

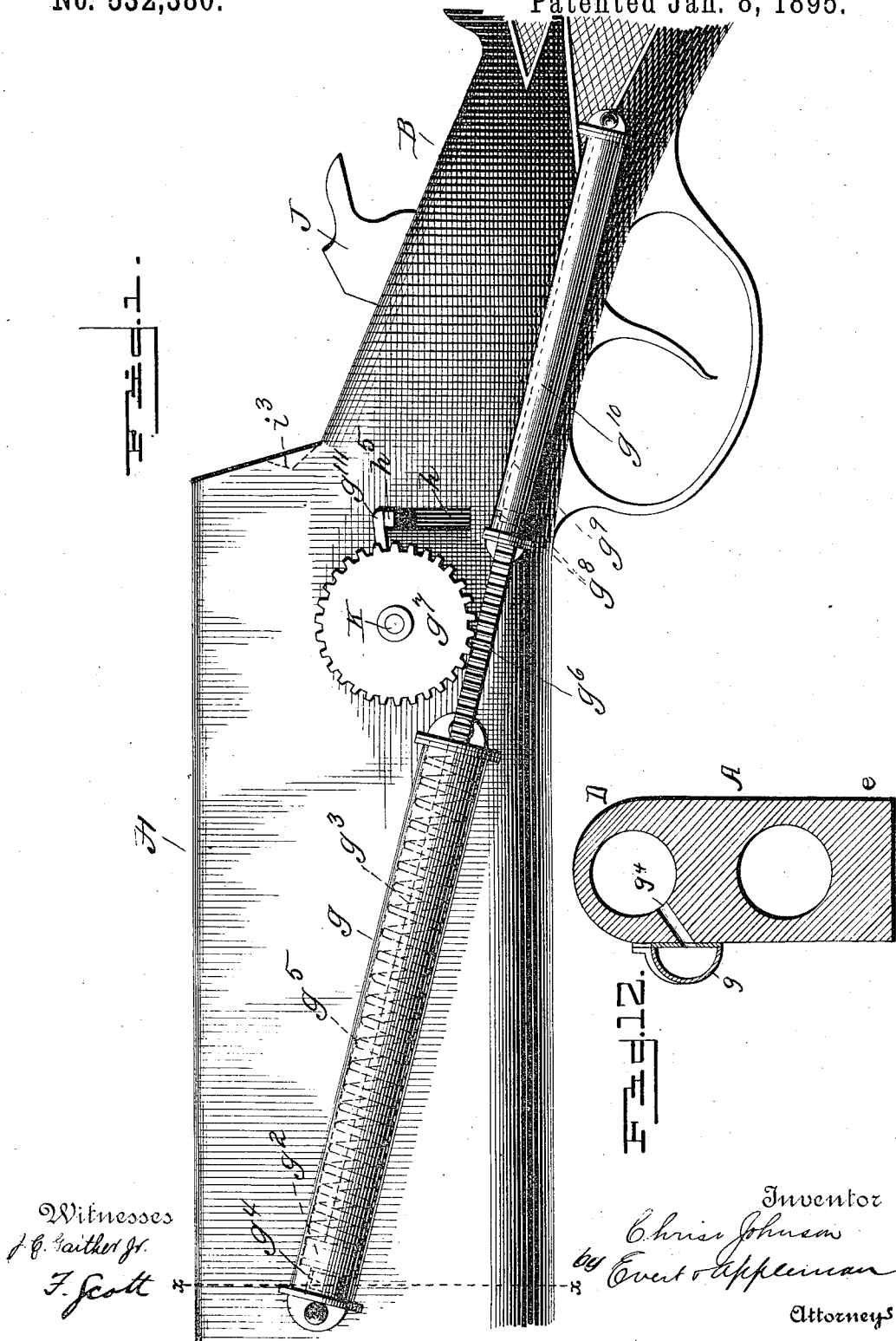
(No Model.)

