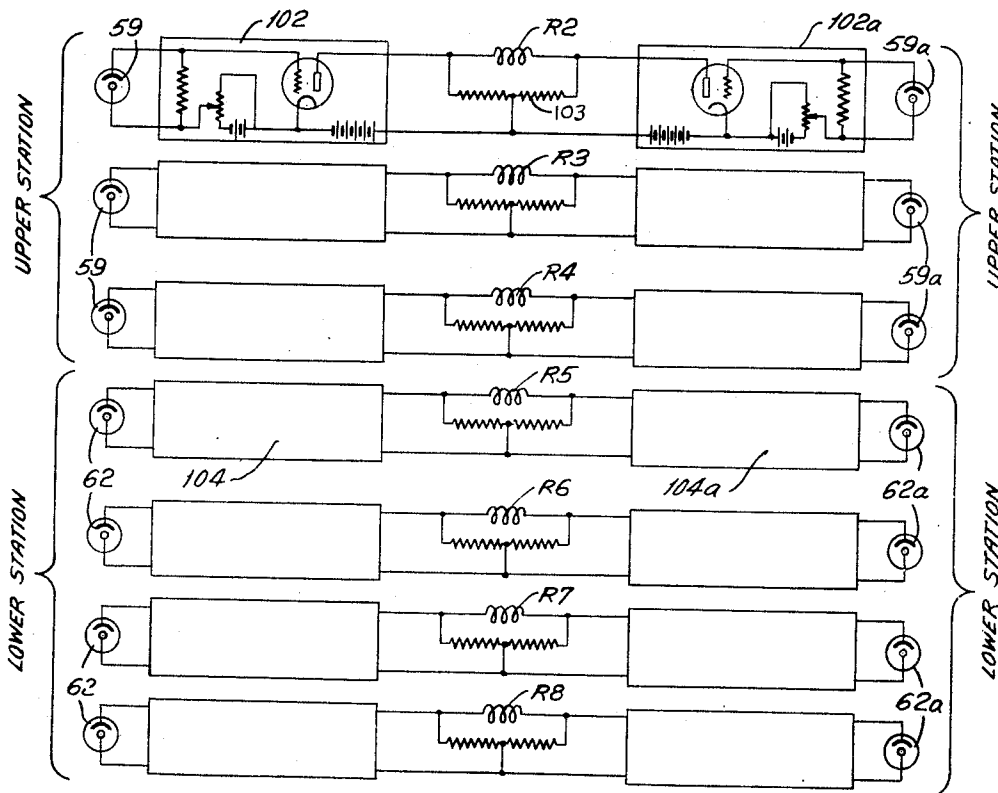


FIG. 8.



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2,320,338

VERIFYING MACHINE

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Application November 18, 1941, Serial No. 419,633

10 Claims. (Cl. 88—14)

This invention relates to a verifying machine, and more particularly to such machines capable of detecting imperfections existing in film records which are used for controlling the operations of statistical machines.

It has been suggested to employ photographic film records having differentially positioned control spots formed thereon for controlling the statistical operations of machines. A suitable film record of this type is shown in U. S. Patent No. 2,124,906, wherein it is shown that the relative positions of the control spots in the different columnar areas represent the digital values of the designated data. It is explained in this patent how the control circuits are energized at differential times, whenever the said coded control spots or designations are sensed, for controlling the accumulating unit of the machine, and thereby adding the amounts sensed successively on the film records.

It is known that imperfections or flaws are present at times in some of the film record stock, which imperfections or flaws are of a character capable of modifying the light rays, when sensed, so as to cause the establishment of unwanted circuits in the statistical machines, and thereby cause erroneous results to be obtained by these machines. An object of the present invention resides in the provision of an improved device for detecting such imperfections, flaws, or unwanted markings or designations in the film which unwanted imperfections, flaws, markings, or designations are of a character capable of influencing the related means for sensing the film records.

