Feb. 12, 1952 F. W. SAMMONS 2,585,042

APPARATUS FOR SCHEDULING AND FOLLOWING PRODUCTION OPERATIONS

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Fig. 1.

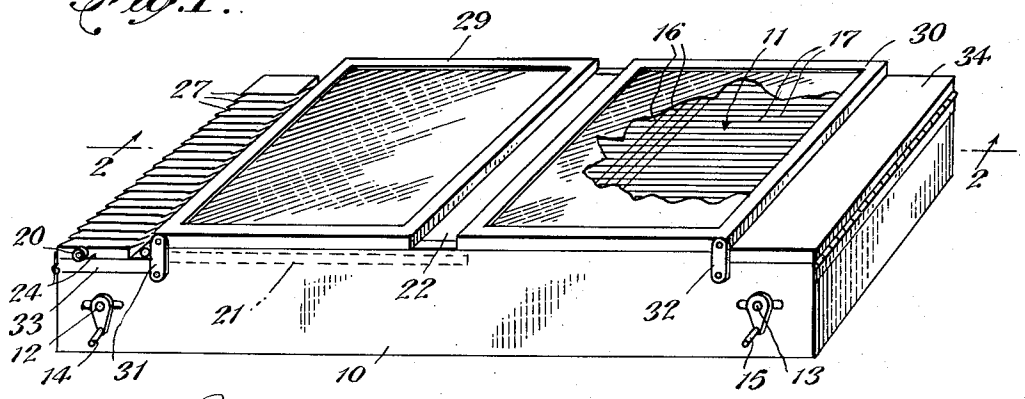


Fig. 2.

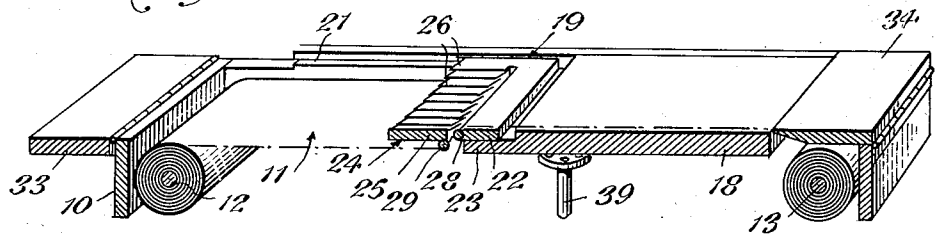


Fig. 4.

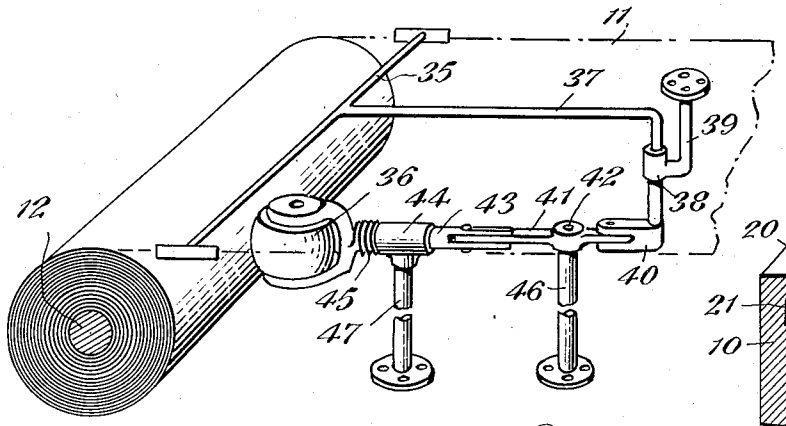


Fig. 3

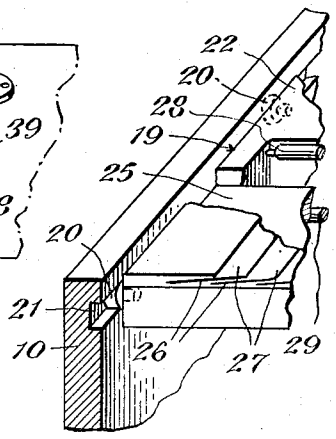
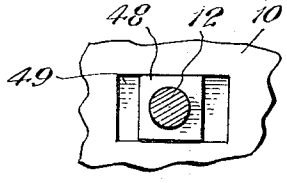


Fig. 5.



