

Oct. 29, 1940.

J. W. SOHNS

2,219,458

RECORDING APPARATUS

Filed May 21, 1937

3 Sheets-Sheet 1

Fig. 1

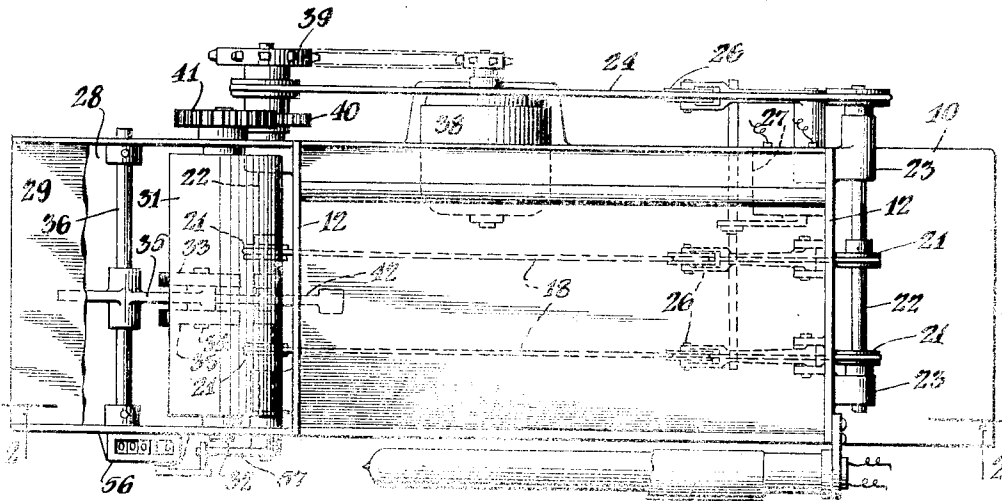
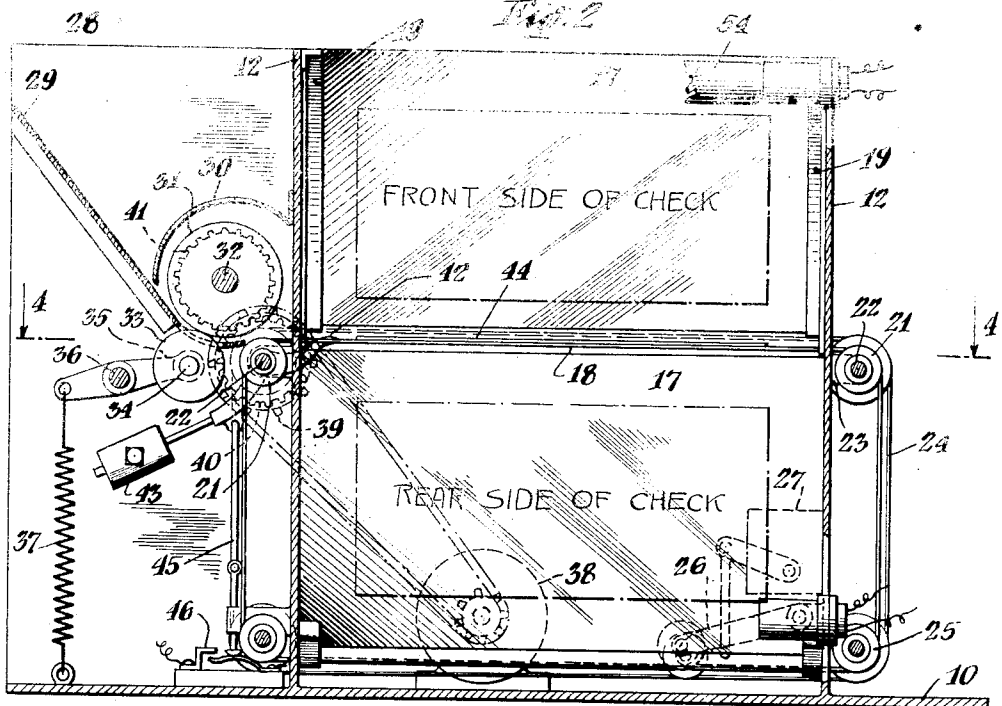


Fig. 2



INVENTOR
John W. Sohns
BY
Duell, Kane & Smoot
ATTORNEYS

Oct. 29, 1940.

