
History



'Alpenglow on Everest North Face', Philip MacLeod Coupe,
oil, 125cm x 176cm. (*Alpine Club*)

JOHN MIDDENDORF
‘Engineered Beyond All Reason’

The Early Piton: 1870-1920



The cover of Fritz Schmitt's *The Mountaineer Today* (1937), with the piton's importance in 1930s alpinism clearly illustrated. Schmitt was a working-class climber who was fired from his job as a railwayman in 1933 for his opposition to the Nazis and went on to have a distinguished publishing career.

In the late 1800s, the Campanile Basso became one of the Dolomites' last great problems, one that Hans Barth, among the top free climbers of his day, dubbed the 'Dent du Géant of the Eastern Alps'. Part of the Brenta group, the spectacular sub-range of the southern limestone Alps in Trentino, Campanile Basso is hidden from the valleys below, so the sight of this wild 300m tower first appears at close range, drawing the climber's eye wistfully – and often fearfully – to its dramatic and lofty summit. Trentino was also home to the Società degli Alpinisti Tridentini, an organisation dedicated to reinvigorating Italian morale in the region as it chafed under the Austro-Hungarian Empire.



Campanile Basso, crucible of modern rock climbing.

Among their number was the wealthy photographer and innovative climber Carlo Garbari who wanted the summit of the Campanile Basso for Italy. In 1897, Garbari and his two guides made a spirited attempt, which involved intricate route finding and bold free climbing up exposed and difficult rock, spiralling up the south, east and west faces. After 300m, the team was stopped by a 20m headwall just short of the summit. At a small ledge later dubbed the 'Garbarikanzel', the Garbari Pulpit, the junior guide, Nino Povoli, boldly free climbed up this blank wall but was unable to commit to the final difficult and unprotected moves to easier ground.

Rope management had been evolving in the 1890s, especially in the eastern Alps, from the Alpine method where several people climbed together connected by a rope, all of them poised to support any slip of

the team, to the system where a single climber led and another, the second, braced on the cliff, held the rope close in hand, perhaps wrapped around the arm for added friction. On Campanile Basso in 1897, without solid anchors on the small ledge of the Garbari Pulpit, a 10m factor-two fall on the static manila ropes of the day would either snap the rope against an edge or else the force would rip the trio from the mountain.

Nevertheless, in his book, *Half a Century of Alpinism*, the great Tita Piaz told a possibly tall tale of how, with the climbers perched among loose rocks covering the ledge, Garbari pulled a gun on his unwilling guides to force them on to the summit, an action, Piaz wryly noted, that 'saved Garbari forever from being bothered by unemployed guides.' Yet despite the urging of Garbari, it was not yet time for the summit of Campanile Basso and the team retreated.

Two years later in 1899, Austrians Otto Ampferer and Karl Berger followed Garbari's route to the ledge and were also stumped by the obvious direct route up the headwall. Instead, fearlessly, Ampferer made a blind and airy traverse around the exposed north-west corner, found a weakness up the middle of the imposing north wall and climbed onto the celebrated summit, 'a spacious plateau with a block altar in the middle'. The summit of what the Austrians preferred to call the Guglia di Brenta was won and the ascent became big news across the whole European climbing community. And in

reporting their ascent in the 1899 *Mitteilungen des Deutschen und Österreichischen Alpenvereins* 'Reports from the German and Austrian Alpine Clubs', the Austrians acknowledged their use of pitons for the descent.

Subsequent ascents would add many more pitons to the route. In the 1907 edition of *Mitteilungen*, Hans Barth wrote:

As smooth as a snake, the wild rock tower rises an estimated 300m. It's a good thing that modern mountaineers have enough respect for these wild rock monsters that they don't kill them completely with wire cables, stairs and railings, [and only] mark vulnerable places with iron pins and rope rings.

Barth noted that the second ascent of the Campanile Basso, made by two Munich climbers, had marked a number of these 'vulnerable places' with pitons. A fixed rope was also reported as being in place at one section. On Barth's ascent in 1901, made with the superbly named engineering entrepreneur and author Alfred von Radio-Radii, he described bringing sharp steel pitons for the ascent and looking up from the base to a 'yellow-red overhang adorned with rope rings': slings and pitons. Later, unsure of where the route continued, he sees: 'A hook!¹ So it has to go this way.' At a tiny ledge, he notes:

Our predecessors once again had left their weapons in the body of this wild mountain, and we thanked them for their support.

And again, on a section midway, where the route exits a chimney and moves out onto an exposed face:

The first climbers again tamed the stubborn rock with a hook, so one calms down about climbing the pillar.

For the final bold climbing around the north-west corner to the final wall, he writes, 'an alcove with rusty hooks in it, above it a brittle outcrop with a hammered peg and a weathered hemp rope ring still seems to hold,' followed by a description of the committing moves above. In short, by the third ascent of Campanile Basso, the route had a good number of added pitons and safer belays. With increasing safety at precarious and exposed belays using piton anchors tied off with cord, short lead falls and swings onto the anchors could be risked. It was still a dangerous route for the time. In 1911, Eugen Prosch from Würzburg fell while traversing the north-west edge at the Garbari Pulpit. Having disappeared from view, his companions heard a scream and there was a jolt on the rope, which then went slack. Prosch fell several hundred metres to the gully below and his body was cut in two on a sharp rock.

