

.256 inch and .276 inch ENFIELD EXPERIMENTAL AMMUNITION

By 1903 the first Mark of .303 inch Short Magazine Lee Enfield rifle had been approved for service, progressively replacing the earlier Lee Enfield and Lee Metford long rifles and carbines with the new rifle intended for common use by infantry, cavalry and other arms. Notwithstanding the fact that the SMLE rifle later proved itself as one of the most efficient bolt action rifles of all time, its initial introduction in Britain met with considerable adverse comment, not least from target shooters who saw in the SMLE a weapon inherently less accurate than the earlier long Lee Enfield.

The War Office, for somewhat different reasons, also had some reservations and did not see the SMLE as the long term future rifle. As early as 1908 the Chief Superintendent of Ordnance Factories had recommended to the Director of Artillery that .256 inch calibre ammunition to a new design should be made up for trial to gain experience with high velocity rimless cased ammunition. These ammunition trials had been extended by 1909 to include .276 inch calibre ammunition, the weapons being suitably chambered barrels of the appropriate calibre screwed on to Lee Enfield actions with the actions being altered to have front locking lugs to gain improved accuracy.

It was not until 1910 that a draft specification was drawn up for a new service rifle and, in September 1910, the Small Arms Committee agreed, *inter alia*, the following points:-

1. The length of the new rifle, to be common for both infantry and cavalry, was to be as close as possible to the .303 inch SMLE rifle.
2. It was to be fitted with a ten round detachable magazine.
3. It was to be charger loaded.
4. A Mauser type action was to be employed with:
  - a. forward locking lugs with a secondary safety shoulder to the bolt and
  - b. a rotary bolt movement to obtain primary extraction, the extractor not to rotate with the bolt.
5. It was to have an aperture backsight, adjustable for all RANGES TO 1600

6. The new rifle was to use rimless cartridges (calibre was not at this time laid down).

Prior to the final selection of a final cartridge, which was in .276 inch calibre, a very considerable trials programme with both .256 inch and .276 inch ammunition was carried out.

#### .256 inch CALIBRE AMMUNITION

In October 1908 the Director of Artillery approved CSOF's recommendation to experiment with .256 inch calibre ammunition and two barrels were therefore manufactured and screwed to Lee Enfield actions, chambered to take a rimless cartridge to design RL 16007. It was intended that this cartridge, with a 150 grain bullet, would achieve a muzzle velocity of 2800 f/s (853 m/s). In all three variants of RL 16007 were made, all in .256 inch calibre, but varying as follows:-

RL 16007A having a thicker base than the original but retaining the single firehole in the anvil tip found with RL 16007

RL 16007B having an altered neck

RL 16007C having a different cap, of copper.



|   |       |           |
|---|-------|-----------|
| Overall length                                | 3.2"  | (81.3 mm) |
| Case Length                                   | 2.24" | (56.9 mm) |
| Head diameter                                 | .518" | (13.2 mm) |
| Rim diameter                                  | .514" | (13.0 mm) |
| Bullet to design RL 16006                     |       |           |
| Diameter                                      | .262" | (6.65 mm) |
| Lead core. Bullet common to all four variants |       |           |

Fig 1 .256 inch Cartridge RL 16007

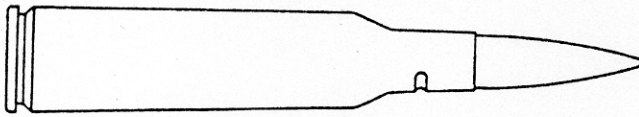
With a charge of 44 grains MDS cordite RL 16007 achieved a muzzle velocity of 2767 f/s (843 m/s).

RL 16007C was later necked out to .276 inch calibre, the two larger calibre versions being designs RL 16273A and RL 16273B.

Although the .276 inch calibre ultimately emerged as dominant, work on the .256 inch calibre continued until at least mid 1912 in at least three further main .256 inch designs:-

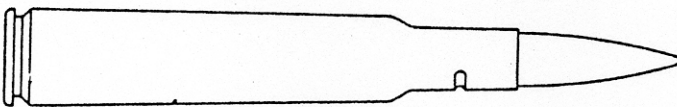


RL 16939 and its variant RL 16939A  
 RL 17303  
 RL 17305 and its variant RL 17305A ) dated 1911  
 (RL 17305A was semi rimless)



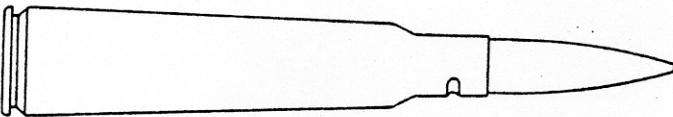
Overall length 3.187" (81 mm)  
 Case length 2.36" (60 mm)  
 Head diameter .519" (13.2 mm)  
 Rim diameter .514" (13.0 mm)  
 Bullet 144 grains  
 (RL 16939A had a 155 gr bullet)

Fig 2 .256 inch Cartridge RL 16939



Overall length 3.387" (86 mm)  
 Case length 3.58" (65.5 mm)  
 Head diameter .479" (12.2 mm)  
 Rim diameter .474" (12 mm)  
 Bullet 155 grains

Fig 3 .256 inch Cartridge RL 17303



Overall length 3.387" (86 mm)  
 Case length 2.45" (62.2 mm)  
 Head diameter .522" (13.3 mm)  
 Rim diameter .534" (13.6 mm)  
 Bullet 155 grains to design  
 RL 16939A  
 (Cartridge RL 17305 differed in being rimless)

Fig 4 .256 inch Cartridge RL 17305A  
 (semi rimless)

As late as 1912/13 the Design Department at Woolwich produced a drawing RL 20072 covering a .256 inch steel cored bullet with a copper envelope.

It was concluded by the Small Arms Committee that to achieve 2800 f/s velocity in .256 inch calibre with a bullet of .26" (6.65 mm) diameter, a charge of 48 to 50 grains of MDS cordite would be needed and this in turn would require a case length of 2.835" (72 mm). This length was very undesirable, coupled with which were manufacturing problems connected with necking down cases to this calibre. These were strong factors in the ultimate decision to concentrate on the .276 inch calibre.

### .276 inch CALIBRE AMMUNITION

In general the rimless cased .276 inch ammunition retained the large capacity cases of the .256 inch series and, initially at least, bullet weights of around 150 grains which had characterised the .256 inch series were also retained.

In any examination of .276 inch ammunition (and to a lesser extent .256 inch) it becomes apparent that RL (Royal Laboratory) drawing references were allocated, with no apparent reason for different treatment, to complete cartridges, to cases alone and to bullets alone. Sometimes individual bullet drawing references became matched to particular cartridge cases but some seem not to have been used with any specific case and used for the bullet alone.

At least forty eight different .276 inch ball cartridge designs existed and, while many of these differed only in having bullet variations, at least thirty case types or significant case variations are included in the total. Additionally for certain of the more established .276 inch design variations other than ball existed, - drill, dummy, blank and proof.

Excluding .276 inch bullets forming part of a specific RL cartridge drawing and therefore bearing the same RL number, at least fifty four other .276 inch ball bullets were designed between 1909 and 1912. Further .276 inch ball and armour piercing bullet designs appeared during the 1914-18 war.

In 1909 the first .276 inch barrel was made up, chambered for cartridge RL 16273 (which was the .276 inch version of the earlier .256 inch RL 16007C). RL 16273 existed in variants "A" and "B", both having one firehole in the tip of the anvil.

|                 | "A"                                    | "B"                                       |
|-----------------|--|---|
| Bullet          | 150 grains, design<br>design RL 16515A | 141 grains<br>supplied by Kings<br>Norton |
| Muzzle Velocity | 2799 f/s (853 m/s)                     | 2788 f/s (850 m/s)                        |
| MDS Cordite     | 48.4 grains                            | 48.6 grains                               |

"B" also had a thicker cap, burred in.





Overall length 3.17" (80.5 mm)  
 Case length 2.24" (56.9 mm)  
 Head diameter .518" (13.2 mm)  
 Rim diameter .514" (13.0 mm)  
 Bullet. 150 grain  
 design RL 16515A

Fig 5 .276 inch Cartridge RL 16273A

(Cartridge RL 16273B with the 141 grain KN bullet had an overall length of 3.02" (76.7 mm))

Two further variants of RL 16273 existed, "C" and "D" which had normal two hole Berdan type primers in place of single hole. "C" retained the 150 grain bullet to RL 16515A while "D" had a 150 grain bullet to RL 16515 which was slightly larger in diameter but shorter than RL 16515A.

Influenced by the .280 inch Ross bullet then under trial elsewhere, the Small Arms Committee in December 1909 requested a 180 grain bullet for the .276 inch trials, this weight being similar to that of the Ross. The Small Arms Committee also wished to see how the 180 grain bullet would perform with an increased charge, even if this meant using a longer cartridge case. A series of longer cased cartridges were in due course produced for trial with 180 grain bullets by the Ordnance Board, but in the meantime further shorter case trial work continued.



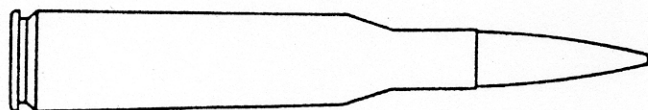
Length 1.54" (39.12 mm)  
 Diameter .280" (7.11 mm)

Steel envelope

Fig 6 .280 Ross 180 grain Match Bullet

Cartridge RL 16749 of 1910 appears to be a significant design in that it was the first of the .276 inch series to employ a case length of 2.36 inches (59.9 mm) which was the length finally chosen for the 1913 troop trials cartridge, although a variety of other lengths were tried in the interim. Two additional variants of RL 16749 also existed, all three cartridges having the same case length and all used 150 grain bullets as follows:-

RL 16749 150 grain bullet to design RL 16776  
 RL 16749A 150 grain bullet to design RL 16776 (This variant had a modified neck, cap and cap burr)  
 RL 16749B 150 grain bullet to design RL 16515A ("B" also had a slightly modified cap)

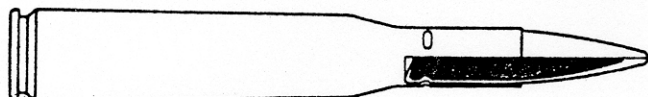


Overall length 3.17" (80.5 mm)  
 Case length 2.36" (59.9 mm)  
 Head diameter .519" (13.2 mm)  
 Rim diameter .514" (13.0 mm)

Fig 7 .276 Cartridge RL 16749B

The case of RL 16749B later appeared in cartridge designs RL 16934 and RL 17295

Shortly afterwards in 1910 two designs of long necked .276 inch cartridge were produced, RL 16762 and RL 16762A, the "A" variant differing, apart from the bullet, in having a slightly modified cap.



