No. 728,826. PATENTED MAY 26, 1903.

D. ANDERSON.

TIMING APPARATUS AND ALARM FOR MACHINERY.

APPLICATION FILED MAY 20, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 2.

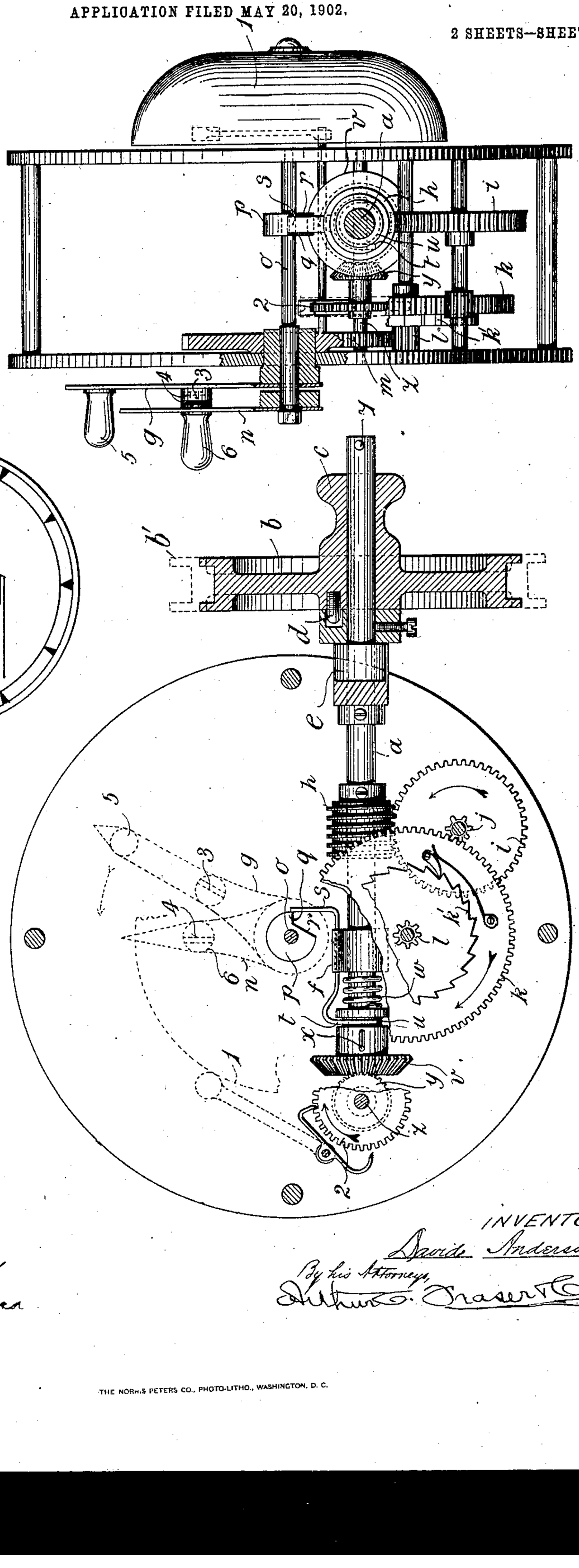


FIG. 3.

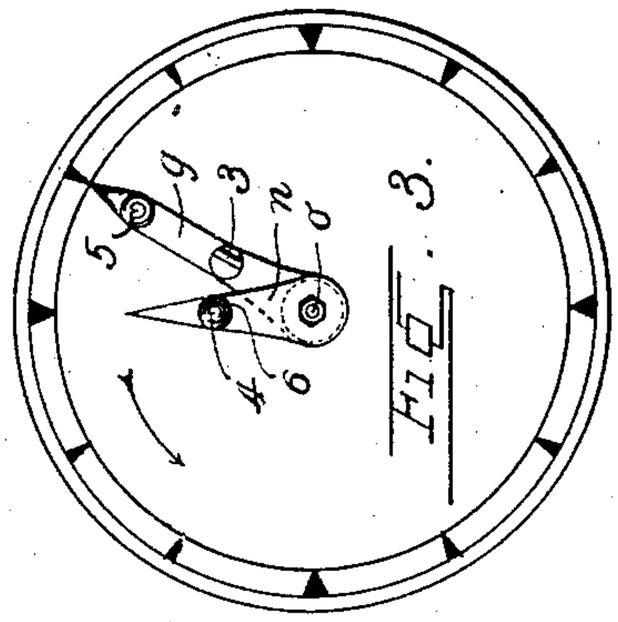


FIG. 1.