This and other objects are attained by providing a pair of duplicate film records having formed thereon identical sets of coded photographic control spots or designations representing the data, and analyzing the pair of film records concurrently, whereby detecting circuits are controlled under joint control of the analyzed records for detecting and indicating the presence of any unwanted markings or designations in either of the said film records.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a detailed view of the film strips to be compared showing the coded data designations formed thereon, and with a diagrammatic indi-

cation showing the areas sensed by the upper and lower sensing stations.

Fig. 2 is a front elevation view of the machine.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a detail view of the film feed driving mechanism.

Fig. 5 is a top view showing the details of one of the film gate assemblies.

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 2.

Fig. 7 is a detail view showing the film marking devices and the driving mechanism for the film marking devices.

Fig. 8 is a circuit diagram of the machine.

General description

For the purposes of the present machine for verifying the data recorded on film strips, it is assumed that the individual film strips which are compared are originally prepared or recorded by different individuals. Fragmentary sections of the film strips are shown in Fig. 1 and are designated 10 and 10a. Therefore, when these film strips are fed through the machine, in synchronism, and compared with each other, it is obvious, since each record is prepared by a different person, that an accurate check of the data designations or other markings formed thereon can be made. The purpose of this machine is not only to check the accuracy of the coded data designations recorded on the film records, but also to check the individual film records as to the presence of any unwanted or undesirable markings, designations or formations thereon, which markings, designations, or formations readily could cause false operations to occur in statistical machines adapted for control by film strips.

To accomplish this end, upper and lower sensing stations are provided for each film strip, which stations are designated 38, 38a and 39, 39a (Figs. 2 and 3). The reference characters 38 and 39 represent the upper and lower sensing stations, respectively, for the film strip 10, and the reference characters 38a and 39a represent the upper and lower sensing stations, respectively, for the film strip 10a. Individual drive means including the sprockets 21 and 21a are provided for continuously feeding the individual records of the film strips 10 and 10a, through the film gate assemblies 19 and 19a, and past the related upper and lower sensing stations.

In view of the fact that duplicate elements are provided in many instances for feeding, analyzing, and marking the film records, detailed de-

scription will be given of but one of the duplicated train of elements. Whenever similar parts or elements are shown, the same reference characters are used for designation purposes, one set of reference characters being provided with the suffix *a*.

At the upper sensing stations, light sensing means are provided and comprise light responsive means, such as the photocells 59 and 59a for sensing the light modifying data designations on the film strips 10 and 10a. The light rays directed to the upper sensing stations 38 and 38a are transmitted to the related photocells by means of suitable light conducting rods 61 and 61a, respectively. Similar sensing means, including photocells 62 and 62a, are provided at the lower sensing stations whereat the film strips are analyzed for the presence of any unwanted designations in the spaces between the data columns.

The said photocells at the upper and lower sensing stations are effective to control the energization of associated comparing circuits, which circuits, in turn, are arranged to control the energization of the control magnets 72 and 73 of the film marking means, at the upper and lower sensing stations, respectively, whenever dissimilar data designations or additional unwanted designations, are sensed. The said marking means are rendered operative, and are effective, while the said film strips are in motion and continuously fed by the feeding means.

Photographic film records

Referring now to Fig. 1, fragmentary sections of the photographic film controlling elements 10 and 10a are shown. Each film controlling element has a plurality of photographic reproductions thereon at successively spaced intervals along the film, which individual reproductions 11 and 11a will be referred to as individual records. The usual feed apertures 12 are provided in the film strips. Each individual record is provided with a plurality of light modifying control spots or designations 13, which designations are disposed at different index point positions on the record, so as to represent by their positions thereon the data values represented thereby. In practice and according to the embodiment shown, such coded designations are shown on the film records in index point relation in general conformance with the manner in which index perforations are disposed on perforated record cards in the Hollerith accounting system. That is, the differential positions, or index point positions of the control spots or designations delineate the particular values of the represented data. In Fig. 1, the data represented by the coded designations 13 on both film records 10 and 10a is 207.

