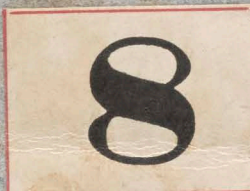


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## COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss

Superior Court  
Criminal Session# 5545  
5546COMMONWEALTH

v.

NICOLA SACCO et alAFFIDAVIT OF CHARLES J. VAN AMBURGH

I, Charles J. Van Amburgh, being first duly sworn,  
on oath depose and say as follows:

My name is Charles J. Van Amburgh. I live at 635 Boston Avenue, Bridgeport, Connecticut. At the present time I am employed by The Remington Arms-Union Metallic Cartridge Company as an assistant ballistic engineer. I am 41 years of age, and my education was obtained in grammar school, supplemented by an attendance of four years, 1906-1910, at the Springfield Technical High School, Springfield, Mass. I took a mechanical course there. From that time to date I have specialized in the handling of firearms and ammunition, devoting particular attention to the experimental end of such work. For nine years I was employed at the Springfield Armory in the Experimental Department, having to do with tests and experiments with rifles, revolvers, pistols and machine guns. Such tests consisted in the adjustment of machine guns and other arms and required a minute study of the markings, chamber impressions, breech-block impressions, firing pin impressions,



rifling marks and general manifestations found on bullets and fired cases, (shells), used in the different classes of firearms. The purposes of these tests were to determine the causes of mal-functions in firearms and reasons for determining their misbehavior under any and all conditions of firing. During that time I handled and fired many types of firearms, pistols, revolvers and machine guns as made by the Government and as submitted by inventors, and such as were obtained abroad by military representatives and brought to the Springfield Armory and there tested for the purpose of learning any features of them which might be an improvement or lead to an improvement in the operation and design of the then existing types of weapons used in the various branches of the United States Service, Army, Navy, Marine Corps and National Guard. I was in the employ of the Government at that time as an assistant in the Experimental Department of the Springfield Armory at Springfield, Mass.

During the period of my employment at the Springfield Armory I was detailed on three occasions, one of which was as an inspector of ammunition at the works of the Remington Arms-Union Metallic Cartridge Company, Bridgeport, Conn., and on two occasions as an inspector of pistols and machine guns at the works of the Colts Patent Firearms Company, Hartford, Conn. My experience in such work led to a familiarity with the practice of measuring and gauging of shells, primers, bullets, and all components of small-arms ammunition, and also a familiarity with the methods of measuring and gauging scientifically with the best known instruments the interiors of rifled arms and the operations employed in the manufacture of the barrels of all small arms as well as other components of rifles, revolvers and pistols.

At the request of the Ordnance Department in Washington, I accepted a permanent detail to Frankfort Arsenal, at Frankfort, in Philadelphia, Pennsylvania. I was there one year and my duties were as an assistant in the proof-house. Such duties



consisted of firing to determine pressure, velocity, and accuracy of cartridges used in the United States Army rifles, revolvers and pistols, also in making determinations of the ballistics of powder samples of smokeless powders used in the above United States Army rifles, revolvers and pistols. During that time cartridges of makes other than used by the United States Services were tested to determine their ballistic properties; also firearms of many makes and kinds were submitted for critical examination. One of the arms which was a subject of daily test and observation was the United States Automatic Pistol which was and is made by the Colts Patent Firearms Company.

As my next employment I accepted a position as assistant proof-master with the New England Westinghouse Company at East Springfield, Mass. That company, during the war, was manufacturing rifles for the Russian Government. My specific duties with that company were, in person, making very important ballistic tests and experiments with rifles and cartridges, namely, in ascertaining velocities, pressures and accuracy as well as determining, experimentally, the serviceability and strength of samples of gun barrel steel submitted from time to time by contractors. My general duties were in directing the proof and accuracy testing of the Russian 3-Line Rifle.

During my service with the New England Westinghouse Company, I was transferred from their East Springfield plant to their branch plant in Meriden, Conn., where I had sole charge of the lay-out and testing for proof and accuracy of the Russian 3-Line Rifle.

In January of 1917, because of the fall of the Russian Government, work on the Russian rifle was suspended. The Meriden plant was purchased by the Colts Patent Firearms Company of Hartford, Conn. All buildings, machinery, and employes remained and work was taken up for the Colts Company on the United States Machine Rifle, Model 1918. The work on the United States Machine Rifle consisted of designing,



testing fixtures and directing tests for pressure proofs of barrels and their accuracy and functioning. I remained with the Colts Company until May, 1918, when I accepted the tender of a commission in the United States Army, as an instructor and the rank of Captain, for duty principally at the Small-arms Firing School at Camp Perry, Ohio. My duties as instructor in small-arms firing or marksmanship involved my transfer to various camps, including Camp Dodge, Iowa, training of troops for overseas duty, Camp Benning, Georgia, where I was detailed as an instructor at the School of Musketry. In January of 1919 the activities in marksmanship and musketry training in the United States Army being no longer of prime importance because of the Armistice of November, 1918, were reduced gradually to a small scale. I was then detailed to the United States Ordnance Department and transferred to the New York Arsenal on Governors Island, New York Harbor. There I was directed to establish and direct a small-arms repair station for the overhauling, cleaning, repairing and packing of rifles, revolvers, automatic pistols and machine guns used during the war activities and then being turned in by units returning from overseas and being hastily demobilized. As a part of my duties while at this latter station I was designated as Small-arms Inspector for the Central Armament District, comprising a district extending from New York to the southern boundaries of Virginia, in which there were seven large training camps in each of which was maintained an ordnance unit whose duties it was necessary for me to direct and supervise by personal visits from the headquarters at the New York Arsenal.

