

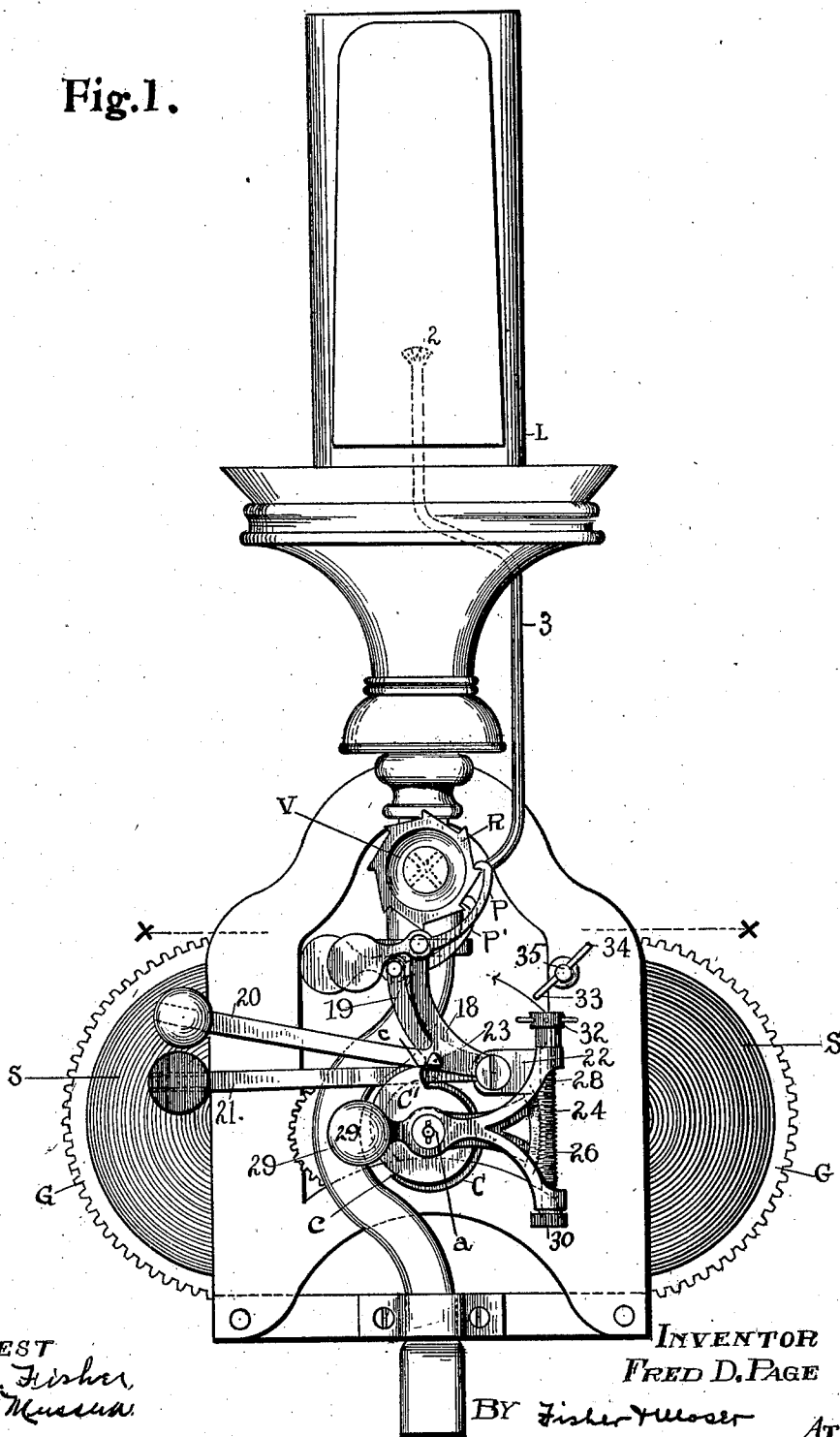
F. D. PAGE.
 AUTOMATICALLY LIGHTING AND EXTINGUISHING GAS AND OTHER LAMPS.
 APPLICATION FILED DEC. 5, 1910.

1,001,678.