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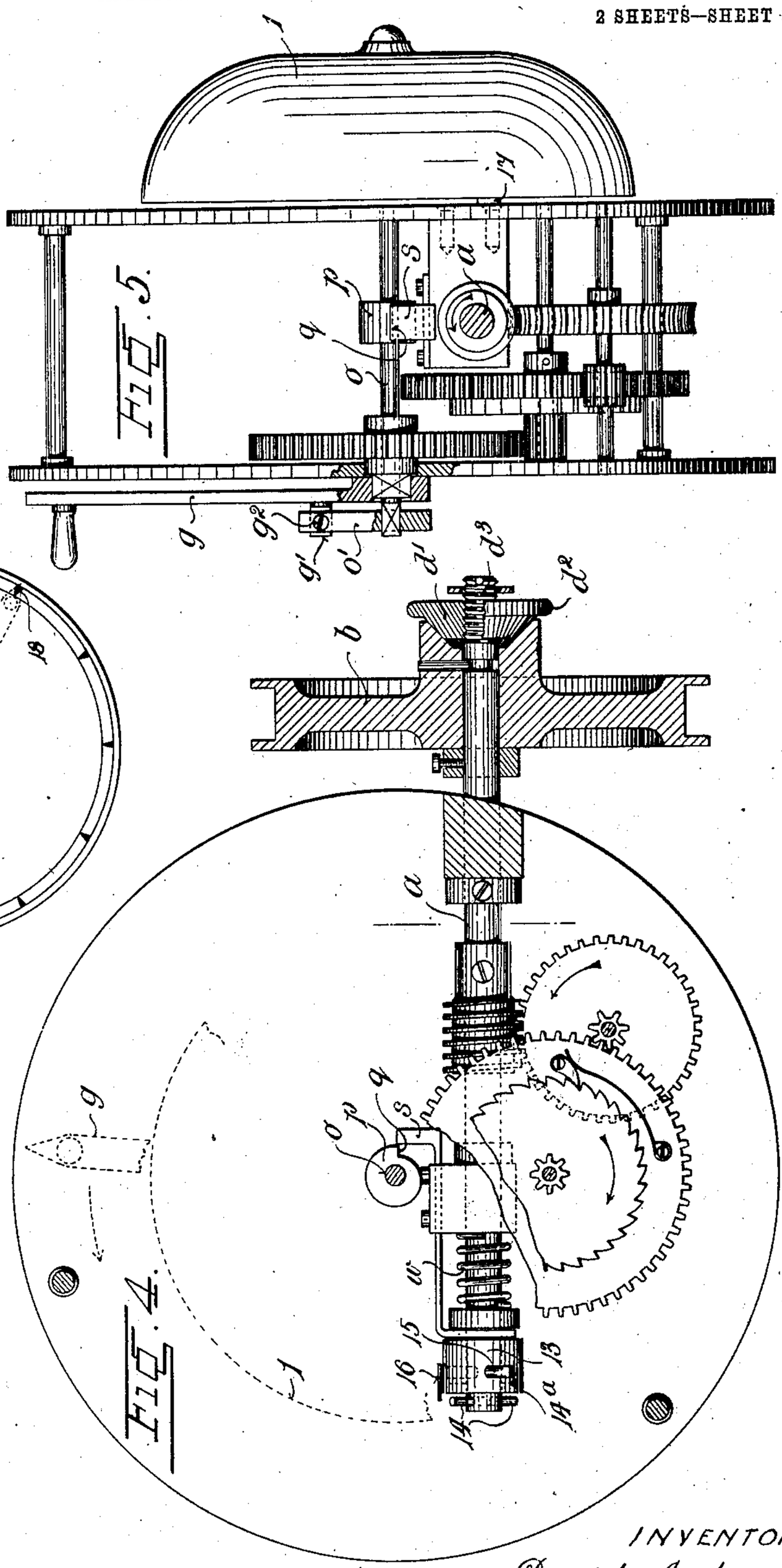
NO MODEL. 2 SHEETS—SHEET 2.