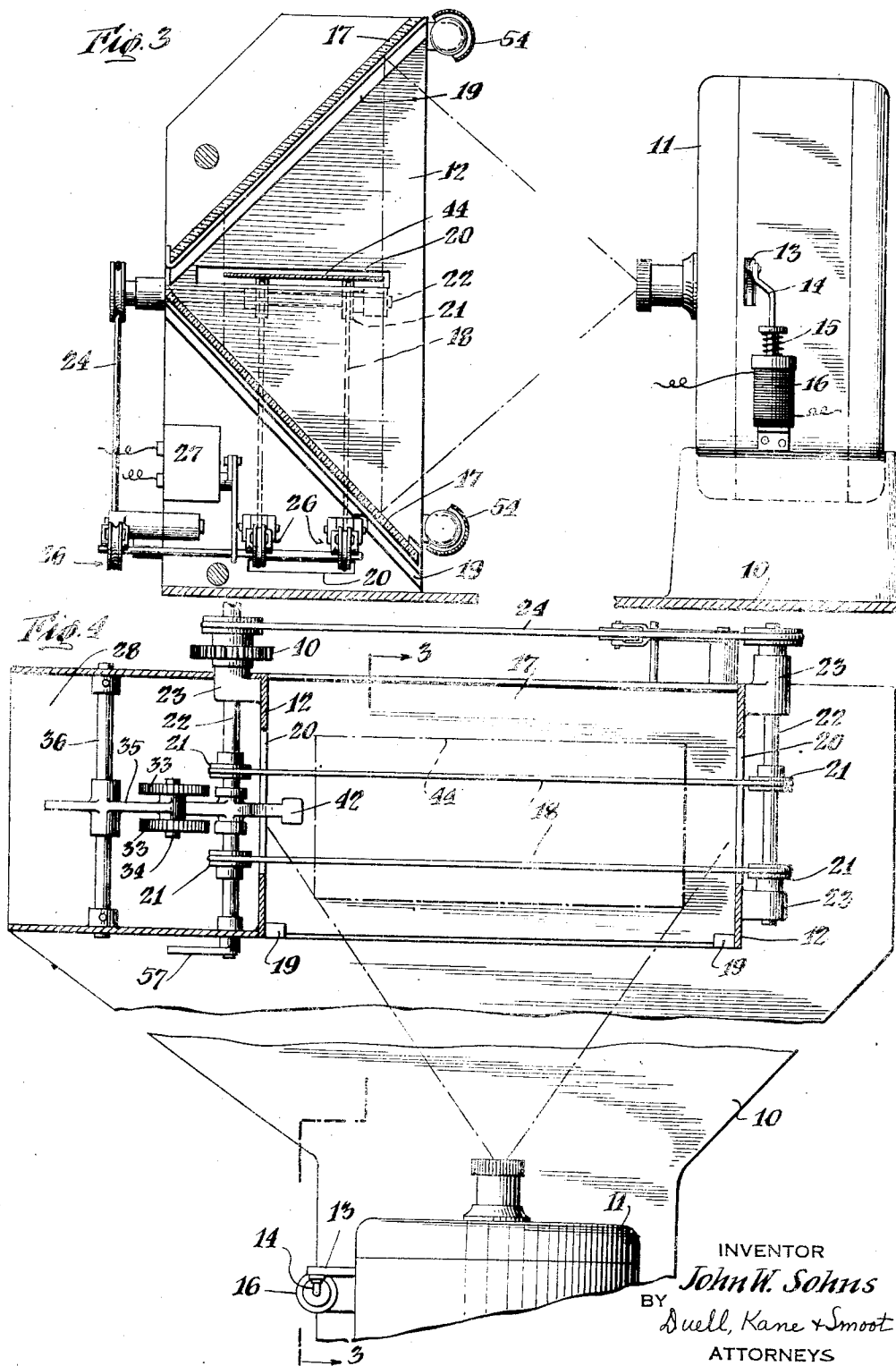
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3 Sheets-Sheet 2