Overall length 3.17" (80.15 mm)  
 Case length 2.585" (65.7 mm)  
 Neck length .62" (15.75 mm)  
 Head diameter .479" (12.2 mm)  
 Rim diameter .474" (12.0 mm)  
 Bullet 150 grain to design RL 16776A. The "A" cartridge variant had a 150 grain bullet RL 16515B)

Fig 8 .276 inch Cartridge RL 16762

In June 1910 six .276 inch cartridges were put up for trial by the Ordnance Board, representing an effort to consolidate the experience gained so far and incorporating the earlier Small Arms Committee request for 180 grain bullets in longer cases. Three different case lengths were involved, each of which were loaded with two weights of bullet - 150 grain and 180 grain.

| Cartridge Design | Bullet Design | Bullet Weight (grains) | Case Length |      | Overall Length |    | Case Capacity (Cu in) |
|------------------|---------------|------------------------|-------------|------|----------------|----|-----------------------|
|                  |               |                        | in.         | mm   | in.            | mm |                       |
| RL 16933         | RL 17094      | 180                    | 2.36        | 59.9 | 3.19           | 81 | .256                  |
| RL 16934         | RL 16515B     | 150                    | 2.36        | 59.9 | 3.19           | 81 | .267                  |
| RL 16935         | RL 17094      | 180                    | 2.56        | 65.0 | 3.39           | 86 | .284                  |
| RL 16936         | RL 16515B     | 150                    | 2.56        | 65.0 | 3.39           | 86 | .295                  |
| RL 16937         | RL 17094      | 180                    | 2.76        | 70.1 | 3.59           | 91 | .312                  |
| RL 16938         | RL 16515B     | 150                    | 2.76        | 70.1 | 3.59           | 91 | .323                  |



In these trials RL 16936 was a cartridge which was considered good and not to have given trouble and variants of this design appeared later. Designs RL 16933 and RL 16934 which had a common case appeared in later trials loaded with 150 grain and 180 grain bullets to designs RL 16977A, 16979A, 17351A, 17351/1, /2, /3 and RL 17351/4\ (RL 17351/1 was the same as RL 16515B). Case RL 16937 appeared later in cartridge RL 17296 loaded with 150 grain bullet RL 16980A.



Fig 9 .276 inch Cartridge RL 16933

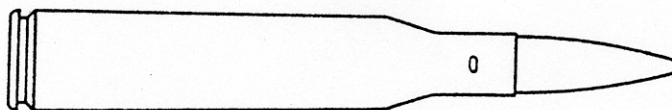


Fig 10 .276 inch Cartridge RL 16935

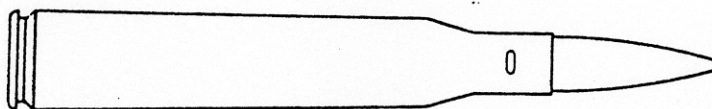


Fig 11 .276 inch Cartridge RL 16938



Fig 12  
.276 inch Bullet  
RL 17351/1 (same as  
RL 16515B)  
150 grains  
Length: 1.217" (30.9 mm)  
Core: Lead/antimony



Fig 13  
.276 inch bullet  
RL 17351/2  
150 grains  
Length: 1.299" (33 mm)  
Core: Aluminium tip  
filler



Fig 14  
.276 inch bullet  
RL 17351/3  
150 grains  
Length: 1.38" (35 mm)  
Core: Aluminium tip  
filler



Fig 15  
 .276 inch bullet  
 RL 16977A  
 180 grains  
 Length: 1.531" (38.8 mm)  
 Core: Lead/antimony



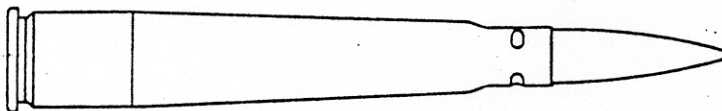
Fig 16  
 .276 inch bullet  
 RL 16978A  
 150 grains  
 Length: 1.531" (38.8 mm)  
 Core: Aluminium tip  
 filler



Fig 17  
 .276 inch bullet  
 RL 16980A  
 150 grains  
 Length: 1.391" (35.3 mm)  
 Core: Aluminium tip  
 filler

(all the bullets in Figs 11-16 had a diameter of .283" (7.18 mm))

At about this time a design of .276 inch cartridge was experimented with having a long tapered case and a semi rimless head. The necking was designed to be as for the service .303 inch cartridge. This cartridge was to design RL 17137.



Overall length 3.587" (91.1 mm)  
 Case length 2.73" (69.3 mm)  
 Head diameter .50" (12.7 mm)  
 Rim diameter .544" (13.8 mm)  
 Bullet. 150 grains to design  
 RL 16515B

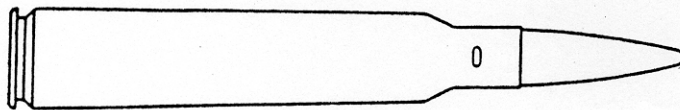
Fig 18 .276 inch Cartridge RL 17137

The specification for a new rifle was, as already mentioned, issued in 1910 and stated the need for a rimless cartridge case but with calibre unspecified. In June 1911, the Director of Artillery asked the Small Arms Committee for its recommendations in .276 inch calibre, not .256 inch, and in the same month the Committee recommended that the Chief Superintendent of Ordnance Factories should make up rimless ammunition to design RL 17460 with an overall length of 3.4 inches (86.4 mm) to be fitted with the following bullets:-

Bullet type RL 16515B in three weights - 155, 165 and 175 grain

Bullet type 17094 with reductions in weight achieved by inserting aluminium tip fillers in three weights - 155, 165 and 175 grain.





Overall length 3.387" (86.0 mm)  
 Case length 2.585" (65.7 mm)  
 Head diameter .521" (13.2 mm)  
 Rim diameter .520" (13.2 mm)

Fig 19 .276 inch Cartridge RL 17460  
 (with bullet RL 16515B, 150 grains)

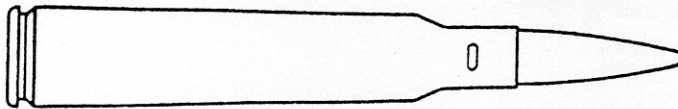
Five hundred rounds of each loading of RL 17460 were made up for trials to determine velocity, pressure, accuracy and trajectory. The barrels for these trials were fitted to Lee Enfield actions. At the same time the manufacture of two complete .276 inch rifles embodying all the points of the new rifle specification was put in hand, the rifles to be chambered for RL 17460.

By September 1911, CSOF had recognised that to fit all six bullet designs to the one case was impracticable since the 175 grain bullets projected too far into the case and gas escaped past the bullet before it was sealed in the barrel. As a result a further series of cartridges were manufactured with cases to design RL 17511A and RL 17511B ("B" having a slightly longer neck than "A"), both being generally similar to the earlier RL 16936 which had given good results in the Ordnance Board trials. RL 17511A and B were improvements on RL 16936 in that they had less severe necking and gave easier extraction. Various bullets were loaded into these cases:-

| Bullet Design | Weight (grains) | Core     | Case Capacity (Cu in) | MDT Cordite Charge (grains) | Cartridge Overall Length in. mm | Observed Velocity f/s m/s |
|---------------|-----------------|----------|-----------------------|-----------------------------|---------------------------------|---------------------------|
| RL 17509(1)   | 155             | Lead/ant | .271                  | 50.6                        | 3.4 86.4                        | 2791 851                  |
| RL 17509(2)   | 165             | Lead/ant | .267                  | 53.0                        | 3.4 86.4                        | 2737 834                  |
| RL 17509(3)   | 175             | Lead/ant | .270                  | 53.2                        | 3.5 88.9                        | 2701 823                  |
| RL 17509(4)   | 155             | Alum tip | .275                  | 54.5                        | 3.55 90.1                       | 2874 876                  |
| RL 17509(5)   | 165             | Alum tip | .275                  | 53.0                        | 3.55 90.1                       | 2769 844                  |
| RL 17509(6)   | 175             | Alum tip | .275                  | 52.5                        | 3.55 90.1                       | 2691 820                  |

RL 17509(1) and RL 17509(2) were fitted to case RL 17511A and the other bullet to case RL 17511B.

A third variant - RL 17511C was later produced and fitted with a 180 grain bullet.



Overall length 3.4" (86.4 mm)  
 Case length 2.585" (65.7 mm)  
 Head diameter .523" (13.3 mm)  
 Rim diameter .517" (13.1 mm)  
 (Head diameter of variants "B"  
 and "C" was .528" (13.4 mm),  
 rim diameter being unchanged)

Fig 20 .276 inch Cartridge RL 17511A  
 (with 155 grain RL 17509(1) bullet)

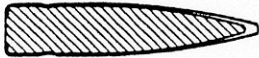


Fig 21  
 .276 inch bullet  
 RL 17509(1)  
 155 grain  
 Length: 1.249" (31.7 mm)  
 Core: Lead/antimony  
 (Construction also  
 representative of  
 17509(2) and (3))

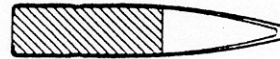


Fig 22  
 .276 inch bullet  
 RL 17509(4)  
 155 grain  
 Length: 1.395" (35.4 mm)  
 Core: Aluminium tip  
 filler



Fig 23  
 .276 inch bullet  
 RL 17509(5)  
 165 grain  
 Length: 1.395" (35.4 mm)  
 Core: Aluminium tip  
 filler



Fig 24  
 .276 inch bullet  
 RL 17509(6)  
 175 grain  
 Length: 1.395" (35.4 mm)  
 Core: Aluminium tip  
 filler

(All bullets in Figs 20 to 23 had .283" (7.18 mm) diameters)

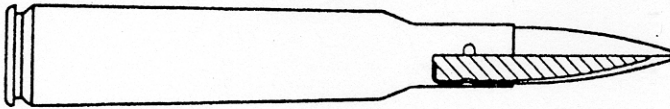
The trials with case RL 17511B and the four bullets RL 17509(3), (4), (5) and (6) were extended into 1912 and included firings from .276 inch Enfield experimental rifles as well as rebarreled Lee Enfields.

Later in 1912 design RL 17641 and its variant RL 17641A (which had a slightly stronger case) were produced, the "A" variant being tried at the School of Musketry, Hythe with three different bullet weights (all to design RL 17509, with 155 grain, 165 grain and 175 grain weights). Dummy cartridges of the "A" variant were also produced. The results of the trial were not



encouraging and faults found included the following:-

hard extraction and some torn case heads  
heavy recoil  
excessive muzzle flash  
much metallic fouling.



Overall length 3.387" (86.0 mm)  
Case length 2.585" (65.7 mm)  
Head diameter .528" (13.4 mm)  
Rim diameter .517" (13.1 mm)

Fig 25 .276 inch Cartridge RL 17641A  
(with a 150 grain bullet of  
general design similar to  
RL 17509)

A further variant, RL 17641B, dated December 1911, had the case shortened and was fitted with bullets of both 150 and 180 grains. Case length for this "B" variant was 2.49 inches (63.25 mm) (63.25 mm).

