C. G. FREY.

FLUID PRESSURE RAILWAY BRAKE.

APPLICATION FILED OCT. 3, 1908.

945,087. Patented Jan. 4, 1910.

Fig. 1.

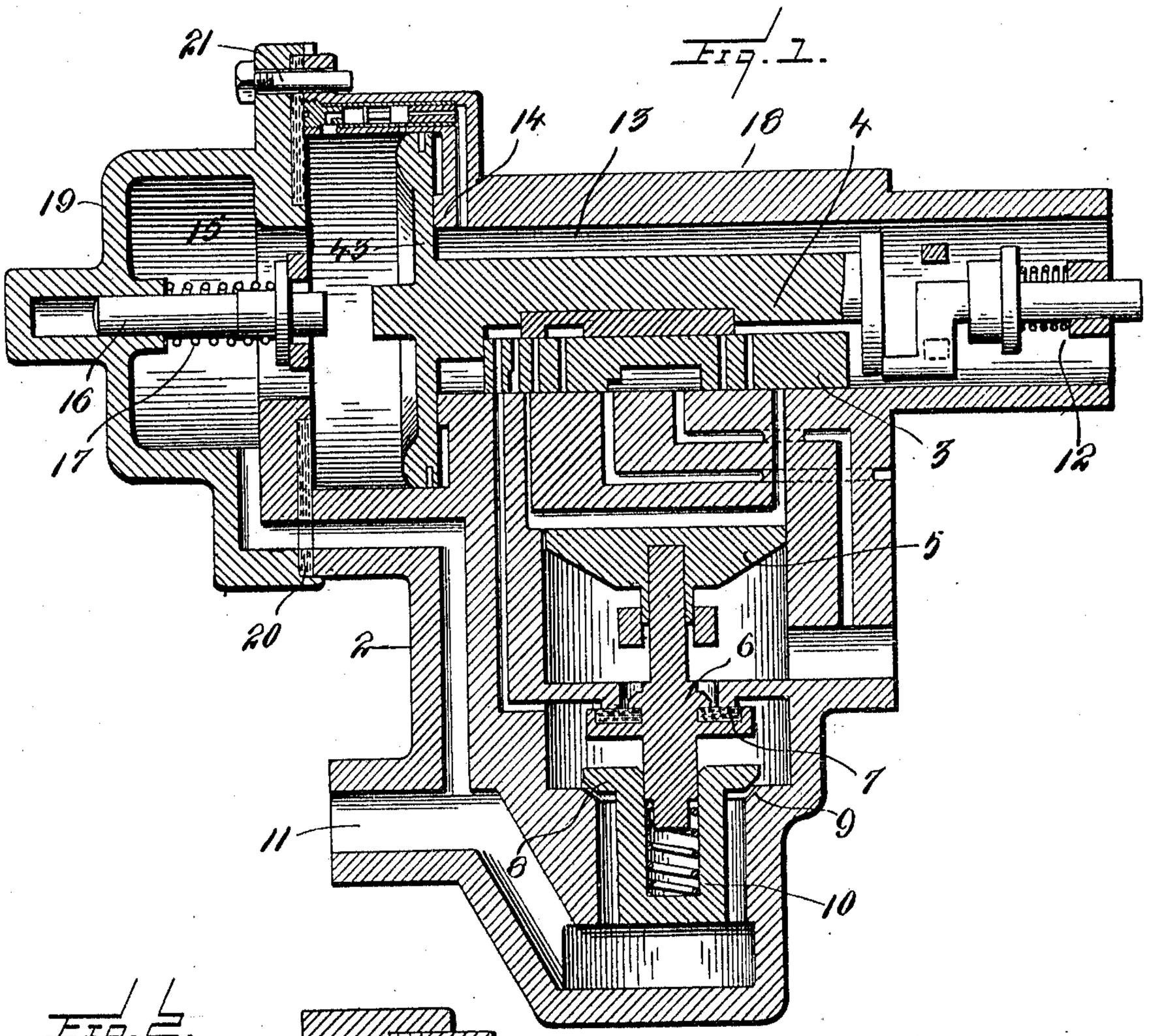


Fig. 2.

