July 8, 1924.

H. B. BLANKÉ

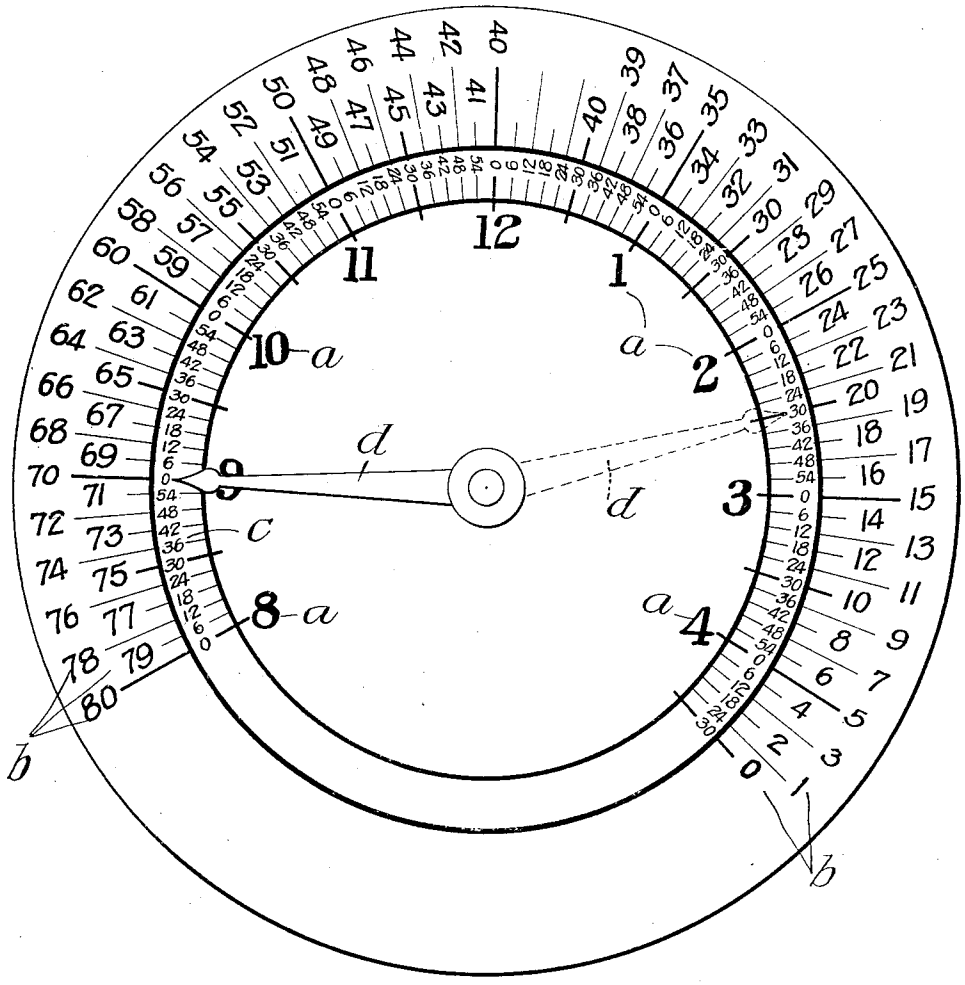
1,500,701

TIME CLOCK DIAL

Filed May 23, 1923

2 Sheets-Sheet 1

Fig. 1



Inventor:
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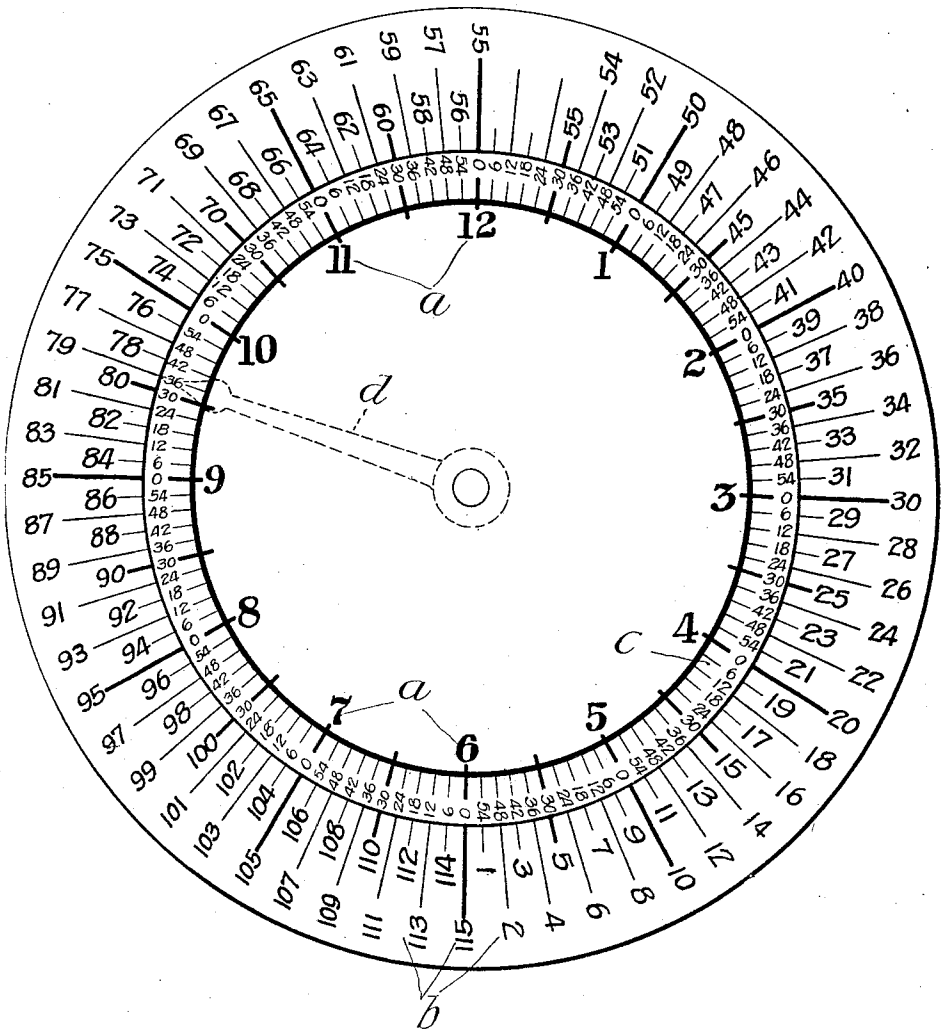
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TIME CLOCK DIAL

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Fig. 2



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Patented July 8, 1924. 1,500,701

UNITED STATES PATENT OFFICE.

HERMAN B. BLANKÉ, OF CHICAGO, ILLINOIS.

TIME-CLOCK DIAL.

Application filed May 23, 1923. Serial No. 640,816.

To all whom it may concern:

Be it known that I, HERMAN B. BLANKÉ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Time-Clock Dials, of which the following is a specification.

My invention relates to dials for time clocks of the type used primarily to assist the timekeeper of a shop or factory to keep a record of the hours of work performed and wages earned by the individual employés. The object of the invention is to reduce to a minimum the amount of computation necessary on the part of the timekeeper and to simplify as far as possible the nature of the computations which must be performed especially in those cases where the hours of an individual employé do not conform to the standard working day of the institution. In most shops and factories the working day commences and ends at given times with a given period for lunch, and in such case if the employé keeps to these hours the computation of his time and pay is simple, but in many cases there is overtime or an employé may start late or quit early, and one of the objects of my invention is to take care of such cases and to reduce the amount of work which the timekeeper must do and simplify the computations he must make in order to arrive at the proper amount of pay due.

I accomplish my objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1 shows a specialized dial for a standard 8 hour day commencing at 8 o'clock in the morning and ending at 4:30 in the afternoon, with a half hour recess at noon.