Film feeding means

In view of the fact that duplicate elements are provided for feeding both films 10 and 10a, it is believed that the following description relating to one group of such elements is sufficient for a full and complete understanding of these groups of elements. Referring now to Fig. 2, the film strip 10 is shown disposed on a rotatably mounted supply reel 14 and attached to a take-up or winding reel 15. The said film strip travels over a stud 16, around the idler sprockets 17 and 18, through a film gate assembly 19, around an idler sprocket 20, driving sprocket 21, and under the stud 22 to the take-up reel 15.

Referring now to Figs. 3 and 4, the driving

mechanism is shown comprising a suitably supported motor 23 for rotating a drive gear 24 fixed on the end of the motor shaft 25. Gear 24 meshes with and drives a rotatably mounted idler gear 26 which in turn drives the constantly meshed gear 27, the latter being secured to shaft 28. Shaft 28 is suitably journaled in the bearing 29 carried by a side frame 30. The right end of shaft 28, as viewed in Fig. 3 has secured thereto the driving sprockets 21 and 21a. By means of the described drive the said sprockets 21 and 21a are effective to advance the related film strips 10 and 10a through the said film gate assemblies 19 and 19a. Suitable drive means, such as pulley 31, is secured to shaft 28 to drive the shaft 32 through the intermediate means comprising a belt 33 and pulley 34 secured to shaft 32. Shaft 32 is suitably journaled in the side frame 30 and extends to the right, as viewed in Fig. 3, to which shaft 32 are secured the take-up reels 15 and 15a. The said belt 33 can be of the spiral spring type, and the ratio between pulleys 31 and 34 preferably is such that the belt 33 will tend to overdrive pulley 34, thus causing the film strips 10 and 10a to be tightly wound on reels 15 and 15a, respectively.

In Fig. 3, the idler sprockets 20 and 20a are shown provided with separate grooves 35 and 35a. An individual pivoted lever 36 as shown in Fig. 2, is provided for each sprocket so that one end thereof rides in the related groove. The other end of the said lever is arranged to engage suitably disposed contacts 37. The arrangement is such that when, for example, the film strip 10 is disposed around the idler sprocket 20, the lever 36 is forced out of the groove 35 and thereby causes the associated contacts 37 to be closed. Whenever the film strip 10 is exhausted, the lever 36 can then drop into the groove 35 and permit the said contacts 37 to be opened. The purpose of this arrangement will be described later.

Film gate assembly

The individual film gate assemblies are indicated generally by the reference characters 19 and 19a in Fig. 3. With reference now to Figs. 2, 3 and 5, one of the said assemblies will be described in detail. Each assembly includes a rectangular backing plate 40 suitably secured to a support 41 (see Fig. 2). The said backing plate is provided with suitable openings 42 (Fig. 2) extending transversely of the plate 40. A recessed channel 43 extending longitudinally of the plate is formed therein through which the film strip 10 is fed. The center portion of this channel is relieved, as indicated by the reference character 44, in order to prevent the said film strip from being marred as it is fed through the film gate. A cover plate 45 is provided to hold the film strip in the said channel of the backing plate. The cover plate 45 is urged in this holding position by the action of the flat springs 46, the ends of which are secured to the backing plate 40. Small metal straps 47 are secured to the cover plate 45 and are provided with openings which fit over the pins 48 which are secured to the backing plate 40. These pins 48 insure accurate positioning of the cover plate with respect to the backing plate. A suitable knob 49 is provided on the cover plate so that it can be conveniently removed from the backing plate, whenever it is desired to insert a film strip, or obtain access to that portion of the film strip in the gate assembly. Openings 50

are provided in the cover plate 45, which openings are disposed opposite the openings 42 provided in the backing plate so as to be aligned therewith.