Yet despite such horrors, the arrival of pitons had transformed climbing

1. A direct translation of the German *Haken*, often used for peg. See later in the article for more on nomenclature. Barth also uses the word *Sifti*, similar to the British English word 'peg' or 'pin', also German for 'pencil'.

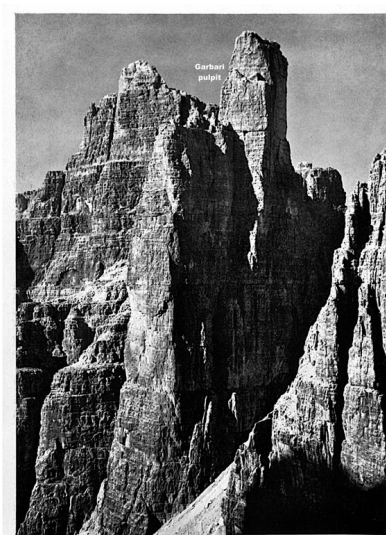
on the Campanile Basso. In 1904, Nino Povoli (later written as Pooli) returned, redeeming himself by climbing directly up the headwall, presumably with a safer belay. (In 1907, Conrad Kain reported 'two iron spikes and a rope-off ring, and an anchor at the belay.')

The mountain soon became a test-piece for the best climbers in the eastern Alps, including the Austrian alpinist Vineta Mayer with her husband and Joseph Ostler from the Kufstein, who made the eighth ascent. (A few years later, Vineta's sons, Guido and Max, helped pioneer their era's longest and hardest routes in the Dolomites). In 1908, the visiting American Oliver Perry-Smith led a bold new route up the south-west face, and in 1911 Beatrice Tomasson climbed the tower with Angelo Dibona and Michele Bettega.

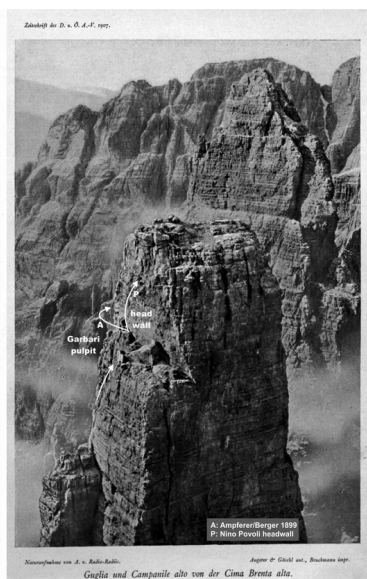
Twelve years after the first ascent, Paul Preuss', solo first ascent of the east face of the Campanile Basso remains one of the most spectacular on-sight solos in climbing history, a 500m line that also became 'well-pitoned', according to the *AJ* 1961, despite its clean origins. One of the climbers that Tita Piaž most respected – along with Georg Winkler and Paul Preuss – was Rita Graffer, noted for her lead of the *Preuss* with her younger brother, presumably when the route was not yet 'well-pitoned'. She also put up a new 350m route on the south-west arête of Campanile Basso using 12 pitons in 1934. That same year, the *Alpine Journal* downgraded the original route to the status of 'classic', noting exactly 619 ascents to that point. In the later published 'piton debates' of 1911-12, Piaž argued that pitons for safety were justified, as life was more important than bravado, and regretted the 'double falls' of the time: when a falling leader also ripped the second to their death. Piaž deeply lamented Preuss' death, climbing solo on the north ridge of the Mandlkogel.

The early years of climbing on the Campanile Basso opened the eyes of many to new horizons in the vertical world. Yet it also illustrates that the story of alpinism's most inspiring climbs is also one of inventive minds: pioneers who realised the potential of new tools, refined them and then used them to venture onto ever more visionary lines up the most imposing vertical walls on Earth. But the process was always controversial, and nowhere more so than in the long and tortuous history of the piton. Its development drew on existing technology, advances in metallurgy, the design genius of a few visionaries and the never-ending debate among climbers about what constitutes an ethical ascent.

In 1880, A F Mummery declared the summit of the Dent du Géant 'absolutely inaccessible by fair means' after being turned back by a steep band of exposed slabs leading to the top. Several other teams had also tried and failed. Two years later, in 1882, Jean Joseph Maquignaz, his son Baptiste and nephew Daniel Maquignaz broke with Alpine tradition to forge a route up the slabs, over a period of days systematically hammering in a number of rudimentary pitons, described as 'stanchions', into cracks as hand- and foot-holds, fixing ropes as they went. Their clients, the notable Sella family, followed these ropes for the first ascent. The route, 'Sella's Staircase', is often said to mark the end of the Silver Age of alpinism. And with the extensive use of



Photo, French Peakers, 1900. *Alpine Journal*, 1901
 THE CAMPANILE BASO FROM THE SOUTH-WEST. THE GREAT WESTERN SHOULDER BUTTRESSES THE WEST WALL. FROM THE SOUTH END OF THE TERRACE ABOVE IT, PIERRE BLANC AND C. F. MEADE MADE THE FIRST ASCENT OF THE SOUTH WALL IN 1900.