Figure 2 shows a dial which embodies the invention as applied to a 12-hour day.

Like numerals denote like indicia in both views.

According to my invention in its preferred form each hour is divided into tenths, in this sense operating upon the decimal principle. This is not new in itself, but is new in association with other characteristics of the invention.

In accordance with the principle of my invention a "zero hour" is selected and opposite to it is marked a number corresponding to the full number of units (tenths of hours) in the working day. This scale, which for identification may be termed the "aggregate units scale" decreases by unitary increments to the end of the working day where the scale will bear the symbol "0". In other words, the aggregate units scale instead of increasing from the zero hour is at a maximum at the zero hour and decreases to zero at the end of the day. In practice, an employé will have allotted to him a tentative credit of the number of units remaining in the day from the time when he commences work, whether he starts at the zero hour or later in the day. Then the timekeeper will deduct from this tentative allotment the number of units remaining in the day when said employé quits. Obviously if the employé remain until the end of the day the number of units to be subtracted will be 0 and hence the tentative allotment will not be diminished. If, however, he quits prematurely his tentative allotment will be reduced by a significant figure, viz., the figure corresponding to the number of units remaining between the hour that he quits and the standard quitting hour.

To give a concrete example reference may be had to Figure 1. Here, as before stated, the standard day is eight (8) hours with a half hour at noon. Obviously in an eight hour day there are eighty units of one-tenth of an hour each. Consequently opposite to the figure 8 on the hour scale *a* I mark the number 80 in the scale *b* which for identification may be designated the aggregated units scale. This scale decreases by units from 8 o'clock until 12 noon, when 40 units will have expired. Consequently the number 40 appears in scale *b* opposite to the number 12 in scale *a*. As work is suspended from 12 to 12:30 the working time does not accummulate during that period and hence I apply the number 40 to the commencement of the afternoon period. It will be observed that the number 40 appears at the graduation corresponding to 12:30 P. M. in scale *a*. Scale *b* then decreases from 40 to 0, the latter symbol occurring in scale *b* opposite to the hour 4:30.

While it is not an essential feature of the invention I employ a third scale *c* which in the illustrated case occurs intermediately between the scales *a* and *b*, and indicates the minutes of each particular hour. This may be termed the "minute scale" and is gradu-

ated into periods of six minutes each—corresponding to the number of minutes in the unitary periods of scale *b*. In this scale the numbers commence at zero at the beginning of each hour, thus enabling a person in reading the dial to recite the time thus: 8:24—8:36—8:54, etc., depending upon the position of the pointer or clock hand *d*. By the addition of this scale it becomes possible to read the time clock as if it were an ordinary clock but having a single or hour hand and the hours being graduated into units of six minutes each.

In using a specialized dial like the one shown in Figure 1 the procedure is as follows: If an employé starts at 8 o'clock in the morning he will have tenatively allotted to him eighty units. If he takes a recess of 30 minutes at noon and works until 4:30 in accordance with the standard day at that institution he will have worked through eighty units of time, and the number of hours is obvious upon mere observation. In other words, the employé has worked a full day of eight hours and he will receive a monetary credit of eighty units multiplied by the rate per unit. This case presents no difficulty and the timekeeper hardly needs any special scale to assist him. Take the case, however, of an employé who commences late in the morning, for example 9 o'clock, as indicated by the hour hand in Figure 1. The hour hand points to 70 on scale *b* and this number of hours will be tentatively credited to him. Suppose now he works until 2:30 P. M., taking the usual time out at noon—when he quits at 2:30 the hour hand will point to 20 on the scale *b* as indicated by the dotted lines in the figure. When the timekeeper comes to compute the time worked and the money due this employé he will subtract 20 from 70, leaving 50 as the number of units during which the employé worked. In other words, the operation on the part of the timekeeper is always one of subtraction, the starting hour constituting the minuend and the quitting hour the subtrahend. This system has more than one advantage. In the first place it enables the timekeeper to mark down the minuend for each empoyé as soon as that employé starts, thus enabling him to get a part of his work done immediately. The subtrahend, whatever it is, will be both later in the day and a smaller number so that if the numbers are set down in the order in which they occur they will also be set down in the order appropriate to the computation. In the second place it eliminates the need of computation in those cases where the employé stays to the end of the day, even though starting late. For example, if the employé started at 9 o'clock and worked until the end of the working day, the single number 70 (constituting the minuend) would be the only one needed to indicate the amount of time to be credited to the individual.