The small-arms ordnance activities incident to the turning in of demobilized units were pretty well finished by September of 1919, at which time I requested and obtained my discharge from the Army, to accept a position with the Remington Arms-U. M. C. Company, of Bridgeport, Conn.

I have remained with the Remington Company from that time



to the present. My duties there have consisted of tests and experiments on arms and ammunition of all calibres and types. In connection with these tests it has been practically my daily duty to examine firing pins and breech blocks of such weapons, actually to fire such weapons with various types of cartridges, not only with our own make, but with that of all foreign and American makes; thereafter to preserve the bullets fired from such arms and the shells from which such bullets were fired, and to make a microscopical examination of the marks on such bullets and shells, and comparing such marks with the markings of the rifling, firing pins and breech blocks of the arms from which such bullets were fired.

It is necessary, in making particular determinations, to observe not only the markings on breech blocks and firing pins of fired shells, but also to observe and note any and all impressions made on the shell surface by any portion of the chamber walls of the barrel, and such scoring, gouging, or cutting as will occur through the action of ejectors, extractor hooks, and other parts of the mechanism of rifles, revolvers and automatic pistols.

During the past twenty years I have specialized in marksmanship and have participated in many state and national contests. I have won the regimental championship, 5th Massachusetts, three times, the New England Aggregate, consisting of the highest total of all scores fired over a period of five days at the New England Tournament at Wakefield, Massachusetts, in the summer competition of the year 1907; the Pennsylvania Military Championship in August of 1913; second place in the National Championship, Camp Perry, Ohio, 1911. In 1920 I won the Governor's Cup, Camp Perry, Ohio, from a field of 1,400 competitors, comprising the best selected marksmen of the army, navy, marine corps, National Guard, and civilian rifle clubs throughout the United States. In January, 1923, I was awarded a Distinguished Marksman's rating and decoration by the United States War Department for excellence in competitive marksmanship extending over the years mentioned.

During the years above set forth I have become familiar



by almost daily use, with the examination of guns and ammunition under the microscope, with the use of micrometers and gauge-checking instruments, and am familiar with the latest and most modern appliances for making accurate measurements on such arms and ammunition. I am also familiar with the modern methods of photography to record the marks and impressions of the most minute character on such arms and ammunition.

I further depose and say that I have read and carefully considered the affidavit of Albert H. Hamilton, dated April 14, 1923, on file in this case.

With reference to that portion of said Hamilton affidavit which states said affiant's opinion that the five Vanzetti cartridges were taken from the original package within less than four years of the present time, it is my opinion that said conclusion on the part of the said Hamilton is merely guesswork. My reason for such opinion is that the appearance of age either on the body of shells, or in the lettering, so far as it is based on the appearance of corrosion, is not significant and cannot be significant, because corrosion depends entirely on the extent of the dampness to which such shells have been submitted, and also on the control which the oil present on all shells has exerted on such corrosion. In this case, if there was oil, as is usually the case, in the indentations of the lettering, corrosion would not proceed as rapidly in such indentations as it would on the body of the shells. Microscopic examination shows that there is nothing further in respect to the lettering which assists in the determination of the time when these shells were taken from the original package.

On one of the Remington shells appear the letters "S.H." and it may be noted that the letters "S.H." do not mean soft head, as would appear to be Mr. Hamilton's conception of the meaning of said letters, but mean solid head. It can be determined when shells were last made with the "S.H." appearing on them, but the ascertainment of such date would not affect a determination of the time when such shell or



shells were last taken from the original package, because it is easily understood that these shells, long after such manufacture, may have been allowed to remain in the original package. In so far, however, as the time of removal from the original package is dependent on the appearance of the shells with respect to corrosion, this time, in the absence of definite information from a person with actual knowledge of such time of removal, is necessarily a matter of conjecture or guesswork, as above stated.

It is, therefore, my opinion that it is impossible to determine the age of a shell from the amount of corrosion thereon.

I further depose and say that in my own experience I have observed such discoloration on packages made within a year of the time of my observation, in which such cases the discoloration was evidently due to the conditions surrounding those cartridges, and more especially due to what was probably the action of acid exuding from the pores of the skin of the person or persons who handled such cartridges. When I referred herein before to oil on the shells I referred to lubricating oil which must be present during certain operations in the manufacture of the cartridge case or shell, particularly in the drawing, and which to a greater or lesser extent remains on the casing.

There is nothing in the appearance of the Ripley shells which in my opinion shows them to have left the original package between ten and fifteen years ago. What I have said previously in reference to the appearance of the Vanzetti cartridges applies to the Ripley cartridges. The determination of the time of leaving the original package is entirely guess work.

