

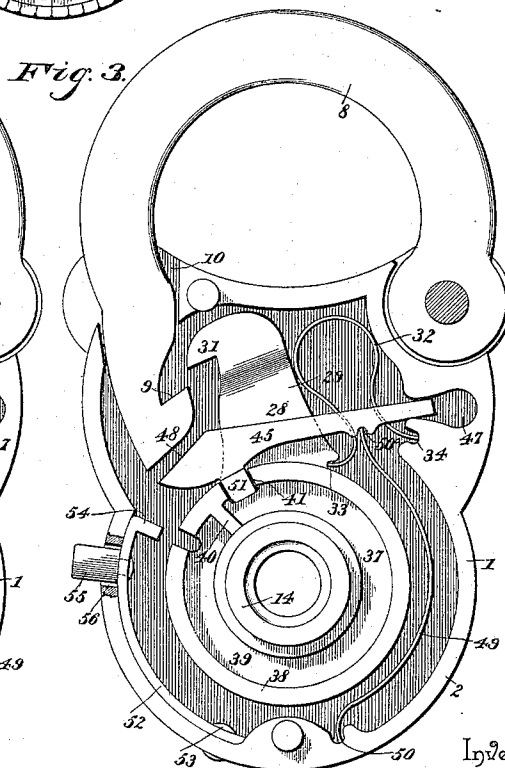
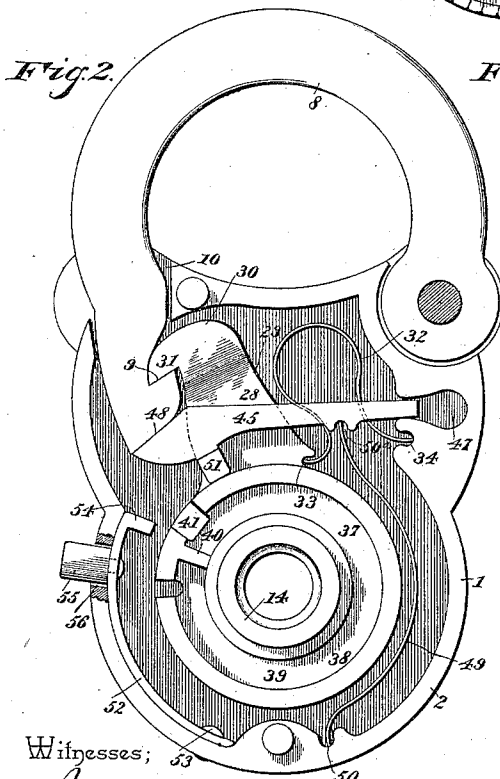
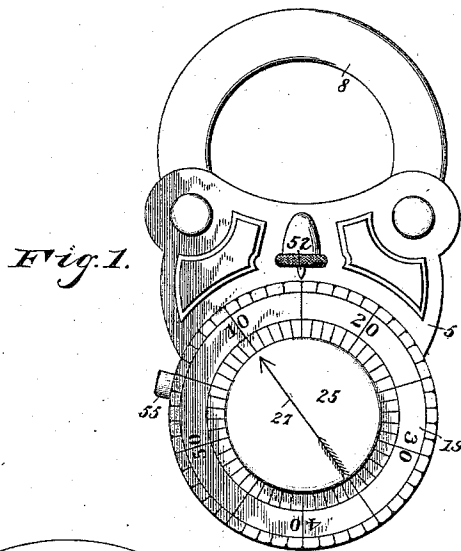
(Model.)

3 Sheets—Sheet 1.

F. M. BEARD & F. P. SHEPARD.
PERMUTATION PADLOCK.

No. 470,389.

Patented Mar. 8, 1892.



Witnesses;

J. M. Witherspoon
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By their Attorneys,

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Inventors,
Frank M. Beard &
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(Model.)

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Fig. 4.