Zählzeit der St. v. G. J. F. 1900.
 A: Ampletenberger 1899
 P: Nino Povolli headwall.
 Photographie von A. v. Kuhn-Rath. *Alpen & Gletsch* vol. 1, Buchdruckerei Leipzig.
 Gaglia und Campanile alto von der Cima Brenta alta.

The complexities of reaching the summit of the Campanile Basso became an ethical dilemma in the early 1900s.

mechanical tools for the ascent of the Dent du Géant, debate on the sporting limits of style and the use of tools in the mountains began in earnest.²

Eventually, hammered stanchions like those used in 1882 evolved and their name became 'pitons' in English while remaining Haken or 'hooks' in German. This article explores how this game-changing technology went from late Silver Age climbers using simple wrought-iron spikes to 1920 and the first 'modern' steel piton credited to Hans Fiechtl and other lesser-known climbers. It's a story about how ambition drives technological change, a never-ending cycle of one leading to the next, and how alpinism defines its own limits.

First Steps

The ice axe, the first iconic mountain climbing tool, was from the start used as it is today for both ice and rock, sometimes hooked on a high rocky ledge to assist vertical gain. As climbers moved onto longer steeper rock routes, ice axes were often in the way, and for a short time a metal hook became an alternative lightweight tool of choice. Edward Whymper, whose ascent of the Matterhorn closed the Golden Age of alpinism, carried a clawed hook attached to a short piece of rope. The 17-year-old Munich climber Georg

2. The second ascent was made less than a month later by W W Graham and the guides Auguste Cupelin and Alphonse Payot. Graham used all of the sieged ropes and pitons of the Sella expedition but also climbed to the other, slightly higher summit of the tooth. Soon after, he applied for but was denied membership of the Alpine Club, perhaps because of his use of what members considered unsporting methods to claim an ascent. The route up the steep slabs of the Dent du Géant is still to this day maintained with thick grabby fixed ropes; but even with the ropes, the route requires the skills and abilities of a 5.6 rock climber and very exposed climbing.

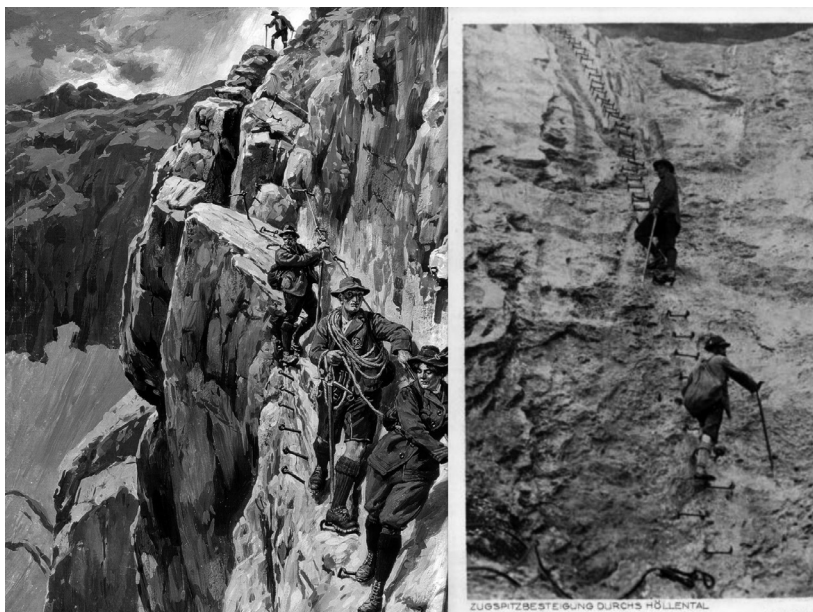


Edward Whymper's 'climbing claw'.

Winkler carried a hook attached to a rope, and occasionally used it for descent from the many rocky spires he climbed, perhaps even from his famous solo ascent of the Vajolet Towers in 1887. Sometimes called a 'grappling hook', the 'claw' could also be placed at the end of an alpenstock, according to Whymper though modern climbers might feel climbing on a blindly placed hook requires great faith.

As late as 1905, the Austrian alpinist and surgeon Günther von Saar described himself using a 'strong steel hook, in the form of a question mark, attached to a 10m rope' as a tool for descent. But after a few of these (as well as some ice axes) had to be left behind as rappel anchors, the straight hammered-in spike became a more logical and acceptable rappel anchor. For example, in addition to the short lengths of rope fixed on the Matterhorn from early in its climbing history, Hans Lorenz, writing in 1900, suggests that from 1870 stanchions were also being used for descent: 'And behold, there is a rusty broken *Stift* [pin] in the rock, hit more than three decades ago, a memorable sign of a memorable time.'