I further depose and say with reference to the second paragraph on page 5 of the said Hamilton affidavit of April 14, 1923, in which said affiant stated his conclusion that the Ripley cartridge marked "X" had been pressed by someone into the muzzle of a 38-calibre Harrington & Richardson revolver having the exact muzzle measurements of the Vanzetti revolver,



and that said cartridge was not pressed into the muzzle of the Ripley revolver, as follows: I notice that Mr. Hamilton did not in said paragraph state the width of the land cut which he found on said bullet marked "X", nor did he state the corresponding width of the land on the Vanzetti revolver, and that in said paragraph he stated merely his conclusion without giving in detail and with exactness the basis of his conclusion. I found marks on said bullet marked "X", which is one of the so-called Ripley bullets, which apparently were caused by the fact that the bullet at some time had been inserted into the barrel of some firearm. I found five marks on this bullet which were lightly registered thereon, which indicated to me that said bullet had been inserted in the barrel of some firearm having five lands. I measured carefully the width of the land cuts on this bullet and found that they measured in the order in which I examined them .080, .082, .082, .089, and .089 of an inch. I then measured a land of the so-called Vanzetti revolver and found it to measure at its widest point, which occurs at the base of the land, .103, and at the top surface of the land it measured .098. From these measurements and from the appearance under the microscope, I found that one side of the land has a pronounced slope. These measurements prove that the said Ripley bullet marked "X" was not inserted in the barrel of the Vanzetti revolver.

I further depose and say that I then measured a land in the so-called Ripley revolver and found it to measure .0927 of an inch. The walls of this land are practically perpendicular with reference to the axis of the bore and equal in appearance on both sides. It is to be noted, therefore, that the land cuts on the Ripley bullet marked "X" more nearly correspond with the land width in the Ripley revolver than with the land width in the Vanzetti revolver. Lands and grooves, which constitute the rifling of the barrel of a revolver, are made by the same grooving tool, and, therefore, the width of land and groove throughout the barrel is uniform.



The markings on the said Ripley bullet were so slight that it is impossible to determine the pitch of the rifling which caused these markings.

I further depose and say that the Harrington & Richardson revolver is relatively a cheap revolver and that the shop standards as to width of land and groove are not maintained uniformly in the various revolvers manufactured by said company.

I further depose and say that the width of the lead zone between the crimping of the shell on the bullet and the point of the bullet has no significance and can be of no assistance in determining the age of the bullet, for the reason that the width of said zone in a given make of cartridge is dependent on the depth to which the bullet is seated in the shell. The depth to which a bullet is seated in a shell can readily vary by .020 of an inch, even among shells manufactured by the same company and at the same time. An accurate determination of variation within the bullet itself, exclusive of the cartridge shell, can be made only by extracting the bullet and measuring it separately.

I further depose and say that in all of the Vanzetti and Ripley bullets there are scores, bruises, cuts and scratches such as are very common indeed to the exposed portions of lead bullets. Such mutilations occur in manufacture and are present to some extent on cartridges even while being freshly packed at the factory. The further handling of cartridges incident to shipping and storage in the warehouses and sporting goods stores, as well as the tumbling in usage which they are subjected to by the customer, is an experience which it is well known and understood causes any amount of bruising, cutting and scratching as mentioned as being present in the cartridges referred to in this case.

I depose and say further that there is no mark on any of the Ripley or Vanzetti bullets which can be said to be a



scratch of a finger nail to the exclusion of any other means,  
cause, or instrumentality.

Charles J. Van Amburgh

Norfolk, ss

October first, 1923, personally appeared  
the above named Charles J. Van Amburgh, and made oath that the  
foregoing affidavit by him subscribed is true before me.

Harold F. Williams  
Justice of the Peace.  
Notary Public



5545-6

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Com. v. Sacco

Affidavit of

Chas. J. Van Cleeburgh

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OFFICE OF CLERK OF COURTS  
NORFOLK COUNTY.



COMMONWEALTH

v.

NICOLA SACCO ET AL

AFFIDAVIT OF CHARLES J. VAN AMBURGH



## COMMONWEALTH OF MASSACHUSETTS

Norfolk ss

Superior Court  
Criminal SessionCOMMONWEALTH

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NICOLA SACCO ET AL

## AFFIDAVIT OF CHARLES J. VAN AMBURGH

I, Charles J. Van Amburgh, being first duly sworn,  
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My name is Charles J. Van Amburgh. I live at 635 Boston Avenue, Bridgeport, Connecticut. At the present time I am employed by The Remington Arms-Union Metallic Cartridge Company as an assistant ballistic engineer. I am 41 years of age, and my education was obtained in grammar school, supplemented by an attendance of four years, 1906-1910, at the Springfield Technical High School, Springfield, Mass. I took a mechanical course there. From that time to date I have specialized in the handling of firearms and ammunition, devoting particular attention to the experimental end of such work. For nine years I was employed at the Springfield Armory in the Experimental Department, having to do with tests and experiments with rifles, revolvers, pistols and machine guns. Such tests



\* consisted in the adjustment of machine guns and other arms and required a minute study of the markings, chamber impressions, breech-block impressions, firing pin impressions, rifling marks and general manifestations found on bullets and fired cases, (shells), used in the different classes of firearms. The purposes of these tests were to determine the causes of malfunctions in firearms and reasons for determining their misbehavior under any and all conditions of firing. During that time I handled and fired many types of firearms, pistols, revolvers and machine guns as made by the Government and as submitted by inventors, and such as were obtained abroad by military representatives and brought to the Springfield Armory and there tested for the purpose of learning any features of them which might be an improvement or lead to an improvement in the operation and design of the then existing types of weapons used in the various branches of the United States Service, Army, Navy, Marine Corps and National Guard. I was in the employ of the Government at that time as an assistant in the Experimental Department of the Springfield Armory at Springfield, Mass.

