

(No Model.)

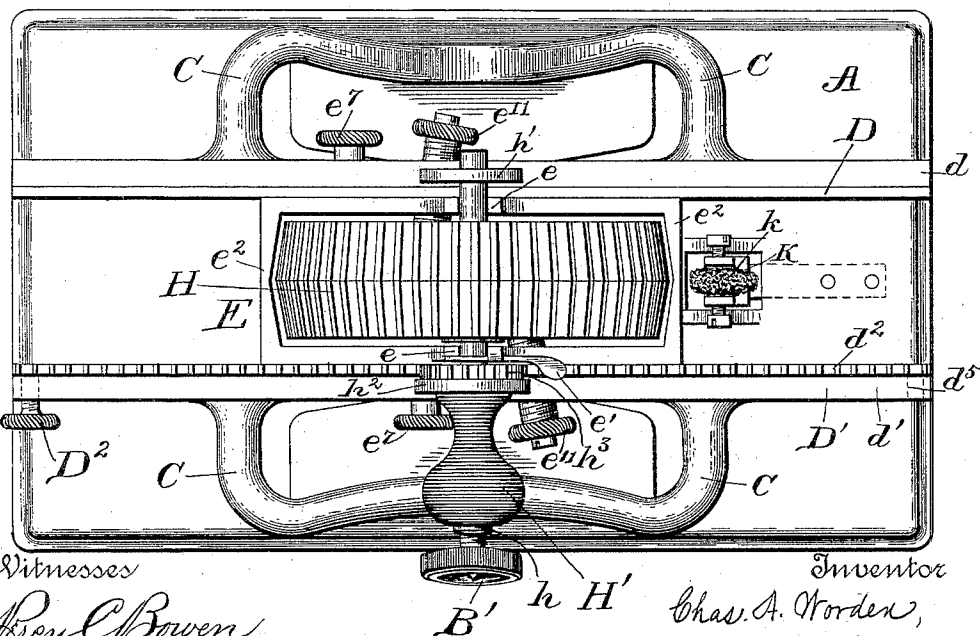
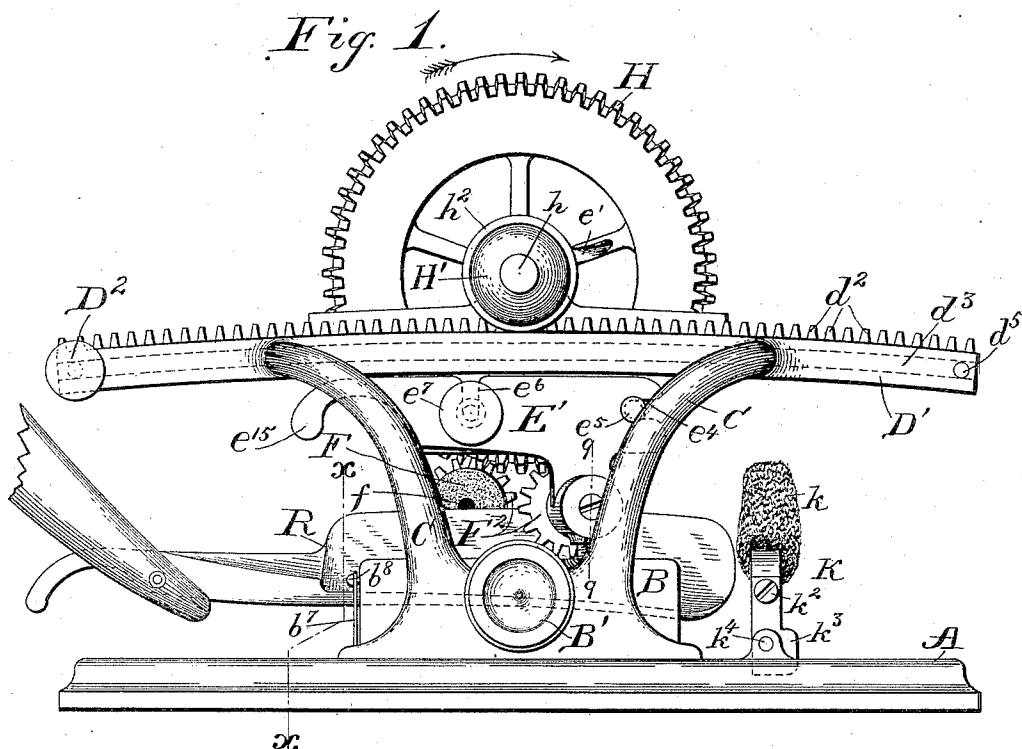
3 Sheets—Sheet 1.