Patented Aug. 29, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



ATTEST
 E. M. Fisher
 S. C. Moser

INVENTOR
 FRED D. PAGE

BY Fisher & Moser ATTYS.

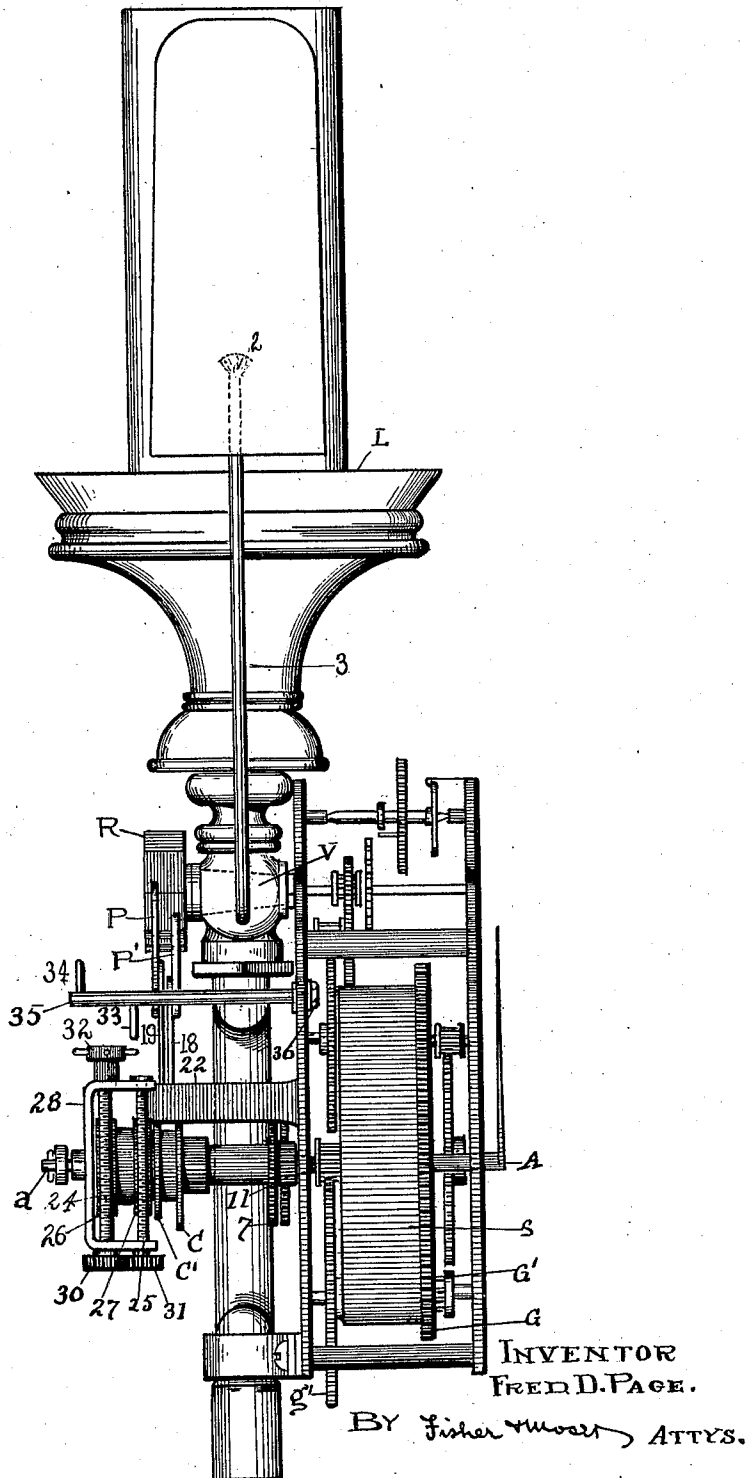
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3 SHEETS-SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