4 Sheets—Sheet 1.

C. JOHNSON.
GAS OPERATED FIREARM.

No. 532,380.

Patented Jan. 8, 1895.



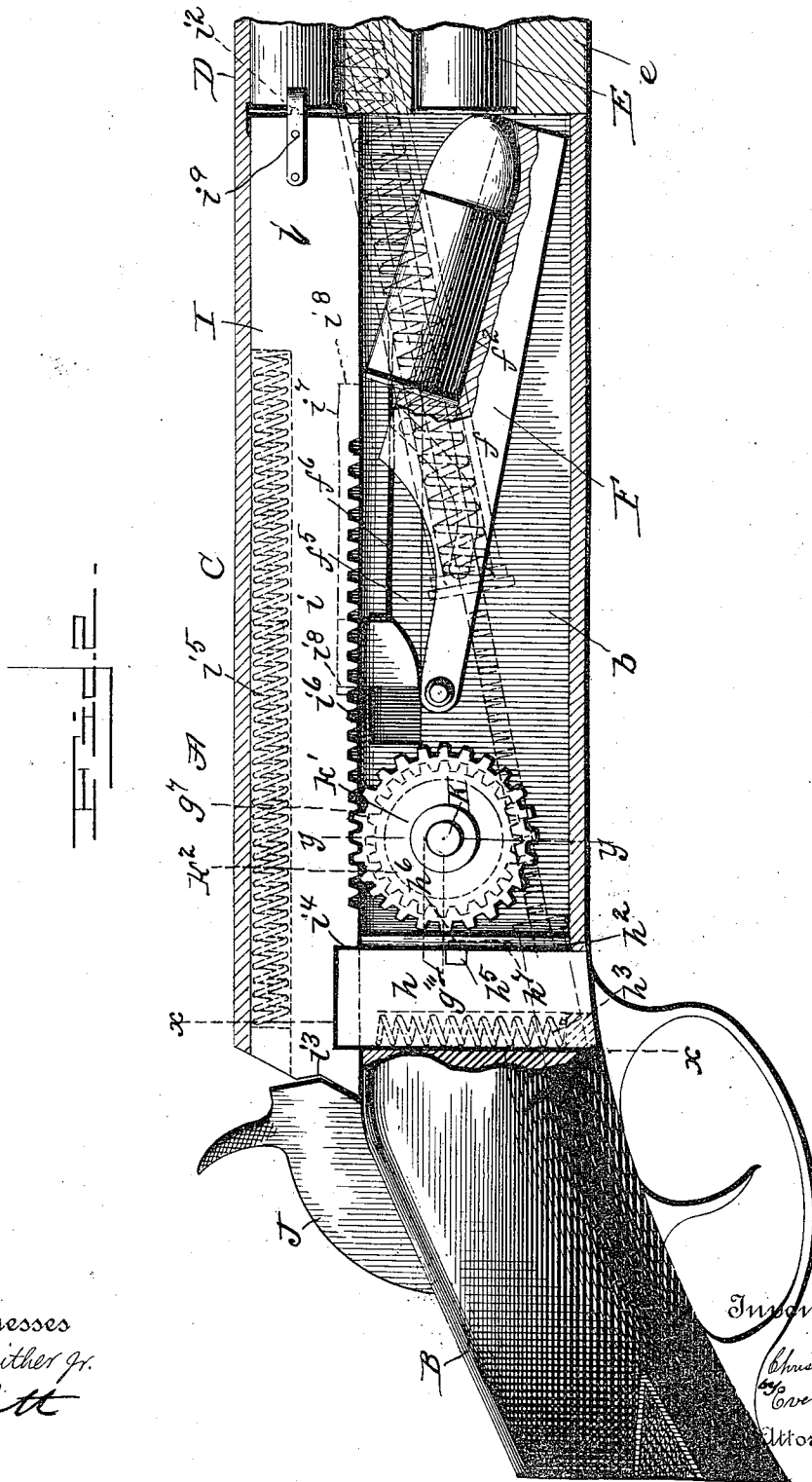