At the end of the 19th century, technical rock climbing began its branching-off from alpine mountaineering, which had become a popular activity by the early 1900s. The Deutscher und Österreichischer Alpenvereins (DuÖAV), created by merger of the German and Austrian Alpine Clubs in 1873, exploded in membership from fewer than five thousand members in 1874 to a hundred thousand by the 1910s. Memberships of the Club Alpin Français, Schweizer Alpen-Club and Club Alpino Italiano also expanded. Comfortable huts that could sleep 50 or more were constructed in the high meadows and on cliffs where there was once only a small shepherd's shack. New railroads allowed easy pan-European travel and tunnels bored through the Alps, like the Mont Cenis Tunnel completed in 1871, allowing easy transit under mountain ranges that had been a major expedition overland for the previous generation. The mountain dragons were being tamed.

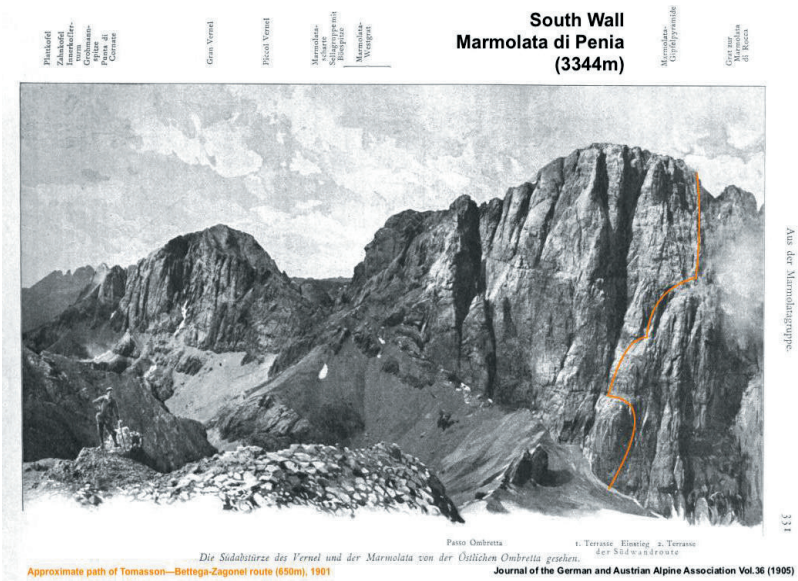


The construction of an *Alpenweg* involving iron ladders and rods with wire cables for safety turned the Zugspitze (2692m) from a rarely climbed peak to a huge tourist draw, attracting thousands of what were known as *Hochtouristen*.

This infrastructure boom extended into the mountains. Existing routes were fixed with new equipment to aid a broader range of ability: these were the *Alpenweg*, with rungs and ladders fixed to overcome technical sections. A good example was the Zugspitze (2692m) in the Wetterstein range in the eastern Alps: modern Germany's highest mountain. A Bavarian army surveyor Lt Josef Naus claimed the first recorded ascent in 1820, but subsequent ascents were relatively few until an *Alpenweg* was constructed in 1875. A 15m slab was equipped with an iron ladder (the 1911 guide calls it the 'chicken ladder') and a series of drilled iron rods (*Eisenstiften*) with wire cables protected a slippery traverse. In 1897 a large refuge – the *Münchner Haus* – was built on its summit. The accessibility of Germany's highest mountain caused controversy in the Alpine clubs as thousands of *Hochtouristen* (high altitude tourists) swarmed the summit, with many alpinists lamenting how the 'Queen of the Bavarian Alps' had 'lost its horror.'³

The installation of metal bolts and wire cables⁴ to protect exposed areas

3. The first cable car was constructed in 1926, from the village of Ehrwald in modern Austria, using technology developed by the mining history. Soon after, the mountain became a focal point for adventurous stunts and demonstrations of allegiance to the Nazis. Although it's worth adding that E L Strutt, in a 1942 *Alpine Journal* account of his adventures in the Eastern Alps in the 1890s, could still write: 'Even now, when the cliffs have been engineered beyond all reason, the climb from the Höllental still counts as a good expedition.'
4. The general use of hardware in the mountains increased rapidly in this period: Marmolada saw its first via ferrata up the west ridge in 1903, using *Eisenstiften* (iron rods) and wire cables to ensure safe passage for all *Hochtouristen*. Alpine clubs and militaries established new routes over passes between ranges, sometimes blasting steep gullies and cliff sides, also helping maintain control of the frontier, the natural defensive border between regions. Expanding infrastructure involved huge efforts to establish huts and rifugios in the



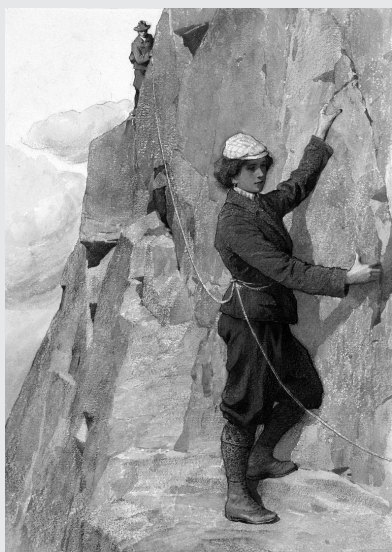
The south face of the Marmolada, first climbed in 1901 by a team including Beatrice Tomasson. The ascent was later downplayed by the influential historian Domenico Rudatis and faded from view until this century.

and provide steps and handholds in the mountains was referred to as *Anbringung von Versicherungen*, the ‘Fixing of Security’. The phrase *Künstliche Hilfsmittel* (artificial aid) first appears in the 1880s, defined in the *Mitteilungen*. These included wooden ladders, ropes tossed over flakes and even rockets fired over summits⁵, in addition to the iron rods and cables being installed on Alpenweg. (Bottled oxygen was also on the list.) Failure on a climb was often excused with the suggestion that the route was ‘absolutely inaccessible without the use of artificial aids’, as one report in 1891 put it.