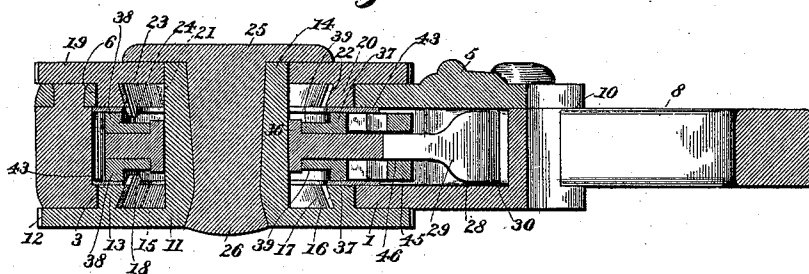


Fig. 5.

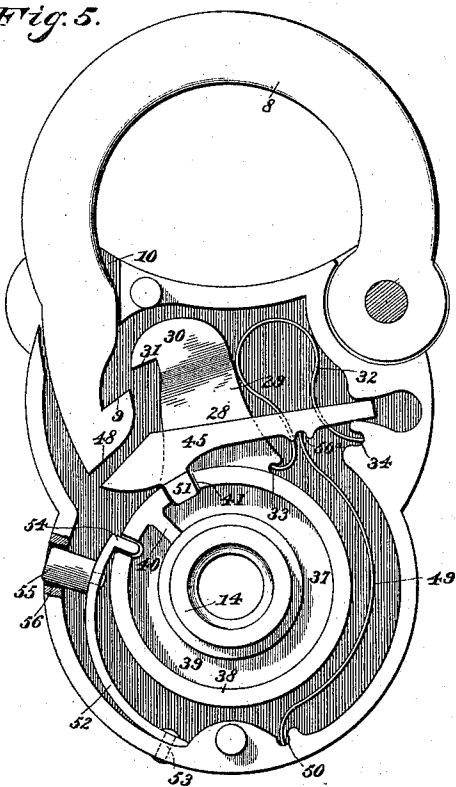
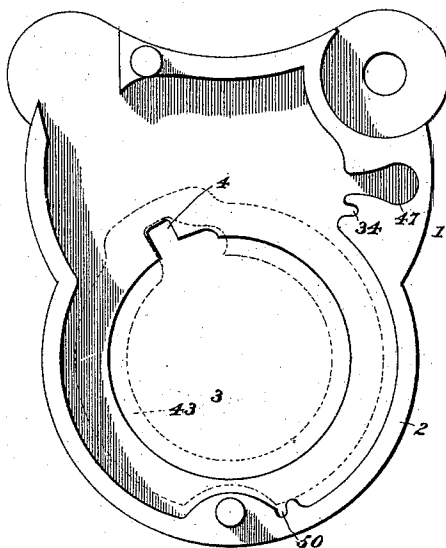


Fig. 6.



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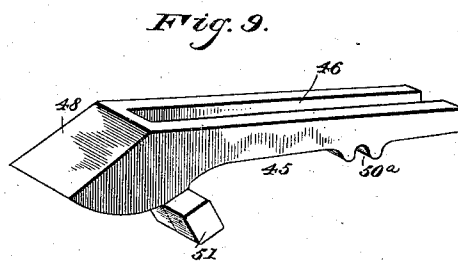
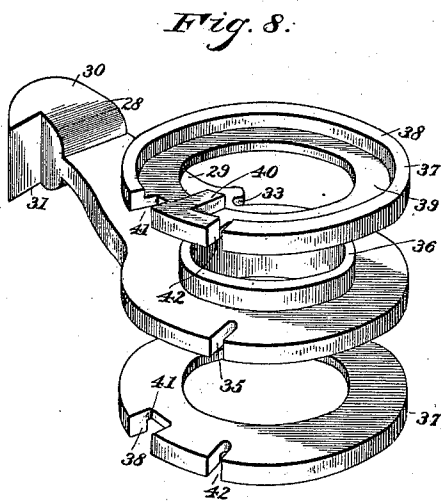
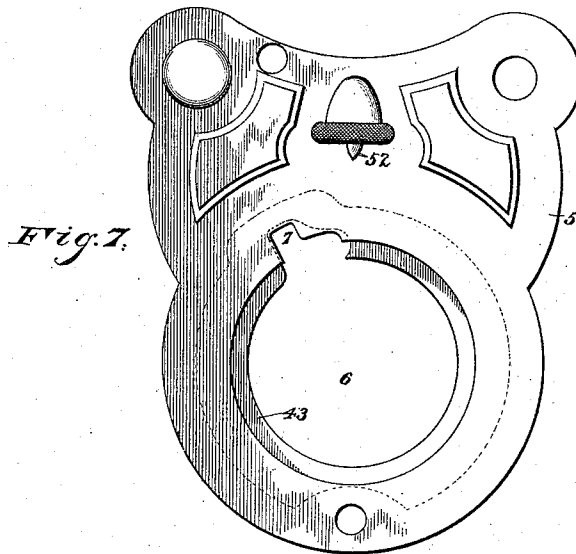
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UNITED STATES PATENT OFFICE.