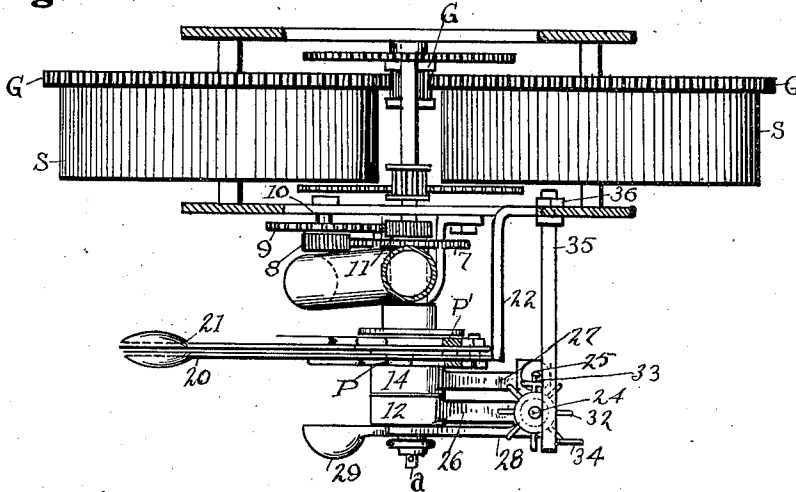
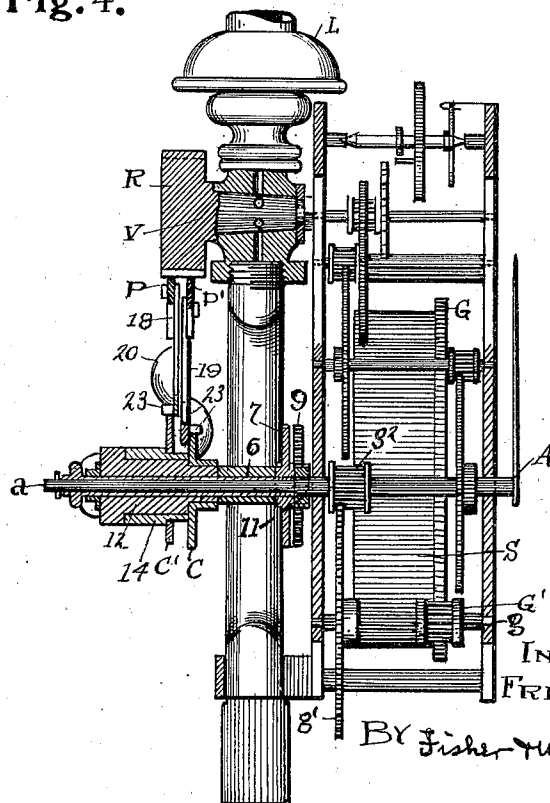


Fig. 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATICALLY LIGHTING AND EXTINGUISHING GAS AND OTHER LAMPS.

1,001,678.

Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed December 5, 1910. Serial No. 595,545.

To all whom it may concern:

Be it known that I, FRED D. PAGE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Automatically Lighting and Extinguishing Gas and other Lamps, of which the following is a specification.

My invention relates to means for automatically lighting and extinguishing gas and other lamps, and while the invention is shown herein as appertaining more especially to a street lamp of the gas or vapor type, it should be understood that the invention is not limited to street lamps as such nor to such as consume gas or vapor, but may be used with other stationary lamps or lights whatever the lighting medium, as, for example, electric lights of different kinds in which the automatic mechanism would probably require some modification to suit the different locations or constructions of switches for turning the light on and off.

In the accompanying drawings, which show one of possibly many different embodiments of the invention to obtain the desired results, Figure 1 is a front elevation of the invention with the inclosing casing or housing for the mechanism removed. Fig. 2 is a side elevation as compared with Fig. 1. Fig. 3 is a plan view on section line $x-x$, Fig. 1. Fig. 4 is a central vertical sectional detail taken through the gas controlling valve and showing certain controlling parts in that connection as will hereinafter fully appear.