C. A. WORDEN.
MACHINE FOR SHARPENING RAZORS.

No. 487,140.

Patented Nov. 29, 1892.

Fig. 1.



Witnesses

Frederick C. Bowen.
John C. Wilson.

Fig. 2.

Inventor

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Fig. 3.

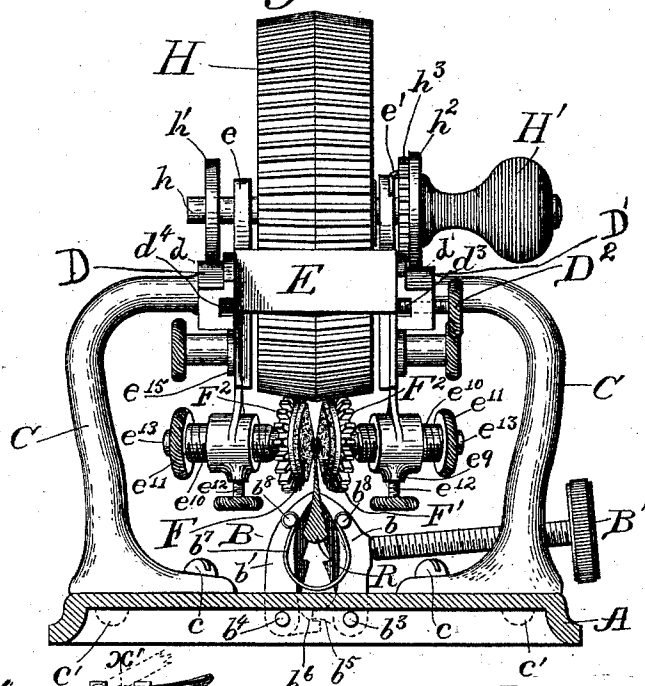


Fig. 4.

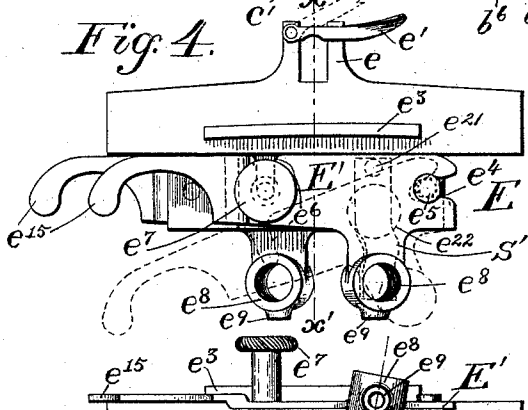
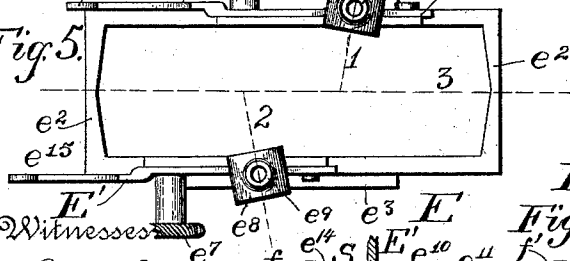


Fig. 5.



Witnesses

Frederick C. Bower
John C. Wilson

Fig. 6.

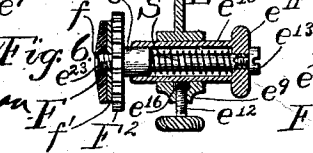


Fig. 7.

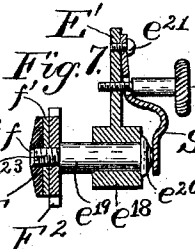


Fig. 8.