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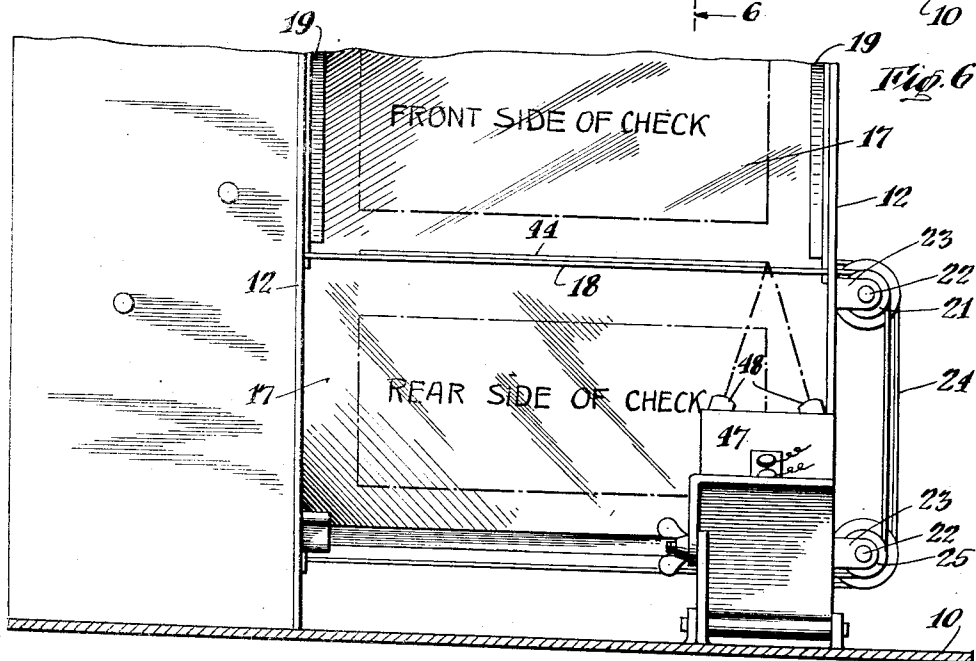
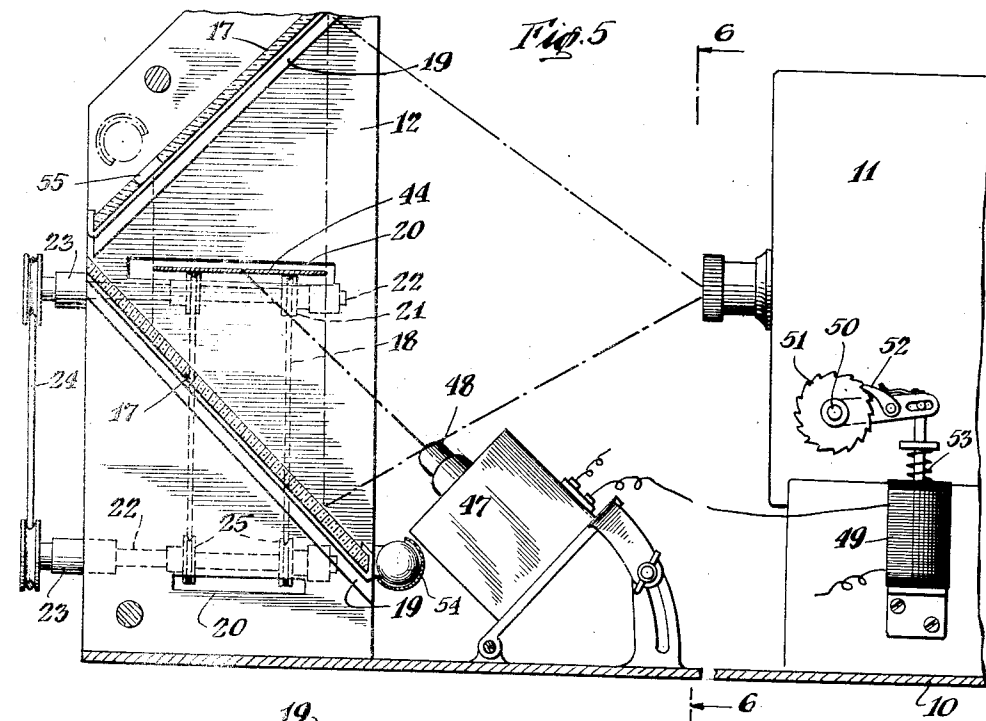
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3 Sheets-Sheet 3



INVENTOR
John W. Sohns
BY
Duell, Kane & Smoot
ATTORNEYS

UNITED STATES PATENT OFFICE

2,219,458

RECORDING APPARATUS

John W. Sohns, Bronxville, N. Y.