During the period of my employment at the Springfield Armory I was detailed on three occasions, one of which was as an inspector of ammunition at the works of the Remington Arms-Union Metallic Cartridge Company, Bridgeport, Conn., and on two occasions as an inspector of pistols and machine guns at the works of the Colts Patent Firearms Company, Hartford, Conn. My experience in such work led to a familiarity with the practice of measuring and gauging of shells, primers, bullets, and all components of small-arms ammunition, and also a familiarity with the methods of measuring and gauging



scientifically with the best known instruments of the interiors of rifled arms and the operations employed in the manufacture of the barrels of all small arms as well as other components of rifles, revolvers and pistols.

At the request of the Ordnance Department in Washington, I accepted a permanent detail to Frankfort Arsenal, at Frankfort, in Philadelphia, Pennsylvania. I was there one year and my duties were as an assistant in the proof-house. Such duties consisted of firing to determine pressure, velocity, and accuracy of cartridges used in the United States Army rifles, revolvers and pistols, also in making determinations of the ballistics of powder samples of smokeless powders used in the above United States Army rifles, revolvers and pistols. During that time cartridges of makes other than used by the United States Services were tested to determine their ballistic properties; also firearms of many makes and kinds were submitted for critical examination. One of the arms which was a subject of daily test and observation was the United States Automatic Pistol which was and is made by the Colts Patent Firearms Company.

As my next employment I accepted a position as assistant proof-master with the New England Westinghouse Company at East Springfield, Mass. That company, during the war, was manufacturing rifles for the Russian Government. My specific duties with that company were, in person, making very important ballistic tests and experiments with rifles and cartridges, namely, in ascertaining velocities, pressures and accuracy as well as determining, experimentally, the serviceability and strength of samples of gun barrel steel submitted from time to time by contractors. My general duties were in directing the proof and accuracy testing of the Russian 3-Line Rifle.

During my service with the New England Westinghouse



Company, I was transferred from their East Springfield plant to their branch plant in Meriden, Conn., where I had sole charge of the lay-out and testing for proof and accuracy of the Russian 3-Line Rifle.

In January of 1917, because of the fall of the Russian Government, work on the Russian rifle was suspended. The Meriden plant was purchased by the Colts Patent Firearms Company of Hartford, Conn. All buildings, machinery, and employes remained and work was taken up for the Colts Company on the United States Machine Rifle, Model 1918. The work on the United States Machine Rifle consisted of designing, testing fixtures and directing tests for pressure proofs of barrels and their accuracy and functioning. I remained with the Colts Company until May, 1918, when I accepted the tender of a commission in the United States Army as an instructor and the rank of Captain, for duty principally at the Small-arms Firing School at Camp Perry, Ohio. My duties as instructor in small-arms firing or marksmanship involved my transfer to various camps, including Camp Dodge, Iowa, training of troops for overseas duty, Camp Benning, Georgia, where I was detailed as an instructor or at the School of Musketry. In January of 1919 the/in <sup>activities</sup> marksmanship and musketry training in the United States Army, being no longer of prime importance because of the Armistice of November, 1918, were reduced gradually to a small scale. I was then detailed to the United States Ordnance Department and transferred to the New York Arsenal on Governors Island, New York Harbor. There I was directed to establish and direct a small-arms repair station for the overhauling, cleaning, repairing and packing of rifles, revolvers, automatic pistols and machine guns used during the war activities and then being



turned in by units returning from overseas and being hastily demobilized. As a part of my duties while at this latter station I was designated as Small-arms Inspector for the Central Armament District, comprising a district extending from New York to the southern boundaries of Virginia, in which there were seven large training camps in each of which was maintained an ordnance unit whose duties it was necessary for me to direct and supervise by personal visits from the headquarters at the New York Arsenal.

The small-arms ordnance activities incident to the turning in of demobilized units were pretty well finished by September of 1919, at which time I requested and obtained my discharge from the army, to accept a position with the Remington Arms-U. M. C. Company, of Bridgeport, Conn.

I have remained with the Remington Company from that time to the present. My duties there have consisted of tests and experiments on arms and ammunition of all calibres and types. In connection with these tests it has been practically my daily duty to examine the rifling in the barrels of pistols and revolvers, to examine firing pins and breech blocks of such weapons, actually to fire such weapons with various types of cartridges, not only with our own make, but with that of all foreign and American makes; thereafter to preserve the bullets fired from such arms and the shells from which such bullets were fired, and to make a microscopical examination of the marks on such bullets and shells, and comparing such marks with the markings of the rifling, firing pins and breech blocks of the arms from which such bullets were fired.

It is necessary, in making particular determinations, to observe not only the markings on breech blocks and firing pins



of fired shells, but also to observe and note any and all impressions made on the shell surface by any portion of the chamber walls of the barrel, and such scoring, gouging, or cutting as will occur through the action of ejectors, extractor hooks, and other parts of the mechanism of rifles, revolvers and automatic pistols.

