R. A. KAUFFMAN.

AUTOMATIC VEHICLE TOP.

APPLICATION FILED MAR. 24, 1916.

1,226,079.

Patented May 15, 1917.

2 SHEETS—SHEET 1.

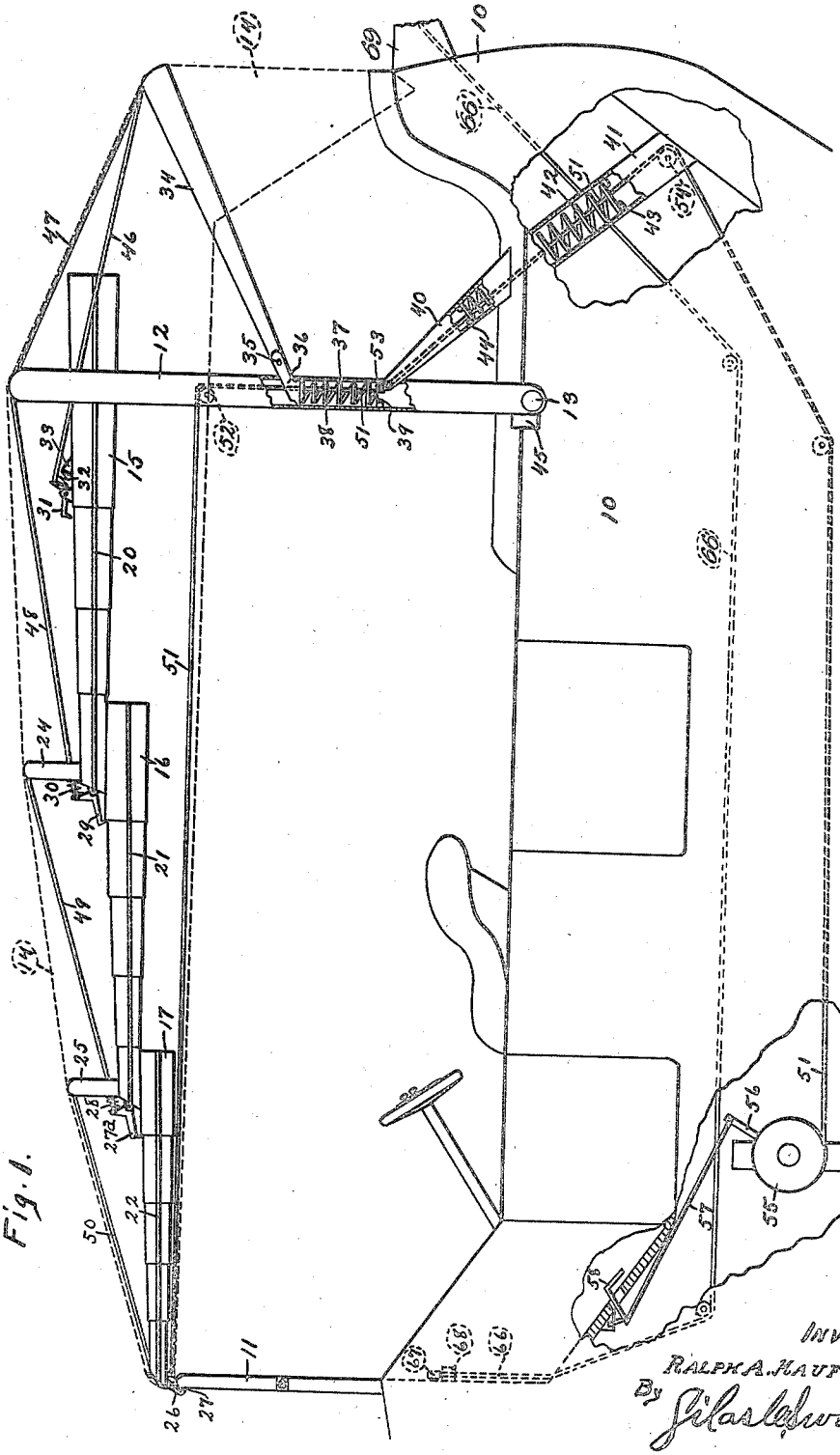


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

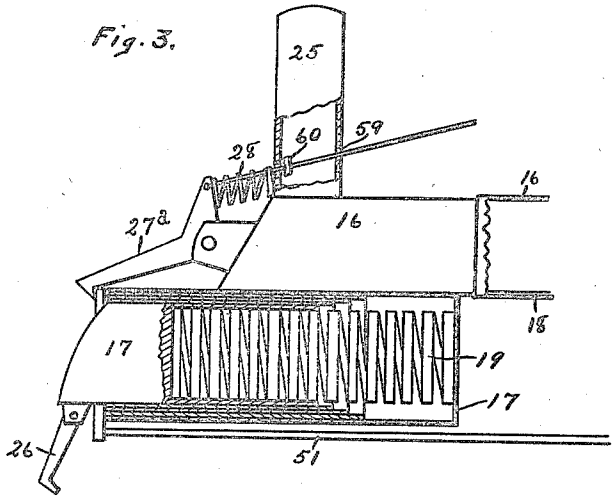


Fig. 4.

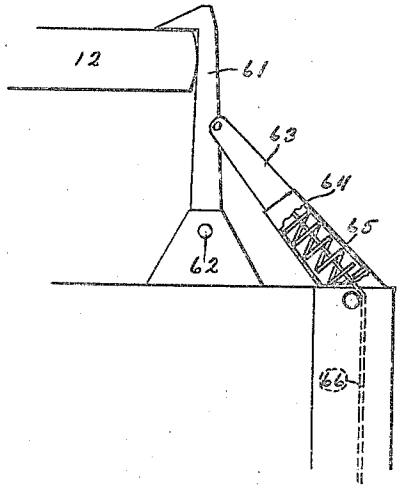
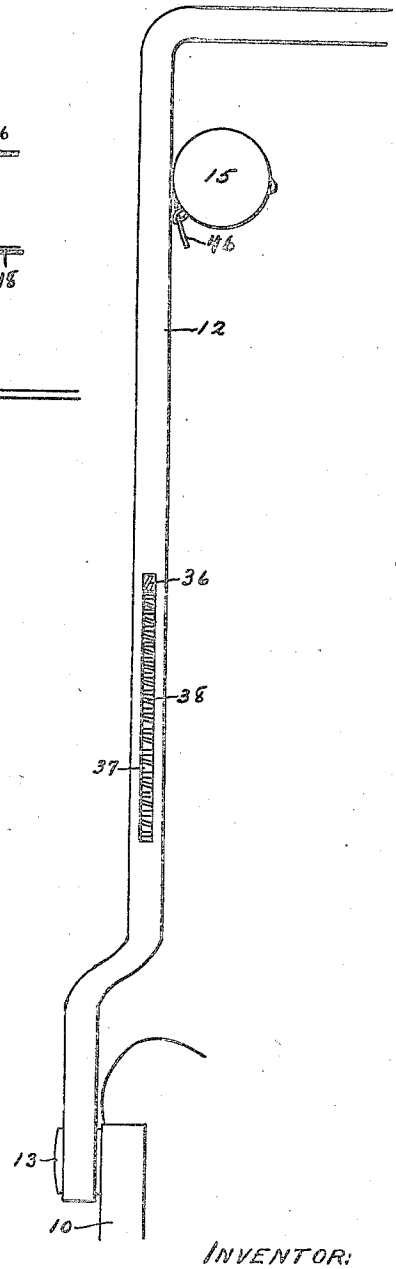


Fig. 2.



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UNITED STATES PATENT OFFICE.

RALPH A. KAUFFMAN, OF WATERLOO, IOWA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO EARL VON OSTERHELDT, OF DES MOINES, IOWA.

AUTOMATIC VEHICLE-TOP.

1,226,079. Specification of Letters Patent. Patented May 15, 1917.

Application filed March 24, 1916. Serial No. 86,504.