Application May 21, 1937, Serial No. 143,932

5 Claims. (Cl. 88—24)

This invention relates to a structurally and functionally improved recording apparatus, capable of use in numerous different connections but primarily intended for the recordation and duplication of checks, record sheets, ledger pages, and any other data sheets.

It is an object of the invention to provide a unit of this character and by means of which both sides of a record sheet or strip will be recorded. In other words, the present apparatus will include a structure such that substantial portions of the strip or sheet which is being duplicated will not be obstructed or hidden in the reproduction.

A further object of the invention is that of providing a recording unit which will require a minimum of manual attention, substantially the entire operation being of an automatic nature and free from the liability of error. This is true even if such manual attention as is necessary is accomplished in a desultory and careless fashion in that the machine will—insofar as practicable—compensate for errors and carelessness.

Still another object is that of furnishing an apparatus of this character and which will include relatively few parts, each simple and rugged in construction and capable of operating over long periods of time with freedom from all difficulties.

With these and other objects in mind, reference is had to the attached sheets of drawings, illustrating practical embodiments of the invention, and in which:

Fig. 1 is a plan view of the reproducing or recording machine;

Fig. 2 is a front view thereof, taken along the lines 2—2 and in the direction of the arrows of Fig. 1;

Fig. 3 is a transverse sectional view taken along the lines 3—3 and in the direction of the arrows of Fig. 4;

Fig. 4 is a sectional plan view taken along the lines 4—4 and in the direction of the arrows of Fig. 2;

Fig. 5 is a view similar to Fig. 3, but showing an alternative form of construction, and

Fig. 6 is a sectional front view taken along the lines 6—6 and in the direction of the arrows of Fig. 5.

In these views the numeral 10 indicates a base, adjacent one end of which a camera 11 is positioned. Adjacent the opposite edge of the base supports 12 are provided for the purpose of mounting a structure hereinafter more partic-

ularly described, and upon which the articles to be reproduced are presented.

At this time it is to be understood that while a unit constructed in accordance with the teachings of the present invention might be employed for numerous different purposes such as the reproduction of maps, ledger sheets, statements, etc., it will be of particular value when utilized in connection with the recording of checks such as are presented at banks and clearing houses. Accordingly, in the present exemplifications, the structure is of primary utility for use in the latter connection. This, however, it is to be understood, is for the purpose of illustration and is not intended in a limiting sense except where otherwise indicated in the appended claims.

As afore brought out, it is preferred to employ as the recording unit per se a camera. While this unit may take numerous different forms, it may conveniently include a shutter actuating and film advancing mechanism controlled in any desired manner. This control as illustrated in Figs. 1 to 4, conveniently includes a lever 13 which, when swung downwardly results in an exposure and which when moved upwardly causes an advance of the film so that an unexposed surface of the latter is presented for the next succeeding exposure. Secured to lever 13 is an actuating arm 14 normally urged upwardly by means of a spring 15, this arm being either connected to, or forming a part of, an armature controlled by solenoid 16. The latter may be of the "delay action" type. In other words, if current is imposed upon its windings, a structure is present such that an appreciable interval of time elapses before sufficient flux is built up to result in a retraction of arm 14. This is not essential but, as will hereafter appear, is preferable if a structure such as is suggested is employed.

Supported between the mounting walls 12 are a pair of mirrors 17 which may be of the surface reflection type and which are disposed at a ninety degree angle with respect to each other and at a forty-five degree angle with respect to a line drawn from their point of mergence and the axis of the lens associated with the camera 11.

Extending substantially in this latter plane is a conveyor, preferably including a pair of cords, wires, or other convenient elements 18, having bodies of relatively reduced areas. The mirrors are supported by the walls 12 by, for example, using mounting strips 19 secured to the inner

faces of the supports and extending in contact with the end zones of the mirrors. The walls or supports 12 are moreover formed with slots in line with the upper course of the conveyor.