Case RL 17641A was also tried with a series of conical bullets, shown under, which gave no benefits but which, however, produced worse barrel fouling. Conical bullets in .276 calibre had been experimented with earlier on a limited scale.



Fig 26  
.276 inch bullet  
RL 17509B(1)  
155 grains  
Length: 1.35" (34.3 mm)



Fig 27  
.276 inch bullet  
RL 17509B(2)  
165 grains  
Length: 1.41" (35.8 mm)

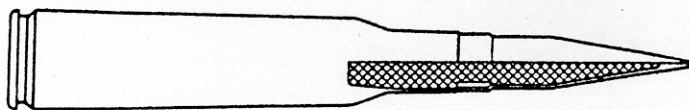


Fig 28  
.276 inch bullet  
RL 17509B(3)  
175 grains  
Length: 1.47" (37.4 mm)

(All bullets in Figs 25 to 27 had a diameter of .283 inches (7.18 mm) and lead/antimony cores)

The fourth conical bullet, RL 17509C(1) weighed 155 grains and was generally similar to RL 17509B(1) but slightly longer (1.4" or 35.6 mm) and with a longer "spire".

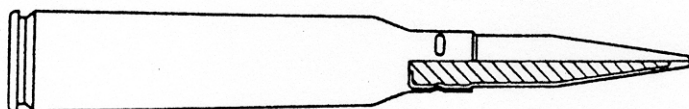
A further conical bullet appeared late in 1911, as part of cartridge design RL 17675C(1) (based upon a cut down RL 17511A case). Here the long conical bullet had a metal core with the



Overall length 3.387" (86.0 mm)  
 Case length 2.22" (56.4 mm)  
 Head diameter .523" (13.3 mm)  
 Rim diameter .517" (13.1 mm)  
 Bullet. 160 grains, conical  
 length 1.72" (43.7 mm)

Fig 29 .276 inch Cartridge RL 17675C(1)

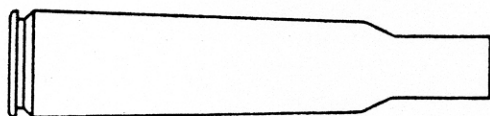
Further trials with conical bullets took place in early 1912 with a new cartridge which was a cut down RL 17511B case having the design number RL 17741. This cartridge used a 175 grain bullet of the same drawing number and, when fired in a heavy barrel, gave the most satisfactory ballistic results yet seen, but still with excessive barrel fouling.



Overall length 3.387" (86.0 mm)  
 Case length 2.292" (58.2 mm)  
 Head diameter .528" (13.4 mm)  
 Rim diameter .517" (13.1 mm)  
 Bullet. 175 grain conical, basic  
 diameter .276" (7 mm) but with  
 two raised portions at rear  
 .284" (7.2 mm) in diameter

Fig 30 .276 inch Cartridge RL 17741

In early 1912 trials were held with further cartridges based upon cut down RL 17511B cases - these being designs RL 17781A and RL 17781B. In all three the case was the same, being longer than RL 17741, but each had a different bullet form. Each bullet design incorporated one or more raised "driving bands" at the rear of the bullet, greater in diameter than the main portion of the bullet. Overall cartridge length for all three was 3.387 inches (86 mm).



Case length 2.393" (60.8 mm)  
 Head diameter .528" (13.4 mm)  
 Rim Diameter .517" (13.1 mm)

Fig 31 .276 inch Case RL 17781



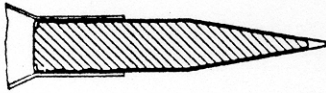


Fig 32  
 .276 inch bullet  
 RL 17781 in case neck  
 175 grains  
 Core: Lead/antimony

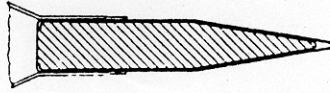


Fig 33  
 .276 inch bullet  
 RL 17781A in case neck  
 175 grains  
 Core: Lead/antimony



Fig 34  
 .276 inch bullet  
 RL 17781B in case neck  
 160 grains  
 Centre core of copper,  
 rest lead/antimony

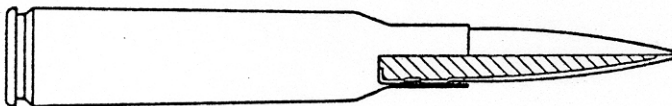
Bullets drawn in Figs 32 to 34 were 1.48" (37.6 mm) in length, .276" (7 mm) in body diameter with .284" (7.2 mm) band diameters.

None of the three bullets in the RL 17781 case proved to be accurate. None the less the earlier mentioned conical bullet RL 17741 and the later RL 17781, 17781A and RL 17781B were tried in March 1912 in the original length RL 17511 case (2.585 inches or 65.7 mm). Ammunition was manufactured as follows for still further trials:-

3000 rounds of RL 17511B case with bullet RL 17781

3000 rounds of RL 17511B case with bullet RL 17781A

and at the same time a new case, RL 18000A was introduced (the earlier case RL 17641A modified as to wall thickness and length). RL 18000A was included in the trials, 3000 rounds being fitted with bullet RL 17781 and 3000 with bullet RL 17781A. RL 18000A was also produced at this time with a 188 grain bullet.



Overall length 3.387" (86.0 mm)  
 Case length 2.35" (59.7 mm)  
 Head diameter .528" (13.4 mm)  
 Rim diameter .517" (13.1 mm)

Fig 35 .276 inch Cartridge RL 18000A  
 (with 188 grain bullet)

It was determined that bullet envelope material was the main reason for the excessive barrel fouling encountered in many of the .276 inch cartridge trials. Case RL 17641A with 175 grain bullets to RL 17509(3) had been used in special fouling trials with bullet envelopes containing different percentages of copper and nickel, and also with steel envelopes. In August 1912, trials with case RL 18000A and



RL 17781 bullets were held, the bullet envelopes being of what was then called "German bullet envelope material" (taken to be cupro nickel clad steel) and nitrocellulose propellant. This seems to be first reference to this form of propellant in .276 inch cartridges.

Still in an attempt to cure barrel fouling, experiments were held in 1912 with:-

1. Paper wrapped bullets (inclusive diameter .2835" (7.2 mm) and bullet diameter alone of .2795" (7.1 mm)
2. With discs fitted to the base of the bullet
3. With cupped bullet bases.

In 1912 the first apparent instance of .276 inch ammunition being ordered from Kynoch occurred when 500 cases to design RL 18000A were ordered, with bullets.

Design RL 18000 was now emerging as the final contender. By November 1912 a modified case, RL 18000B was under trial, with three experimental Enfield .276 inch rifles chambered for it. Various bullets were tried with this case, all having cupro nickel clad steel envelopes:-

|                                 | <u>Diameter</u> | <u>Charge</u> |
|---------------------------------|-----------------|---------------|
| 1. 175 grain bullet RL 17509(3) | .283" (7.19 mm) | 48.7 grains   |
| 2. 175 grain bullet RL 17509(3) | .281" (7.13 mm) | 49.0 grains   |
| 3. 165 grain bullet RL 17509(2) | .283" (7.19 mm) | 49.0 grains   |
| 4. 165 grain bullet RL 17509(2) | .281" (7.13 mm) | 49.8 grains   |

The Small Arms Committee found all four combinations to be suitable. They recommended that the thousand experimental rifles then being manufactured for large scale troop trials should use RL 18000 type cases with the 165 grain bullet of mean diameter .282 inches (7.16 mm). The 165 grain bullet gave a flatter trajectory than the 175 grain at ranges up to 800 yards and was therefore preferred. In fact, the cartridge issued for troop trials in 1913 was to design RL 18000C.

In December 1912 the scale of issue of the .276 inch experimental rifle and ammunition for troop trials, to be issued by May 1913

was shown as:-

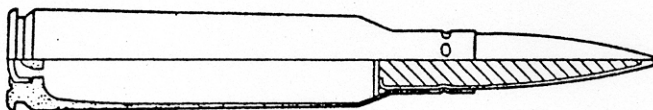
Cavalry 300 rifles (100 to one squadron in each of three cavalry regiments, one in South Africa, two in Britain)

Infantry 560 rifles (70 to one company in each of eight infantry Battalions, seven in Britain, one in Egypt)

School of Musketry, Hythe 75 rifles

School of Musketry, Bloemfontein 75 rifles

|             |                |                      |
|-------------|----------------|----------------------|
| Ammunition: | Troops abroad  | 250 rounds per rifle |
|             | Troops at home | 700 rounds per rifle |
|             | Schools        | 500 rounds per rifle |

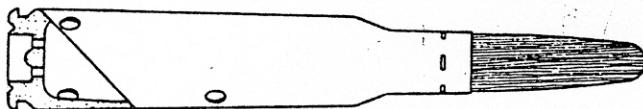


Overall length 3.23" (82.0 mm)  
 Case Length 2.35" (59.7 mm)  
 Head diameter .528" (13.4 mm)  
 Rim diameter .517" (13.1 mm)  
 Bullet. 165 grain, CNCS envelope, 98/2 lead/antimony core, secures by 6 indents  
 1.365" (34.7 mm) long

Fig 36 .276 inch Ball Cartridge  
RL 18000C  
 (troop trials cartridge)

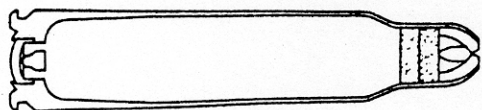
RL 18000C differed from the earlier RL 18000A, apart from having a different bullet, only in minor case details. The "C" variant had a slightly greater powder capacity by having slightly thinner walls and case head. The "C" variant also had a circumferential groove around the cap chamber. The primer cap was of copper containing 0.6 grains of composition.

Other .276 inch ammunition issued and based upon case RL 18000C comprised dummy drill, inspectors dummy, blank and proof.



Overall length 3.23" (82.0 mm)  
 Case length 2.35" (59.7 mm)  
 Head diameter .528" (13.4 mm)  
 Rim diameter .517" (13.1 mm)  
 Red stained boxwood bullet.  
 No primer cap. 4 holes in case walls.

Fig 37 .276 inch Dummy Drill  
Cartridge RL 20409



Case length 2.35" (59.7 mm)  
 Head diameter .528" (13.4 mm)  
 Rim diameter .517" (13.1 mm)  
 Six petal rose crimp, two straw  
 board wads, charge of 10 grains  
 sliced cordite size 20

Fig 38 .276 inch Blank Cartridge  
RL 20408

Two different inspectors dummy cartridges existed, to designs RL 18000c(a) and RL 18000C(c). The former was lead weighted and the latter coal dust filled. Visual examination of two different .276 inch inspectors dummies of the RL 18000 series shows both to have anvils but no fire holes or caps, one being brass finished as far as the case is concerned and the other tinned. Bullets appear to be of standard ball type.