To all whom it may concern:

Be it known that I, RALPH A. KAUFFMAN, citizen of the United States of America, and resident of Waterloo, Blackhawk county, Iowa, have invented a new and useful Automatic Vehicle-Top, of which the following is a specification.

The object of this invention is to provide improved means for raising and lowering an extension vehicle top by mechanical means.

A further object of this invention is to provide means for raising an extension vehicle top automatically without any effort on the part of the operator other than the release of a latching device.

A further object of this invention is to provide means for lowering and folding an extension top without any effort on the part of the operator other than the release of a clutch device.

A further object of this invention is to provide an improved construction for an extension top frame.

A further object of this invention is to provide an improved construction and arrangement of yielding pressure devices for automatically expanding and extending a top frame.

A further object of this invention is to provide improved means for latching an extension top in contracted position.

My invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawing, in which—

Figure 1 is a side elevation, partly in section, of a vehicle equipped with my improved top, except the latch for the top which is omitted to economize space, the outlines of the top cover being indicated by dotted lines. Fig. 2 is a rear elevation of a portion of the upright bow and connected devices. Fig. 3 is a longitudinal section illustrating one set of telescoping devices in contracted position. Fig. 4 is a side elevation, partly section, illustrating the top latching devices.

In the construction of the device as shown the numeral 10 designates generally the body of a vehicle, which may be of any desired construction, preferably having an upright member, such as a windshield 11, at its forward end. An upright bow 12, having the usual yoke shape, is mounted adjacent the rear end portion of the body 10 and is secured at its ends to said body by pivots 13, one of which is shown. Collapsible frame devices are carried by the bow 12 on opposite sides of said bow and above the body 10, and are adapted to be extended materially forwardly of said bow and carry a flexible top cover 14, indicated by dotted lines in Fig. 1, above said body, and are also adapted to be contracted toward said bow and be folded therewith at the back of the body 10. It is to be understood that the collapsible frame devices on opposite sides of the bow 12 are identical, one set only being shown in the drawing. In the drawing herewith the collapsible frame members comprise three sets 15, 16, 17 of telescoping members, the largest and rearmost member of the rear set 15 being secured rigidly to the inside of the bow 12 and adjacent but spaced slightly below the top thereof, and being closed at its rear end and open at its forward end to receive the other members of the set, which members gradually reduce in size so that they may all be telescoped within said rear member. The rearmost member of the intermediate set 16 is secured rigidly to the bottom of the foremost member of the set 15, and is closed at its rear end and open at its forward end, the other members of the same set being adapted to telescope therein. The rearmost member of the forward set 17 is secured rigidly to and beneath the foremost member of the intermediate set 16, and is closed at its rear end and open at its forward end, the other members of the same set being adapted to telescope therein. The telescoping members of the set 16, with the exception of the forward member thereof, are formed with longitudinal slots 18 (Fig. 3) in their bottoms, to permit telescoping movement of the said foremost member, which carries the members of the set 17. The telescoping members of the set 15, with the exception of the foremost member thereof, are similarly constructed, for a similar purpose, the slots thereof not being shown in the drawing. An expansive coil spring 19 is mounted within the hollow telescoping members of the set 17, impinging at its ends the rear wall of the rearmost member and the forward wall of the foremost member, and tends to hold said members in expanded

or extended positions. The members of the respective sets 15, 16, 17 of telescoping members preferably are formed with longitudinal interengaging ribs 20, 21, 22. It is the function of the ribs 20, 21, 22, to prevent rotary movement of the several members relative to their neighbors.

A bow 24 is fixed at its ends to, rises slightly above and connects the foremost members of the opposite sets 15, and a similar bow 25 is provided for the foremost members of the opposite sets 16, to assist in supporting the top 14.

A hooked latching detent 26 is pivoted on the front end of the foremost member of the telescoping set 17, that is at the extreme forward end of the top frame, and is adapted to engage a lug 27 on the top of the windshield 11, when the top is in extended position, to assist in holding and steadying said top and preventing undue vibration thereof.