For more than three decades after the time of Whymper, as climbing got steeper, lines on rock were primarily focused on major chimney features with ‘windows’: safe places often found in long deep cracks offering a good belay stance. But towards the end of the 19th century, climbers began venturing out onto the exposed faces of the Dolomites. To explore this wild new terrain, alpinism had to find a compromise between the wholesale equipping of Alpenweg (and similar but later via ferrata and Klettersteig) and a wholly pure free-climbing ethic. The debate of what constituted aid

deeper ranges. Metal rung ladders were drilled and cemented into stone slabs to avoid the need for any risky climbing in variable weather conditions, and more complex Alpenvereinsweg (‘Alpine Club Trails’) were designed and constructed: one project in 1910 on the western border involved 620kg of iron rods and 340m of wire rope, with 500 steps cut into the rock. In a single season, trail crews installed the 870 iron rods with expert rock drilling and anchoring techniques. The iron rods, weighing 1kg each and installed with chisel, soon evolved into lighter, more efficient tools for anchoring in rock.

5. C T Dent wrote in his 1892 Badminton Library book *Mountaineering*: ‘Climbers, more ingenious than prudent, have endeavoured, by means of rocket apparatus, to fire up a rope armed with a grapnel. This plan was tried unsuccessfully in an early attempt on the Aiguille du Géant.’



The indomitable Mizzi Langer (1872-1955), alpinist and rock climber, ski racer and entrepreneur, equipment designer and inspiration for a new generation of women alpinists.

FIRST CLIMBING SHOPS

The pre-First World War period in the eastern Alps was an era of heroic climbs up spectacular limestone cliffs that had once seemed unimaginable as climbs. As pitons were adopted from other industries, then manufactured for climbing purposes by local blacksmiths, mass production and the ready availability of shop-bought hardware equipped a new generation of climbers pushing standards on big Alpine walls. One of the first dedicated gear shops, in business by 1900, belonged to Marie 'Mizzi' Langer (1872-1955), an Austrian alpinist and rock climber, and medal-winning ski racer. Mizzi's shop in Vienna offered all the latest equipment for the alpinist and skier, including well-designed and fashionable women's outfits for the mountains, advertised as 'sporty and functional'. Her catalogues

showed women not just climbing but in the lead, inspiring a generation of women alpinists, such as Käthe Bröske and many others who were climbing at the highest levels. The main Klettergarten in Vienna is named after her.

Mizzi Langer's illustrated catalogues contained not only the latest equipment but also tips on the most modern skiing and climbing techniques. Gustav Jahn, an accomplished alpinist and artist, captured the Alpine zeitgeist with his seasonal illustrations: beautiful pristine ski fields in winter and the mountain experience in summer. Mizzi Langer catalogues were featured in the 1905 *Mittellungen*, a notable exception to the 'understandable rule' of the DuÖAV not to endorse businesses, thanks to the artwork of Gustav Jahn and technique articles by noted climbers such as Hans Barth.

The Austrian National Library has copies of Mizzi Langer's advertisements in the monthly periodical *Der Gebirgsfreund* (The Mountain Friend), which reported on a range of mountain activities from 1890 to 1941. Climbing gear listed for 1910 included rappel slings with ring (*Abseil-Schlingen und Ringe*), pitons (*Mauerhaken*), foldable candle lanterns for alpine starts and marking papers (*Marklerungsblätter*), which were sheets of red paper strips left at key spots of an ascent to mark a trail for descent. A pack of 50 were offered free to customers.



Early wrought-iron *Mauershaken* from c1880 and c1890 associated with the Zsigmondy brothers and Schmitt. Early pegs were simply metal-ware manufactured for other purposes that proved useful to alpinists. (*Messner Museum*)

in the mountains was further fuelled as new technologies brought alpinists more portable 'security' than heavy stanchions.