The object of the invention is clearly apparent from the foregoing description and views, and the plan is to localize the attachment as to individual lamps, whereby each lamp or light of whatever kind or character may have a complete installation of my new and original automatic controlling mechanism immediately associated therewith and adapted to turn the light on and off successively at predetermined times or periods according to the number of hours or days the light is to burn continually, or, to put the matter negatively, the number of consecutive hours or days the lamp is to remain extinguished, the idea in any case being to substitute a comparatively cheap and simple mechanism for automatically light-

ing and turning off street lamps instead of employing men or boys to do the work as has heretofore been the prevailing practice in towns and cities generally so far as I have observed or known. This latter practice obtains universally, as I have reason to believe, notwithstanding sundry patented devices that have come to my notice and which are more or less elaborately designed to do this work but which, so far as I am aware, have not been found either practicable or desirable, and at any rate are not being used anywhere if my advices are correct.

Now, having the object of the invention clearly in mind, the means shown are by preference such as apply to a street lamp burning gas, and whatever works successfully with such a lamp can easily be applied to other lamps or lights with only such slight alteration in the application as different lamps or different styles of valves or switches may require, and which changes are understood to be within the scope and spirit of the present invention. The said means therefore comprise an attachment to a street lamp indicated as a whole by L and provided with the usual rotatable valve V adapted to control the flow of the gas. My invention comes to these parts with a ratchet head R or its equivalent as a ratchet member or part, fixed on the stem of said valve and having teeth adapted to be successively engaged and actuated by counterweighted pawls P and P'. These pawls have, first, the function of turning the valve through said ratchet to open position for illumination and, secondly, of turning the valve to closed position and cutting off the light. However, this language needs modification to this extent only that I maintain a pilot light 2 at the top of small pipe 3 with a constant flame and this independent of valve V, so that while said valve is turned on and off in the full sense a slight starting flame is maintained in the lamp by the independent channel 2. Of course I could substitute this with an electric sparking device but find the present arrangement altogether the better one from the viewpoints both of economy and simplicity.

As an actuating medium for the respective pawls P and P' I may employ any well known clock mechanism or its equivalent. In this instance I show two spring drums

S which are supposed to comprise the clock power mechanism, though a single such mechanism would suffice, and which have short shafts 4 of their own carrying gears 5 G which mesh with a relatively small pinion G' on shaft *g* having gear *g'* which in turn meshes with pinion *g*² on arbor A. The said arbor corresponds to the usual hour arbor of a clock, so that it possesses a definite rate of rotation from which calculation can be made as to the other or connecting parts between the same and said pawls, the idea being to maintain the standard time principle as to minutes and hours in and through such intervening mechanism to the said pawls and the valve V, thereby enabling the automatic parts as a whole to be set to open and close the valve at the predetermined times determined upon and as measured by minutes or hours.

Obviously, while the two pawls P and P' engage the same ratchet wheel R, they must engage it at different times since one opens the valve and the other closes it. Both also get their actuation from rotatable cams C and C', respectively, and said cams are mounted on the reduced extension *a* of arbor A for both joint and independent rotation. This mounting comprises a loose sleeve 6 driven by gear 7 affixed thereto at its inner end and which in turn is driven by a pinion 8 and gear 9 on stud 10 located at one side of arbor A, see Fig. 3. Gear 9 is operated by pinion 11 on hour-arbor A of the clock, which may be of any suitable kind. The gearing as described is designed to rotate sleeve 6 once around every twenty-four hours and likewise cams C—C' to open and close the valve successively. Joint rotation of said cams is obtained by their common support—sleeve 6, but, as a matter of fact, cam C' is also supported for independent rotation on hub 12 of cam C, having a hub 14 of its own sleeved over hub 12. Independent rotation of cams C—C' is provided so as to change their relative positions in respect to one another—particularly the high points *c—c'* on each, respectively. In other words, said cams are adapted to be reversely rotated so that said high points may be set in different radial positions in respect to one another, thereby changing the interval of time between opening and closing movements of the valve to correspond with the changing seasons—shortening and lengthening of the days and nights, winter and summer.