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APPARATUS FOR SCHEDULING AND FOLLOWING PRODUCTION OPERATIONS

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6 Claims. (Cl. 35—24)

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This invention relates to apparatus for scheduling and following production, and more particularly such apparatus wherein a movable strip of paper-like material is employed for chronological indications of scheduled transactions. The invention is especially useful in connection with scheduling and following the progress of component parts in order that they may be combined at a predetermined time, to which use, however, it is not restricted.

The usual apparatus for scheduling and following production embodies spaced holes in a board and pegs positioned therein, or extended tapes, or separate sheets of paper. Color code signals are also frequently used. Such arrangements do not generally give a permanent record, or if they do, they do not present such records in readily comparable form. Furthermore, these arrangements usually require translation of codes or other interpretations, determinations or conclusions which impair ready comprehension and comparison.

I have now found that it is possible to construct scheduling and following apparatus in such form that it may, at all times, be used to present a continuous up-to-the-minute permanent record, which focuses attention on the current date. Furthermore, the apparatus is capable of recording schedule periods of any reasonable length or duration. Also, the novel apparatus easily includes written comments. Still further, a photostat of the record contained in the apparatus speaks for itself, without oral explanation, as to past performance, present conditions, and scheduled future operations. Moreover, the permanent record may be used for subsequent scheduling.

One form of the invention is illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of an apparatus for scheduling and following production constructed in accordance with the invention.

Figure 2 is a vertical longitudinal section taken on the line 2—2 of Figure 1, certain parts being removed to show the construction more clearly.

Figure 3 is a broken perspective view showing the following panel and its slidable position in the frame.

Figure 4 is a perspective view of the aligner; and

Figure 5 is a fragmental view showing one of the slidable bearings for the spindle journals.

In the illustrative embodiment of the invention shown in the drawings, a box-like frame 10

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contains the scheduling and following mechanism. Within the frame 10 a strip of paper-like material 11 is carried for movement in at least one direction longitudinally of the frame. As here shown, the ends of the strip 11 are wound upon spindles 12 and 13 journaled transversely of the frame at either end thereof. Although the strip 11 may be wound from either spindle upon the other, it will ordinarily be wound from the spindle 13 upon the spindle 12. The spindle 12 will therefore be referred to as the used storage spindle, and the spindle 13 will be referred to as the supply spindle.

Cranks 14 and 15 are fixed to the ends of the spindles 12 and 13, respectively, which extend through one longitudinal vertical wall of the frame 10. Thus the strip 11 may be wound from one spindle upon the other and moved along the length of the frame.

The strip of paper-like material may be paper, tracing cloth or other suitable flexible material upon which notations may be made. The strip has longitudinal and transverse lines upon it. The transverse lines 16 divide the strip along its length into sub-lengths which may be used to denote successive chronological units, and the longitudinal lines 17 divide the strip transversely into separate tracks along each of which successive notations regarding the same item may be chronologically recorded. Clearly, these divisions may be otherwise employed according to different purposes for which the apparatus may be used.

Thus, by recording successive hours, days, weeks, months or the like longitudinally along the strip, and by listing vertically upon the strip separate items the progress of which is to be scheduled and followed, a running record of scheduling and performance may be kept. Furthermore, where schedules are not met, revised schedules may be easily noted on the strip.

The direction of normal movement of the strip 11 longitudinally of the frame 10 is governed by convention as to indications of time sequence. Because we write from left to right, and time intervals are conventionally recorded sequentially from left to right, it is preferred to mark successive chronological units from left to right along the strip. Furthermore, in order that present conditions may be viewed in their proper relationship to past performance and scheduled future transactions, it is found convenient to keep the current time position shown upon the strip in the middle of the frame. Such an arrangement makes it easy to focus attention

on the current time period. Accordingly the right-hand half of the strip seen in the frame will always show the scheduled future, extending forward progressively away from the current time shown in the middle of the frame. Conversely the left-hand half of the strip seen in the frame will always show past performance, the records extending backwards away from the middle of the frame. The strip of paper-like material 11 will, therefore, be moved from right to left in the frame 10 with the passage of time.