FRANK M. BEARD AND FRANK P. SHEPARD, OF GUTHRIE, OKLAHOMA TERRITORY.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 470,389, dated March 8, 1892.

Application filed September 4, 1891. Serial No. 404,768. (Model.)

To all whom it may concern:

Be it known that we, FRANK M. BEARD and FRANK P. SHEPARD, citizens of the United States, residing at Guthrie, in the county of Logan and Territory of Oklahoma, have invented a new and useful Permutation-Padlock, of which the following is a specification.

Our invention relates to permutation-padlocks; and it has for its object to provide a device of this character which will be simple in construction, strong and durable, and yet a padlock which is so constructed that the parts thereof cannot be unlocked unless the combination is known, by means of which the various parts may be thrown into alignment in their unlocked position, and at the same time to provide a lock which may be operated by an almost indefinite number of combinations, yet being provided with but few parts, which render the same less liable to become broken or out of order and unfit for use, while effecting the objects for which permutation-padlocks are constructed; and with these objects in view the invention consists in a pivoted hook controlled and operated in connection with the hasp of an ordinary padlock by specially constructed and arranged tumblers and locking devices hereinafter more fully described, illustrated in the accompanying drawings, and specifically pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a permutation-padlock constructed in accordance with our invention. Fig. 2 is a front elevation of the lock, the front plate and dial being removed to expose the interior parts thereof in their locked position. Fig. 3 is a similar view showing the various parts in alignment and in their unlocked position. Fig. 4 is a vertical sectional view of the lock. Fig. 5 is a similar view illustrating the manner of changing the combination. Figs. 6 and 7 are detail views of the lock-casing and inclosing cap, respectively. Fig. 8 is a perspective view of the pivoted hook and the tumblers one above the other in their correct positions for assembling. Fig. 9 is a detail in perspective of the slotted locking-pawl.

Referring to the accompanying drawings, 1 represents the back plate or main casting of

the lock, having the ordinary encircling flange 2, within which is inclosed the various parts of the lock, and is further provided with the central perforation 3, which is designed to accommodate the portions of the locking device to be described, and the periphery of which perforation being itself provided with the guide and retaining notch or recess 4. The said casing is inclosed by the usual cap 5, which is provided with a registering and corresponding perforation 6 and an aligning guide and retaining-notch 7, which lies directly over and in line with the corresponding guide and retaining-notch 4 in the main casting comprising the lock-casing.

Pivottally secured to the upper outer end of the casing 1 is the ordinary link or hasp 8, which is provided with the ordinary locking-shoulder 9, that is adapted to be thrown within the opening 10, located in the opposite side of said casing and designed for the reception of said hasp and be locked within the casing in the manner to be hereinafter described.

A revolving operating-plate 11, provided with a notched periphery 12, is designed to work upon the outside of the back plate 1 and is provided with an inwardly-extending annular flange 13, that is designed to register with the sides of the central perforation 3, and, fitting snugly therein, is designed to form a bearing for said revolving plate, which is further provided with a central inwardly-extending hollow neck or collar 14, which extends through the barrel of the casing and forms a pivot or operating-stud, upon which are mounted portions of the locking device. Said annular flange 13 is provided with a notch or opening 15, which as said plate is revolved and operated is designed to be thrown into alignment with the notches 4 and 7, respectively, of the back and front plates comprising the lock-casing, and said annular flange is inwardly beveled, as shown at 16, to accommodate the flaring spring-metal strip 17, which is bent circular and placed within the inner periphery of said annular flange, and is held securely in its place by its own tension, and is prevented from accidental displacement by said incline or bevel to said flange, and is provided with an inwardly-extending projection or tongue 18, which as the plate 11 is revolved