Two proof cartridges were listed:-

- RL 18000B(i) for proof pressure barrels
- RL 18000B(j) for proof of rifles

### 1913 Troop Trials

In August 1913 reports began to come back from the user units on the .276 inch dummy drill cartridge RL 20409 showing the cartridge to be unsatisfactory in that the wooden bullets broke off in use. As a result CSOF produced samples of four new types of drill cartridge for examination by the Small Arms Committee. In all four types metal enveloped bullets were used. The four types were:-

1. with case and bullet coppered
2. case coppered, bullet sandblasted and then blackened with lacquer
3. case and bullet sandblasted and lacquered black
4. case and bullet tinned

Type 1. was considered to be the best and in addition it was suggested that a circular cannellure on the case would aid identification.

In November 1913 two more designs of dummy drill were submitted to the Small Arms Committee. These were RL 20911 and



RL 20979, these being followed by a third type known as the "Swiss type", believed to have the circumferential case cannelure mentioned earlier. One hundred of the Swiss type were made up for trials at Hythe where they were reported upon as being completely satisfactory.

By mid 1913 reports were also coming in from user units on the .276 inch ball ammunition and the rifle. The rifle was generally well reported on but trouble had been experienced with the ammunition, mainly due to the propellant. A large number of missfires occurred which could be attributed to the rifle, but the most serious complaints related to caps blowing out and to hard extraction. The culminating fault was a rifle bursting in Aldershot. In this instance a cartridge had been left in a hot chamber which had then "cooked off", generating chamber pressure of about 26 tons per square inch (tsi). It was shown that this pressure would have been built up even had nitrocellulose been used instead of cordite. Test .276 inch cartridges loaded with nitrocellulose supplied by Kynoch and placed in heated chambers generated, with 45 grains of nitrocellulose, 29.75 tsi pressure. It became clear that until a suitable propellant had been developed, the new .276 inch rifle and cartridge could not be passed into service.

In November 1913 experiments were started to reduce barrel wear, which the main trials had shown to be significant. For this trial two bullets, both variants of RL 20000J were used. The first had two driving bands but was found to be unsuitable as the bullet failed to centre. The second had three driving bands with deep cannelures, over a CNCS envelope. In April 1914, Kings Norton also suggested the use of driving bands and submitted two designs with cupro nickel bullets and mild steel bands. Four .276 inch rifles were issued to Kings Norton for bullet trials, the outcome of which, however, was not recorded.

War broke out in the late summer of 1914 and further trials with .276 inch rifles and ammunition were shelved. Briefly, in 1917, the rifle and ammunition were considered for special armour piercing use, described below.

### General Points on .276 inch Ammunition

1. Cartridge cases were normally of brass but some RL 18000 type cases were made of steel.
2. .276 inch ammunition is found, prior to the RL 18000 series, with both brass and copper caps.
3. Except where specifically shown primers were of the two hole Berdan type. Design RL 16777C is known to be a Boxer primed design.
4. High pressure was a feature of many .276 inch designs and caps were often burred in.
5. Although described as rimless, many .276 inch cases had higher diameter heads than rims.
6. Propellant up to 1910 was usually MDS cordite, later replaced by MDT cordite.
7. Bullet envelopes up to 1912 were generally of cupro nickel.
8. Manufacturers of .276 inch ammunition in Britain, apart from the Royal Laboratory at Woolwich, were Kynoch, Kings Norton and Greenwood and Batley. Some .276 inch ammunition was also made in the United States.
9. Ammunition to design RL 18000C, although never approved for service, was sometimes referred to as "Mark 1" and on some contract ammunition the numeral "1" appeared on the headstamp.
10. Most of the ammunition prior to the RL 18000 series was unheadstamped.

### Miscellaneous .276 inch Enfield Bullets of Unknown Reference or Date

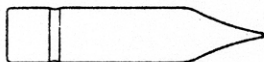


Fig 39  
 .276 inch bullet  
 "Ogee" type  
 Weight: 165 grains  
 Length: 1.33" (33.8 mm)  
 Diameter: .281" (7.15 mm)

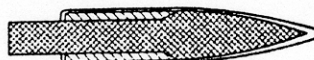


Fig 40  
 .276 inch bullet  
 Steel core  
 Weight: 131 grains  
 Length: 1.53" (39 mm)  
 Diameter: .283" (7.2 mm)

### .276 inch 1917 Armour Piercing Ammunition

During the 1914-18 war a requirement arose for rifle calibre armour piercing ammunition. Early designs of .303 inch AP bullets were not very effective and, on a limited scale, sporting rifles in a number of commercial calibres were issued in an attempt to achieve the required effect. A more promising line of approach however was seen to be in the utilisation of the high velocity .276 inch Enfield cartridge of 1913, fired from the rifle used in the troop trials of that year.

In February 1917 the Munitions Design Committee of the Ministry of Munitions recommended that work be started on a .276 inch armour piercing cartridge, utilising the original 1913 cartridge cases to RL 18000C.

Initially two types of tapered base bullets were produced, to designs RD 288A and 288C. These had soft brass envelopes and 80 grain steel cores.



Fig 41  
 .276 inch AP bullet  
 RD 288A  
 132 grains weight  
 Length: 1.45" (36.8 mm)

These two bullets proved to be unsteady in flight. Apart from being produced in AP form they were also produced in solid brass. Also produced in solid brass were three further designs, RD 542, RD 543 and RD 544. These solid brass bullets were produced for purely ballistic work, in view of the difficulty in obtaining sufficient AP components. The five brass bullets were fired with the following results:-

|                       | WEIGHT (grains) | VELOCITY (f/s) | PRESSURE (tons per square inch) |
|-----------------------|-----------------|----------------|---------------------------------|
| RD 288A Brass version | 151             | 2885           | 23.7                            |
| RD 288C " "           | 148             | 2845           | 20.7                            |
| RD 542                | 147             | 2800           | 20.9                            |
| RD 543                | 128             | 3000           | 19.8                            |
| RD 544                | 148             | 2882           | 22.2                            |



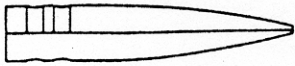


Fig 42  
 .276 inch brass bullet  
 RD 542  
 Length: 1.45" (36.9 mm)  
 Diameter: .285" (7.25 mm)

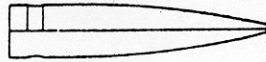


Fig 43  
 .276 inch brass bullet  
 RD 543  
 Length: 1.29" (33 mm)  
 Diameter: .285" (7.25 mm)

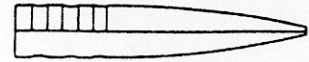


Fig 44  
 .276 inch brass bullet  
 RD 544  
 Length: 1.45" (36.9 mm)  
 Diameter: .285" (7.25 mm)

As a result of the ballistic trials a further design similar to, but not identical with, RD 542 was produced. This was RD 570 which was produced in both solid brass and AP form. The brass version had a base plug of lead and fibre to give it a centre of gravity similar to the AP version, and weighed 147 grains. The AP version weighed 140 grains and had a soft brass envelope and a tungsten steel core. Later, for further ballistic work, a third version of RD 570 was made with a brass envelope and lead core weighing 174 grains. By the time the trials were halted, the tungsten steel cored bullet had pierced .354 inches (9 mm) of steel plate at 200 yards range.

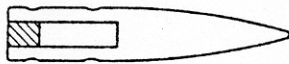


Fig 45  
 .276 inch brass bullet  
 to match RD 570  
 Length: 1.45" (36.9 mm)  
 Diameter: .287" (7.3 mm)

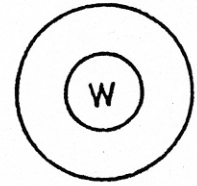
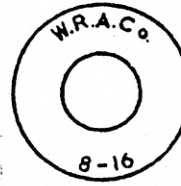
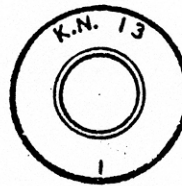
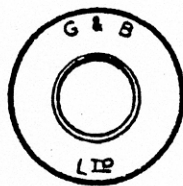
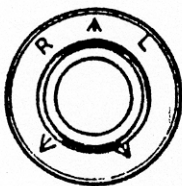
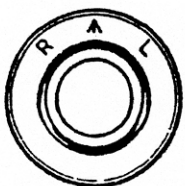


Fig 46  
 .276 inch AP bullet  
 RD 570  
 Length: 1.45" (36.9 mm)  
 Diameter: .287" (7.3 mm)

.276 inch Enfield armour piercing ammunition was not taken beyond the experimental stage and was not taken into service.

Between 1922 and 1935 the .276 inch cartridge case, necked out to take .303 inch bullets of various types, was used in experimental work connected with armour piercing designs and plate testing.

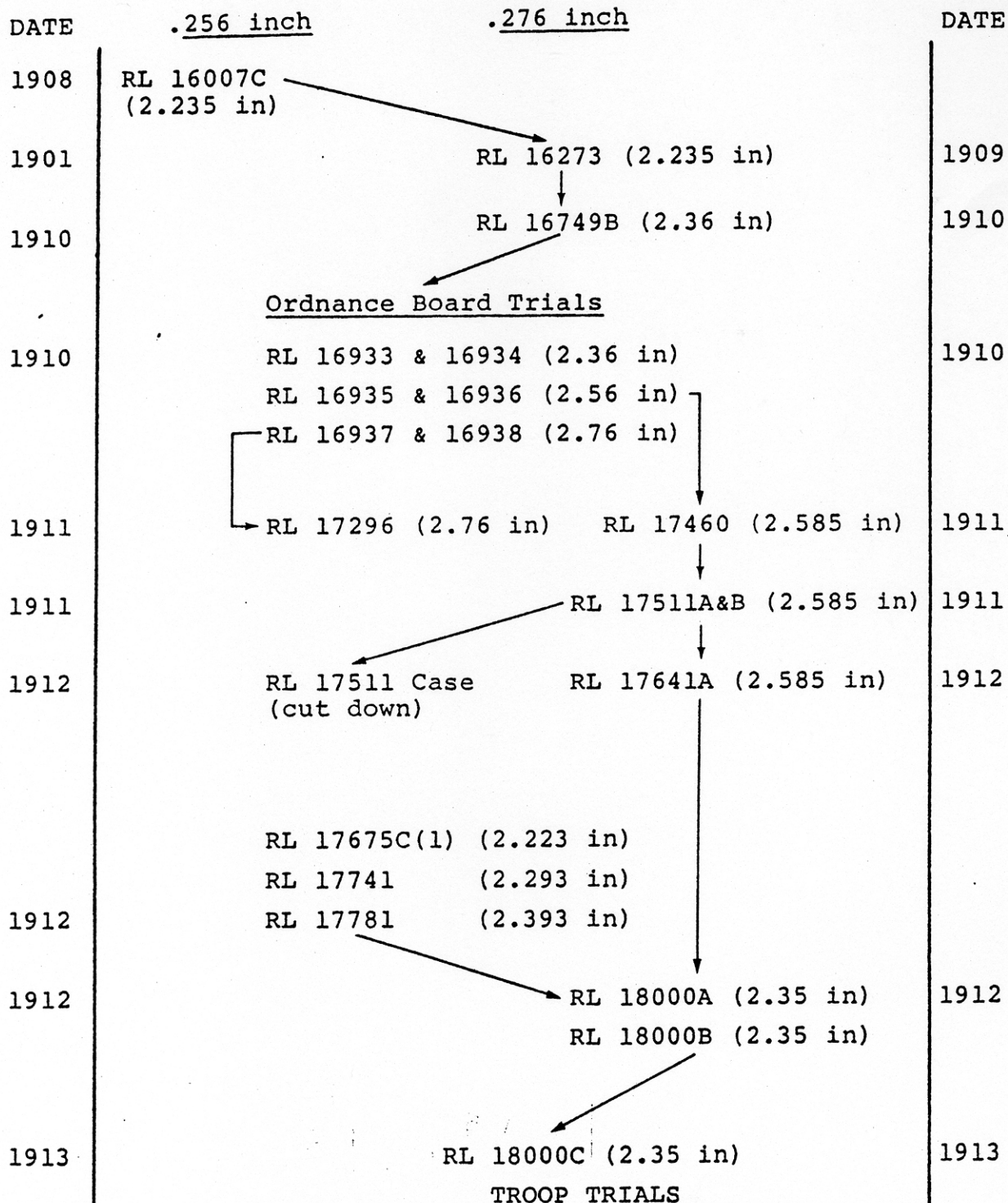
#### HEADSTAMPS



All are found on RL 18000C cases

.276 inch CartridgesDevelopment Path for Main Case Types

(case lengths given in brackets)