- 5 The cords 18 or their equivalents extend through the slots 20 and at points beyond walls 12 pass around grooved wheels or pulleys 21. These are mounted upon shafts 22 rotatably supported upon brackets 23 secured to the outer faces of walls 12. The movement of these shafts 22 is preferably synchronized by a drive 24 common to both of the same. The lower course of the conveyor may pass through slots similar to 20 and situated below the lowermost mirror 17. To properly guide the conveyor in line with these slots further elements—roller assemblies—25 may be provided and tensioning units 26 may cooperate with this lower course of the conveyor and the drive 24, to maintain both of the same in properly taut condition. To this end three separate units may be employed, each of which is coupled to a disconnecting switch 27 for a purpose hereinafter more fully set forth.

- It is to be understood that units to be recorded 25 may be fed to the machine by any desired automatic or semi-automatic type of mechanism. In the interest of simplicity no such mechanism has been shown, but instead there has been illustrated a hopper 28 having an inclined base 29, over which strips or record sheets are to be individually passed to the machine. Within this hopper a deflecting shield 30 may be positioned to guide the records which are to be reproduced and beyond this shield a platen 31 is mounted upon a shaft 32. The base of the hopper is slotted and through this base a pair of rollers 33 extend and cooperate with the platen surface. These rollers are mounted upon a shaft 34 supported by a lever 35 rockingly mounted as at 36. The outer end of the lever is normally maintained in depressed position by a spring 37. It is to be observed that the rollers 33 are preferably closely spaced and arranged intermediate the ends of platen 31. As a consequence of this construction it has been found that even if a sheet of paper is dropped into hopper 28 with its axis extending at a tangent to the conveyor, this sheet or slip will be re-arranged between the platen in conjunction with the rollers, so that it will lie properly upon the upper course of the conveyor.

- A motor 38 may drive sprocket 39, the latter being preferably mounted by the shaft 22. In this manner the entire conveyor will be operated as will also the drive 24. A gear 40 may be connected to the shaft and have its teeth mesh with the teeth of gear 41 coupled to shaft 32. Consequently, the platen will also be simultaneously operated.

- 60 A control lever 42 may be rockingly supported adjacent the receiving end of the machine and have its end extend between the cord member 18 constituting the upper course of the conveyor. The outer end of this lever may be weighted as at 43. It follows that as a sheet or strip of material 44 moves incident to contacting platen 31, the outer end of this strip or sheet will engage lever 42 to depress the same. As the rear edge of the strip or sheet traverses the end of lever 42, it finally moves to a position at which it clears the same.

- Coupled to the lever is an actuating member 45 which may serve to open a switch structure 46. As the lever moves upwardly incident to the strip or sheet shifting beyond the same, actuator 45

will be moved to close switch 46. This switch is connected to a suitable source of electrical current supply (not shown), and to the solenoid 16. As afore brought out, the latter is preferably of the delayed action type. Thus, even 5 although the unit may not be in proper position as lever 42 swings upwardly, it will be in such position by the time arm 14 is attracted. The upper and lower faces of the sheet or strip will be reflected in the surfaces of mirrors 17 and 10 thus a single exposure will provide for a photographic record of both faces of the sheet or slip being simultaneously made. Due to the fact that the conveyor cords 18 or their equivalents are of relatively reduced width and, moreover, in view 15 of the fact that they extend longitudinally of the sheet body, only a minimum masking of the under face of the sheet will occur, due to these conveyor elements. In the case of a check, the endorsements thereon will, of course, extend transversely to the conveyor elements, so that practically no objections can ever occur. Of course, insofar as the upper face is concerned, it will not be masked.