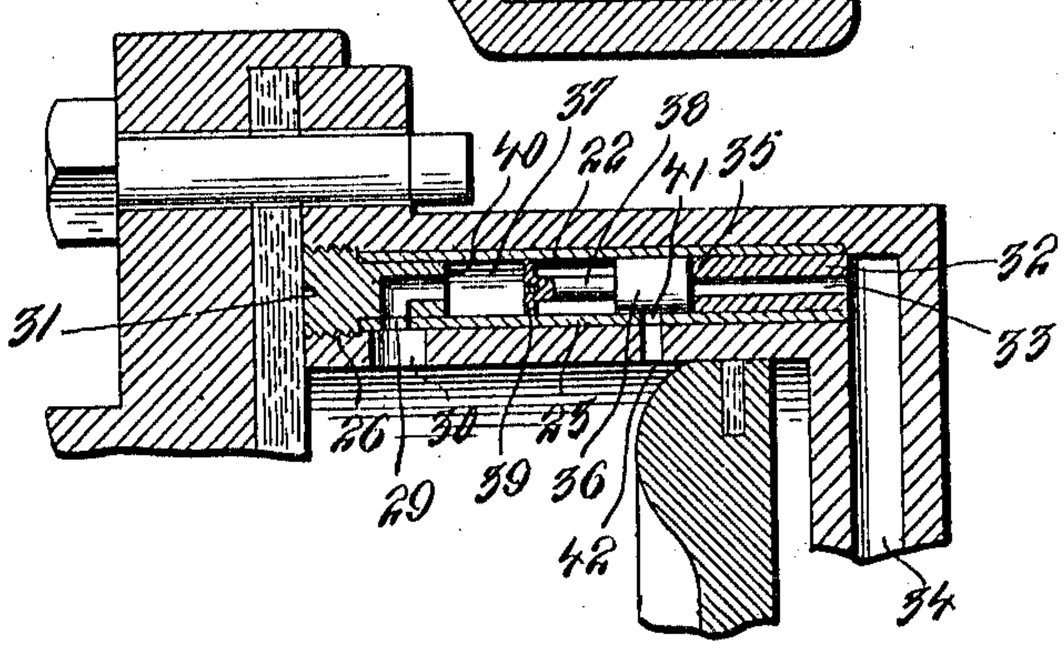
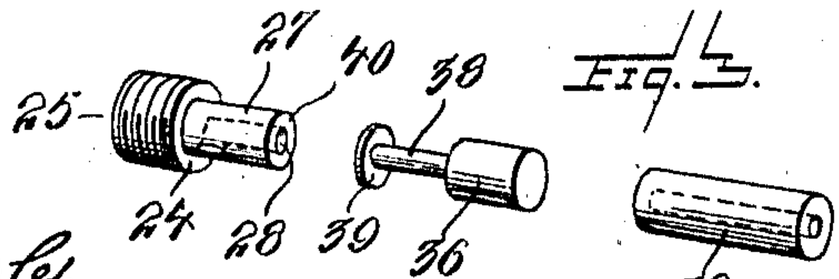


Fig. 3.



WITNESSES:

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FLUID-PRESSURE RAILWAY-BRAKE.

945,087. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed October 3, 1908. Serial No. 455,937.

To all whom it may concern:

Be it known that I, CHARLES G. FREY, a citizen of the United States of America, residing at Youngwood, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Fluid-Pressure Railway-Brakes, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to fluid pressure railway brakes and the object thereof is to provide the quick action triple valve mechanism with means whereby the auxiliary pressure is equalized with the train pipe pressure on a service application to prevent the accidental application of emergency in case the piston or slide valve is retarded or sticks or for any cause whereby the triple piston does not respond to a train pipe reduction on a service application.

The invention is designed primarily to overcome the undesired emergency of the quick acting triple thereby reducing the damage to draw bars, cars, lading, serious delays to traffic, and for insuring the safety of the traveling public.