# .256 inch CARTRIDGE DESIGN REFERENCES

| Design No. | Overall Length (inches) | Case Length (inches) | Rim Diameter (inches) | Head Diameter (inches) | Primer | Other Case Detail | Bullet            |
|------------|-------------------------|----------------------|-----------------------|------------------------|--------|-------------------|-------------------|
| RL 16007   | 3.2                     | 2.24                 | .514                  | .518                   | *      |                   | 150 gr, RL 16006  |
| RL 16007A  | 3.2                     | 2.24                 | .514                  | .518                   | *      | Thickened bridge  | 150 gr, RL 16006  |
| RL 16007B  | 3.2                     | 2.24                 | .514                  | .518                   | *      | Altered neck      | 150 gr, RL 16006  |
| RL 16007C  | 3.2                     | 2.24                 | .514                  | .518                   | *      | Altered cap       | 150 gr, RL 16006  |
| RL 16939   | 3.187                   | 2.36                 | .514                  | .519                   |        | -                 | 144 gr            |
| RL 16939A  | 3.187                   | 2.36                 | .514                  | .519                   |        | -                 | 155 gr            |
| RL 17303   | 3.387                   | 2.58                 | .474                  | .479                   |        | Long neck         | 155 gr, RL 16939A |
| RL 17305   | 3.387                   | 2.45                 | .529                  | .533                   |        | Long tapered case | 155 gr, RL 16939A |
| RL 17305A  | 3.387                   | 2.45                 | .533                  | .522                   |        | Semi rimless      | 155 gr, RL 16939A |

# .276 inch CARTRIDGE DESIGN REFERENCES

|           |       |       |      |       |    |                     |                   |
|-----------|-------|-------|------|-------|----|---------------------|-------------------|
| RL 16273A | 3.17  | 2.24  | .514 | .518  | *  |                     | 150 gr, RL 16515A |
| RL 16273B | 3.0   | 2.24  | .514 | .518  | *  | Thickened cap       | 140 gr, KN design |
| RL 16273C | 3.17  | 2.24  | .514 | .518  |    | -                   | 150 gr, RL 16515A |
| RL 16273D | 3.17  | 2.24  | .514 | .518  |    | -                   | -                 |
| RL 16749  | 3.17  | 2.36  | .514 | .519  |    | -                   | 150 gr, RL 16515  |
| RL 16749A | 3.17  | 2.36  | .514 | .519  |    | Altered neck & cap  | 150 gr, RL 16776  |
| RL 16749B | 3.17  | 2.36  | .514 | .519  |    | Altered cap         | 150 gr, RL 16776  |
| RL 16762  | 3.17  | 2.585 | .474 | .479  |    | Long neck           | 150 gr, RL 16515A |
| RL 16762A | 3.17  | 2.585 | .474 | .479  |    | Altered cap         | 150 gr, RL 16776A |
| RL 16777  |       | 2.36  | .514 | .519  |    | Modified RL 16749B  | 150 gr, RL 16515B |
| RL 16777A |       | 2.36  | .514 | .519  |    | Altered cap burr    |                   |
| RL 16777B |       | 2.36  | .514 | .519  |    | Altered cap chamber |                   |
| RL 16777C |       | 2.36  | .514 | .519  | ** |                     |                   |
| RL 16777D |       | 2.36  | .514 | .519  |    | Altered cap chamber |                   |
| RL 16801  | 3.17  | 2.24  | .514 | .519  |    | Modified RL 16273   |                   |
| RL 16933  | 3.187 | 2.36  | .514 | .5185 |    | -                   | 180 gr, RL 17094  |
| RL 16934  | 3.187 | 2.56  | .514 | .5185 |    |                     | 150 gr, RL 16515B |
| RL 16935  | 3.387 | 2.56  | .514 | .5185 |    |                     | 180 gr, RL 17094  |
| RL 16936  | 3.387 | 2.56  | .514 | .5185 |    |                     | 150 gr, RL 16515B |



.276 inch CARTRIDGE DESIGN REFERENCES (continued)

| Design No.             | Overall Length (inches) | Case Length (inches) | Rim Diameter (inches) | Head Diameter (inches) | Primer | Other Case Detail         | Bullet              |
|------------------------|-------------------------|----------------------|-----------------------|------------------------|--------|---------------------------|---------------------|
| RL 16937               | 3.587                   | 2.76                 | .514                  | .5185                  |        |                           | 180 gr, RL 17094    |
| RL 16938               | 3.587                   | 2.76                 | .514                  | .5185                  |        |                           | 150 gr, RL 16515B   |
| RL 17137               | 3.587                   | 2.73                 | .544                  | .500                   |        |                           | 150 gr, RL 16515B   |
| RL 17295               | 3.187                   | 2.36                 | .514                  | .519                   |        |                           | 180 gr, RL 16979B   |
| RL 17296               | 3.587                   | 2.76                 | .514                  | .5185                  |        | Semi rimless              | 150 gr, RL 16980A   |
| RL 17304               | 3.387                   | 2.585                | .474                  | .470                   |        |                           | 150 gr, RL 16515B   |
| RL 17354               | 3.387                   | 2.585                | .525                  | .521                   |        |                           | 150 gr, RL 16515B   |
| RL 17354A              | 3.387                   | 2.585                | .525                  | .482                   |        | Altered cap, neck and rim | 150 gr, RL 16515B   |
| RL 17382               | 3.387                   | 2.585                | .525                  | .521                   |        |                           | 180 gr, RL 17094    |
| RL 17460               | 3.387                   | 2.585                | .520                  | .521                   |        |                           | Various bullets     |
| RL 17461               | 3.187                   | 2.36                 | .514                  | .519                   |        |                           | 150 gr, RL 17351/2  |
| RL 17462               | 3.187                   | 2.36                 | .514                  | .519                   |        |                           | 150 gr, RL 17351/3  |
| RL 17467               | 3.387                   | 2.55                 | .537                  | .538                   |        |                           | 160 gr, RL 17459/5  |
| RL 17511               | 3.387                   | 2.585                | .517                  | .523                   |        |                           | 155 gr, RL 17509/1  |
| RL 17511A              | 3.387                   | 2.585                | .517                  | .523                   |        | Altered neck radii        | 155 gr, RL 17509/1  |
| RL 17511B              | 3.387                   | 2.585                | .517                  | .528                   |        | Longer neck than A        | 165 gr, RL 17509/2  |
| RL 17511C              | 3.387                   | 2.585                | .517                  | .528                   |        | Long neck                 | Various bullets     |
| RL 17641               | 3.387                   | 2.585                | .517                  | .528                   |        |                           | 180 gr              |
| RL 17641A              | 3.387                   | 2.585                | .517                  | .528                   |        |                           | 150 gr and 180 gr   |
| RL 17641B              | 3.387                   | 2.49                 | .517                  | .528                   |        |                           | Various bullets     |
| RL 17675C (1)          | 3.387                   | 2.22                 | .517                  | .528                   |        | Shortened case            | RL 17509 series     |
| RL 17741               | 3.387                   | 2.292                | .517                  | .523                   |        | Cut down RL 17511A        | 150 gr and 180 gr   |
| RL 17781               | 3.387                   | 2.393                | .517                  | .528                   |        | Cut down RL 17511B        | 160 gr, boat-tailed |
| RL 17781A              | 3.387                   | 2.393                | .517                  | .528                   |        | Cut down RL 17511B        | 175 gr              |
| RL 17781B              | 3.387                   | 2.393                | .517                  | .528                   |        | Cut down RL 17511B        | 175 gr              |
| RL 18000A              | 3.387                   | 2.35                 | .517                  | .528                   |        | Cut down RL 17511B        | 175 gr              |
| RL 18000B              | 3.387                   | 2.35                 | .517                  | .528                   |        | Modified RL 17641A        | 160 gr              |
| RL 18000C              | 3.230                   | 2.35                 | .517                  | .526                   |        |                           | 175 gr, RL 17781    |
| TROOP TRIALS CARTRIDGE |                         |                      |                       |                        |        |                           | 188 gr, RL 20000A   |
| RL 18000C              | 3.230                   | 2.35                 | .517                  | .528                   |        |                           | 165 gr, 175 gr,     |
|                        |                         |                      |                       |                        |        |                           | 165 gr              |

All the above cartridges were made with 2 hole Berdan primers except those marked \* had single hole Berdan primers and those marked \*\* had Boxer primers

.256 inch BULLET DESIGN REFERENCES

| Design No. | Length<br>(inches) | Diameter<br>(inches) | Weight<br>(grains) | Cannelure | General Description                         |
|------------|--------------------|----------------------|--------------------|-----------|---|
| RL 16006   | 1.34               | .262                 | 150                | None      | Pointed, lead core                          |
| RL 20072   |                    |                      |                    |           | Steel core, copper jacket,<br>circa 1912/13 |