is designed to operate a portion of the locking device. Mounted over the end of the neck or stud 14, extending through the opposite side of the casing, is the opposite revolving operating and dial plate 19, which is designed to revolve over the front inclosing cap 5 and is provided with an inwardly-extending annular flange 20, which is designed to snugly fit within and revolve around the perforation 6, located centrally within said cap. The said annular flange is provided with a notch or opening 21, which when the various parts are operated is designed to be in alignment with the corresponding notch in the opposite revolving plate and in both the front and back plates of the lock-casing, said flange being also similarly inwardly inclined or beveled, as at 22, which is designed to accommodate and retain in position the flaring spring-piece 23, corresponding to that located within the annular flange of the opposite revolving plate, and is also provided within an inwardly-extending operating tongue or projection 24. The said front dial-plate is further provided with a series of degrees or graduations, which note the various combinations at which the lock is set, and is held securely in place over the top of said neck or stud 14 and upon the front of the lock-casing by means of the supplemental circular disk or plate 25, provided with an integral stem 26, which is designed to be fitted within said hollow neck or stud of the back plate and be swaged or otherwise suitably rigidly secured within said stud, so that as the back revolving plate rotates the said supplemental disk or plate 25, revolving over the face of the dial-plate, also revolves, and said supplemental disk, being provided with a pointer 27, indicates as it rotates the combination at which the back revolving plate and the parts of the lock which it operates are in their aligned and unlocked position.

Loosely mounted upon the stud 14, extending through the barrel of the casing, is the locking-hook 28, which is provided with an upwardly-extending neck 29, at the upper terminal of which is an enlarged head 30, provided with a locking-tongue 31, that is designed to engage the locking-shoulder 9 of the link or hasp 8 and is always normally held in its locked position in engagement with said hasp by the tension of the leaf-spring 32 engaging the notch 33 at the lower end of the neck 29 and the notch 34 in the inclosing flange 2, comprising the lock-casing. The said locking-hook 28 is further provided with the notch or recess 35, formed in one side of its outer periphery, and with the opposite annular collars or flanges 36, which extend from either side of the body of the hook, which is mounted over said stud and over which the revolving tumblers 37 are designed to be placed and rotate thereover. The said revolving tumblers 37 are provided with an outer encircling flange 38, between which and the flanges of the pivoted hook over which said

tumblers are mounted is formed an annular recess or groove 39, within which the inwardly-extending tongues 18 and 24 of the opposite operating-springs 23 and 17, respectively, are designed to travel and operate the said tumblers as the opposite revolving plates rotate by the said tongues or projections engaging the stops 40, extending inwardly from said encircling flanges 38 across the path of travel of the operating-tongues. The said tumblers are further provided with the registering notches or recesses 41, that are designed when in alignment to correspond and register with the corresponding notches or recesses 4, 7, 15, and 21, respectively, of the back and front plates and the revolving disks located thereon, and said tumblers are further provided with the supplemental notches 42, that are adapted to be thrown in alignment with the notch 35 of the locking-hook 28 for the purpose of holding the parts of the lock rigid while changing the combination.

In order that the annular flanges of the revolving disks 11 and 19 may not interfere with the revolving tumblers located on each side of the intermediate hook, interposed bearing-plates 43 are secured to the front and back plates, respectively, and are provided with registering perforations and notches and extend slightly within the perforations in said plates, forming a flange or seat upon which the bottom of the flanges upon the revolving plates rest and revolve therearound.