To overcome the foregoing objections without changing the construction of the triple valve mechanism now in general use is the aim of this invention and its object is attained by equalizing the auxiliary pressure with the train pipe pressure on a service application in case the piston of the triple is retarded in its movement, such equalizing of the pressure will prevent the accidental and undesired emergency application.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like characters of reference denote corresponding parts throughout the several views, Figure 1 is a vertical sectional view of a quick acting triple valve mechanism showing the adaptation therewith of a means in accordance with this invention to cause the equalizing of the auxiliary pressure with the train pipe pressure on a service application in case the piston or slide valve is retarded in its movements. Fig. 2 is a detail in sectional plan illustrating the means in accordance with this invention for equalizing the auxiliary pressure with the train pipe pressure on a service application, and, Fig. 3 is a disassembled view of the elements constituting a double seated check valve for opening and closing the forward portion of the piston chamber with respect to the rear portion thereof.

Referring to the drawings in detail, 2 denotes a valve body, 3 a slide valve, 4 a triple piston stem, 5 an emergency piston, 6 an emergency valve, 7 an emergency valve seat, 8 a check valve, 9 a check valve seat, 10 a check valve spring, 11 a train pipe opening, 12 the retarded release device, 13 a piston chamber which communicates with the auxiliary reservoir, 14 a seat for the piston 4, 15 a continuation of the chamber 13 and which communicates with the train pipe, 16 a graduating post, and 17 a graduating spring. The foregoing elements are of known construction and it is thought unnecessary to describe their operation.

The casing of the triple valve mechanism comprises what may be termed a body portion 18 and a cap piece 19, one being separated from the other. The cap piece 19 fits upon the body portion 18 and has interposed between it and the said body portion a gasket 20 whereby when the cap 19 is secured to the body portion 18, the valve casing is air-tight. The cap piece 19 is secured to the body portion 18 through the medium of the hold fast devices 21 or any other suitable means.

The body portion 18 at its top is provided with a bore 22. The bore 22 is substantially L-shaped, within the longitudinally extending portion of the bore 22 is seated the bushing 23, the length of said bushing 23 being less than the length of the longitudinally extending portion of the bore 22. Seated within the bushing at one end thereof is a tubular member formed of two different diameters, that portion of larger diameter of the said tubular member is indicated by the reference character 24 and is formed with peripheral threads 25 which engage with interior threads 26 formed at one end of the longitudinally extending portion of the bore 22. That portion 24 of larger diameter of the tubular member abuts against one end of the bushing 23 and closes what may be termed

the outer end of the longitudinally extending portion of the bore 22. That portion of smaller diameter of the tubular member and which is indicated by the reference character 27 is provided with an L-shaped port 28. The vertical portion of the said port 28 communicates with the forward portion 15 of the chamber 13 through the medium of an opening 29 provided in the bushing 22 and an enlarged opening 30 provided in the body portion 18. Owing to the manner in which the tubular member is constructed, it is fixedly secured in position and prevented from longitudinal displacement within the bushing 23. To permit of the removal of the tubular member when it is desired to get to the interior of the bushing 23, that portion 24 of larger diameter of said tubular member has its outer end formed with a notch or slit 31 adapted to receive a suitable instrument whereby the said tubular member can be conveniently removed. The tubular member constitutes a means for closing one end of the bushing 23 and also provides means for establishing communication between the interior of the bushing 23 and the forward portion 15 of the piston chamber 13. Arranged within the bushing 23 at what may be termed its inner end, is a plug 32 provided with a centrally disposed port 33 whereby communication is established between the interior of the bushing 23 and the vertically extending portion 34 of the bore 22. The plug 32 has one end thereof forming a valve seat which is indicated by the reference character 35 and against which is adapted to abut a check valve 36. That portion of the bushing 23 between the seat 35 and the inner end of the portion 27 of the tubular member forms what may be termed a valve chamber 37 within which is arranged the double seating check valve 36. The stem of the valve 36 is indicated by the reference character 38 and which terminates in an annular disk 39 adapted to seat against the end 40 of the reduced portion 27 of the tubular member whereby the port 28 is closed. The valve 36 is of such length as to close an opening 41 in the bushing 23, the said opening communicating with a port 42 which opens into the forward portion 15 of the piston chamber 13. The vertically extending portion of the bore 22 opens at its lower end into the piston chamber 13 at the rear of the piston head 43.