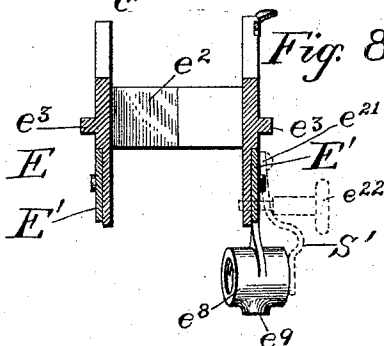
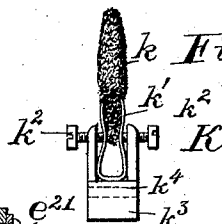


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES A. WORDEN, OF THE UNITED STATES ARMY.

MACHINE FOR SHARPENING RAZORS.

SPECIFICATION forming part of Letters Patent No. 487,140, dated November 29, 1892.

Application filed July 11, 1892. Serial No. 439,648. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. WORDEN, captain in the United States Army, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Machines for Sharpening Razors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in devices for sharpening razors; and it consists of a machine by which the razor may be sharpened by mechanical means.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters.

Figure 1 represents a side elevation of my improved machine for sharpening razors. Fig. 2 represents a plan view of the same. Fig. 3 represents an end view, partly in section, along the line xx of Fig. 1. Fig. 4 represents a side view of the traveling carriage detached. Fig. 5 represents a view of the carriage as seen from beneath when detached. Fig. 6 represents a section through one of the revolving buttons carried by the carriage. Fig. 7 represents a similar section of a modification of the same. Fig. 8 represents a section of the carriage along the line xx' of Fig. 4 and looking to the right. Fig. 9 represents an end view of the lubricating attachment. Fig. 10 represents a section along the line yy of Fig. 11 and illustrates the ratchet and pawl connected to the shaft of the combined gear and fly wheel H. Fig. 11 represents the method of attaching the wheel H to its shaft h and the connections to the said shaft. Fig. 12 represents a bottom view of the platform on which the machine is mounted. Fig. 13 represents a section along the line zz of Fig. 12, and Fig. 14 represents a section along the line $z'z'$ of Fig. 12.

A represents a platform adapted to stand on a table, bureau, or any other flat surface. Rigidly secured to this platform are four legs C, supporting the mechanism for operating the revolving buttons which sharpen the razor, and mounted in the center of this platform is a holding device B, adapted to hold

the razor firmly in place. This holding device consists of two jaws b and b' , lined on the interior with serrated or dentated pads b^2 , of rubber, felt, or other suitable soft and elastic material. These jaws are pivoted on rods b^3 and b^4 , mounted longitudinally in the base-plate or platform A, and one of the said jaws has an arm b^5 , adapted to engage a cam-face b^6 on a corresponding arm of the opposite jaw, the said cam-face and jaw being so adjusted that a motion of the adjusting-screw B' will adjust the one jaw b the same amount that the arm b^5 and cam-face b^6 will adjust the other jaw b' relative to the median line of the machine, which median line corresponds to the edge of the razor R. The soft pads b^2 on the interior of the jaws are preferably so dentated as to register with the three sizes of razor-blades most commonly in use. A spring b^7 , (see Fig. 3,) attached to screws b^8 , tends to open the jaws b and b' . It will be seen that by means of the adjusting-screw B' the razor may be securely clamped between the said jaws and held rigidly there-in during the operation of sharpening.

The mechanism for sharpening the razor is mounted on the four legs C, rigidly secured by the screws c and c' to the base-plate or platform A.

Integral with or securely attached to the upper end of each pair of legs C are rails D and D', the rail D having a track d for the roller h^2 and a rail D' having a track d' for the roller h^2 and a rack d^2 for the pinion h^3 . Parallel to these tracks d and d' , which are curved to approximately correspond with the sharp edge of the razor, are slots d^3 and d^4 , which serve as guides to the carriage E. This carriage E is provided with journals e , in which the shaft h of the wheel H revolves freely, the said journals serving rather as guides for the said shaft than as supports therefor and the said shaft being kept in said journal by a clamp-piece e' on one or both sides. At the side of the carriage guide-flanges e^3 move in the guide-slots d^3 and d^4 in the sides of the tracks D and D', as herein described. A thumb-screw D² blocks the end of the said slot and prevents the carriage from being drawn entirely out of engagement therewith, at the same time affording a ready means for withdrawing the carriage from en-

gement with the slots should that be desired.