A spring-actuated locking-pawl 45 is provided with a longitudinal slot 46, within which the neck 29 of the locking-hook 28 projects and works, as does, also, the spring 32, actuating said hook. The inner end or ends of said locking-pawl are adapted to be supported in and work within the recess 47, located in the side of the lock-casing, and the opposite end of said pawl beyond the end of the slot against which the neck of the locking-hook is normally pressed is provided with a beveled bearing surface or face 48, which is designed to be normally borne against the inner end of the hasp or link 8 by the tension of the leaf-spring 49, one end of which is secured within the notch 50, located in the bottom of the lock-casing and passing around the tumblers and body of the locking-hook. The opposite end is bifurcated and engages the notches 50^a, formed on the under sides of said pawl on opposite sides of the slot 46 therein. At the outer terminal of said locking-pawl on either side of the neck of the locking-hook projecting therethrough the same is provided with the inwardly-projecting locking-lugs 51, which are designed when the hasp is being unlocked to engage the several aligned notches or recesses. It can now be readily seen how the said lock is operated. Being in its locked position, the spring-pressed pawl bears firmly up upon the hasp and keeps the same in engagement with the normally-locked locking-hook engaging said hasp, while the tumblers being in positions in which their notches are

out of alignment prevents the said pawl from being pressed downward by bearing upon the hasp, and in this locked position the inwardly-extending lugs upon the outer end of said locking-pawl are seated out of the circle of travel of the revolving tumblers within the guide and retaining notches or recesses 4 and 7 in the front and back plates, respectively.

The front graduated disk 19 is first turned around once in order that the operating-tongue 24 of the spring 23, carried thereby, may engage the stop 40 of the revolving tumbler thereunder, and is now turned at a point where the figures thereon indicate by the indicator 52 upon the front cap 5 that the notch 41 in said tumbler is directly beneath the locking-lugs 51 of said locking-pawl. The front revolving plate is now turned back to the point which indicates that the notch 21 in the annular flange 20 is in alignment with the notch of the tumbler. The parts of the lock on this side of the locking-hook are now in position for unlocking. The front revolving dial-plate is now held firmly while the opposite revolving plate is rotated. This plate is turned, after being once revolved, so that the operating-tongue 18 of the spring 17 engages the stop of the tumbler thereunder until the pointer 27 upon the supplemental disk 25, carried by said revolving plate, indicates by pointing to the right number the point at which the notch within the tumbler is in alignment with the notch in the opposite tumbler and the opposite revolving plate. The said revolving plate is now turned backward, thus leaving the tumbler carried thereby stationary until it is indicated by the front supplemental disk that the notch 15 in the flange 13 is in alignment with the other aligned notches. The hasp is now pressed inwardly, which causes the spring-actuated locking-pawl to be depressed and throw the lugs 51 thereon in engagement with the aligned notches, thus connecting all parts together, so that by now turning either one of the revolving plates the locking-pawl is slid back within the recess 47, within which its inner ends work, and thereby carry the locking-hook 28 away from and out of engagement with the locking-shoulder of the hasp, which can now be readily withdrawn. After the withdrawal of the hasp a slight turning of either of the revolving plates will throw all parts into their normal positions, except the revolving tumblers, which may be thrown out of alignment by turning said plates back and forth, the hasp being easily relocked by simply pressing the same within the casing, as can be readily seen.

A variety of combinations in the above-described lock may be used, and for the purpose of changing the combination whenever desired we provide the lock with a securing device for holding the tumblers and hook in their aligned positions while changing the combination. Secured to the inner periphery of the flange 2, inclosing the various parts of

the lock, is the leaf-spring 52, riveted at 53 near the bottom of said casing and, extending the requisite distance along the same, terminates in a right angular hook or tongue 54, and is further provided with an operating-button 55, secured to the upper end of said spring and projecting through and without the perforation 56, located in the side of the lock-casing. When the main notches of the revolving tumblers and plates are in alignment with each other, the supplemental notches 42 of the revolving tumblers and the notch 35 of the hook are also aligned when the spring-actuated pawl is pressed inwardly and the said hook backwardly out of engagement with the hasp in the manner above described and in this position are designed to be engaged by the locking tongue or hook 54 by pressing the operating-button 55 inwardly. Holding the revolving tumblers and locking-hook in this position, the said revolving plates are turned separately and independently, which will cause the springs carried thereby to shift their positions within the annular flanges of said plates until the desired combination is made at which the tumblers will be thrown in alignment with each other, the point at which the notches in the flanges of the revolving plates are in alignment with each being always, preferably, zero.