The pawls are mounted on separate bell-cranks 18 and 19 having counterweighted arms 20 and 21, respectively, both bell-cranks being pivotally supported upon a bracket 22 extending laterally at the front of the clock frame. Up-lift of each bell-crank and consequent catching engagement of each pawl with ratchet wheel R is ob-

tained by lateral projection 23 riding on the periphery of the cams. When high-points *c—c'* pass said projections in turn the pawls in turn rotate ratchet wheel R by the downward drop of the counterweighted arms 20 and 21. The difference in time between successive operations is governed by the difference in distance between the high points *c—c'*, as is obvious, and this is automatically regulated by mechanism which comprises a pair of finely threaded screws 24 and 25 having worm engagement with segment arms 26 and 27, respectively, integrally formed or rigidly affixed upon hubs 12 and 14 of cams C and C', respectively. These screws are rotatably mounted side by side, upon a bifurcated part 28 which is firmly fixed upon the outer end of sleeve 6 which rotates upon arbor *a*. Member 28 thus becomes the drive member for both cams. A counterweight 29 balances the screw-side of said member, and a set of intermeshing pinions 30 and 31 on one end of screws 24 and 25, respectively, communicate rotative movement from one to the other, that is, from screw 24 to screw 26 when the former is rotated at intermittent intervals by star-wheel 32 upon each and every engagement thereof with either one of the oppositely extending fingers 33 or 34 on rotatable post 35, see Fig. 1. It will be understood, of course, that member 28 rotates the cams and that star-wheel 32 travels in a circular orbit in line with said fingers to be engaged thereby, either at one side or the other of the axial center of screw 24. Thus, when finger 33 is projected downward in the path of star-wheel 32 as shown in Figs. 1 and 3, screw 24 is rotated to the right as in the hands of a clock, whereas if finger 34 is projected downward by giving post 35 a half of a turn, the other side of star-wheel 32 will engage this finger and reverse the rotation of screw 24. Shift or change of said fingers is resorted to only twice a year—upon the shortest and longest days, respectively, and in the meantime post 35 is locked in fixed and set position by nut 36 or any equivalent device. Now, assuming that cams C—C' are related with their high points *c—c'* in their nearest working relation—a position equivalent to the longest day and shortest night of the year, valve V will be opened immediately at the end of the day as said cams in their revolution carry high point *c* of cam C past projection 23 on bell-crank 18 and permit said bell-crank to drop by gravity and rotate ratchet wheel R an eighth of a revolution by means of pawl P. The valve will then remain open until high point *c'* on cam C' has effected a corresponding action on valve V through second bell-crank 19 and its pawl P', said valve being again rotated an eighth to close the gas passage, and it may be here

stated that this valve is of the four-way kind to give these results. No further action now occurs until high point *c* on cam C makes its complete cycle of movement, excepting that star-wheel 32 is operated, which in turn changes the relative position of cams C—C' by reversely rotating them through screws 24—25 and gear segments 26 and 27, respectively, thereby slightly increasing the distance between high points *c—c'* to give a longer interval of time between opening and closing movements of valve V. The degree of difference in time corresponds exactly to the average requirements of each shortening day and lengthening night, and this operation is automatically repeated and cumulative day after day and night after night until the shortest day and longest night of the year are reached. At this date, post 35 is set or adjusted as stated to reverse the rotative movement of star-wheel 32 and screws 24 and 25, thereby causing a reverse movement of cams C—C' in respect to one another as compared with their former movements. In brief, cams C—C' are now operated day by day to bring their high points *c—c'* in closer relation by degrees to correspond with the increasing longer days and decreasing shorter nights until a re-adjustment or resetting is again required on the longest day and shortest night of the year.

Obviously the mechanisms just described for keeping in time with calendar days and nights and for actuating the valve may be more or less varied or modified without departing from the spirit of the invention as it is embodied in said parts, the idea in any case being to make the attachment strictly automatic in every feature affecting time whether it be in hours or fractions thereof at valve V, or in those portions of the device which appertain to seasonal changes in the lengths of days and nights. Each group of parts has its own function in a sense but yet both are functionally related and dependent as is obvious and hereinbefore fully set forth. Of course the clock or actuating mechanism will require winding at stated periods, say every eight days, but beyond this no attention whatever to the lamps is required except to supply mantles that may require replacing. If mantles be used, as is now the common practice, a pilot or subsidiary light may be regarded as indispensable in the present state of this art.

Counterweighted pawls and actuating levers therefor are shown. A well known equivalent of this would be springs instead of weights, and if the pawls engaged the valve through an intermediate wheel geared to rotate the valve the effect would be the same as with the present construction. These suggestions are offered merely to show that in these and kindred details there is

margin for change without changing the inventive concept, which in all the various details comprehend equivalent parts not shown.