A fixed screw d^5 is provided at the opposite end of the track to prevent the carriage from being pushed out at that end. The plates E' are attached to projecting pieces on the lower side of the carriage. These plates have slots e^4 near the forward end thereof, adapted to engage beneath the head e^5 of a stud attached to the carriage, and they have a slot e^6 , adapted to receive the thumb-screw e^7 , by which means they may be readily attached to, removed from, or adjusted on the said carriage. These plates E' terminate in holders e^8 for the journals of the revolving buttons F and F' . These buttons are set at an angle, as shown by the lines 1 2 in Fig. 5, for reasons which will hereinafter be described. The button F is screwed onto the spindle e^{14} , which carries the pinion F^2 in rear of the button, and is held in the hollow screw e^{10} by the head of the screw e^{13} . The button is normally pushed forward by a spring S , while at the same time adjustment may be given by screwing up on the milled head e^{11} . In order to prevent the said screw e^{10} from unscrewing, a thumb-screw e^{12} passes through a female screw e^9 in the lower side of the holder e^8 and is provided at its inner end with a leather pad or button e^{16} , adapted to be pressed against the said screw e^{10} and to clamp the same in any desired position. The side pieces E' are provided with thumb-lugs e^{15} for convenience in detaching or adjusting the same.

Another method of connecting the buttons revolubly to the side piece E' and yet allowing them an axial play in said side piece is shown in Fig. 7 and in dotted lines in Figs. 4 and 8, where S' represents a spring secured at e^{21} to the said side piece E' and pressed by the thumb-screw e^{22} on the head e^{20} of the cylindrical spindle e^{19} , carrying at its front end the pinion F^2 and the button F . The screw-thread e^{23} is so arranged that the button tends to screw upon the said screw-thread. In order that the button may not protrude beyond the edge of the razor, a cylindrical hole f is provided therein, which should be adjusted relative to the edge of the razor, as shown in Fig. 1. At the back of the button a metallic piece f' is provided, to which the button is glued or otherwise secured. This metallic piece gives a firm base or bearing for the button and at the same time enables a permanent screw-thread to be had to hold the button on the revolving spindle. The button may be either of stone suitable for abrading the razor or of leather for strapping the same. Motion to the buttons is given by the combined fly and gear wheel H , which is adapted to move only in one direction, as will be hereinafter shown. This wheel gears into the pinion F^2 , and so turns the buttons F and F' . The wheel H is loosely mounted on a shaft h , which shaft revolves in the guides e of the carriage and carries rollers h' and h^2 , which roll backward and forward over the tracks d

and d' . To insure motion of the shaft h as the handle H' is moved backward and forward, a pinion h^3 is secured to the roller h^2 , which is keyed to the shaft, and said pinion engages in the rack d^2 . The handle H' is revolubly connected to the end of the shaft h , as shown in Fig. 11.

In order that the revolving buttons may always act on the razor in the same direction or that the descending surface of the button in its revolution may clear the razor edge and the ascending portion may give a sharpening action upward and forward, as in the ordinary manner of stropping from heel to toe, the fly-wheel H is made to revolve only in one direction, that of the arrow in Fig. 1, the inertia given it on the forward stroke of the handle, which is moved backward and forward along the rack, being sufficient to keep the wheel revolving during the return stroke of the handle. This is arranged by the simple ratchet-and-pawl arrangement shown in Figs. 10 and 11, where the wheel is represented as journaled on the shaft h in a collar formed by the disk h^9 and the ratchet h^4 , both of which are rigidly secured to the shaft. The wheel revolves freely on the shaft and has pivoted to its hub a pawl h^5 , pivoted at h^6 and connected at its opposite end to a spring h^7 , also connected to the hub of the wheel. It will be seen that if the shaft be turned in the direction of the arrow the wheel will turn with it; but if while the wheel is revolving in the direction of the arrow the shaft be revolved in the opposite direction the direction of motion of the wheel will not be changed.