Film sensing means

The individual means for sensing the differentially positioned or coded datat designations on the related film records are shown, in Figs. 2, 3 and 6, to comprise the light sources 55 and 56 and the related lens systems 57 and 58, respectively, for projecting lines of light across the film records at the upper and lower sensing stations. A plurality of light responsive means such as photocells 59 are provided at the upper sensing station, for sensing the columnar areas in which the control spots appear, one for each column of data designations to be sensed. The individual photocells are suitably mounted in a strip 60 of insulating material, which strip is secured to the support 41. Individual light conducting rods 61, such as quartz rods, are provided, one for each photocell 59, and are arranged so that the one end thereof is placed opposite the related photocells and are extended to the uppermost opening 42 in the backing plate 40. The said light conducting rods are arranged so that the other ends are disposed along a transverse line in the said opening, as indicated in Fig. 3. The spacing of the ends of the light conducting rods, at the sensing position is equivalent to the spacing of adjacent columns of the light modifying spots or designations on the film records.

The arrangement of the light responsive means and conducting light rods at the lower sensing station, for sensing the spaces between the columns where the control spots 13 are located is similar to that at the upper sensing station. A plurality of photocells 62 are provided, one for each space between the columns of data designations. The said photocells 62 are suitably mounted in a strip 63 of insulating material, which strip is also secured to the said support 41. Individual light conducting rods 64 are provided, one for each photocell 62, and are arranged so that the one end thereof is placed opposite the related photocells and are extended to the lowermost opening 42 in the backing plate 40. The said light conducting rods are arranged so that the other ends are disposed along a transverse line in the last mentioned opening, as indicated in Fig. 3. The spacing of the ends of the light conducting rods 64 at the sensing position is equivalent to the spacing between the columns of data designations on the records.

Film marking means

Referring now to Figs. 3 and 7, it is seen that marking means, in the form of individual abrasive or scoring wheels 70 and 71, are provided at the upper and lower sensing stations, respectively, of the right film gate assembly, as viewed in Fig. 3, and that similar abrasive or scoring wheels 70a and 71a are provided at the upper and lower sensing stations, respectively, of the left film gate assembly. The said abrasive wheels are rotatable and are held opposite the edges of the film strips, and are adapted to be rocked toward the right (see Fig. 3) forcing the wheels into the edges of the films 10 and 10a, thus, forming marked or scored sections in the individual records disposed at the upper and lower sensing stations.

The rocking of the said abrasive wheels is under the control of magnets 72 and 73, the energization of which will be described later in con-

nection with the description of the circuit diagram.

The driving connections for effecting continuous rotation of the said abrasive wheels will now be described. Secured to the shaft 28 is a pulley 74 which transmits motion through the belt 75 to the pulley 76 secured to shaft 77. Shaft 77 is suitably journaled in the bearing 78, the latter being secured to the plate 79, which plate is in turn fastened to the side frame 30. Miter gears 80 and 80a are secured to the shaft 77 and mesh with the mating miter gears 81 and 81a, respectively, the latter being secured to shafts 82 and 82a. Shafts 82 and 82a are suitably supported by the bearing blocks 83. A double pulley 84 is secured to the shaft 82. A belt 85 preferably of elastic material extends upwardly, as viewed in Fig. 7, to drive the shaft 86 to which the abrasive wheel 70 is secured. Another similar belt 87 extends downwardly to drive the shaft 88, to which the abrasive wheel 71 is secured.

With reference now to magnet 72, the associated armature 90 is provided with an elongated member 91, which member is pivotally mounted on the L-shaped brackets 92. The shaft 86a, upon which the abrasive wheel 70a is mounted, is rotatably supported by the said member 91. At the lower or free end of the member 91, a bent ear portion 93 is secured thereto. Pivoted to this ear portion is a link 94 which is also pivoted to an ear portion 95 secured to the lower end of plate 96. The plate 96 which supports the shaft 86, to which the abrasive wheel 70 is secured, is pivotally supported by the said bracket 92.