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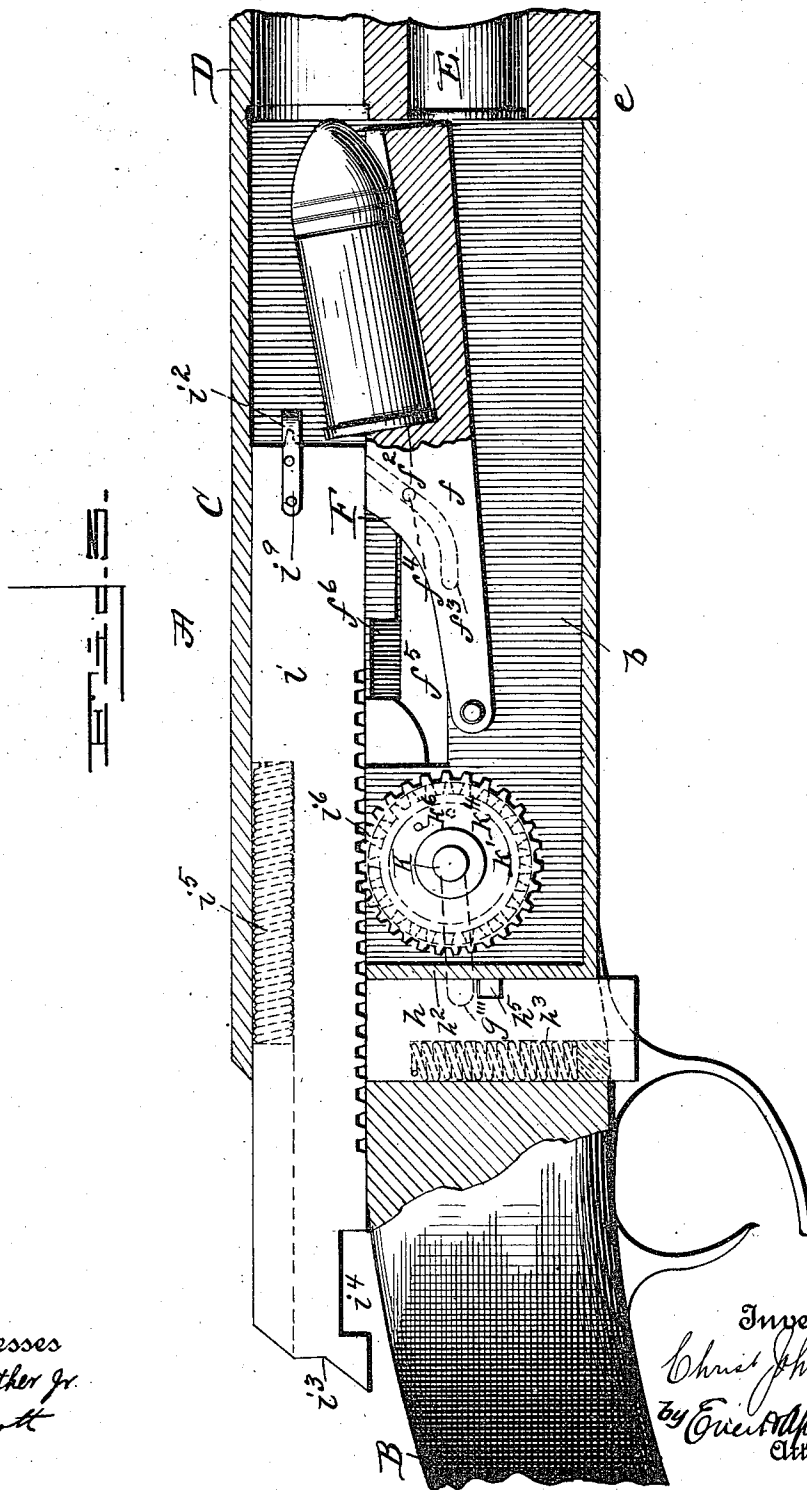
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Patented Jan. 8, 1895.