The revolving honing-buttons are lubricated at one end of their travel by a sponge k , which is preferably kept saturated with water, although oil or other lubricant may be used. This sponge is preferably secured in a yielding device K , having a spring-holder k^1 , held between clamp-screws k^2 and mounted on a block k^3 , pivoted at k^4 . This block, with the lubricating device mounted thereon, is kept normally upright by the spring K' , pressing against the bottom surface k^5 of the said block. By means of this device the sponge may be turned down out of the way of the stropping-buttons and turned up to lubricate the honing-buttons. The buttons being set one behind the other will press the sponge aside, at the same time lubricating themselves. By having the buttons placed one in front of the other, as shown in Fig. 1, the effect of the elasticity of the metal of the razor is added to that of the spring pressing the revolving spindle which carries the button forward toward the razor. Moreover, by having the buttons clear of each other they may be taken off and put on with more convenience.

A number of pairs of buttons for honing and for stropping should be supplied with each machine.

The operation of the device is as follows: The proper buttons are screwed on firmly

against the pinions F². The clamp-screw B' is unscrewed and the razor is clamped firmly in the device B in the proper position. If the razor edge is worn a little, the buttons may be raised or lowered somewhat by means of the clamp-screws e' and the lugs e¹⁵. The position of the buttons should be such that the edge of the razor should very nearly coincide with the horizontal diameter of the hole f, but never above it. The buttons are then adjusted to the right pressure on the razor by the screws e¹⁰, having heads e¹¹, or in the device shown in Figs. 7 and 8 by means of the screw e²². Now, having adjusted the various parts, the handle H' is moved backward and forward along the track D D' and the revolving buttons will sharpen the razor.

It will be seen that if the handle be moved with tolerable rapidity the buttons will revolve very rapidly and will come in contact with every portion of the edge of the razor. Moreover, by having the buttons set at an angle and conical they will enter into the hollow-ground portion of the razor very much more perfectly than is done with the strops and hones ordinarily in use.

Some practice may be necessary in making the various adjustments; but a few experiments with leather buttons, which cannot be set so as to injure the razor, will soon enable the operator to ascertain the proper adjustment for the buttons for either stropping or honing.

In using the hones use oil or water to wet the sponge, water preferably, as it does not soil the machine. The sponge k wipes off all the gritty particles, presents a fresh clear surface with each stroke, and when wet lubricates at the same time.

The handle should never be moved backward without giving it a little push forward first in order to prevent the razor from cutting the button; but a leather button if cut somewhat will operate quite as well as before.

In order to ascertain when the razor is in proper condition when stropping, put the moistened finger in occasionally and touch the edge of the razor. It should stick slightly when in the proper condition.

It will be evident that the machine with or without minor modifications may be adapted to sharpen surgical knives and other cutting implements requiring an exceeding fine edge.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine for sharpening razors, the combination, with a device for holding the razor, of two buttons of suitable abrading material revolving at an angle to the axis of the blade of the razor and traveling along opposite sides of said razor and a device for revolving said buttons.

2. In a machine for sharpening razors, the combination, with a device for holding the razor, of buttons of suitable abrading material arranged at either side of said razor, re-

volving at an angle to the axis of the blade of the razor, means for adjusting the pressure of said buttons on said razor, a carriage mounted over said razor and adapted to carry said buttons along the sides thereof, and a device for revolving said buttons mounted upon said carriage, substantially as described.

3. In a machine for sharpening razors, the combination, with a base-plate, of a holder for the razor mounted therein, a frame mounted on said base-plate, a carriage adapted to move forward and backward on said frame, revolving buttons of suitable abrading material mounted on said carriage and adapted to bear against the sides of said razor, and means for revolving said buttons, substantially as described.

4. In a machine for sharpening razors, the combination, with a base-plate, of a holder for the razor mounted therein, a frame approximately parallel to the edge of the razor mounted on said base-plate, a carriage mounted on said frame and adapted to move forward and backward thereon, spindles placed in journals carried by said carriage, buttons of suitable abrading material mounted on said spindles, and springs normally pressing said buttons against the sides of said razor, as and for the purposes described.