It is apparent that any number of exposure 25 actuators or controls might be employed in lieu of the one suggested. One further control ideally suited for use in a unit of this type is disclosed in Figs 5 and 6 in which numerals heretofore utilized have been employed insofar as practical, 30 to designate parts heretofore described. However, a light sensitive type of unit 47 is preferably employed in the specific embodiment under consideration. This unit in accordance with conventional practice may include a light sensitive 35 element combined with a light source within a casing. Also, preferably included within this casing is a relay, it being understood that an amplifier may conveniently be included in this assemblage of apparatus. Such assemblage has not 40 been shown or described in greater detail because many units of similar type have heretofore been placed on the market and are well known to those skilled in the art. Suffice it to say that the apertures of the unit casing may be defined by flanges 48. To the rear of one of these apertures is a light source and to the rear of the other of the same is the light sensitive tube. The light source may project against the upper mirror 17 and reflect into the aperture in advance of the light sensitive cell. Thus, if this unit is focused as indicated in Fig. 6 against the upper mirror, it follows that the leading edge of the slip supported by the conveyor will interrupt the flow of the light beam, thus energizing the relay to cause current to flow through the windings of solenoid 49. This solenoid may be of the instant acting type and have its armature connected to a shaft 50 by means of an annular ratchet 51 with which a pawl 52 cooperates. A 60 spring 53 may serve to normally urge the armature upwardly to effect an exposure of a frame within the camera 11 and also to operate the shutter mechanism of the latter.

In conclusion it will be appreciated that the 65 slip or sheet upon the upper course of the conveyor may be illuminated in any desired manner as, for example, by utilizing light sources 54 which act against the upper and lower faces of the sheet in order that data appearing upon 70 the same may be sufficiently illuminated that a proper photographic record may be made. It will also be understood that the switch 27 is connected to the motor 38 so that in the event of conveyor failure, the motor will discontinue 75

operation and thus attention will be called to the fact that the apparatus requires repair before a continuance of recording operations is permissible. If for some reason it is not desired to employ a unit 47 which includes a light source, then if the light source 54 is not suitable, an opening such as indicated at 55 may be provided through one of members 17 and to the rear of this opening a light source may be positioned for co-action with the light sensitive element. In that case the element 47 is, of course, shifted to the position indicated in dotted lines. Finally, if desired, a counting unit 56 may be associated with the machine and connected by a lever 57 with lever 42 so that the number of sheets or strips passing through the machine may be tabulated.

Thus, among others, the several objects of the invention as afore noted are achieved. It is obvious that numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A recording apparatus including in combination a base, a pair of reflective surfaces supported by said base in planes approximately 45° from the horizontal, said planes merging at a point to one side of said apparatus to form an apex, the upper reflective surface facing downwardly and projecting at an angle upwardly from such apex, and the lower reflective surface facing upwardly and projecting downwardly at an angle from said apex, and substantially non-obscuring supporting and conveying means including an endless flexible tautened member upon which flat sheet articles may rest likewise associated with said base in a horizontal position at a point within the area of the triangular prism of which said reflective surfaces form side walls and in line with said apex whereby articles may be successively supported thereon substantially only by resting on the upper surface of said support and conveyed horizontally through said space between said reflective surfaces and may be viewed from the side of said apparatus away from said apex by looking into said reflective surfaces, the obverse surface of said articles being visible in the upper of said reflective surfaces, and the reverse surface of said articles being simultaneously visible in the lower of said reflective surfaces, said apparatus also including photographic means, a light sensitive means responsive to the presence of an article upon said conveying means to actuate said photographic means, and gravity chute means for generally feeding said articles to the approximate horizontal starting point of said conveying means and gravity delivery means for delivering said articles from said conveying means after recordation.

2. A recording apparatus including in combination a base, a pair of reflective surfaces supported by said base in planes approximately 45° from the horizontal, said planes merging at a point to one side of said apparatus to form an apex, the upper reflective surface facing downwardly and projecting at an angle upwardly from such apex, and the lower reflective surface facing upwardly and projecting downwardly at an angle from said apex, a substantially non-obscuring supporting and conveying means including endless elongated cordlike tautened members of extremely narrow cross section upon which the

articles may rest likewise associated with said base in a horizontal position at a point within the area of the triangular prism of which said reflective surfaces form side walls and in line with said apex whereby articles may be successively supported thereon by resting on the upper surface of said support and conveyed horizontally through said space between said reflective surfaces and may be viewed from the side of said apparatus away from said apex by looking into said reflective surfaces, the obverse surface of said articles being visible in the upper of said reflective surfaces, and the reverse surfaces of said articles being simultaneously visible in the lower of said reflective surfaces, and means also associated with said base for photographically recording the images appearing in said reflective surfaces when an article is in position on said supporting and conveying means, said apparatus including gravity chute means for generally feeding said articles to the approximate horizontal starting point of said conveying means and gravity delivery means for delivering said articles from said conveying means after recordation.