UNITED STATES PATENT OFFICE.

CHRIST JOHNSON, OF WAUSAU, WISCONSIN, ASSIGNOR OF NINE-TWENTIETHS
TO OLE HANSEN, OF CHOATE, MICHIGAN.

GAS-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 532,380, dated January 8, 1895.

Application filed March 1, 1894. Serial No. 501,936. (No model.)

To all whom it may concern:

Be it known that I, CHRIST JOHNSON, a citizen of the United States of America, residing at Wausau, in the county of Marathon and State of Wisconsin, have invented certain new and useful Improvements in Magazine-Guns, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain new and useful improvements in "fire arms" and particularly to that class known as "magazine guns."

The primary object is to provide an extremely simple and inexpensive combination of parts, together with means for automatically operating the same, whereby all manual manipulation required with arms in use at the present day, shall be entirely dispensed with.

Furthermore, the invention contemplates the employment of a novel and peculiar construction of parts, whereby the expansive force of the gas generated by the explosion of a cartridge may be utilized and properly directed to actuate certain power transmitting mechanism and effect the withdrawal or extraction of the exploded cartridge, and the final ejection of the same, also the elevation and placing of a loaded cartridge in firing position and the readjustment of the breech bolt.

With these and other objects in view various combinations and arrangements of parts are employed, which will be hereinafter more fully set forth, and specifically pointed out in the claims.

In describing the invention in detail, reference is had to the accompanying drawings, forming part of this specification, and wherein like letters indicate corresponding parts in the several views, in which—

Figure 1 is a view in side elevation of a magazine gun, showing a preferred construction arranged to embody my improvements. Fig. 2 is a vertical longitudinal section of the same, showing the mechanism in firing position. Fig. 3 is a similar view showing the mechanism in action. Fig. 4 is a view in cross section, taken about line x, x , of Fig. 2. Figs. 5 and 6 are detail views in elevation and perspective of the breech-bolt locking device.

Fig. 7 is a view in cross section taken on the line $y-y$ of Fig. 2. Figs. 8 and 9 are detail sectional views of the breech-bolt actuating gearing. Figs. 10 and 11 are detail views in elevation of the cartridge carrier. Fig. 12 is a sectional view taken on the line x, x , of Fig. 1.

In the drawings:—A, denotes the receiver of the gun proper; B, the stock; C, the breech mechanism; D, the barrel, and E the magazine formed in the tip stock e and provided with the well-known form of spring pressed follower for feeding the cartridges on to the carrier F.

Suitably secured to the exterior at one side of the receiving well— b —is an upwardly inclined cylinder— g —which is headed and provided with a piston— g^2 —fitting air-tight, and a rod— g^3 —and communicates with the barrel through the wall of the barrel and terminates adjacent the inner end of the shell of the cartridge, for a purpose to be hereinafter explained.

The piston-rod— g^3 —is encircled by a retractile spring— g^5 —which is inclosed within the cylinder and serves to normally retain the piston at the upper end of the cylinder, as is indicated by dotted line in Fig. 1. Forming a continuation of this piston-rod is a toothed rack bar— g^6 —which is adapted to periodically engage a pinion— g^7 —mounted on a transversely journaled shaft—K—. At the outer end and from opposite sides of this rack, two studs— g^8 —project in opposite directions and enter interior guides— g^9 —of a short cylindrical casing— g^{10} —which latter is suitably attached to the stock. These guides are curved at the ends so as to cause the toothed bar or rod to partially rotate on each stroke thereof, that is to say, on the out-stroke of the rod, the toothed surface thereof will face outward, so as to move by the pinion without engaging the same and owing to the terminal curvature of the guides, the rod at the end of its travel will be partially rotated, thus bringing the toothed face into mesh with the pinion. The teeth of the rod preferably correspond in number, with those of the pinion or are otherwise suitably arranged so that the latter will make a complete revolution during the back-stroke, which results in ef-