5. In a machine for sharpening razors, the combination, with a base-plate, of a holder for the razor mounted therein, a frame having tracks approximately parallel to the edge of the razor mounted on said base-plate, a carriage mounted on said tracks and adapted to move forward and backward thereon, spindles placed in journals carried by said carriage, buttons of suitable abrading material mounted on said spindles, and springs normally pressing said buttons against the sides of the said razor, as and for the purposes described.

6. In a machine for sharpening razors, the combination, with a base-plate, of a holder for the razor mounted therein, a frame having tracks and guide-grooves approximately parallel to the edge of the razor mounted on said base-plate, a carriage adapted to move forward and backward on said tracks and having guide-lugs adapted to engage in said grooves, spindles placed in journals carried by said carriage, buttons of suitable abrading material mounted on said spindles, and springs normally pressing said buttons against the sides of said razor, substantially as and for the purposes described.

7. In a machine of the character described, a clamp for the razor, consisting of two jaws lined with rubber, felt, or other soft and elastic material, the said jaws being pivoted in the said base-plate and the one jaw having a cam-face and the second jaw a lever-arm adapted to engage said cam-face, and a clamp-screw bearing against second jaw, substantially as and for the purposes described.

8. In a machine of the character described, the combination, with a base-plate and a holder for the razor mounted therein, of a

frame mounted on said base-plate, a traveling carriage carrying revolving buttons for sharpening the razor mounted on said frame, and a sponge with a spring-support therefor mounted in the wake of said buttons near the end of said razor, substantially as described.

9. In a machine of the character described, the combination, with a device for holding the razor in a fixed position, of a carriage adapted to move backward and forward in a direction approximately parallel to the edge of the razor, a spindle mounted in journals carried by said carriage, a conical button of suitable abrading material carried by said spindle, a device for revolving said spindle, a spring normally pressing said button against said razor, and a screw adjusting the tension of said spring, substantially as and for the purposes described.

10. In a machine of the character described, the combination, with a base-plate and a holder for the razor secured thereto, of a track mounted over said holder, a carriage moving along said track, spindles mounted in said carriage, buttons of suitable abrading material mounted on said spindles, pinions also mounted on said spindles, and a combined fly and gear wheel mounted in said carriage and moving therewith, with means for turning the said wheel, substantially as and for the purposes described.

11. In a machine of the character described, the combination, with a base-plate and a holder for the razor secured thereto, of a track mounted over said holder, a rack parallel to said track, a carriage moving along said track, spindles mounted in said carriage, buttons of suitable abrading material mounted on said spindles, pinions also mounted on said spindles, a shaft set across said carriage and moving therewith, rollers on said shaft traveling on said track, a pinion on said shaft engaging in said rack, and a combined fly and gear wheel mounted on said carriage and adapted to turn in one direction only, substantially as and for the purposes described.

12. In a machine of the character described, the combination, with a base-plate and a holder for the razor secured thereto, of a track mounted on said base-plate and approximately parallel with the edge of said razor, a rack parallel to said track, a carriage moving along said track, spindles mounted in said carriage at an angle to the direction of motion thereof, conical buttons made of suitable abrading material and pinions both mounted on said spindles, a shaft set across said carriage and moving therewith, rollers on said shaft moving on said tracks, a pinion on said shaft engaging in said rack, a double-beveled gear-wheel loosely mounted on said shaft and engaging said pinions, a ratchet and pawl connecting said shaft with said gear-wheel, and means for turning said wheel, substantially as described.

13. In a machine of the character described, the combination, with the traveling carriage, and the button-spindles, and the buttons and pinions mounted thereon, of the shaft set transversely to the carriage, with a handle loosely mounted thereon for moving said shaft and said carriage backward and forward, the combined fly and gear wheel loosely mounted on said shaft, and the ratchet and pawl connecting said wheel to said shaft, substantially as and for the purposes described.

14. In a machine of the character described, the combination, with the traveling carriage E, of the side pieces E', carrying the button-spindles and having slots therein and hand-lugs, as shown, the stud e^1 , secured to the carriage and engaging in the forward slot, and the clamp-screw e^2 , engaging in the rear slot, whereby the height of the said button-spindles and buttons may be adjusted, substantially as described.

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

CHARLES A. WORDEN.

Witnesses:

FAYETTE W. ROE,
AUGUSTUS SMITH.