.276 inch BULLET DESIGN REFERENCES

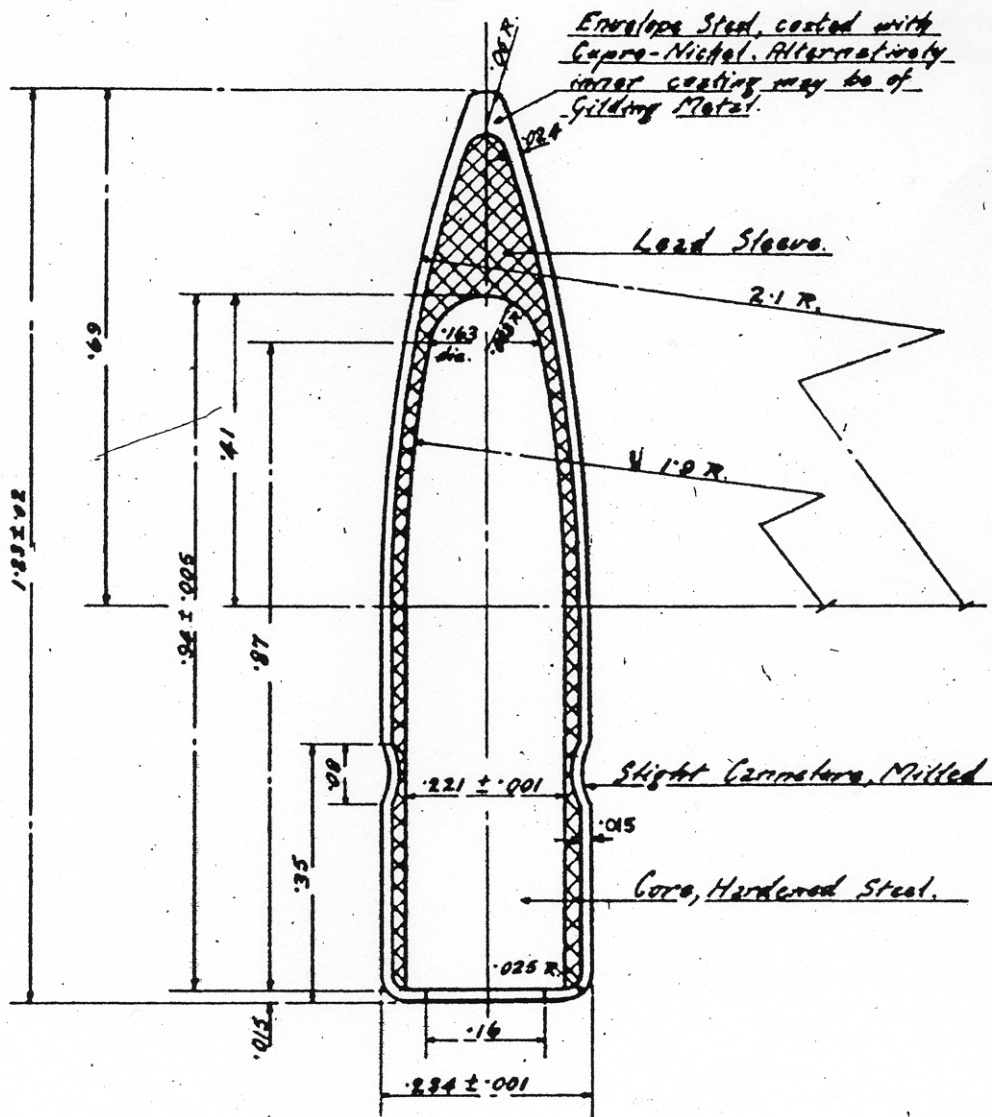
|              |         |       |                    |      |                                 |
|--------------|---------|-------|--------------------|------|---------------------------------|
| RL 16515     | 1.192   | .284  | 150                | One  | Pointed, lead core              |
| RL 16515A    | 1.24    | .283  | 150                | None | " " "                           |
| RL 16515B    | Various | .283  | 150, 155, 165, 175 | One  | " " "                           |
| RL 16776     | 1.228   | .283  | 150                | One  | Pointed, "Russian base"         |
| RL 16776A    | 1.225   | .2845 | 150                | One  | " " "                           |
| RL 16977A    | 1.531   | .283  | 180                | One  | Spire point, lead core          |
| RL 16978A    | 1.531   | .283  | 150                | One  | Spire point, aluminium core tip |
| RL 16979A    | 1.391   | .283  | 180                | One  | Pointed, lead core              |
| RL 16980     | 1.391   | .283  | 150                | One  | Pointed, aluminium core tip     |
| RL 17094     | Various |       | 150, 155, 165, 175 | One  | Some with aluminium core tips   |
| RL 17351/1   | 1.217   | .283  | 150                | One  | Similar to RL 16515B            |
| RL 17351/2   | 1.288   | .283  | 150                | One  | Pointed, aluminium core tip     |
| RL 17351/3   | 1.36    | .283  | 150                | One  | " " "                           |
| RL 17351/4   |         |       |                    | One  | " " "                           |
| RL 17351A    |         |       |                    |      |                                 |
| RL 17459/5   | 1.393   | .283  | 160                | One  | Spire point, lead core          |
| RL 17509/1   | 1.249   | .283  | 155                | One  | Pointed, lead core              |
| RL 17509/2   | 1.308   | .283  | 165                | One  | " " "                           |
| RL 17509/3   | 1.366   | .283  | 175                | One  | " " "                           |
| RL 17509/4   | 1.395   | .283  | 155                | One  | Pointed, aluminium core tip     |
| RL 17509/5   | 1.395   | .283  | 165                | One  | " " "                           |
| RL 17509/6   | 1.395   | .283  | 175                | One  | " " "                           |
| RL 17509/B/1 | 1.35    | .283  | 155                | One  | Spire point, lead core          |
| RL 17509/B/2 | 1.41    | .283  | 165                | One  | " " "                           |
| RL 17509/B/3 | 1.47    | .283  | 175                | One  | " " "                           |
| RL 17509/C   | 1.4     | .283  | 155                | One  | " " "                           |

.276 inch BULLET DESIGN REFERENCES (continued)

| Design No. | Length<br>(inches) | Diameter<br>(inches) | Weight<br>(grains) | Cannelure | General Description            |
|------------|--------------------|----------------------|--------------------|-----------|--------------------------------|
| RL 20000B1 |                    |                      | 175 )              | None      | Similar to RL 17781 but fluted |
| RL 20000B2 |                    |                      | " )                | "         | " " " but milled               |
| RL 20000B3 |                    |                      | " )                | "         | " " RL 17781A but fluted       |
| RL 20000B4 |                    |                      | " )                | "         | " " " but milled               |
| RL 20000B5 |                    |                      | " )                | "         | Finer flutes than RL 20000B3   |
| RL 20000C  |                    |                      | " )                | "         | Similar to .256 inch RL 20072  |
| RL 20000D  |                    |                      | " )                |           | Front copper, rear lead        |
| RL 20000E  |                    |                      | " )                |           | Cupro nickel disc on base      |
| RL 20000F  |                    |                      | " )                |           | " " " "                        |
| RL 20065/5 |                    |                      | " )                |           | Hemispherical nose             |
| RL 20065/6 |                    |                      | " )                |           | " " "                          |
| RL 20065/7 |                    |                      | " )                |           | " " "                          |

thought to be





Rev. N. R. 67.

Drawn by: [Signature]

Checked by: [Signature]

Scale: 5/1.

Traced by: [Signature]

Passed by: [Signature]

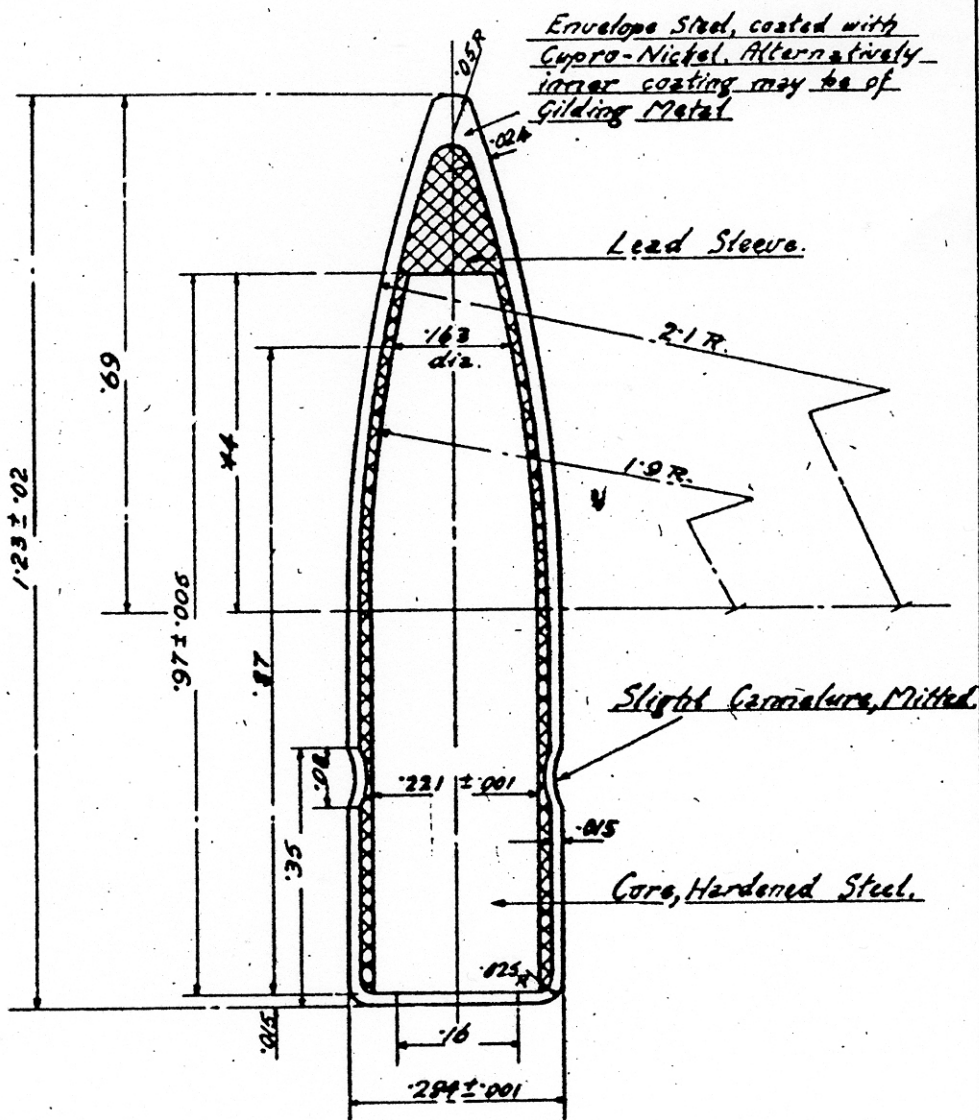
Dimensions in inches.

[Signature] for G.S.R.D.

276<sup>n</sup> A.P. BULLET.  
EXPERIMENTAL DESIGN.