fecting an engagement between a radial projection — g''' — of the pinion and an arm of the latch h^5 situated in the recess of the breech-block — I — which latter is slidably mounted in position and consists of a bar — i — provided at one end with a firing pin — i^2 — and at the other end with a suitable projection or seat — i^3 — to receive the impact of the hammer — J — said breech block also having the under side thereof adjacent said projection, cut away to form a notch — i^4 — for the reception of a spring actuated lock-bolt — h —. This bolt has a limited vertical movement in suitable guides — h^2 — and is normally held engaging the notch of the breech-block by an upwardly acting spring — h^3 —. Slidably mounted in a recess of this bolt — h — and at right angles to the length of the same, is a latch — h^5 — one arm of which projects through an opening in the side-wall of the receiving well and is adapted to be engaged by the radial projection of the pinion aforesaid. The arm is also provided with a stud — h^6 — which enters an inclined guide-slot — h^7 — formed in the face of one of the bolt-guides — h^2 —. (See Fig. 2.) Thus as the arm is depressed by the rotary movement of the radial projection — g''' — the inclination of the slot — h^7 — will tend to draw said arm inwardly until it finally becomes disengaged from said projection, thereby allowing the pinion to continue its rotation.

As the latch is partially depressed, it overcomes the resistance of the spring — h^3 — and carries downwardly the lock-bolt — h — thereby releasing the breech-bolt — I — which latter is immediately moved outwardly against the action of its spring — i^3 — by the revolving pinion — k' — engaging the rack or toothed surface — i^6 — thereof. These successive steps last described, are made to follow closely one after the other, by the following arrangement of parts: Slidably mounted on a square portion of the shaft — k — which carries the fixed pinion — g^7 — and the loosely mounted pinion — k' — is a disk — k^2 — from which two lugs or studs — k^3 — k^4 — project respectively, radially and axially. The former, located on the periphery, enters a cam guide-slot — k^5 — (see Fig. 7) which causes the disk when rotated to move to and from the pinion — k' —. This sliding movement is utilized to effect a locking engagement between the lug — k^4 — above described and a similar lug — k^6 — projecting in the opposite direction from the pinion — k' —. Thus assuming the several members to be in their normal position, as shown in Figs. 2 and 7, that is, with the radial lug resting centrally of a depression — k^7 — in the cam guide-slot, from which it follows, that the wheels would be separated, the lug — k^6 — slightly in advance of the lug — k^4 — and the parts — h^3 — g''' — engaging. As the pinion — g^7 — is rotated motion will be imparted directly to the disk — k^2 — causing the lug — k^4 — to ride out of the depression, but before the disk has been moved along the shaft sufficiently to effect an

interlocking of the lugs — k^4 — k^6 — the bolt — h — will be actuated as before stated, and immediately following this step the lugs are brought into engagement, and the pinion thereby rotated sufficiently to move the breech-bolt outwardly until properly checked. During the outward travel of this bolt, its spring is compressed and as the lug of the disk — k^3 — again enters the depression and becomes disengaged from pinion — k' — the spring acts, forcing the breech-bolt home and reversing the rotation of the pinion — k' — which latter assumes its normal position, with its lug slightly in advance of the lug — k^4 — at the same time, the locking-bolt — h — actuated by its spring, is forced into the notch — i^4 — and thereby secures the breech-bolt rigidly in position.

The carrier — F — comprises a pivoted carriage — f — provided with a cartridge receiving seat — f^2 — and is slotted as at — f^3 —. Into this slot a pin — f^4 — of a slide — f^5 — projects. The slide runs in suitable ways — f^6 — with a projection thereof entering a slot or recess — i^7 — of the breech-bolt, the end walls of which form shoulders — i^8 — adapted to abut against the projection and force the slide back and forth. This motion serves to elevate and depress the carriage by reason of the pin and slot connection.