A hooked detent 27^a, preferably of bell-crank form, is pivoted on the forward end of the foremost member of the set 16, and the hooked horizontal arm thereof is adapted to engage the forward end of the foremost member of the set 17, when in contracted position as shown in Fig. 3, and hold the members in such position against the action of the spring 19. An expansive coil spring 28 is provided, impinging at its ends the bow 25 and the upper arm of the bell-crank detent 27^a, thus forcing said detent into position for holding engagement at all times, and insuring latching engagement when the devices are brought into contracted position. A similar bell-crank detent 29 and spring 30 are provided at the forward end of the foremost member of the set 15, for engaging the foremost member of the set 16 and holding the same in contracted position. A similar bell-crank detent 31 is pivoted on the forward portion of the rearmost member of the rear set 15 and is adapted to engage the forward end of the foremost member of the same set and hold the members of that set in contracted position, and the spring 32 for said detent has its rear end abutting a lug 33 mounted on the top of the rear member of the set.

An automatic back bow is provided normally extending upwardly and rearwardly from a median point of the upright bow 12, and comprises a bow member 34, which serves to support the rear upper part of the top 14, said bow being pivoted at its ends by bolts 35 to rearwardly projecting end portions of sliding head members 36 (one only of which is shown) mounted slidably within the upright portions of the upright bow 12, the end portions thereof projecting through vertical slots 37 in the rear faces of said upright portions. An expansive coil spring 38 is mounted in each side of the upright bow 12 beneath and engaging at its upper end the lower face of a sliding head member 36, and supported at its lower end by lugs 39 within said upright bow, and said springs serve to normally hold said sliding head members at their upper limit of travel within the bow.

An automatic top raising arm 40 is pivoted at its upper end to the upright bow 12 (one on either side) adjacent the lower end of the spring 38, extends rearwardly and downwardly therefrom, and passes slidingly through the body 10, preferably at a point adjacent the end of the rear seat thereof. The top raising arm 40 is hollow and preferably tapers toward its upper end, and is adapted to be moved rearwardly and downwardly within an open ended cylinder 41 fixed to and extending obliquely upwardly and forwardly from the rear part of the body 10, and inclosed within said body so as normally to be entirely hidden from view. It is to be understood that these devices are duplicated on opposite sides of the vehicle, one set only being shown. An expansive coil spring 42 is mounted within the fixed cylinder 41 and projects within the lower rear end of the top raising arm 40, and abuts at its ends lugs 43, 44 fixed respectively within said members. It is the function of the springs 42 to force the top raising arms 40 upwardly and forwardly, and thereby raise and hold the upright bow 12 into upright position as shown. Stops such as 45 may be provided to limit forward movement of the upright bow 12 and maintain the same in upright position.

Stabilizing cables 46, one of which is shown, are fixed to the top portion of the back bow 34, extend forward, and are fixed to the upright arms of the bell-cranks 31, and stabilizing cables 47 connect the upper portion of the said back bow to the upper portion of the upright bow 12, and support the outer end of said back bow. Stabilizing cables 48 are fixed to the upper portion of the bow 12, extend forwardly, and are connected to the upper arms of the bell-cranks 29, and stabilizing cables 49 are fixed to the upper portion of the top bow 24, extend forwardly, and are connected to the upper arms of the bell-cranks 27^a. It is the function of these stabilizing cables to steady and support the top frame from the upright bow, and limit forward movement of the telescoping frame members. A stabilizing cable 50 (or pair of them) also extend from the top bow 25 to the forward end portions of the foremost telescoping member of the set 17.

An operating cable 51 is fixed at one end to the forward end portion of the foremost telescoping member of the set 17, that is, to the forward end of the extension top frame, extends rearwardly in a horizontal

plane, enters the upright member of the upright bow 12, passes around a direction pulley 52 therein, passes downwardly, through the sliding head 36, spring 38, and around a direction pulley 53, then enters and traverses the top raising arm 40 and fixed cylinder 41, around a direction pulley 54, and thence forwardly beneath or within the body 10. Forward draft of the lower end of the cable 51, it is evident, will cause a telescoping or contracting movement of the top frame members, and a folding of the extension top. For this purpose I have shown a drum 55 mounted for rotation in the frame of the vehicle, to which is attached the opposite end of the operating cable 51, and on which said cable is adapted to be wound. The drum 55 preferably is provided with suitable clutch-controlled driving connections (not shown) with the power plant of the vehicle, which driving connections may be of any suitable character, and form no part of my present invention. A clutch lever 56 in connection with the clutch of the drum 55 may be connected by a rod or link 57 to a lever 58, which is located within reach of the operator, and may be oscillated by him to engage the clutch and effect a rotation of the drum and consequent draft on the operating cable 51.