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No. 728,826. Patented May 26, 1903.

# UNITED STATES PATENT OFFICE.

DAVID ANDERSON, OF CLAPHAM PARK, ENGLAND.

## TIMING APPARATUS AND ALARM FOR MACHINERY.

SPECIFICATION forming part of Letters Patent No. 728,826, dated May 26, 1903.

Application filed May 20, 1902. Serial No. 108,180. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID ANDERSON, engineer, of 9 Poynders road, Clapham Park, in the county of London, England, have invented certain new and useful Improvements in Timing Apparatus and Alarms for Machinery, of which the following is a specification.

This invention relates to a timing apparatus for stationary machinery used in manufacturing and other purposes, and especially such as is used for laundry purposes, dyeing, cleaning, &c.

A timing apparatus made in accordance with my invention comprises a portable attachment consisting of an indicator-hand so geared by means of connections adaptable to varying machines with the machinery or driving-shaft thereof that the indicator is driven by and indicates the angular velocity or number of revolutions of a machine in terms of time upon a dial, said indicator-hand being adapted to be so set in regard to a second pointer or point on the dial that on the indicator-hand arriving at said pointer or point a clutch or other means will act to connect up an alarm mechanism to the indicator-driving mechanism, and so cause the alarm to be actuated thereby.

The accompanying drawings illustrate a timing mechanism or alarm made in accordance with my invention.

Figure 1 is a sectional front elevation, Fig. 2 is a sectional side elevation, and Fig. 3 is a face view, of the dial and hands. Fig. 4 is a sectional front elevation showing a timing mechanism or alarm made in accordance with my invention where only one indicating-hand is employed, the alarm being released on the said hand arriving at a given point on the dial. Fig. 5 is a sectional side elevation of Fig. 4. Fig. 6 is a detail of the alarm mechanism, and Fig. 7 is a face view of the dial and hand of the construction shown in Figs. 4 and 5.

*a* is the main driving-spindle of the apparatus, which is driven from the shafting of the machine to which it is applied through a pulley *b*, which pulley is interchangeable, so that pulleys of varying dimensions, as shown at *b'* in dotted lines, Fig. 1, may be substituted as required to insure that the shaft or spindle *a* will run at a predetermined speed—say one hundred revolutions per minute—whatever may be the speed of the shaft from which it is driven. This pulley *b* is arranged to slide upon the shaft *a*, for which purpose it is provided with a milled head *c*, formed on a suitable extension. The pulley drives the shaft through a clutch *d*. The shaft *a* is mounted in bearings *e f* and drives the indicator-hand *g* through worm *h* and intermediate gearing *i j k l m*, so that the said hand *g* moves approximately under normal conditions of speed at the same speed as the minute-hand of a clock. A ratchet *k'* is provided between the wheels *k* and *l*. *n* is another hand or pointer on the dial, hereinafter called the "alarm-pointer," and corresponds to the hour-hand of a clock. This alarm-pointer, however, does not move until the alarm is in operation. The said alarm-pointer *n* normally occupies the position of zero or twelve o'clock on the dial and is mounted on a through-spindle *o*, which carries a cam *p*, having a nose *q* and a depression *r*. In the normal position the nose *q* presses out an arm *s*, having a forked end *t*, engaging a sleeve *u*, carrying a bevel-wheel *v* and sliding upon the spindle *a* against the action of a spring *w*. The sleeve *u* is driven from the shaft through a pin-and-slot connection *x*, although a squared portion of the shaft may be used instead of the said connection. The spring abuts against the bearing *f*. When released by the cam *p*, the bevel-gear *v* comes into engagement with bevel-pinion *y*, mounted upon a transverse shaft *z*, and actuates an alarm-bell 1, the action being controlled by the escapement 2.

The indicator-hand *g* has a projection 3, adapted to engage a projection 4 on the alarm-pointer *n* when the hands come together. The hand *g* and alarm-pointer *n* are each provided with a knob 5 and 6, respectively.