R. D. N° 5223.

25-8-37



Reg. No. P. 6571

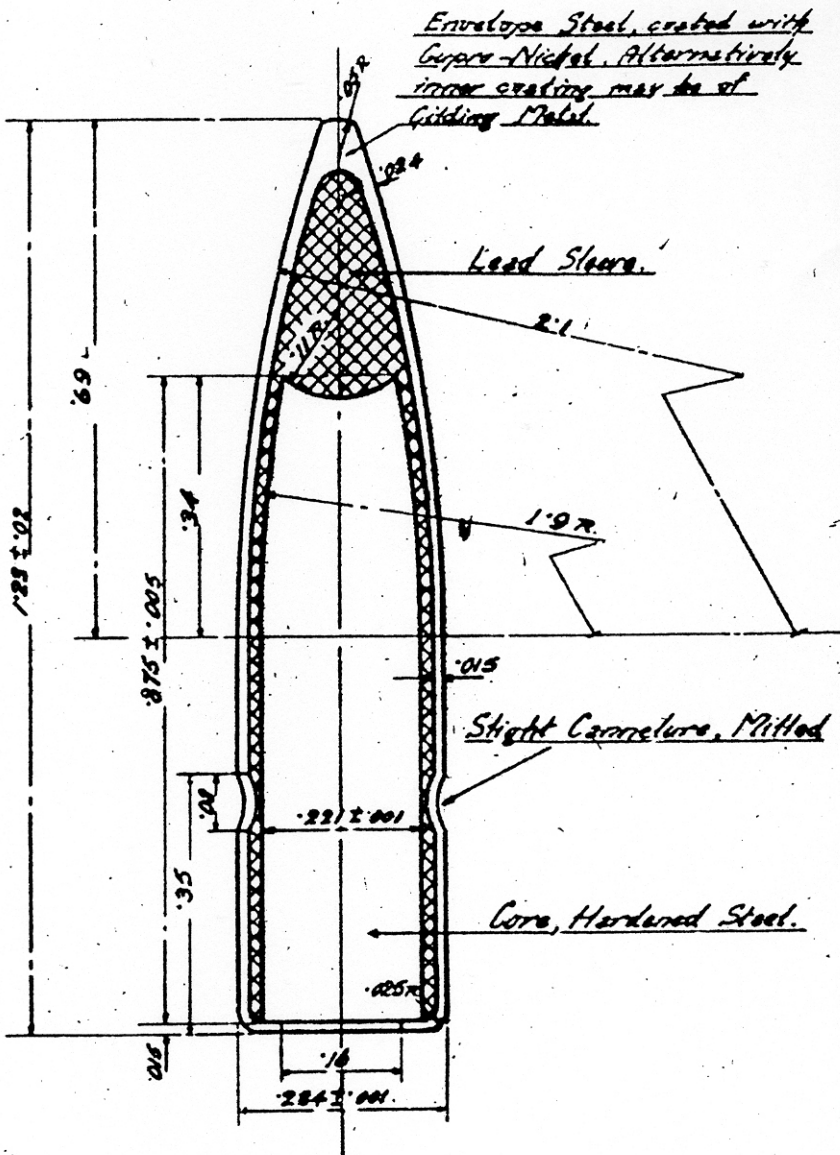
Drawn by: [Signature] Checked by: [Signature] Scale: - 9/1

Traced by: [Signature] Passed by: [Signature] Dimensions in inches.

**.276" A. P. BULLET.**  
**EXPERIMENTAL DESIGN.**

**R.D. No. 5224.**

23-8-37.



Reqn. F.652

Drawn by: B. Checked by: J. M. Scale: 1/4"

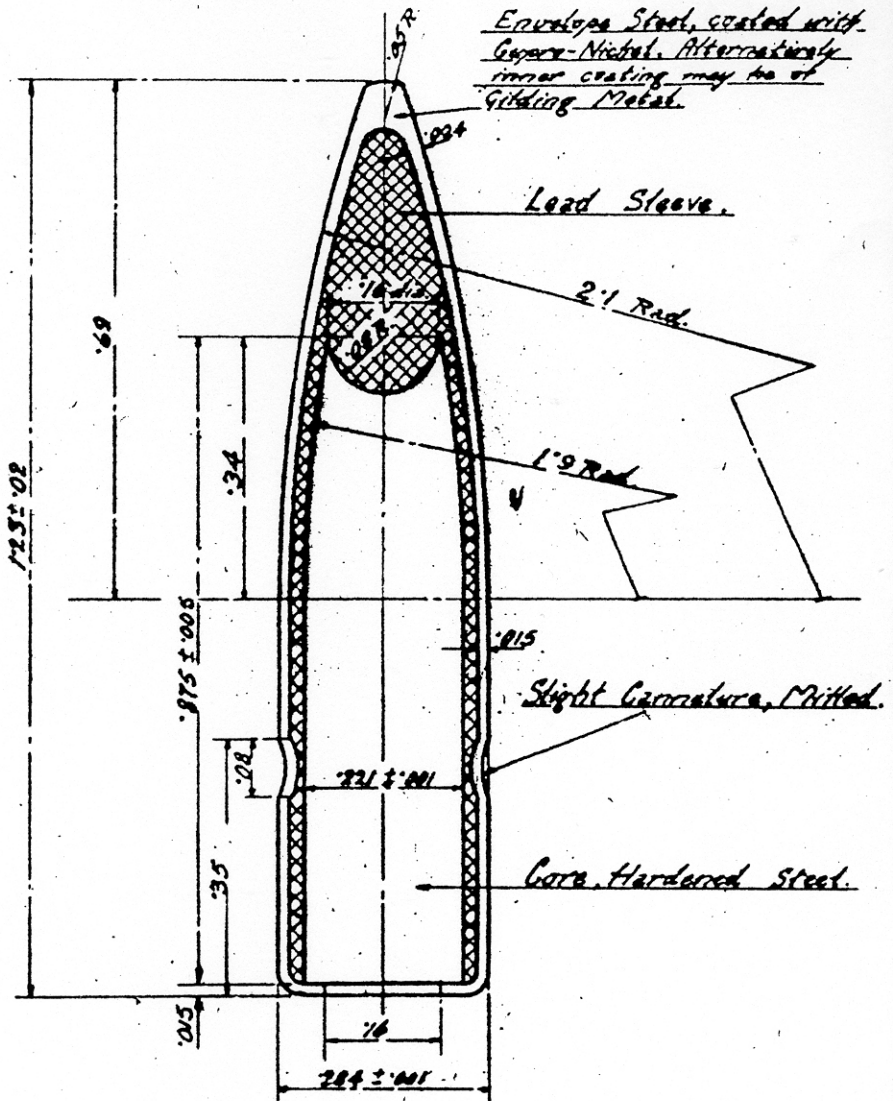
Traced by: B. Peared by: J. M. Dimensions in inches.

276" A.P. BULLET.  
EXPERIMENTAL DESIGN.

R.D.Nº 5225.

13-1-12





Reg. N° 6571

Drawn by: [Signature] Scale: 9/1

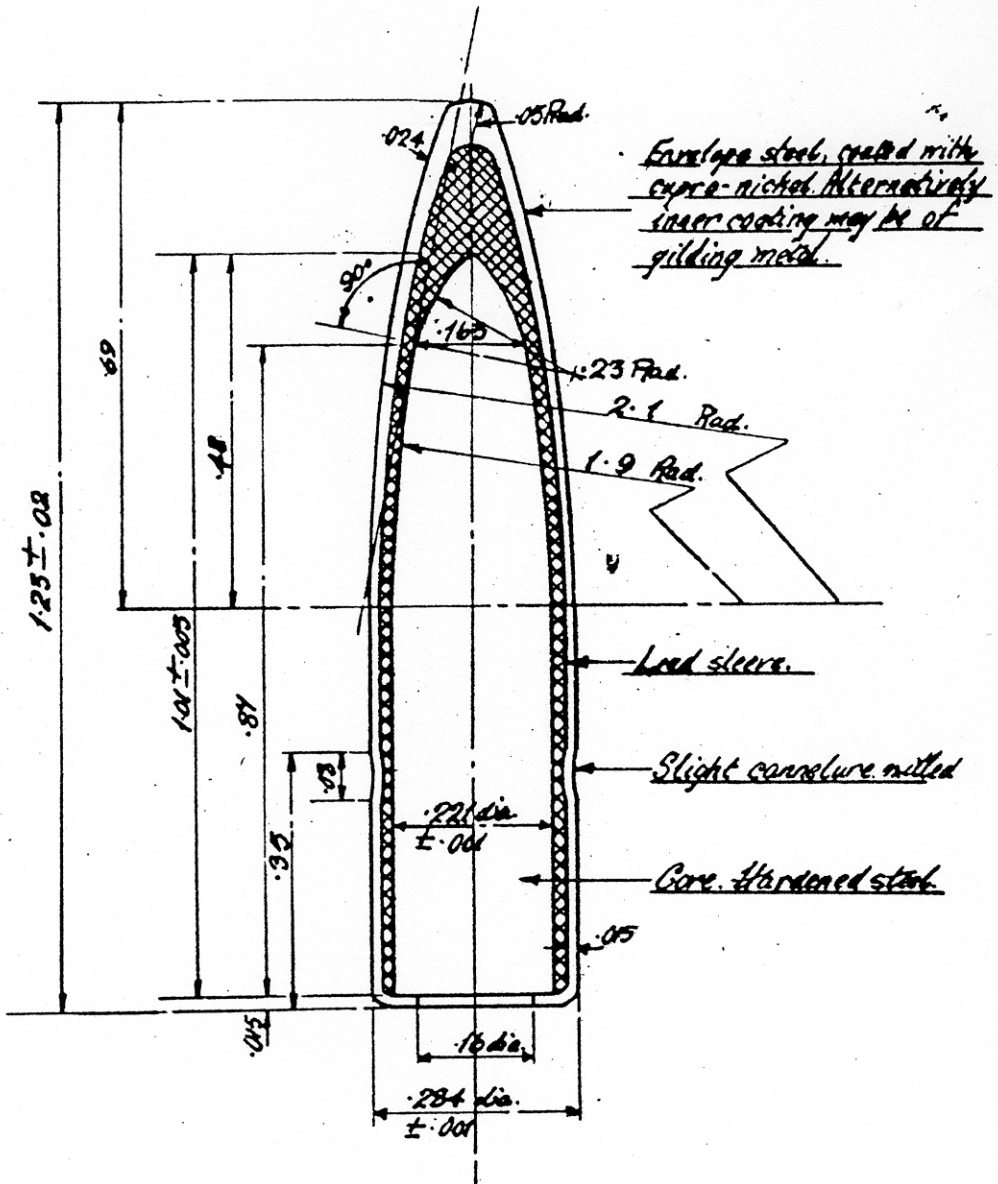
Traced by: [Signature] Dimensions in inches.

[Signature] for G.S.R.D.

**276" A.P. BULLET.**  
**EXPERIMENTAL DESIGN.**

**R.D.N° 5226.**

26-6-37.