In order to support the strip 11 while schedule notations are made upon it, a scheduling table 18 is fixed in the frame 10; and the strip of paper-like material passes over the scheduling table as the former moves from the supply spindle 13 toward the used storage spindle 12. Since future transactions only are scheduled, the scheduling table 18 will ordinarily be fixed in the right-hand side of the frame. Moreover, the scheduling table is made as long as possible in order to permit scheduling over as long a future period as possible. Thus the scheduling table extends from adjacent the right-hand end of the frame for substantially one-half of the length of the latter; and the frame is made long enough to accommodate a scheduling table of sufficient length to permit recording upon the strip 11 schedule periods of any reasonable length or duration. Revisions of schedule may be made on the strip upon the scheduling table, in accordance with more recent information. It is unnecessary to move the strip to the right for this purpose so long as such revisions are made prior to the "current date."

However, late completion of a scheduled transaction may require revision of notations on or subsequent to the "current date." A following panel 19 is, therefore, provided to support the strip 11 while such revisions are made. The following panel 19 is slidable toward and away from the scheduling table in the frame 10, upon rollers 20 which move in parallel longitudinal channels 21 extending longitudinally of the frame near its top. The channels 21 extend from the middle of the frame to points closely above the position of the used storage spindle 12. The following panel forms a notation and writing board 22 which slides beneath the strip 11. Thus it is possible to make notations upon the strip regarding changes of scheduled performance after the strip has passed beyond the scheduling table 18.

As a matter of convenience, it is preferred to reduce the vertical section of the scheduling table sharply at the position of the frame corresponding to the "current date." Thus a transverse shelf 23 is formed at the end of the scheduling table beneath the "current date" position, and the notation and writing board 22 slides over this shelf with its top surface coplanar with the top surface of the scheduling table 18. See Figure 2.

The following panel 19 also includes a record unit 24, which is preferably unitary with the notation and writing board 22 and slides therewith in the frame. The record unit comprises a base 25 upon which is mounted a plurality of overlapping envelopes 26 of well known form having transparent lower index windows 27 each projecting from beneath the envelope next above it. The index windows are spaced to register with the respective tracks into which the longitudinal lines 17 divide the strip 11. Thus the record in each envelope is conveniently related to a scheduled item, the progress of which is being followed, and the contents of an envelope may be quickly removed and studied in connection with a related item.

In many instances, it is desirable to have the follow panel 19 and the record unit 24 positively held in their positions as shown in Fig. 2. This may be accomplished by several means, one of which is to have an extension take the place of the roller 20 and have it in frictional engagement with the channel 21. Another manner of accomplishing the result would be to have the ordinary type of catch on the underside of follow panel 19 for engagement into a depression in surface 23. Such frictional engagement or button engagement or the like, will maintain the follow panel 19 and the record unit in position when the paper strip 11 is moved to the left or right, as the case may be.

The sheet of paper-like material 11 passes from above the notation and writing board 22, between the latter and the record unit 24, beneath which it extends to the roll upon the used storage spindle 12. To facilitate relative movement of the strip 11 and the following panel 19, the upper edge of the notation and writing board nearest the record unit has a horizontal roller 28 thereon, and the lower edge of the record unit nearest the notation and writing board preferably has a parallel roller 29 thereon. Thus the strip 11 may be easily moved past the following panel and the following panel may be easily moved along the strip.

A simple example of the use of the apparatus follows: An assembly of three elements is required on a certain day. From past records it is known that the time required for assembling the elements is two days; the times required to obtain the respective elements are ten days, five days and one day. The strip of paper-like material being marked longitudinally (say along its upper edge) with a chronological sequence of dates, the strip 11 is turned until the date upon which the completed assembly is required appears at the right of the scheduling table 18. A notation is made on each of three longitudinal tracks, beneath the date on which the assembly is scheduled to be completed. Next the date when all of the elements are to be received is noted in each of the three longitudinal tracks two days in advance of the completion date. Then the date upon which each element is to be ordered is marked on a separate track of the three, ten days before the scheduled receiving date for the first element, five days for the second, and one day for the third. Chronological indications of scheduled transactions are thus made upon the strip 11.

Each day the strip is advanced in the frame to bring the marking on the strip corresponding to that day to the "current date" position of the frame. As the order dates for the three elements appear in the "current date" position, the elements are ordered, and a notation is made on the proper track to that effect. As the elements are received the fact is noted on the strip. Revised delivery promises are also noted on the track of the affected element; and the whole schedule is amended at once. Fulfilling of the schedule is also noted on the strip 11.