During the past twenty years I have specialized in marksmanship and have participated in many state and national contests. I have won the regimental championship, 5th Massachusetts, three times, the New England Aggregate, consisting of the highest total of all scores fired over a period of five days at the New England Tournament at Wakefield, Massachusetts, in the summer competition of the year 1907; the Pennsylvania Military Championship in August of 1915; second place in the National Championship, Camp Perry, Ohio, 1911. In 1920, I won the Governor's Cup, Camp Perry, Ohio, from a field of 1,400 competitors, comprising the best selected marksmen of the army, navy, marine corps, National Guard and civilian rifle clubs throughout the United States. In January, 1923, I was awarded a Distinguished Marksmans rating and decoration by the United States War Department for excellence in competitive marksmanship extending over the years mentioned.

During the years above set forth I have become familiar by almost daily use, with the examination of guns and ammunition under the microscope, with the use of micrometers and gauge-checking instruments, and am familiar with the latest and most modern appliances for making accurate measurements on such arms and ammunition. I am also familiar with the modern methods of photography to record the marks and impressions of the most minute character on such arms and ammunition.



I have had no experience in testifying in court as an expert until called by the Government to testify in the cases of Commonwealth v. Sacco and Vanzetti, in the court at Dedham in June, 1921.

I further depose and say that I have read and carefully considered the affidavit of Albert H. Hamilton, dated April 14, 1923, on file in this case.

With reference to that portion of said Hamilton affidavit which states said affiant's opinion that the five Vanzetti cartridges were taken from the original package within less than four years of the present time, it is my opinion that said conclusion on the part of the said Hamilton is merely guess-work. My reason for such opinion is that the appearance of age either on the body of shells, or in the lettering, so far as it is based on the appearance of corrosion, is not significant and cannot be significant, because corrosion depends entirely on the extent of the dampness to which such shells have been submitted, and also on the control which the oil present on all shells has exerted on such corrosion. In this case, if there was oil, as is usually the case, in the indentations of the lettering, corrosion would not proceed as rapidly in such indentations as it would on the body of the shells. The only scientific determination which can be made as to the age and discoloration is to ascertain when last any of those particular shells were manufactured.

On one of the Remington shells appears the letters "S. H.", which means solid head, and it can be determined when shells were last made with the "S. H." appearing on them, but the ascertainment of such date would not affect a determination of the time when shell or shells were last taken from the



original package, because it is easily understood that these shells, long after such manufacture, may have been allowed to remain in the original package. In so far, however, as the time of removal from the original package is dependent on the appearance of the shells with respect to corrosion, this time, in the absence of definite information from a person with actual knowledge of such time of removal, is necessarily a matter of conjecture or guess-work, as above stated.

It is, therefore, my opinion that it is impossible to determine the age of a shell from the amount of corrosion thereon.

I further depose and say that in my own experience I have observed such discoloration on packages made within a year of the time of my observation, in which such cases the discoloration was evidently due to the conditions surrounding those cartridges, and more especially due to what was probably the action of acid exuding from the pores of the skin of the person or persons who handled such cartridges. When I referred herein before to oil on the shells I referred to lubricating oil which must be present during certain operations in the manufacture of the cartridge case or shell, particularly in the drawing, and which to a greater or lesser extent remains on the casing.

I further depose and say with reference to the second paragraph on page 5 of the said Hamilton affidavit of April 14, 1923, in which said affiant stated his conclusion that the Ripley cartridge marked "X" had been pressed by someone into the muzzle of a 38-calibre Harrington & Richardson revolver having the exact muzzle measurements of the Vanzetti revolver, and that said cartridge was not pressed into the muzzle of the Ripley revolver, as follows: I notice that Mr. Hamilton did not in said paragraph state the width of the land cut which



he found on said bullet marked "X", nor did he state the corresponding width of the land on the Vanzetti revolver, and that in said paragraph he stated merely his conclusion without giving in detail and with exactness the basis of his conclusion. I found a mark on said bullet marked "X" which is one of the so-called Ripley bullets, which apparently was caused by the fact that the bullet at some time had been inserted into the muzzle, or possibly into the breach, of some firearm. I found five marks on this bullet which were lightly registered thereon, which indicated to me that said bullet had been inserted in the barrel of some firearm having five lands. I measured carefully the width of the land cuts on this bullet and found that they measured in the order in which I examined them .080, .082, .082, .089, and .089 of an inch. I then measured a land of the so-called Vanzetti revolver at the muzzle and found it to measure at its widest point, which occurs at the base of the land, .103, and at the top surface of the land it measured .098. From these measurements and from the appearance under the microscope, I found that one side of the land has a pronounced slope. These measurements prove that the said Ripley bullet marked "X" was not inserted in the muzzle of the Vanzetti revolver.

I further depose and say that I then measured two lands in the so-called Ripley revolver and found them to measure .0927 and .0919 of an inch. The walls of these lands are practically perpendicular with reference to the axis of the bore and equal in appearance on both sides. It is to be noted, therefore, that the land cuts on the Ripley bullets marked "X" more nearly correspond with the land width in the Ripley Revolver than with the land width in the Vanzetti revolver.