Now, upon energization of the magnet 72 to attract its armature 90, the lower portion of the pivoted member 91 is rocked to the right, as viewed in Fig. 3, to urge the rotating abrasive wheel 70a in contact with the edge of the film strip 10a fed through the film gate assembly 19a. By means of the connecting link 94, the pivoted plate 96 is also rocked to the right (see Fig. 3) to urge the rotating abrasive wheel 70 in contact with the film strip 10 fed through the film gate assembly 19. Thus, it is seen, that upon energization of the single electromagnetically controlled means, such as magnet 72, the abrasive wheels 70 and 70a are positioned so as to be effective to mark the film strips 10 and 10a at the upper sensing station.

The elements associated with and controlled by the magnet 73 are precisely the same as those associated with and controlled by the magnet 72 to cause the abrasive wheels 71 and 71a to be urged into contact with the film strips 10 and 10a to mark these strips at the lower sensing station, and for this reason, it is deemed unnecessary to repeat the description of these elements controlled by magnet 73.

Circuit diagram

Referring now to Fig. 8, the operation of the machine will be described. Assume that the film strips 10 and 10a are properly positioned in the machine for a comparing run, thereby causing the film lever contacts 37 and 37a to be closed; assume further that the line switches 101 are closed to cause energization of the light sources 55 and 56.

Thus, upon depression of the start key SK to close the associated contacts 100, a circuit is completed to the coil of relay R1 to energize this relay and cause the associated contacts R1a and R1b to be closed. A holding circuit is established,

upon closure of contacts R1a, through the closed contacts 37 and 37a for the said relay R1. Upon closure of contacts R1b the motor circuit is closed to effect energization of the motor 23 causing the film strips 10 and 10a to be continuously fed, in synchronism, by the driving sprockets 21 and 21a (Fig. 3). The described conditions are maintained until the film strip supply is exhausted causing the contacts 37 and 37a to be opened to break the holding circuit for relay R1.

Now, upon advancement of the film strips, the individual records formed thereon are presented successively to the upper and lower sensing stations. It is well understood, that as the coded control spots or data designations 13 on the film records are fed past the upper sensing stations, the light rays impinging upon the light conducting rods 61, and consequently the related photocells 59, are modified or interrupted at the upper sensing stations. The photocells 59 and 59a which sense the corresponding or duplicate columns on the records formed on film strips 10 and 10a are connected to common comparing circuits. For example, the uppermost photocell 59, in Fig. 8, is connected to the input circuit of a suitable and well known type of amplifier 102, the output of which is connected to one terminal of the coil of relay R2, the other terminal of which is connected to the output of amplifier 102a which is connected to the uppermost photocell 59a. The return circuits of the amplifiers are connected to a central tap on resistor 103, the terminals of which are connected in shunt relationship with the said coil of relay R2. The amplifiers 102 and 102a are conditioned so as to be conductive whenever light rays are impinging on the connected photocells 59 and 59a. Thus, it is seen that if equal amounts of light impinge on the photocells 59 and 59a, the value of the current flowing in each of the output circuits will be the same, the terminals of the relay coil R2 will be at the same potential, and therefore no current will flow through the coil of relay R2.

If, however, the light values impinging on photocell 59 differ from the light values impinging on photocell 59a, the common comparing circuit will be unbalanced, i. e., the terminals of the coil of relay R2 will not be at the same potential, and a resultant current will flow through the said relay coil, energizing the said relay. The said amplifiers are so adjusted that when the light values impinging on photocell 59 vary sufficiently from the light values impinging on photocell 59a, and vice versa, to indicate an error, sufficient current will flow in the comparing circuit to energize the relay coil included in the circuit. Thus, it will be understood, that whenever either one of said photocells is conditioned by the light rays modified by any unwanted markings or designations of a character capable of influencing either of said photocells, the common related comparing circuit will be caused to be in an unbalanced condition, thereby indicating the presence of such unwanted designations in one of the film strips.