3. A recording apparatus including in combination a base, a pair of reflective surfaces supported by said base in planes approximately 45° from the horizontal, said planes merging at a point to one side of said apparatus to form an apex, the upper reflective surface facing downwardly and projecting at an angle upwardly from such apex, and the lower reflective surface facing upwardly and projecting downwardly at an angle from said apex, a substantially non-obscuring supporting and conveying means including endless elongated cordlike tautened members of extremely narrow cross section upon which the articles may rest likewise associated with said base in a horizontal position at a point within the area of the triangular prism of which said reflective surfaces form side walls and in line with said apex whereby articles may be successively supported thereon substantially only by resting on the upper surface of said support and conveyed horizontally through said space between said reflective surfaces and may be viewed from the side of said apparatus away from said apex by looking into said reflective surfaces, the obverse surface of said articles being visible in the upper of said reflective surfaces, and the reverse surfaces of said articles being simultaneously visible in the lower of said reflective surfaces, means also associated with said base for photographically recording the images appearing in said reflective surfaces when an article is in position on said supporting and conveying means, and light sensitive means cooperating with said photographic means and responsive to the presence of an article on said supporting and conveying means to cause the actuation of said photographic means, said apparatus including gravity chute means for generally feeding said articles to the approximate horizontal starting point of said conveying means and gravity delivery means for delivering said articles from said conveying means after recordation.

4. A recording apparatus including in combination a base, a pair of reflective surfaces supported by said base in planes approximately 45° from the horizontal, said planes merging at a point to one side of said apparatus to form an apex, the upper reflective surface facing downwardly and projecting at an angle upwardly from such apex, and the lower reflective surface fac-

ing upwardly and projecting downwardly at an angle from said apex, a substantially non-obscuring supporting and conveying means including endless elongated cordlike tautened members of extremely narrow cross section upon which the articles may rest likewise associated with said base in a horizontal position at a point within the area of the triangular prism of which said reflective surfaces form side walls and in line with said apex whereby articles may be successively supported thereon substantially only by resting on the upper surface of said support and conveyed horizontally through said space between said reflective surfaces and may be viewed from the side of said apparatus away from said apex by looking into said reflective surfaces, the obverse surface of said articles being visible in the upper of said reflective surfaces, and the reverse surfaces of said articles being simultaneously visible in the lower of said reflective surfaces, means also associated with said base for photographically recording the images appearing in said reflective surfaces when an article is in position on said supporting and conveying means, and a light sensitive cell responsive to the presence of an article on said supporting and conveying means to actuate said photographic means.

5. A recording apparatus including in combination a base, a pair of reflective surfaces supported by said base in planes approximately 45° from the horizontal, said planes merging at a point to one side of said apparatus to form an apex, the upper reflective surface facing down-

wardly and projecting at an angle upwardly from such apex, and the lower reflective surface facing upwardly and projecting downwardly at an angle from said apex, a substantially non-obscuring supporting and conveying means likewise associated with said base in a horizontal position at a point within the area of the triangular prism of which said reflective surfaces form side walls and in line with said apex whereby articles may be successively supported thereon by resting on the upper surface of said support and conveyed horizontally through said space between said reflective surfaces and may be viewed from the side of said apparatus away from said apex by looking into said reflective surfaces, the obverse surface of said articles being visible in the upper of said reflective surfaces, and the reverse surfaces of said articles being simultaneously visible in the lower of said reflective surfaces, means also associated with said base for photographically recording the images appearing in said reflective surfaces when an article is in position on said supporting and conveying means, and a light source adapted to be reflected by one of said reflective surfaces and a light sensitive element cooperating therewith and in line with the reflected light from said light source, said light source and light sensitive cell being so positioned that an article on said supporting and conveying means will interrupt the transmission of light from said light source to said light sensitive means and actuate said means for photographically recording said images.

JOHN W. SOHNS.