Lands and curves, which constitutes the rifling of the barrel of a revolver, are made by the same grooving tool, and, therefore, the width of land and groove throughout the barrel must be very nearly uniform. The markings on the said Ripley bullet were so slight that it is impossible to determine the pitch of the rifling which caused these markings.

I further depose and say that the Harrington and Richardson revolver is relatively a cheap revolver and that the sharp standards as to widths of land and groove are not maintained uniformly in the various revolvers manufactured by said company. So far as the standard widths of land and grooves is concerned, the Smith & Wesson and Iver Johnson companies each manufacture revolvers with five lands and five grooves of approximately the same standard width as those in the Harrington & Richardson revolvers.

I further depose and say that the width of the lead zone between the crimping of the shell on the bullet and the point of the bullet has no significance and can be of no assistance in determining the age of the bullet, for the reason that the width of said zone in a given cartridge is dependent on the depth to which that bullet is seated in the shell. The depth to which a bullet is seated in a shell can readily vary by .020 of an inch, even among shells manufactured by the same company and at the same time. An accurate determination of variation within the bullet itself, exclusive of the cartridge shell, can be made only by extracting the bullet and measuring it separately.

I further depose and say that in all of the Vanzetti and Ripley bullets there are scores, bruises, cuts and scratches such as are very commonly indeed to the exposed portions of



lead bullets. Such mutilations occur in manufacture and are present to some extent on cartridges even while being freshly packed at the factory. The further handling of cartridges incident to shipping and storage in the warehouses and sporting goods stores, as well as the tumbling in usage which they are subjected to by the customer, is an experience which it is well known and understood causes any amount of bruising, cutting and scratching as mentioned as being present in the cartridges referred to in this case.

I depose and say further that there is no mark on any of the Ripley or Vanzetti bullets which can be said to be a scratch of a finger nail to the exclusion of any other means, cause, or instrumentality.

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Norfolk ss.

October 1, 1923.

Personally appeared the above named Charles J. Van Amburgh, and made oath that the foregoing affidavit by him subscribed is true before me.

---

Justice of the Peace.



BOND

HAMMERBORN



COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss

Superior Court  
Criminal Session

COMMONWEALTH

v.

NICOLA SACCO et al

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on oath depose and say as follows:

My name is Charles J. Van Amburgh. I live at 635 Boston Avenue, Bridgeport, Connecticut. At the present time I am employed by The Remington Arms-Union Metallic Cartridge Company as an assistant ballistic engineer. I am 41 years of age, and my education was obtained in grammar school, supplemented by an attendance of four years, 1906-1910, at the Springfield Technical High School, Springfield, Mass. I took a mechanical course there. From that time to date I have specialized in the handling of firearms and ammunition, devoting particular attention to the experimental end of such work. For nine years I was employed at the Springfield Armory in the Experimental Department, having to do with tests and experiments with rifles, revolvers, pistols and machine guns. Such tests consisted in the adjustment of machine guns and other arms and required a minute study of the markings, chamber impressions, breech-block impressions, firing pin impressions,



rifling marks and general manifestations found on bullets and fired cases, (shells), used in the different classes of firearms. The purposes of these tests were to determine the causes of mal-functions in firearms and reasons for determining their misbehavior under any and all conditions of firing. During that time I handled and fired many types of firearms, pistols, revolvers and machine guns as made by the Government and as submitted by inventors, and such as were obtained abroad by military representatives and brought to the Springfield Armory and there tested for the purpose of learning any features of them which might be an improvement or lead to an improvement in the operation and design of the then existing types of weapons used in the various branches of the United States Service, Army, Navy, Marine Corps and National Guard. I was in the employ of the Government at that time as an assistant in the Experimental Department of the Springfield Armory at Springfield, Mass.

During the period of my employment at the Springfield Armory I was detailed on three occasions, one of which was as an inspector of ammunition at the works of the Remington Arms-Union Metallic Cartridge Company, Bridgeport, Conn., and on two occasions as an inspector of pistols and machine guns at the works of the Colts Patent Firearms Company, Hartford, Conn. My experience in such work led to a familiarity with the practice of measuring and gauging of shells, primers, bullets, and all components of small-arms ammunition, and also a familiarity with the methods of measuring and gauging scientifically with the best known instruments the interiors of rifled arms and the operations employed in the manufacture of the barrels of all small arms as well as other components of rifles, revolvers and pistols.

At the request of the Ordnance Department in Washington, I accepted a permanent detail to Frankfort Arsenal, at Frankfort, in Philadelphia, Pennsylvania. I was there one year and my duties were as an assistant in the proof-house. Such duties



consisted of firing to determine pressure, velocity, and accuracy of cartridges used in the United States Army rifles, revolvers and pistols, also in making determinations of the ballistics of powder samples of smokeless powders used in the above United States Army rifles, revolvers and pistols. During that time cartridges of makes other than used by the United States Services were tested to determine their ballistic properties; also firearms of many makes and kinds were submitted for critical examination. One of the arms which was a subject of daily test and observation was the United States Automatic Pistol which was and is made by the Colts Patent Firearms Company.