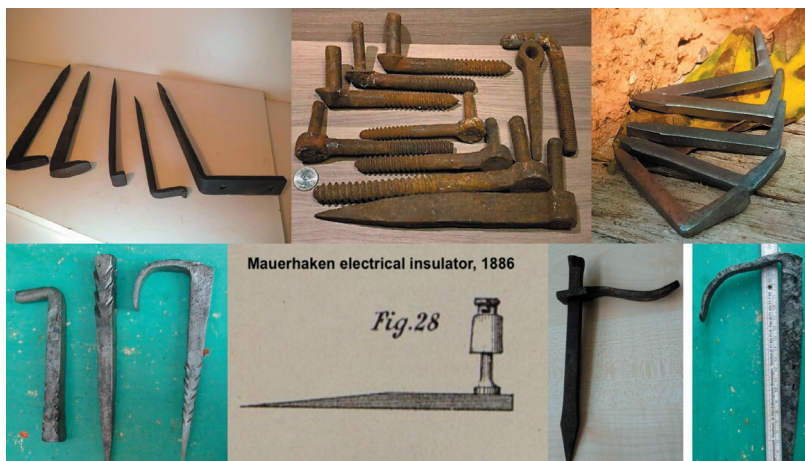
Twentieth-century climbing kicked off with Beatrice Tomasson's famous first ascent of the south wall of Marmolada in 1901, the largest steep big wall climbed at the time at over 500m. The wall had seen several attempts by then and several mountain guides had made solo reconnaissance. It was an obvious prize, a clear next step in big-wall climbing thanks to its size, altitude and prominence in the landscape. Beatrice, who was for a time the governess of E L Strutt, climbed the Marmolada with her regular guide Michele Bettega and Bortolo Zagonel.

The team used four pitons in key sections for their one-day ascent, although the ways and means of that ascent were debated for the next few decades. A description was never presented, so subsequent climbers had to figure out the route for themselves. The second ascent in 1902 by the German brothers Georg and Kurt Leuchs involved three days of initial reconnaissance, then two days on the wall in frosty conditions with a bivouac. Guido Rey climbed the route with Tita Piazz in 1910, describing his adventure in *Alpinismo Acrobatico* as the 'most difficult in the whole chain of the Alps.' Today, the route involves 27 pitches of climbing and has over 50 fixed pitons. Despite the route's significance and commitment, this landmark ascent was largely forgotten after the First World War, as its technical difficulty was eclipsed by a new generation of piton-assisted ascents in the Alps, and then written out of histories in the 1930s.⁶

In 1903, the Dresden climber Fritz Eckardt, philosophising in a series on the 'sporting side of alpinism', compared climbing to other athletic pursuits and noted how many sports depended on the tools as much as the capabilities of the sportsperson. (He also presciently discussed the problems of competition.) Eckardt noted how aids like wire ropes, pitons, bolts and handrails are called 'unfair means', using the English phrase presumably as a nod to British ethics, but that ice axes, ropes, crampons and snowshoes are tolerated. In the struggle of ascent, Eckhardt emphasised how it is nature that dictates the necessary equipment, those 'inventions of the human spirit'. It was clear by 1903 that for most leading eastern European climbers pitons could be described as 'necessary equipment'.

6. Italian historian Domenico Rudatis wrote two pages on how the Tomasson ascent was not a significant milestone. Thereafter, it disappeared from histories until this century.

From 1885, the term *Mauerhaken* ('wall hook') began appearing in the *Mitteilungen* as a hammered-in metal tool for security. *Mauerhaken* is not a term unique to climbing: it applies to any sort of masonry hook hammered between stones or into adobe dwellings and used for attaching lanterns, cooking gear, horse reins, signs and so forth. It dates back centuries: the double *Mauerhaken* was a common symbol on coats of arms representing security built into castle walls. Early electrical engineers adopted the term for insulators on telegraph poles (1886). Fire brigades included *Mauerhaken* as part of their climbing equipment for brick and stone structures well before it was ever used to refer to a piece of gear used for mountaineering (1877).



A selection of *Mauerhaken*.

In German, the general word for piton is still *Haken*, or hook. Among historical terms *Mauerhaken* is most common but *Stahlhaken* (steel hook), *Felshaken* (rock hook) and *Ringhaken* (ring hook) were also used, sometimes interchangeably. Karabiners were originally called *Karabinerhaken*. We also see *Eisenstift* (iron pin), used in the context of a hammered piton, such as the report on the ascent of the Dachstein (1876 *Mitteilungen*), which also involved fixing a ladder on the route. But *Eisenstift* as a bolt for a hole drilled with a drill or stone chisel soon became differentiated from *Mauerhaken* for cracks.

Steeplejacks (think Fred Dibnah) also used wrought-iron wall hooks, called 'iron dogs' (sometimes also called 'staples') for laddering up chimneys. The technique of connecting multiple ladders with hammered-in wall hooks to service tall industrial chimneys, designed to force pollutants high into the atmosphere rather than settling in local communities, dates back to the mid 1700s and was a burgeoning profession in the early climbing era.

Towards Lightweight Steel Anchors

Thus pitons were introduced, first as abseil anchor, then as belay anchor and eventually as aid for ascent on routes. For example, in 1894, Ludwig

Purtscheller reports on the first traverse of the Meije with the Zsigmondy brothers.

One of the most terrible abseiling points is located on the Zsigmondy ridge between Pic Central and Grand Pic de la Meije, its height is thought to be around 30m. The foot of the rock face, because it overhangs, is hidden from view. [We] overcame this obstacle by driving a Mauerhaken into a crevice in the rock slab, wedging it firmly with stones and attaching a Seilring [rope sling]. Such tricks with the rope are always a bit daring. They can only be justified in those cases where there are no other means.