REF. Nº E6371

DRAWN BY S.P. CHECKED BY A. SCALE. 3/1

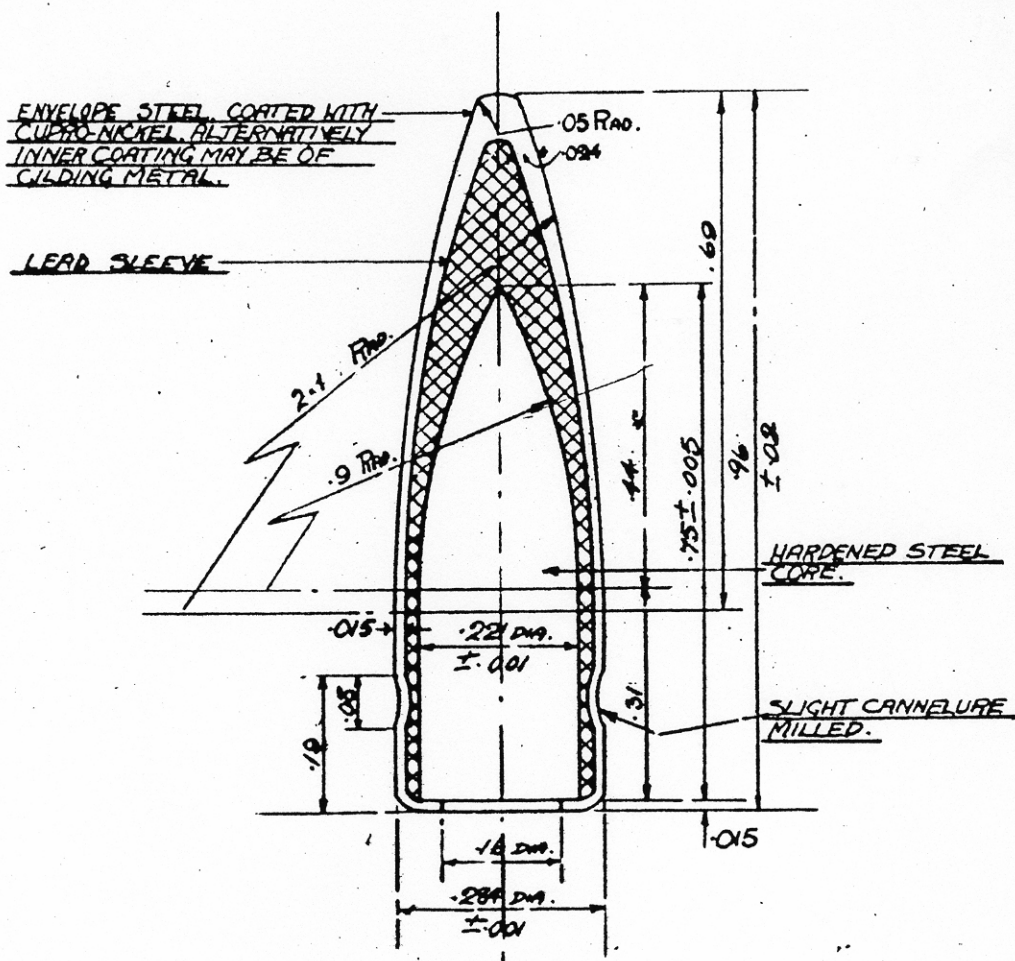
TRACED BY J.L. ADDED BY DIMENSIONS IN INCHES.

— F.R.C.S.P.D.

**.276" A.P. BULLET.**  
**EXPERIMENTAL DESIGN.**

**R.D.Nº 5227.**

75-8-34



**REF ID: A6571**

**DOAN'S.**

CHECKED BY M. J. SCALE 5/1

**TRAFALGAR**

POSED BY ~~3~~ DIMENSIONS IN INCHES

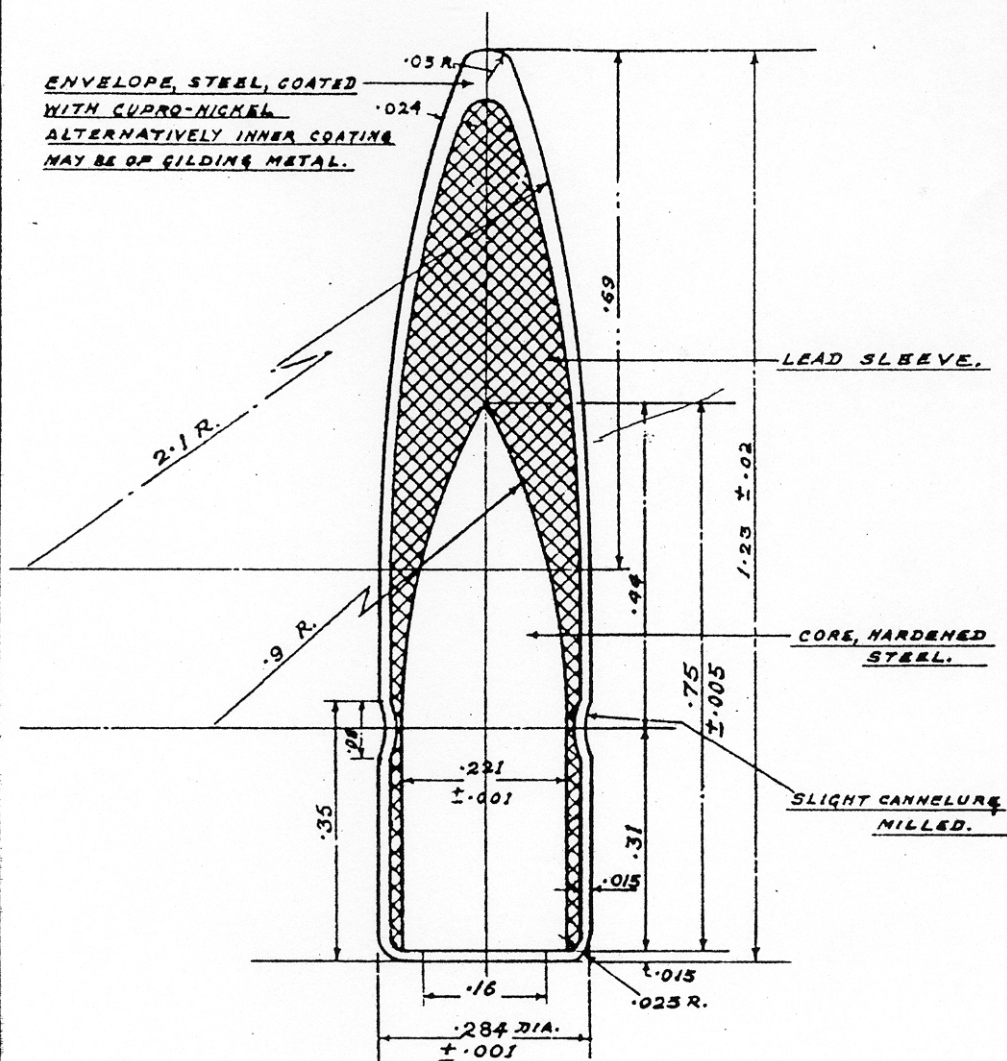
**R.D.N.º 5228**

**·276" A.P. BULLET.**  
**EXPERIMENTAL DESIGN.**

**25-8-33**







REQ. N° 6571

DRAWN BY: J.T. CHECKED BY: J.T. SCALE: 5/1.

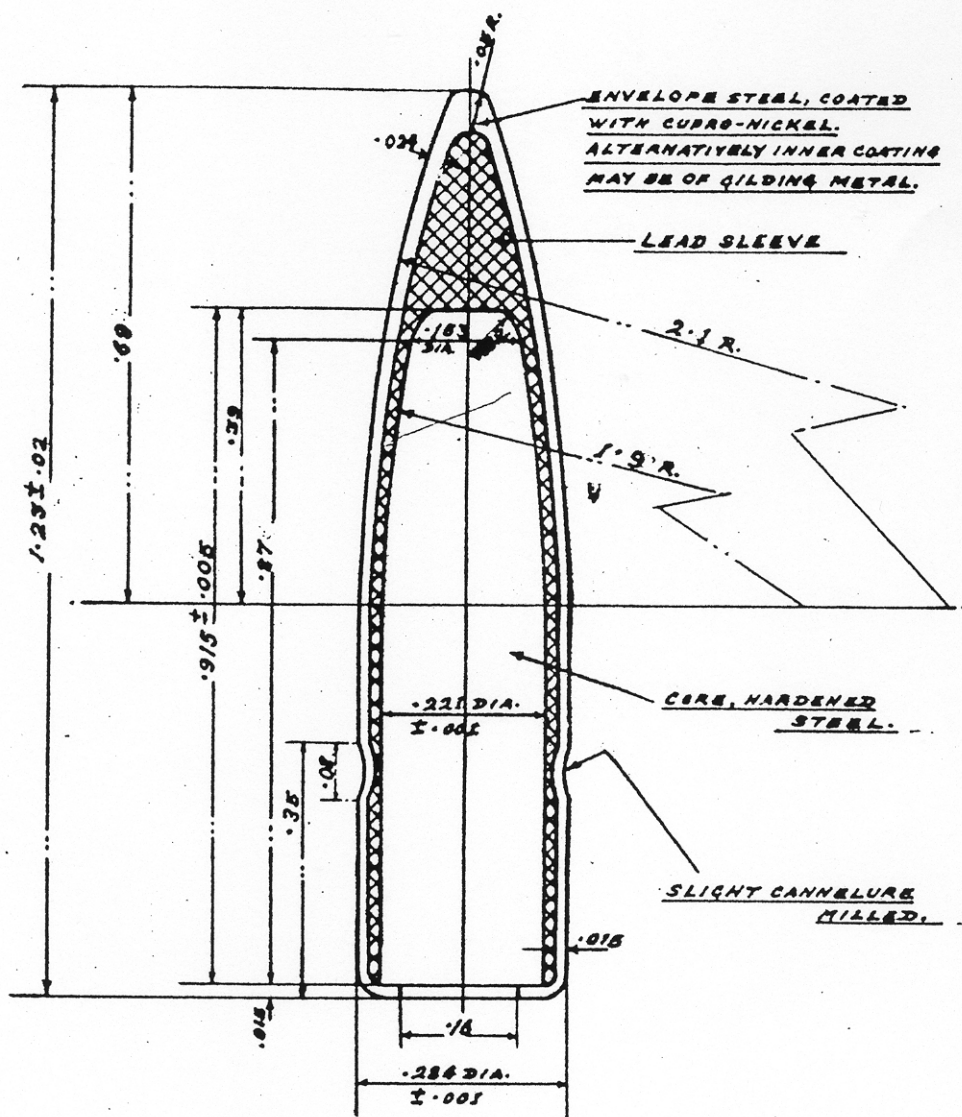
TRACED BY: J.T. PASSED BY: J.T. DIMENSIONS IN INCHES.

FOR G.S.R.D.

**.276" A.P. BULLET.**  
**EXPERIMENTAL DESIGN.**

R.D.N° 5230

25-8-37



REQN° F6571

DRAWN BY: J.P.P. CHECKED BY: J.A. SCALE: 5/1

TRACED BY: R.A. PASSED BY: J.A. DIMENSIONS IN INCHES

**.276" A.P. BULLET.**  
**EXPERIMENTAL DESIGN.**

R.D. N° 5231

25-8-37