As my next employment I accepted a position as assistant proof-master with the New England Westinghouse Company at East Springfield, Mass. That company, during the war, was manufacturing rifles for the Russian Government. My specific duties with that company were, in person, making very important ballistic tests and experiments with rifles and cartridges, namely, in ascertaining velocities, pressures and accuracy as well as determining, experimentally, the serviceability and strength of samples of gun barrel steel submitted from time to time by contractors. My general duties were in directing the proof and accuracy testing of the Russian 3-Line Rifle.

During my service with the New England Westinghouse Company, I was transferred from their East Springfield plant to their branch plant in Meriden, Conn., where I had sole charge of the lay-out and testing for proof and accuracy of the Russian 3-Line Rifle.

In January of 1917, because of the fall of the Russian Government, work on the Russian rifle was suspended. The Meriden plant was purchased by the Colts Patent Firearms Company of Hartford, Conn. All buildings, machinery, and employes remained and work was taken up for the Colts Company on the United States Machine Rifle, Model 1918. The work on the United States Machine Rifle consisted of designing,



testing fixtures and directing tests for pressure proofs of barrels and their accuracy and functioning. I remained with the Colts Company until May, 1918, when I accepted the tender of a commission in the United States Army, as an instructor and the rank of Captain, for duty principally at the Small-arms Firing School at Camp Perry, Ohio. My duties as instructor in small-arms firing or marksmanship involved my transfer to various camps, including Camp Dodge, Iowa, training of troops for overseas duty, Camp Benning, Georgia, where I was detailed as an instructor at the School of Musketry. In January of 1919 the activities in marksmanship and musketry training in the United States Army being no longer of prime importance because of the Armistice of November, 1918, were reduced gradually to a small scale. I was then detailed to the United States Ordnance Department and transferred to the New York Arsenal on Governors Island, New York Harbor. There I was directed to establish and direct a small-arms repair station for the overhauling, cleaning, repairing and packing of rifles, revolvers, automatic pistols and machine guns used during the war activities and then being turned in by units returning from overseas and being hastily demobilized. As a part of my duties while at this latter station I was designated as Small-arms Inspector for the Central Armament District, comprising a district extending from New York to the southern boundaries of Virginia, in which there were seven large training camps in each of which was maintained an ordnance unit whose duties it was necessary for me to direct and supervise by personal visits from the headquarters at the New York Arsenal.

The small-arms ordnance activities incident to the turning in of demobilized units were pretty well finished by September of 1919, at which time I requested and obtained my discharge from the Army, to accept a position with the Remington Arms-U. M. C. Company, of Bridgeport, Conn.

I have remained with the Remington Company from that time



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to the present. My duties there have consisted of tests and experiments on arms and ammunition of all calibres and types. In connection with these tests it has been practically my daily duty to examine firing pins and breech blocks of such weapons, actually to fire such weapons with various types of cartridges, not only with our own make, but with that of all foreign and American makes; thereafter to preserve the bullets fired from such arms and the shells from which such bullets were fired, and to make a microscopical examination of the marks on such bullets and shells, and comparing such marks with the markings of the rifling, firing pins and breech blocks of the arms from which such bullets were fired.

It is necessary, in making particular determinations, to observe not only the markings on breech blocks and firing pins of fired shells, but also to observe and note any and all impressions made on the shell surface by any portion of the chamber walls of the barrel, and such scoring, gouging, or cutting as will occur through the action of ejectors, extractor hooks, and other parts of the mechanism of rifles, revolvers and automatic pistols.

During the past twenty years I have specialized in marksmanship and have participated in many state and national contests. I have won the regimental championship, 5th Massachusetts, three times, the New England Aggregate, consisting of the highest total of all scores fired over a period of five days at the New England Tournament at Wakefield, Massachusetts, in the summer competition of the year 1907; the Pennsylvania Military Championship in August of 1913; second place in the National Championship, Camp Perry, Ohio, 1911. In 1920 I won the Governor's Cup, Camp Perry, Ohio, from a field of 1,400 competitors, comprising the best selected marksmen of the army, navy, marine corps, National Guard, and civilian rifle clubs throughout the United States. In January, 1923, I was awarded a Distinguished Marksman's rating and decoration by the United States War Department for excellence in competitive marksmanship extending over the years mentioned.

During the years above set forth I have become familiar



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by almost daily use, with the examination of guns and ammunition under the microscope, with the use of micrometers and gauge-checking instruments, and am familiar with the latest and most modern appliances for making accurate measurements on such arms and ammunition. I am also familiar with the modern methods of photography to record the marks and impressions of the most minute character on such arms and ammunition.

I further depose and say that I have read and carefully considered the affidavit of Albert H. Hamilton, dated April 14, 1923, on file in this case.

With reference to that portion of said Hamilton affidavit which states said affiant's opinion that the five Vanzetti cartridges were taken from the original package within less than four years of the present time, it is my opinion that said conclusion on the part of <sup>the</sup> said Hamilton is merely guesswork. My reason for such opinion is that the appearance of age either on the body of shells, or in the lettering, so far as it is based on the appearance of corrosion, is not significant and cannot be significant, because corrosion depends entirely on the extent of the dampness to which such shells have been submitted, and also on the control which the oil present on all shells has exerted on such corrosion. In this case, if there was oil, as is usually the case, in the indentations of the lettering, corrosion would not proceed as rapidly in such indentations as it would on the body of the shells. Microscopic examination shows that there is nothing further in respect to the lettering which assists in the determination of the time when these shells were taken from the original package.