As the hours are divided into tenths the matter of computing the wages due is simplified for it requires merely a multiplication of the rate per hour multiplied by a number which may or may not contain a decimal fraction, but never a common fraction.

The same underlying principle may, of course, be employed in connection with shifts of any other duration, for example in Figure 2 is shown a so-called 12 hour day commencing at 6 o'clock in the morning and having a 30 minute period for lunch. In such case the working day will contain 115 unit periods of one-tenth of an hour each. Assuming that the zero hour is 6 o'clock in the morning the number 115 will be placed opposite the hour 6 in the scale *b*. At 12 o'clock noon there will be 55 remaining units to complete the normal working day and hence the number 55 is placed opposite the hour 12 in the scale *a*. As no work is being done during the noon hour the same number will be placed opposite to the 12:30 graduation in this scale *a*. If the employé works till 6 o'clock at night the number to be subtracted from the starting number will be 0 and hence it is not necessary to make any computation other than a mental one to note that the employé has worked until the end of the working day.

One of the advantages of my system is that the form of dial shown in Figure 2 is of universal application in those cases where the working day commences at 6 o'clock or later and a half hour period is set aside for lunch. This form, for example, is applicable to an eight hour day commencing at 8 o'clock in the morning, a lunch period of thirty minutes at noon, and a day ending at any time up to 6 o'clock. The chief difference is that it requires the setting down of both the starting and the stopping time for each employé whereas with a specialized dial made to fit the institution most of the employés (who naturally start on time and end on time) require no arithmetical computation. All the timekeeper has to do is to note that the employé started on time and ended on time, and even in the case where the employé starts late, if he finishes at the quitting hour, the subtrahend being 0 does not need to be set down and the elapsed time will be indicated by the number representing the tentative allotment corresponding to the time of starting.

From the foregoing it will be observed that in accordance with my system the scale representing the elapsed time does not commence at zero, increasing as the time elapses, but commences at the tentative maximum and decreases. It is this principle taken in connection with the dividing of the hours

into tenths that so greatly simplifies the work necessary for the timekeeper to do.

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

1. A non-rotating clock dial for use of timekeepers where a working day is less than twelve hours, said dial having an hour scale representing the usual hourly divisions and having a second scale consisting of decimal divisions of an hour and numerals equal to the total of such divisions in a normal working day located opposite to the beginning point of a normal working day and decreasing by decimal parts of an hour so that the zero point will come opposite to the end of a normal working day, the second scale having an interval for recess in which said numerals are omitted so that the first numeral after the recess period is the same as the last one before such recess period.

2. A clock dial for timekeepers having an hour scale with subdivisions and a serially numbered scale fixed relatively thereto and having 0 opposite to the quitting time of the normal working day and the maximum number of time units in a working day opposite to the starting hour of a normal working day, said second scale being interrupted during a period corresponding to the noon hour of a normal working day, and a third scale associated with the other two and being graduated in divisions of an hour equal in length to the time units of the serially numbered scale.

3. A clock dial for timekeepers having an hour scale with subdivisions and a serially numbered scale fixed relatively thereto and having 0 opposite to the quitting time of the normal working day and the maximum number of time units in a working day opposite to the starting hour of a normal working day, said second scale being interrupted during a period corresponding to the noon hour of a normal working day, and a third scale associated with the other two and being graduated in divisions of an hour equal in length to the time units of the serially numbered scale, the third scale being arranged intermediately between the hour scale and the serially numbered scale.

In witness whereof, I have hereunto subscribed my name.

HERMAN B. BLANKÉ.