The operation is as follows: With the parts in position as illustrated by Fig. 2; as the cartridge is exploded a portion of the gas finds escape through the port — g^4 — and owing to its expansive force the piston — g^2 — is driven downwardly in the cylinder, compressing the spring — g^5 — and the toothed rod moved rearwardly but not engaging the pinion. At the limit of the stroke, the rod is automatically shifted and the reaction of the spring retracts the piston. It is this movement that is utilized to actuate the breech mechanism and is first imparted to the pinion by the rack. As the pinion is rotated through one-twelfth to one-tenth of a revolution its radial projection first depresses the lock-bolt — h — to release the breech-bolt and the remaining portion of the rotary movement is transmitted to the pinion — k' — as above set forth, to force said breech-bolt outwardly and compress its spring. This outward movement of the bolt withdraws the exploded shell in the usual manner by means of the spring-clamp jaws — i^9 — and ejects it in a manner and by any means well known in the art. At the same time the shoulder — i^8 — bringing up against the projection of the slide, forces it outwardly and thereby elevates the carriage and places the cartridge in proper position to be engaged and forced into the breech by the breech-block.

It will be noted that when the carriage is elevated, a portion of the forward end partially covers the entrance to the magazine thus effectually preventing the escape of the cartridges therefrom. The breech-bolt is retained in the outward position until the pin-

ion — k' — becomes automatically disengaged from the disk — k^2 — when the spring — i^5 — acts causing the breech-bolt to move outwardly and into engagement with the elevated shell which latter is thereby forced into the breech and secured by the self-acting lock-bolt — h — forcing up into the notch of the breech-bolt.

It will be observed that the carrier is not depressed until after the shell has been forced home, since the shoulder of the bolt — I — is so relatively arranged that it does not engage the slide until after this step in the operation has been performed. Furthermore, it will be apparent that every part automatically assumes its normal position and particularly the disk and pinion — k' — k^2 — and their engaging lugs, preparatory to the next discharge of the arm.

I do not wish to be understood as limiting myself to the exact construction herein illustrated and described, as various changes may be made in the same without materially departing from the present invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fire arm, the combination of a barrel adapted for the reception of a cartridge, of a vent adjacent the breech, a cylinder communicating with the vent, a piston rod and toothed rack bar integral therewith, working in the cylinder and suitable connections between the toothed rack bar and the breech bolt, whereby the breech mechanism is operated, for the purpose described.

2. In a fire arm, the combination with the barrel suitably stocked, of a vent leading from the breech, a cylinder communicating with the vent, a piston rod and integral toothed rack bar working in the cylinder, and means for throwing the rack bar into engagement with a pinion and suitable connections be-

tween the pinions and the breech bolt, whereby the breech mechanism is operated for the purpose described.

3. In a fire arm, the combination of a barrel having a vent, a cylinder communicating with the vent, a piston rod working in the cylinder having an integral rack bar the end thereof operated in a guide by which the rack bar is periodically rotated, a pinion engaged by the rack bar, a spring held breech bolt, a device for locking said bolt and means for operating the bolt locking mechanism, through the rack bar and pinion for the purpose described.

4. In a fire arm, the combination with a barrel having a vent, of a cylinder communicating with the vent, a piston operating the piston rod, and integral rack bar, a breech bolt, a device for locking the bolt, a cartridge carrier operatively connected to the bolt and receiving motion therefrom and means for operating the breech mechanism by the connection between the rack bar and breech bolt, substantially as described by a portion of the energy in the gas caused by the explosion of the cartridge, through the connection between the cylinder, rack bar and breech mechanism for the purpose described.

5. In a fire arm, the combination with the barrel having a vent, an exterior cylinder communicating with said vent, a piston rod having an integral rack bar working in the cylinder, a spring held breech bolt and a device for locking said bolt, and means between the breech bolt and the rack bar for unlocking said bolt and for actuating the breech mechanism by the rack bar for the purpose described.

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

CHRIST JOHNSON.

Witnesses:

FRED. GENRICH,
JOHN JOHNSON.