Seilring ('rope ring') can be an ambiguous term in the early journals as it applies to both metal rings, primarily used for abseil anchors (primarily called *Abseilring*), and also to a short sling of rope (also known as *Rebschnur* or *Repshuur* and later as *Seilschlinge*) used to connect the running rope to the pitons, called a 'running belay'. Note that well into the 1920s, a *Stahlhaken mit Seilring* (a steel piton connected to the running rope system with metre length of 5-7mm cord), was the standard system in the days before strong karabiners. Ropes slings, *Seilring*, were still the primary means of connecting rope and peg, and designers of the era discussed smoothing and rounding the piton eye to ensure there were no sharp edges to damage the attachment cord. Hence the standard technique of tying off a fixed piece of protection with a short loop of rope being the standard practice of the day; dynamic lead falls were not yet an option so a low-friction ring was not required and hemp on hemp does not have the same danger as later nylon ropes do with their low melting point. Early ring pitons used for climbing were made for other purposes and unless thick and heavy, a wrought-iron ring would have been a weak point in the system.

By the end of the 1800s, there are increasing references to three *Mauerhaken* being carried in a climber's pockets as standard equipment for many German and Austrian alpinists, along with rope slings to attach the pitons to the rope system. Fixed pitons were noted at crux sections in route descriptions, and by the early 1900s, climbers in the eastern Alps began to admit openly the use of *Mauerhaken* for ascent. During an ascent of the



An unknown climber illustrating the use of *Seilring*, the method of tying the lead rope into a rope sling before the advent of karabiners.



What's he got in his pockets? The great Angelo Dibona (1879-1956), pioneering guide and ski instructor who claimed to have only placed 15 pitons when Luis Trenker asked him, six of them on the north face of the Laliderer. He was known to carry three or so in his pockets.

Watzmann, Germany's third highest peak, Wilhelm von Frerichs admitted in the 1903⁷ *Mitteilungen* to driving a 'wall hook' to overcome an overhang: 'the rock became climbable, the terrible wall lay below us,' he wrote and then added, 'maybe this confession costs me my mountaineering reputation.' Controversy over the use of pitons would culminate in the Mauerhakenstreit debates of 1911-12.

The early *Mitteilungen* have frequent references to 'Haken mit Seilring', 'hook with rope ring', often in use as an aider for pulling on and also stepping into and sometimes referred to wryly as a noose, as climbers bypassed a section 'von Seilring zu Seilring', aiding up a line of fixed gear. It's easy to imagine the progression from using pitons with ropes slings as an occasional hand or foothold, to pitons providing protection

for the roped climber a few moves past the piton.

Starting in the 1890s Oskar Schuster advanced piton-protected climbing to a high art on the sandstone crags of Elbsandsteingebirge. Schuster was one of the best all-around rock, ice and expedition climbers of the era and describes placing pitons (and bolts) 'of many sizes' on tricky leads.⁸

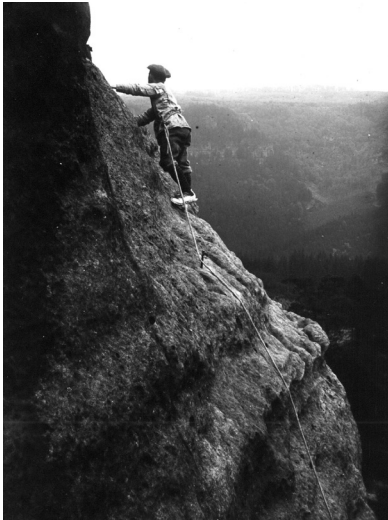
The game filtered south and climbers aimed initially to use pitons only for 'security' – belays and protection, and not for aid – and bolder free climbs became possible in the first decade of the 20th century. In a far cry from the rock engineering specialists busily establishing the early via ferrata at this time with literally tons of gear, the early Alpine rock climbers of the early 1900s were going light and efficient, from the ground up, with a minimum of tools to get the job done with a high standard of free climbing.w

The great Italian climber Tita Piazz made the sixth ascent of the Campanile Basso in 1902 and in the years after advanced the art to new levels on the limestone big walls in the eastern Dolomites⁹, using pitons efficiently for

7. Von Frerichs wrote a 35pp retrospective of the Watzmann in the 1903 *Mitteilungen*.

8. Schuster made extensive explorations in the Caucasus but was caught there by the Russians at the outbreak of the First World War and died of typhus in an Astrakhan internment camp in 1917.

9. From the 1906 *Mitteilungen*: '[the Piazz-Wenter 1902 ascent], in particular, has become important for the future of the Guglia, because the first and still only authorised German mountain guide got to know and love this first-class climbing tour and since then, as a Guglia specialist, has climbed it many times.' Piazz was heavily involved with mountain rescue, including over 100 incidents in his career, and was known for his complex rigging when safe rope and anchoring techniques were required at a moment's notice. Throughout his career, Piazz adopted all the latest climbing tools.