Now, upon energization of the said relay, the contacts R2a are closed to cause energization of the control magnet 72 at the upper sensing station. It is remembered, upon energization of this magnet, the abrasive wheels 70 and 70a are rocked so as to engage the edges of the individual records which are found to be in disagreement, and thus mark these said records, while in motion, for identification at the end of the film run. Obviously, other comparing circuits, including relays R3 and R4, and the photocells 59 and 59a

for sensing other columns on the film records are controlled by the said photocells, just as described hereinabove.

Now, as the individual records on the said film strips 10 and 10a are fed past the lower sensing stations, whereat the said photocells 62 and 62a are disposed and arranged to analyze or sense the spaces between the columnar areas wherein the data designations appear, these photocells are conditioned by the light rays directed thereto to render the associated amplifiers 104 and 104a respectively, conductive.

Coils of the relays R5—R8 are connected in individual comparing circuits connected to the related amplifiers 104 and 104a, and are controlled similarly as relays R2—R4, in the manner described hereinabove. From this description referred to, it should be evident that, so long as the spaces between the data columns, which are sensed by photocells 62 and 62a, are free from light modifying flaws, imperfections, or markings, the comparing circuits remain in a balanced condition so that relays R5—R8 remain deenergized. However, upon the sensing of an unwanted mark on one of the records, one of the related comparing circuits is caused to be in an unbalanced condition, thereby causing the energization of one of the relays R5—R8. Upon energization of one of these relays the related contacts of the group R5a—R8a are closed to complete a circuit to the control magnet 73 to effect marking of the film records fed through the lower sensing stations at this instance. This marking operation is set forth in detail hereinabove, and therefore need not be repeated here.

A plurality of Veeder counters 105 and 106 (see Fig. 2) are provided which are controlled by the related magnets 107 and 108. The unit counters are of a well known type, and need not be described in detail at this time. For a detailed description of this type of counter, reference can be made to U. S. Patent No. 2,043,295. Upon each energization of the associated control magnet, one is added each time in the units order. These magnets are shown connected in shunt relationship with the film marking control magnets 72 and 73, respectively, so that upon each energization of the latter the associated counter magnet is energized, thereby giving the observer the total of the number of errors detected in each film strip during the comparing run. Since each error is marked on the edges of the film strips, the errors in these film strips can easily be located and rectified.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A verifying machine of the character described for comparing the coded data designations formed on two record strips comprising means for continuously feeding, in synchronism, the two record strips, individual means for sensing the coded data designations on the said record strips, which designations on one strip should conform to the designations on the other strip, means jointly controlled by the individual sens-

ing means for determining the presence of any unwanted designations of a character capable of influencing either of the said sensing means, continuously rotating scoring devices, one for each record strip, normally out of engagement with the related record strips, and means controlled by the said determining means, upon the sensing of any unwanted designation on one of the record strips, for causing the said scoring devices to engage concurrently the related record strips for scoring the said sensed record strips while the latter are in motion and continuously fed by the said feeding means.

2. The invention recited in claim 1 wherein the said means controlled by the said determining means comprises a single electromagnetically controlled means for causing the said scoring devices to engage concurrently the related record strips.

3. The invention recited in claim 1 wherein means are provided for holding the said scoring devices opposite one of the edges of the related record strips whereby, upon engagement of the said devices and record strips, the edges of the related strips are scored.

4. The invention recited in claim 1 wherein counting means are provided, and additional means controlled by the said determining means for controlling the said counting means whenever any unwanted designation is sensed on one of the said record strips.

5. A verifying machine of the character described for comparing the coded data designations formed on two record strips comprising means for continuously feeding, in synchronism, the two record strips, individual means for sensing the coded data designations on the said record strips, which designations on one strip should conform to the designations on the other strip, means jointly controlled by the individual sensing means for determining the presence of any unwanted designations of a character capable of influencing either of the said sensing means, continuously operable marking devices, one for each record strip, normally out of engagement with the related record strips, and means controlled by the said determining means, upon the sensing of any unwanted designation on one of the record strips, for causing the said marking devices to engage concurrently the related record strips for marking the said sensed record strips while the latter are in motion and continuously fed by the said feeding means.