In operation, assuming the spindle to be provided with a suitable pulley to drive it in the manner described and the said pulley to have been slid out of connection with the clutch *d* by means of the milled head *c*, the hands *g* and *n* are free to be moved in the direction of the arrow, so that first the alarm-pointer *n* is turned around and set at zero or twelve o'clock, and then the indicator-hand *g* is turned around and set at the desired num-

ber of minutes or divisions from the alarm-pointer *n*. By a modification, if required, the indicator-hand *g* may be made resilient or have a sliding action on its spindle to allow of the hand being depressed, so that the stop 3 thereon can pass the stop 4 on the hand *n*, whereby the hand and alarm-pointer having been moved clear of one another they can be set as required. In the drawings the indicator-hand is shown as set at five minutes. A stop 7 prevents the pulley being slid too far. After adjustment of the indicator and alarm-pointer hand to the required time for which the machinery is to run before the alarm is sounded the pulley *b* is returned into engagement with the clutch and the indicator-hand *g* is slowly traveled through the connecting mechanism until its stop 3 comes into engagement with the stop 4 on the alarm-pointer *n*. The indicator-hand *g* still travels and carries with it the alarm-pointer *n*. This turns the cam *p* on its spindle, moves away the nose *q*, and allows the arm *s* to slide back into the recess *r*. This allows the spring *w* to push the bevel-wheel *v* into engagement with the pinion *y*. The spindle *z* is thus driven from the shaft *a* and the alarm sounded continuously or for a given period determined by the cam or until the operator by releasing the pulley *b* from the clutch stops the mechanism and resets it for use.

By the above description it will be seen that the indicator-hand is driven from the machinery and indicates in terms of time, while should the machinery slow down or otherwise vary from its normal speed the time at which the cam is actuated to couple up the alarm will be correspondingly varied, and the machine will thus perform its allotted task. It will also be seen that the timing apparatus is portable and capable of being fixed in the most convenient position for observation and for being driven from the machinery in motion or from the counter-shaft which drives the same or, in fact, any moving part of stationary machinery the work of which it is required to time, and the speed of the actuating-shaft *a* can be readily and conveniently set to the required number of revolutions when the normal angular speed or number of revolutions per minute of the shaft which actuates it is known, and, what is most important, the operators, who are in most cases unskilled, can readily set the indicator-hand and alarm-pointer in the terms of time for the period which it is required the machine shall run.

Referring now to the construction shown in Figs. 4, 5, 6, and 7, in Figs. 4 and 5 the arrangement of spindle *a*, interchangeable pulley *b*, and gear for driving the traveling pointer or indicator-hand *g* is the same as previously described with reference to Figs. 1 and 2; but the second pointer *n* therein shown is dispensed with and the alarm mechanism is coupled up to the shaft *a* as soon as the indicator-hand *g* reaches the point "12" on the dial, Fig. 7. In order that this may take place, the spindle *o* of the indicator-hand is provided with a cam *p*, normally keeping the clutch 13 out of engagement with projections 14 on the shaft *a*. The cam *p* slides the clutch upon the shaft by means of an arm *s*. A spring *w* presses the clutch to operative position when it is released. The clutch 13 is provided with projections 15, which when the clutch is rotated engage a resilient arm 16 and alternately raise and release the same, so as to strike a projection 17 on the alarm-bell 1. In operation the hand *g* is turned in the direction of the arrow, Fig. 7, and set at the desired number of minutes or divisions from the point "12" on the dial. For instance, it may be set at twenty minutes, or the fourth division from the point "12," as indicated by dotted lines at 18, Fig. 7. In turning the hand to this position the face of the cam *p* keeps the clutch in inoperative position, so that when the shaft *a* is rotated through the driving-pulley *b* the alarm is not sounded, but the rotation of the shaft through the gearing gradually travels the indicator-hand *g* until it arrives at the point "12." In this position the nose *q* of the cam passes out of engagement with the arm *s*. The spring *w* at once acts to push the clutch against the projections 14, which engage in recesses $14^a$ when the shaft is rotated, and thus lock the clutch to the shaft, so that it rotates therewith, and the projections 15 cause the resilient arm 16 to rise and fall in quick succession and sound the alarm, and the alarm will continue ringing until the indicator-hand has been traveled a considerable distance around the dial, which distance will be determined by the particular formation of the cam. The alarm can be stopped from ringing either by moving around the indicator-hand a sufficient distance or by releasing the clutch *d'*, Fig. 4, between the pulley *b* and shaft *a*. The clutch *d'* shown is in the form of a cone provided with a milled edge $d^2$ and screwed by a left-handed thread $d^3$ on the spindle *a*. The thread is arranged so that the cone-clutch *d'* is unwound in the opposite direction to which the pulley travels. By this means it is only necessary for the operator to hold the clutch, when the movement of the pulley will automatically release it. The clutch can be at once put into gear by winding it in the opposite direction—that is to say, in the same direction as the pulley runs. In order that the indicator-hand *g* may be set in accurate position with regard to the nose of the cam *p*, it is mounted separately on the spindle *o* and has a projection *g'*, which passes between two arms of a block *o'*, carried by the spindle *o*. Set-screws $g^2$ are provided for adjusting the position of the projection *g'* and hand *g* with regard to the block *o'*.