As illustrated in Fig. 3, the top bow 25 is hollow, and the stabilizing cable 49 passes through relatively small apertures 59 therein, and has fixed to it, within said bow, a stop member 60 of larger diameter than said holes, thus limiting movement of said cable in both directions.

When draft is applied on the operating cable 51, the latch 26 having been released manually, the first effect is a movement to the rear of the telescoping members of the set 17, and this movement continues until said members are completely telescoped within one another, as shown in Fig. 3. When the members of the set 17 have reached their rearmost limit of motion, a continuation of draft on the cable 51 will have the effect of moving rearwardly the foremost member of the set 16 of telescoping members, to which foremost member is rigidly secured the rearmost member of the forward set 17. Such movement has the effect of slacking the stabilizing cable 49 to the extent of the limit of movement of the stop member 60, which moves to the position shown in Fig. 3, permitting the spring 28 to operate on the detent 27^a, causing said detent to assume a latching position relative to the contracted members of the set 17, and hold them in such contracted position. Further draft on the cable 51 has the effect of contracting, in turn, the members of the sets 16 and 15, and latching them in such position, in a similar manner.

The telescoping frame members having all been contracted, further draft on the cable 51 will result in a rearward oscillation of the upright bow 12, to which the rearmost of said telescoping members is rigidly secured. This movement causes an oscillation of the rear bow 34 on its pivots 35, bringing it into approximately parallel relations with the upright bow 12, and these bows are together moved rearwardly and downwardly to the common position of folded tops, adjacent the rear part of the body 10. It is to be understood that the flexible top cover 14 is folded and compacted during such operation, in a common manner. At the same time the heads 36 are drawn downwardly in the upright portions of the bow 12, contracting the spring 38, the projecting portions of said heads moving downwardly in the slots 37. As the upright bow 12 is oscillated the top raising arms 40 are forced within the cylinders 41, thus contracting the springs 42 and placing them under tension.

Any desired means may be provided for latching the top in the contracted or folded position described, supplementary to the holding action of the cable 51, and to this end a latch 61 is pivoted on a transverse horizontal axis 62 at the rear of the body 10, preferably being mounted on a bracket 69 extending rearwardly from said body, and is formed with a forwardly looking hook at its end adapted to engage the upright bow 12 at times, and hold the same in its lowermost position. A tension arm 63 is pivoted at one end to an intermediate portion of the latch 61, extends rearwardly and downwardly, and has its end slidably mounted in a casing 64, in which is mounted an expansive spring 65 adapted to engage and apply tension to said arm 63 for the purpose of holding the latch 61 forwardly in engaging position with the bow 12. A releasing cord 66 is fixed at one end to the latch 61, passes down through the tension arm 63 and casing 64, thence passes forwardly to a place convenient to the operator of the vehicle. The forward end of the cord 66 may be provided with a ring or knob such as 67, supported by a bearing 68 through which the cord passes, thus limiting rearward movement of the cord. Draft may be applied to the forward end of the releasing cord 66 to the end of oscillating rearwardly the latch 61, thus releasing it from engagement with the bow 12. When this is done the whole top is free to assume an upright or extended position, and the springs 42 and 37 act, in the first instance, to propel the upright bow 12 and members carried thereby to upright position, and to force upwardly the heads 36 and rear bow 34, said rear bow assuming its oblique position by force of gravity, as limited by the cable 47. The springs 19 then act to extend