One of the Remington shells appears the letters "S. H." and it may be noted that the letters "S.H." do not mean soft head, as would appear to be Mr. Hamilton's conception of the meaning of said letters, but mean solid head. It can be determined when shells were last made with the "S.H." appearing on them, but the ascertainment of such date would not affect a determination of the time when such shell or



shells were last taken from the original package, because it is easily understood that these shells, long after such manufacture, may have been allowed to remain in the original package. In so far, however, as the time of removal from the original package is dependent on the appearance of the shells with respect to corrosion, this time, in the absence of definite information from a person with actual knowledge of such time of removal, is necessarily a matter of conjecture or guesswork, as above stated.

It is, therefore, my opinion that it is impossible to determine the age of a shell from the amount of corrosion thereon.

I further depose and say that in my own experience I have observed such discoloration on packages made within a year of the time of my observation, in which such cases the discoloration was evidently due to the conditions surrounding these cartridges, and more especially due to what was probably the action of acid exuding from the pores of the skin of the person or persons who handled such cartridges. When I referred herein before to oil on the shells I referred to lubricating oil which must be present during certain operations in the manufacture of the cartridge case or shell, particularly in the drawing, and which to a greater or lesser extent remains on the casing.

There is nothing in the appearance of the Ripley shells which in my opinion shows them to have left the original package between ten and fifteen years ago. What I have said previously in reference to the appearance of the Vanzetti cartridges applies to the Ripley cartridges. The determination of the time of leaving the original package is entirely guess work.

I further depose and say with reference to the second paragraph on page 5 of the said Hamilton affidavit of April 14, 1923, in which said affiant stated his conclusion that the Ripley cartridge marked "X" had been pressed by someone into the muzzle of a 38-calibre Harrington & Richardson revolver having the exact muzzle measurements of the Vanzetti revolver,



and that said cartridge was not pressed into the muzzle of the Ripley revolver, as follows: I notice that Mr. Hamilton did not in said paragraph state the width of the land cut which he found on said bullet marked "X", nor did he state the corresponding width of the land on the Vanzetti revolver, and that in said paragraph he stated merely his conclusion without giving in detail and with exactness the basis of his conclusion. I found marks on said bullet marked "X", which is one of the so-called Ripley bullets, which apparently were caused by the fact that the bullet at some time had been inserted into the barrel of some firearm. I found five marks on this bullet which were lightly registered thereon, which indicated to me that said bullet had been inserted in the barrel of some firearm having five lands. I measured carefully the width of the land cuts on this bullet and found that they measured in the order in which I examined them .080, .082, .082, .089, and .089 of an inch. I then measured a land of the so-called Vanzetti revolver and found it to measure at its widest point, which occurs at the base of the land, .103, and at the top surface of the land it measured .098. From these measurements and from the appearance under the microscope, I found that one side of the land has a pronounced slope. These measurements prove that the said Ripley bullet marked "X" was not inserted in the barrel of the Vanzetti revolver.

I further depose and say that I then measured a land in the so-called Ripley revolver and found it to measure .0927 of an inch. The walls of this land are practically perpendicular with reference to the axis of the bore and equal in appearance on both sides. It is to be noted, therefore, that the land cuts on the Ripley bullet marked "X" more nearly correspond with the land width in the Ripley revolver than with the land width in the Vanzetti revolver. Lands and grooves, which constitute the rifling of the barrel of a revolver, are made by the same grooving tool, and, therefore, the width of land and groove throughout the barrel is uniform.



The markings on the said Ripley bullet were so slight that it is impossible to determine the pitch of the rifling which caused these markings.

I further depose and say that the Harrington & Richardson revolver is relatively a cheap revolver and that the shop standards as to width of land and groove are not maintained uniformly in the various revolvers manufactured by said company.

I further depose and say that the width of the lead zone between the crimping of the shell on the bullet and the point of the bullet has no significance and can be of no assistance in determining the age of the bullet, for the reason that the width of said zone in a given make of cartridge is dependent on the depth to which the bullet is seated in the shell. The depth to which a bullet is seated in a shell can readily vary by .020 of an inch, even among shells manufactured by the same company and at the same time. An accurate determination of variation within the bullet itself, exclusive of the cartridge shell, can be made only by extracting the bullet and measuring it separately.

I further depose and say that in all of the Vanzetti and Ripley bullets there are scores, bruises, cuts and scratches such as are very common indeed to the exposed portions of lead bullets. Such mutilations occur in manufacture and are present to some extent on cartridges even while being freshly packed at the factory. The further handling of cartridges incident to shipping and storage in the warehouses and sporting goods stores, as well as the tumbling in usage which they are subjected to by the customer, is an experience which it is well known and understood causes any amount of bruising, cutting and scratching as mentioned as being present in the cartridges referred to in this case.

I depose and say further that there is no mark on any of the Ripley or Vanzetti bullets which can be said to be a



scratch of a finger nail to the exclusion of any other means,  
cause, or instrumentality.

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Norfolk, ss

October first, 1923, personally appeared  
the above named Charles J. Van Amburgh, and made oath that the  
foregoing affidavit by him subscribed is true before me.

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Justice of the Peace.