An electric switch may be substituted for valve V as hereinbefore described with such modification to make the connection as a given case may require, and an electric current controller to regulate a lighting current or other current not necessarily a lighting current is understood as being comprised in these suggestions. An electrically operated clock also may be used and the claims are to be understood as comprehensive enough to embrace these obvious equivalents in construction and use.

What I claim is:

1. Means adapted to automatically light and extinguish a lamp comprising clock mechanism having an hour arbor and a pair of cams separately rotatable thereon and a lamp having a rotatable valve above and parallel to said arbor and provided with a ratchet-head, in combination with a pair of counterweighted levers pivoted side by side over said cams and in operative engagement therewith, and a pawl pivoted on each lever adapted to engage the head of said valve, said cams being loose to rotate separately on said arbor and means sleeved on said arbor to rotate said cams about said arbor.

2. An attachment for lamps having a clock mechanism with a rotatable arbor, in combination with two cams independently sleeved on said arbor having toothed segments, a bracket sleeved on said arbor and means on said bracket operatively engaging said segments and thereby rotating said cams, levers pivotally supported over said cams and separately engaged thereby, separate pawls pivoted on said levers, and a rotatable gas controlling valve adapted to be engaged successively and at intervals by said pawls and thereby open and close the valve at predetermined periods.

3. An automatic attachment for lamps comprising a time controlled arbor, two separate cams mounted to rotate on said arbor, and means engaged over said arbor operatively engaging said cams, in combination with a rotatable valve, a pair of pivoted levers over said cams and adapted to be lifted thereby to acting position, and a counterweighted pawl on each lever arranged to operatively engage said valve.

4. The attachment described for gas lamps having time mechanism adapted to automatically turn a light on and off, the said attachment comprising a clock mechanism with an hour arbor and a pair of actuating cams separately mounted to rotate independently on said arbor and having toothed segments projecting laterally from their edge, in combination with means to change the working relation of said cams to

each other according to the seasonal length of days and nights, said means comprising a bracket mounted on one end of said arbor, time regulated devices mounted on said
 5 bracket and operatively engaging said segments and means actuated by said cams adapted to turn gas on and off from said lamp.

5. A gas lamp provided with a rotatable
 10 valve having a ratchet head, in combination with means to rotate said valve comprising two counterweighted pawls adapted to hook upon said head, pivotally mounted levers
 15 carrying said pawls and adapted to tilt in operation, a lift cam under each lever, a clock arbor and separate sleeves thereon providing bearings for said cams, a bracket
 20 sleeved on the end of said arbor and means to rotate the same thereon with differential speed, and means carried by said bracket adapted to rotate said cams on their bear-
 25 ings.

6. A gas lamp having a rotatable valve, means to open and close said valve com-
 25 prising two separately mounted and independently rotatable cams having each a toothed segment, in combination with an arbor of a clock supporting said cams and a bracket rotatably mounted on the end of
 30 said arbor, rotatable screws in said bracket engaged with said segments and means to

rotate said screws and thereby adjust said cams relative to each other through said segments.

7. An attachment for a street lamp burn- 35
 ing gas and an hour arbor in a clock mechanism, and means on said arbor to vary the period for the flow of gas according to the length of seasons, said means comprising a
 40 time actuated sleeve on said arbor, a hub on said arbor and two cams mounted and separately rotatable on said hub about the arbor to vary the relations of the high
 45 points thereon and means to operate said cams jointly and to vary the distance between said high points comprising a counter-
 weighted bracket fixed on the end of the said sleeve and a pair of screws in said bracket
 50 operatively engaged with said cams respectively, and means to rotate said screws at predetermined intervals and thereby adjust
 55 the relation of the high points of said cams one to the other, in combination with a gas controlling valve for said lamp and mechanism actuated by said cams to open and
 close said valve alternately.

In testimony whereof I affix my signature in the presence of two witnesses.

FRED D. PAGE.

Witnesses:

E. M. FISHER,
 W. C. TYLER.