in turn the several sets of telescoping members 15, 16 and 17, the latches 31, 29 and 27[a] being released successively to permit such extension. The weight of the rear bow 34 first applies draft on the cable 46 to the end of releasing the latch 31 and permitting the members 15 to expand, and this draft on the cable 46 is continued until full compression of the spring 32 takes place, and thereupon further movement of the rear bow is prevented, by cable 47. As soon as the telescoping members of the set 15 have reached their forward limit of movement a strain is applied on the cable 48, as limited by the stop 60 within the bow 24, and such strain causes a release of the latch 29, thus permitting the members of the set 16 to be extended under the influence of the spring therein. As soon as these members reach their limit of movement a strain is applied on the cable 49, as limited by the stop 60 within the bow 25, and the latch 27[a] is released to the end of permitting expansion of the forward set 17, which is limited by the cable 50. The cover 14 is of course carried by the frame members in such movement until it assumes its normal position over the body, and the devices are then rendered stable in such position by engagement of the latch 26 with the lug 27 on the windshield.

Thus the only effort required on the part of the operator to raise the top to extended position is to apply draft to the cable 66 for the purpose of releasing the latch 61; and the only effort required to contract or fold the top is to apply pressure to the lever 58 to engage the clutch and permit the drum 55 to wind up the cable 51 and compact the frame members as described.

I claim as my invention—

1. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to said bow and acting to raise it to upright position, telescoping members carried by and extending forwardly from said upright bow, yielding pressure devices acting normally to expand said telescoping frame members, and a flexible cover carried by said bow and frame members.

2. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to said bow and acting to raise it to upright position, telescoping members carried by said bow in horizontal position, yielding pressure devices acting normally to expand said telescoping members, means for latching said telescoping members in contracted position, and a flexible cover carried by said bow and frame members.

3. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to said bow and acting to raise it to upright position, telescoping frame members carried by said bow in horizontal position, yielding pressure devices acting normally to expand said telescoping members, means for contracting said telescoping members, and means for latching said telescoping members in contracted position.

4. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member acting to raise said bow to vertical position, telescoping members fixed at right angles to said bow, yielding pressure devices acting normally to expand said telescoping members, means for contracting said telescoping members, means for latching said telescoping members in contracted position, and means for automatically releasing said latches.

5. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to said bow and acting to raise it to upright position, a rear bow pivotally and slidingly connected to said upright bow, telescoping frame members carried by said upright bow, springs acting to expand said telescoping members, and a flexible cover carried by said bows and frame members.

6. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to said bow and acting to raise it to upright position, a rear bow pivotally and slidingly connected to said upright bow, telescoping frame members carried by said upright bow, springs acting to expand said telescoping members, and draft means for contracting said telescoping members and folding said bows.

7. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to and acting to raise said bow, a rear bow pivotally and slidingly connected to said upright bow, telescoping frame members carried by said upright bow, springs acting to expand said frame members, draft means for contracting said telescoping members, and folding said bows, and means for latching said members in contracted and folded position.

8. A vehicle top, comprising an upright bow pivoted at its lower end, spring-pressed means for raising said bow to upright position, folding frame members carried by said bow, springs acting to extend said folding frame members, means for latching said members in folded position, and draft means for contracting said frame members.

9. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member pivoted to and acting to raise said bow, a rear bow pivotally and slidingly connected to said upright bow, a spring acting to raise said rear bow, telescoping frame members carried by said

upright bow, springs acting to expand said frame members, draft means for contracting said telescoping members and folding said bows, and means for latching said members in contracted and folded position.

10. A vehicle top, comprising an upright bow pivoted at its lower end, a spring-pressed member acting to raise said bow to vertical position, telescoping members arranged in sets, the rearmost set being carried by said upright bow and carrying in turn another set, yielding pressure devices acting normally to expand said telescoping members, detents carried by forward ends of each set of telescoping members and adapted to latch the next forward set in closed position, and means for releasing said detents and contracting said telescoping members.

Signed by me at Des Moines, Iowa, this seventeenth day of February, 1916.

RALPH A. KAUFFMAN.

Witnesses:

PAUL W. LE BAR,

EARL M. SINCLAIR.