The construction and operation of our permutation-padlock are now thought to be apparent without further description.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a permutation-padlock, a spring-actuated pivoted hook, revolving tumblers located on opposite sides of said hook and provided with notches, a spring-actuated pawl adapted to engage said notches, and opposite revolving plates adapted to operate said tumblers, substantially as set forth.

2. In a permutation-padlock, a spring-actuated pivoted hook, revolving tumblers located on opposite sides of said hook and provided with notches, a spring-actuated slotted pawl straddling said hook and adapted to engage said notches when in alignment, and opposite revolving plates adapted to operate said tumblers, substantially as set forth.

3. In a permutation-padlock, a spring-actuated pivoted hook, revolving tumblers located on opposite sides of said hook and provided with notches, a laterally-sliding spring-actuated slotted pawl straddling said hook and provided with a beveled bearing-face at its outer end and depending lugs adapted to engage said notches when in alignment, and opposite revolving plates adapted to operate said tumblers, pawl, and hook, substantially as set forth.

4. In a permutation-padlock, the combination, with the casing having perforated front and back plates, of the revolving disk or plate provided with the hollow stud and an annular flange engaging the perforation in said

back plate, a revolving disk or graduated plate mounted over the outer end of said stud and provided with an annular flange engaging the perforation in said front plate, a supplemental indicating-plate carried by said stud, a locking-hook and tumblers mounted on said stud, and means for operating said hook and tumblers from said revolving plates, substantially as set forth.

5. In a permutation-padlock, the opposite revolving disks or plates provided with inwardly-projecting annular flanges having notches, springs provided with projecting tongues located within said flanges, a spring-actuated pivoted hook, revolving tumblers located on opposite sides of said hook and provided with notches and stops adapted to be engaged by said tongue, and a spring-actuated pawl adapted to engage the aligned notches, substantially as set forth.

6. In a permutation-padlock, the opposite revolving disks or plates provided with inwardly-projecting annular flanges having an inclined inner periphery and notches, flaring springs located within said flanges and having inwardly-projecting tongues, a spring-actuated pivoted hook, revolving tumblers located on opposite sides of said hook and provided with encircling flanges, notches and stops projecting inwardly from said flanges in the path of said projecting tongues, carried by the revolving disks, and a spring-actuated pawl adapted to engage the aligned notches, substantially as set forth.

7. In a permutation-padlock, the opposite revolving plates, a spring-actuated pivoted hook provided with opposite collars or flanges, revolving tumblers mounted over said collars or flanges and provided with notches and stops adapted to be engaged by said disks or plates, and a spring-actuated laterally-sliding pawl provided with a longitudinal slot straddling the neck of said hook and with depending locking-lugs adapted to engage said notches when in alignment, substantially as set forth.

8. In a permutation-padlock, the opposite revolving disks provided with inwardly-projecting annular flanges having notches,

springs located within said flanges and provided with inwardly-projecting tongues, a spring-actuated pivoted hook, revolving tumblers located on opposite sides of said hook and provided with encircling flanges facing said annular flanges, notches and stops projecting inwardly from said flanges in the path of said projecting tongues, interposed bearing-plates placed between said opposite revolving plates and said tumblers, and a spring-actuated pawl adapted to engage the aligned notches, substantially as set forth.

9. In a permutation-padlock, the combination, with the casing having perforated front and back plates, of the revolving disk provided with the hollow stud and an annular flange engaging the perforation in said front plate and having an operating-tongue, a supplemental indicating-plate having a stem rigidly secured within said stud, a locking-hook, and tumblers mounted on said stud and controlled by said operating-tongues, substantially as set forth.

10. In a permutation-padlock, the casing, a spring-actuated pivoted hook provided with a notch, revolving tumblers located on opposite sides of said hook and provided with notches engaged by a spring-actuated pawl and supplemental notches corresponding to said notch in said hook, means for operating said tumblers and hook, and a spring secured within the lock-casing and provided with a locking-tongue adapted to engage the aligned supplemental notches and the hook-notch, and an actuating-button projecting through said casing, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

FRANK M. BEARD.
FRANK P. SHEPARD.

Witnesses:
LEMUEL ABBOTT,
W. S. BERRY.