The manner in which the auxiliary pressure is equalized with the train pipe pressure in case the piston 4 or slide valve 3 should have its movement retarded, such equalization of the pressure preventing the accidental application of emergency is as follows: It will be assumed that the parts are in the position shown in Fig. 2 and that a service application has been made. When the service application has been made, should the triple piston or the slide valve or both through some cause not shift, even though the train pipe pressure in the forward portion 15 of the piston chamber was reduced, it is evident that the auxiliary reservoir pressure at the rear of the piston head 43 is greater than the train pipe pressure forwardly of the piston head 43. The auxiliary reservoir pressure will then act upon the valve 36, shift it forwardly in the valve chamber 37 so as to open the port 33 and the port 42, communication will then be established between that portion of the piston chamber at the rear of the piston head 43 and that portion of the piston chamber forwardly of the piston head 43 allowing of the auxiliary pressure to enter into the piston chamber forwardly of the piston head 43 whereby the pressure on both faces of the piston head will then be equalized consequently overcoming any accidental application of emergency. It will be evident that unless the pressure was equalized on both sides of the piston head 43 the higher auxiliary reservoir pressure would shift the piston 4 forwardly, suddenly or as used in the specification accidentally, whereby the post 16 would be shifted, the spring 17 compressed and the emergency application had. Now it will be assumed that the train pipe pressure and auxiliary pressure have been equalized in the piston chamber 13, the train pipe pressure is then built up which causes the valve 36 to shift rearwardly to close the port 42 and port 33. This is had owing to the fact that the opening 30 is of greater diameter than the port 42, the train line pressure entering the opening 30 and into the port 28 where it bears against the disk 39 and shifts the valve to engage the seat 35.

The valve 36 may be of the same diameter from end to end, that is to say, the disk 39 and valve stem 38 may be dispensed with, but it has been found that by employing the valve stem and the disk in the manner as stated, there is less friction on the valve.

What I claim is:

1. In a fluid pressure railway brake, the combination with a triple valve mechanism having its casing provided with a conduit opening into the rear portion of the triple piston chamber at the rear of the triple piston and into the forward portion of said chamber forwardly of the triple piston and having arranged therein a pair of valve seats, of a double-acting valve normally engaging one of the seats for normally closing the rear portion of said conduit to the forward portion of the triple piston chamber, and means whereby communication is established between the said rear and forward portions of said chamber on a service application when the triple piston is retarded whereby the auxiliary reservoir pressure will be equalized with the train pipe pressure thereby preventing an accidental emergency

application, said valve on a service application being shifted from that seat which it normally engages to the other of said valve seats in said conduit thereby closing the forward end of said conduit.

2. In a fluid pressure railway brake, the combination with a triple valve mechanism having its casing provided with a conduit opening into the rear portion of the triple piston chamber at the rear of the triple piston and into the forward portion of said chamber forwardly of the triple piston and having arranged therein a pair of valve seats, of a double-acting valve normally engaging one of the seats for normally closing the rear portion of said conduit to the forward portion of the triple piston chamber, and means whereby communication is established between the said rear and forward portions of said chamber on a service application when the triple piston is retarded whereby the auxiliary reservoir pressure will be equalized with the train pipe pressure thereby preventing an accidental emergency application, said valve on a service application being shifted from that seat which it normally engages to the other of said valve seats in said conduit thereby closing the forward end of said conduit, and means whereby said valve is shifted in the opposite direction to engage the first mentioned seat to shut off communication between rear portion of the conduit and the front portion of said chamber when building up the train pipe pressure after the train pipe pressure and auxiliary reservoir pressure have been equalized in said chamber to prevent an accidental emergency application.