6. A verifying machine of the character described for comparing the coded data designations formed on two record strips comprising means for continuously feeding, in synchronism, the two record strips, individual means for sensing the coded data designations on the said record strips, which designations on one strip should conform to the designations on the other strip, means jointly controlled by the individual sensing means for determining the presence of any unwanted designations of a character capable of influencing either of the said sensing means, marking means, one for each record strip, and means controlled by the said determining means, upon the sensing of any unwanted designation on one of the record strips, for rendering the said marking means operative and effective to mark concurrently the two sensed record strips while the said strips are in motion and continuously fed by the said feeding means.

7. A verifying machine of the character described for comparing the coded data designa-

tions formed on two record strips comprising means for feeding, in synchronism, the two record strips, individual means for sensing the coded data designations on the said record strips, which designations on one strip should conform to the designations on the other strip, means jointly controlled by the individual sensing means for determining the presence of any unwanted designations of a character capable of influencing either of the said sensing means, and means controlled by the said determining means, upon the sensing of any unwanted designation on one of the record strips having means for indicating the presence of the said unwanted designation by acting concurrently upon the two sensed record strips.

8. A verifying machine of the character described for comparing the coded light modifying data designations formed on two photographic film strips comprising means for feeding, in synchronism, the two film strips, individual means for sensing the said light modifying data designations on the said film strips comprising a source of light rays and light responsive means conditioned by the light rays modified by the said designations, which designations on one strip should conform to the designations on the other strip, means jointly controlled by the said light responsive means for determining the presence of any unwanted designations of a character capable of influencing either of the said sensing means, and means controlled by the said determining means, upon the sensing of any unwanted designations on one of the film strips, having means for indicating the presence of the said unwanted designation by acting concurrently upon the two sensed film strips.

9. A verifying machine of the character described for comparing the coded data designations formed on two record strips, said designations being disposed at predetermined index point positions in different columns, comprising means for continuously feeding, in synchronism, the two record strips, individual means for sensing the coded data designations on the said record strips, which designations on one strip should conform to the designations on the other strip, each of said sensing means including means for sensing the data designations disposed in different index point positions in the different columns and means for sensing the spaces between the columns, means jointly controlled by the individual sensing means for determining the presence of any unwanted designations of a character capable of influencing any of the said sensing means in either the said columns or spaces therebetween, marking means, one for each record strip, and means controlled by the said determining means, upon the sensing of any unwanted designation on one of the record strips, for rendering the said marking means operative and effective to mark concurrently the two sensed record strips while the said strips are in motion and continuously fed by the said feeding means.

10. A verifying machine of the character described for comparing the coded data designations formed on two record strips, said designations being disposed at predetermined index point positions in different columns, said machine comprising upper and lower sensing stations for each record strip, means for continuously feeding, in synchronism, the two record strips past the said sensing stations, individual means at each sensing station for sensing the designations on said record strips, which designations on one strip should

conform to the designations on the other strip, said sensing means at the upper sensing stations being capable of sensing the data designations disposed at different index point positions in the different columns, and the sensing means at the lower sensing stations being capable of sensing the spaces between the columns of data designations, individual means jointly controlled by the related sensing means at the upper and lower sensing stations for determining the presence of any unwanted designations of a character capable of influencing any of the said sensing means in either the said columns or spaces therebetween, individual marking means at each upper and lower sensing station for each record strip having common control means for both the marking means at the upper sensing station and common control means for both the marking means at the

lower sensing station, means controlled by the said determining means, upon the sensing of any unwanted designation in the columns on one of the record strips for influencing the control means of the upper sensing station marking means for rendering the said marking means effective to mark concurrently the two sensed record strips while in motion and continuously fed by the said feeding means, and additional means controlled by the said determining means, upon the sensing of any unwanted designation in the spaces between the columns on one of the record strips for influencing the control means of the lower sensing station, marking means for rendering the latter effective to mark concurrently the two sensed record strips while the strips are in motion.

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