Late information respecting past transactions is noted on the strip to the left of the "current date" position, the following panel 19 being shifted to the left to bring the notation and writing board beneath the point on the strip requir-

ing the notation. The record unit 24 always carries separately noted information conveniently related to the notations which are being made on the strip 11.

Thus the apparatus presents at all times a continuous, up-to-the-minute permanent record.

Transparent strip covers 29 and 30, hinged to the frame 10 as at 31 and 32, serve to protect the record on either side of the "current date" position, while permitting ready inspection. The covers may be swung back to permit notations to be made, although "current date" notations may be made at all times. Hinged end covers 33 and 34 may be closed over the spindles 12 and 13 respectively, or may be swung back to give access to the rolls on the spindles without disturbing the strip covers. It is noted that the channels 21 are so formed and of such extent as to permit the record unit 24 to slide out over the end cover 33, thereby making it possible for the notation and writing board to move as closely as possible to the used storage spindle 12.

In order that the elongated strip of paper-like material 11 may roll evenly upon the spindle on which it is wound, a novel aligner is provided. Responsive to pressure exerted upon it by either edge of the strip which tends to wind off of the roll, the aligner acts to tighten the rolling tension of that edge, thereby causing it to wind back on the roll.

The aligner illustrated in Figures 4 and 5 comprises a yoke 35 in contact with both edges of the strip 11 which is being rolled upon the used storage spindle 12, and a roller 36 spring-pressed against the material wound upon the spindle 12. A lever system supports the yoke and the roller.

The lever system includes a rod 37 fixed to the yoke 35 extending away from the spindle 12 beneath and substantially parallel to the strip 11. The rod 37 is pivoted in a bushing 38 upon a bracket 39 fixed to the apparatus, as beneath the scheduling table 18. Thus the rod 37 may swing about the bushing 38 in a plane substantially parallel to that of the strip 11, and the yoke 35 may respond to movement of the strip at right angles to its movement along the frame. A crank 40 is fixed to the rod 37 for movement therewith and extends from the pivot of the rod toward the yoke. A lever 41 is pivoted intermediate its ends, as at 42, for movement in a plane substantially parallel to that in which the rod moves, and is pivoted at one of its ends to the crank 40. The other end of the lever 41 is slidably pivoted to stem 43 which carries the roller 36.

The stem 43 is slidably pivoted intermediate its ends for axial and swinging movement in a plane substantially parallel to that in which the rod 37 moves. Thus the stem 43 is carried in a pivoted sleeve 44 in which it slides axially. A spring 45 is compressed between the sleeve 44 and a forked bearing at the end of the stem 43 which carries the roller 36, thereby urging the stem toward the roll of material wound upon the spindle 12 and causing the roller to bear against the rolled material. The pivot 42 of the lever 41 and the pivoted sleeve 44 are carried by vertical standards 46 and 47, respectively, which may be fixed to the bottom of the frame 10.

From the foregoing, it will be apparent that movement of the yoke 35 in either direction causes the roller 36 to move along the material rolled on the spindle in the same direction, continually exerting its pressure upon it. This action is made effective to tighten the edge of the strip 11 which starts to move off of the roll by providing bearings for the spindle journals which are slidable longitudinally of the strip. Accordingly, the spindle 12 is journaled in bearings 48 which are slidable in horizontal guides 49 in the longitudinal sides of the frame 10. See Figure 5.

Thus, the roller 36 normally bears upon the center of the material wound upon the spindle 12 and keeps the strip 11 tight. However, the roller is shifted toward either end of the spindle from which the strip tends to roll by pressure of the edge of the strip upon the yoke 35. Thereupon, the spindle bearing on that side is moved away from the strip by the pressure of the roller, tightening that side of the strip and causing it to wind back upon the roll. As this occurs the yoke is returned to its original position and the roller is shifted back to the center of the material upon the spindle.

Obviously the aligner may also be applied to the supply spindle 13 in like manner.

Horizontal slots 50 may be provided in one longitudinal side of the frame 10 to permit adjustment of the spindle ends to which the cranks 14 and 15 are applied.

It will be appreciated that the present invention provides a continuous, up-to-the-minute permanent record of scheduled and completed transactions including necessary written comments, which always speaks for itself. A photostat of the record constitutes a complete report, and also may be used for subsequent scheduling.

The particular form of the invention here described and illustrated in the accompanying drawings is presented merely as an example of how the invention may be applied. Other forms, embodiments and applications of the invention, coming within the proper scope of the appended claims, will readily suggest themselves to those skilled in the art.