3. In a fluid pressure railway brake, means to prevent an accidental emergency application on a service application, said means comprising a conduit formed in the wall of the triple piston chamber for establishing communication between the chamber at the rear of the triple piston and the chamber forwardly of the triple piston, said wall further provided with a pair of ports of different diameters opening into said conduit, a valvular member within said conduit for normally closing that portion of the piston chamber forwardly of the triple piston to that portion of the piston chamber rearwardly of the triple piston, and adapted to be shifted on a service application for establishing communication through said port of smaller diameter between that portion of the triple piston chamber at the rear of the piston and that portion of the triple piston chamber forwardly of the piston whereby the auxiliary reservoir pressure will be equalized with the train pipe pressure when the triple piston is retarded thereby preventing an accidental emergency application.

4. In a fluid pressure railway brake, means to prevent an accidental emergency application on a service application, said means comprising a conduit formed in the wall of the triple piston chamber for establishing communication between the chamber at the rear of the triple piston and the chamber forwardly of the triple piston, said wall further provided with a pair of ports of different diameters opening into said conduit, a valvular member within said conduit for normally closing that portion of the piston chamber forwardly of the triple piston to that portion of the piston chamber rearwardly of the triple piston, and adapted to be shifted on a service application for establishing communication through said port of smaller diameter between that portion of the triple piston chamber at the rear of the piston and that portion of the triple piston chamber forwardly of the piston whereby the auxiliary reservoir pressure will be equalized with the train pipe pressure when the triple piston is retarded thereby preventing an accidental emergency application, that port of larger diameter providing means for conducting fluid pressure against said valve for shifting it to shut off communication between the rear and forward portions of the piston chamber when building up the train pipe pressure after the train pipe pressure and auxiliary reservoir pressure have been equalized in said chamber to prevent an accidental emergency application.

5. In a fluid pressure railway brake, means to prevent an accidental emergency application on a service application, said means comprising a conduit formed in the wall of the triple piston chamber and opening into the triple piston chamber at the rear of the normal position of the triple piston and normally closing that portion of the triple piston chamber forwardly of the triple piston to that portion of said chamber rearwardly of the triple piston, the wall of said triple piston chamber provided with a pair of ports opening into the forward portion of said conduit, and a valvular member mounted in said conduit and adapted to normally engage one of said seats and closing one of the ports for shutting off communication between the forward and rear portions of the piston chamber, said valve on a service application when the triple piston is retarded adapted to be shifted from the seat to establish communication between the forward and rear portions of the piston chamber so as to equalize the auxiliary reservoir pressure with the train pipe pressure, said valve when shifted adapted to engage the other of said seats and close the other of said ports.

6. In a fluid pressure railway brake, means to prevent an accidental emergency application of emergency on a service applica-

tion, said means comprising a conduit formed in the wall of the triple piston chamber and opening into the triple piston chamber at the rear of the normal position of the triple piston and normally closing that portion of the triple piston chamber forwardly of the triple piston to that portion of said chamber rearwardly of the triple piston, the wall of said triple piston chamber provided with a pair of ports opening into the forward portion of said conduit, and a valvular member mounted in said conduit and adapted to normally engage one of said seats and closing one of the ports for shutting off communication between the forward and rear portions of the piston chamber, said valve on a service application when the triple piston is retarded adapted to be shifted from the seat to establish communication between the forward and rear portions of the piston chamber so as to equalize the auxiliary reservoir pressure with the train pipe pressure, said valve when shifted adapted to engage the other of said seats and close the other of said ports, said last-mentioned port constituting means for supplying pressure against said valve for shifting it in position to shut off the communication between the forward and rear portions of said chamber when building up the train pipe pressure after the train pipe pressure and auxiliary reservoir pressure have been equalized in said chamber to prevent an accidental emergency application.

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

CHARLES G. FREY.

Witnesses:
H. ALBERT MCMURRAY,
WILLIAM W. FOREMAN.