What I claim, and desire to secure by Letters Patent, is—

1. The improved portable timing apparatus for laundry and other stationary machinery

comprising the combination of a dial marked in terms of time, an indicator traveling over said dial, interchangeable means for driving the indicator at a practically constant and predetermined speed from the machinery to be timed, an alarm, mechanism for actuating said alarm, means whereby the alarm mechanism is coupled up to and driven from the indicator-driving mechanism when the indicator-hand arrives at a given point on the dial and thus indicates that the machinery has been running for a certain period of time, and means for allowing the indicator to be reset for the period of time required, all substantially as and for the purpose set forth.

2. The improved portable timing apparatus for laundry and other stationary machinery comprising the combination of a dial marked in terms of time, an indicator traveling over said dial, interchangeable means for driving the indicator at a practically constant and predetermined speed from the machinery to be timed, an alarm-pointer on said dial, an alarm, mechanism for actuating said alarm, means whereby the indicator engages and actuates the alarm-pointer at the proper time, means whereby the alarm mechanism is coupled up to and driven from the indicator-driving mechanism when the alarm-pointer is actuated thus indicating that the machinery has been running for a certain period of time, and means for allowing the indicator and pointer to be reset for the period of time required, all substantially as and for the purpose set forth.

3. The improved portable timing apparatus for laundry and other machinery comprising the combination of a driving-spindle, interchangeable means for driving said spindle at a practically constant and predetermined speed from a moving part of the machinery to be timed, gearing actuated by said driving-spindle, an indicator-hand actuated by said gearing, a dial marked in terms of time and over which the indicator-hand travels, an alarm-pointer also moving over said dial, an alarm, mechanism for actuating said alarm, a clutch between the alarm-actuating mechanism and the driving-spindle, a cam actuated by the alarm-pointer and normally holding the clutch out of operation, means whereby the indicator-hand engages and actuates the alarm-pointer, and means for allowing the pointer to be reset at normal position, and for setting the indicator-hand at the required period of time on the dial, all substantially as and for the purpose set forth.

4. The improved portable timing apparatus for laundry and other machinery comprising the combination of a driving-spindle, an interchangeable pulley driven from the machinery to be timed, a clutch between the pulley and driving-spindle, means for allowing the pulley to be slid into and out of connection with the clutch, a worm on said driving-spindle, a worm-wheel and gearing driven thereby, an indicator-hand driven by said gearing, a dial over which the indicator-hand travels, an alarm-pointer mounted on the same centering as the indicator-hand, a stop on the indicator-hand, and a stop on the alarm-pointer in the line of travel of the stop on the indicator-hand, a cam actuated by the alarm-pointer, a gap in said cam, a spring-pressed sleeve sliding on the driving-spindle, a bevel-wheel on said sleeve, an alarm, an alarm-actuating spindle, a bevel-wheel on the alarm-spindle, an arm normally engaged by the cam on the alarm-pointer and normally keeping the bevel-wheel on the driving-spindle out of engagement with the bevel-wheel on the alarm-actuating spindle, a gap in said cam for releasing said arm and allowing the bevel-wheel on the driving-spindle to engage and actuate the bevel-wheel on the alarm-actuating spindle when the alarm-pointer and cam are moved by the indicator-hand, all substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DAVID ANDERSON.

Witnesses:
ROBERT M. SPEARPOINT,
ALFRED B. CAMPBELL.