I claim:

1. Apparatus for scheduling and following production comprising a frame, a scheduling table fixed in said frame extending from adjacent one end of said frame for substantially one-half of the length thereof, a combination notation base and a writing board slidable in said frame toward and away from said table, a record unit slidable with said combination notation and writing board in said frame, said frame having a strip of paper-like material for movement over said table and said notation and writing board and under said record unit in either direction longitudinally of said frame, a roller held in the upper edge of said notation and writing board nearest said record unit, a second roller held in the lower edge of said record unit nearest said notation and writing board whereby said strip moves easily between the upper side of said notation and writing board and the lower side of said record unit, said strip having longitudinal and transverse lines thereon whereby itemized transactions may be separately and chronologically indicated upon said strip, one set of lines having dates at one end thereof, some of said itemized transactions being entered on said strip when supported on said table and under future dates thereby to follow production up to and past a current date.

2. In a recording apparatus, the combination of a supporting frame, a table fixed in said frame, said frame having a strip of paper-like material movable over said table, supply rolls for holding the ends of said paper-like material and operated to allow said paper-like material to move across said apparatus, a series of covers at least one of which is transparent for covering most of the

exposed part of said strip of paper-like material, said covers being spaced apart to expose part of said paper-like material on which is to be noted transactions, a support for said paper-like material to allow said notations to be properly made, one of said covers being movable to further expose part of said paper-like material to allow other notations to be made, and a series of subject indices positioned on said frame so that each subject index will be opposite a space between two lines on said paper-like material, said subject indices being movable parallel to the paper-like material in a space in said frame opposite said table.

3. An apparatus for scheduling future events and for recording present events that soon become past events, comprising a frame, a table carried by said frame and extending only a part of the length of said frame, an indices support carried by said frame and movable over a portion of said frame, said frame having a medium passing therethrough over said table and under said indices carrying support, said medium being lined in two different directions to form bounded spaces, one set of lines having a series of consecutive dates entered along one edge thereof, said medium engaging a predetermined area of said frame as of a current date, said medium having entries made in the bounded spaces at the current date and made in bounded spaces at future dates on said medium as supported by said table, said medium being advanced at predetermined intervals to have a portion thereof register with said predetermined area, a movable cover positioned over said medium as supported on said table and arranged to be temporarily moved to allow the future notations to be entered, said medium constituting a permanent record.

4. An apparatus for scheduling future events and for recording present events that soon become past events, comprising a box-like container, a table carried near the top thereof and extending for substantially half of the length of said container, a movable support carried by said container and movable in respect thereto for approximately half its length, said support carrying a series of different indices, a writing board forming a part of said support, said table receiving thereover a medium which passes through said container by passing over said table and over said writing board part and beneath said series of indices part of said movable support, said medium being lined in two different directions and having dates noted at one edge thereof and between said lines, said medium having notations made thereon at current dates and at future dates, said movable support having said medium pass over said writing board part of it and under said indices part of it as said support is moved in respect to said table so as to bring past entries into viewable positions.

5. An apparatus for scheduling and following production by making notations upon a lined medium adapted to be passed therethrough for the purpose of making said notations thereon and to be removed from said apparatus for keeping as a permanent record or repassed through said apparatus for reference to any of said notations at any time, said apparatus comprising a frame, a scheduling table fixed in said frame and over which said medium passes, and a following panel forming a notation and writing board slidable in said frame to and away from said table and under said medium on which notations are made, a base carried by said following panel and having a series of notations thereon in relation to positions of notations made on said medium, said medium after passing over said writing board part of said following panel passes beneath said base to a takeup spindle.

6. An apparatus for scheduling future events and for recording present events that soon become past events, comprising a frame, a table carried by said frame and extending only a part of the length of said frame, a support carried by said frame and movable over most of the portion thereof not occupied by said table, said support comprising a writing board part and an indices supporting part, said frame having a medium passed therethrough and passing over said table and over said writing board part and down beneath said indices supporting part of said support, said medium being lined in two different directions to form bounded spaces, one set of lines having a series of consecutive dates entered along one edge thereof, said medium engaging a predetermined area of said frame as of a current date, said medium having entries made in the bounded spaces at the current date and made in bounded spaces at future dates on said medium as supported by said table, said medium being advanced at predetermined intervals to have a portion thereof register with said predetermined area.

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