Max Matthaüs on the Winklerturm in 1911, illustrating how the rope lay across early pitons. (Walter Hahn)

rock-climbing belays and protection and mastering the use of a specialised piton hammer for faster and safer rock climbs up the steepest terrain.¹⁰ He also had a technique to quickly attach a sling or a rope. While no one, frankly, has any idea of the design of these first steel pitons, I believe it was informed by pitons known from the Elbsandsteingebirge.

By 1911 Angelo Dibona with Luigi Rizzi and Guido and Max Mayer climbed an 800m route on the north wall of the Laliderer in the Karwendel range, equipped with six pitons, according to Dibona. The route required a bivouac and set new standards of difficulty on long routes. One section in particular required complex piton and rope work to

overcome a tricky downward rope traverse.

Not much of the pre-1910 hardware survives, though perhaps some unidentified gear still exists in a local museum. By many accounts, they were not the round eyebolts depicted by Claude Wilson in 1893 and they were not all ring pitons, nor the L-shaped Mauerhaken. Available descriptions suggest instead they were likely flat blades of various lengths and thicknesses and thus probably custom made. While the definitive design of the first steel pitons is unknown, it was likely informed by bolts used in the Elbsandsteingebirge: a steel piton with an inline eye.

From Industrial Tools to Climbing Hardware

Most, if not all pitons used for climbing before 1900 were made of wrought iron rather than steel. Cast iron, with its high carbon content, is strong but too brittle for the purposes of climbing since it shatters when hammered. Wrought iron, as the name implies, can be worked thanks to its much lower carbon content and was a standard smithy material in the 1800s. The early climbing Mauerhaken were crafted from wrought iron in the forges of blacksmiths using hammer and anvil. Broadly speaking, impurities in the iron make it malleable; its internal structure appears almost fibrous, part of the reason it was aesthetically pleasing as well as structurally useful: think Crystal Palace or Eiffel Tower. Wrought iron can also be 'case hardened' by packing it in a high-carbon material and then heating it so that some of the carbon migrates into the iron. In the days before climbing hammers and

10. In the famous *Mauerhakenstreit* debates of 1911-12, Georg Leuchs commented on how Piazz was willing to use up to 30 pitons for an ascent, as reported by Hans Dülfer.



Top: 'The ghost of Hermann von Barth looks on in contempt at wall hooks and rope, the aids of modern climbing technology.' Above: 'There sits the indignant baboon. My dear gentleman. That's unfair competition!' Ring pitons illustrated, from *Der Alpinismus im Bildern*, 1911.

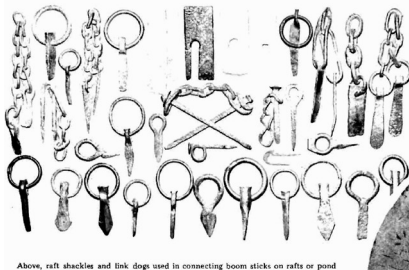
karabiners, these wrought-iron Mau-erhaken, or 'wall hooks', were shaped like a 'L', and pounded into cracks with a suitable stone, then used as a hand or foothold, or rappel anchor. As a belayed point of protection for the next few moves past the anchor, climbers would make sure the rope ran over the wall hook but also often connected them to form a running belay using a Seilring, the knotted sling of cord.

We know also that pitons with an integrated ring were used before 1910. There is a mention in 1905 (of climbers being able 'to drive in a wall hook with ring very firmly, the rope is pulled through, we can finally calm down') and the influential mountaineering author Oskar Meyer mentions their use in 1910 as a point of abseil on the Brèche du Perron.¹¹ Most of these pitons are identical to tools used by loggers to lash log rafts together, called 'log dogs'. The rings appear to be spot rather than forge-welded, so would likely have been made in a factory rather than a local blacksmith's. But the term *Ringhaken*, 'ring hook', does not appear frequently in the old *Mitteilungen*.¹²

The evolutionary link between the original Mau-erhaken and the modern piton was not, therefore, ring pitons but more likely a flat piton with a large inline eye that allowed the thick short cord of a Seilring to be

passed through easily. In the pre-karabiner days, early articles on how to craft pitons emphasise the need to round out the eye in order to prevent damage to a cord under stress. In the days before electric welders in local shops,

11. The term also appears in the 1909 edition of Franz Nieberl's *Das Klettern im Fels*, with illustrations by Carl Moos, an excellent resource for studying climbing-gear evolution as updated editions appeared every decade into the 1950s.
12. Ring pitons, a flat blade of varying sizes with a hole and a welded steel ring, became more available from around 1910 with stronger steels, better welding shops and an expanding electric grid. The term *Ringhaken* became much more common in the 1920s when Sporthaus Schuster began selling flat pitons with welded rings, which were more commonly sold as rappel anchors. In the 1920s and beyond, the term 'Ringhaken' faded as climbers began primarily using the generic Haken, or Fels-haken (steel hook).



Above, raft shackles and link dogs used in connecting boom sticks on rafts or piers

5/8" Hammerhead Rafting Dog



Length: 6.5"
Inside Eye: 1.38"
Weight: 1 lb.



Log dogs or 'rafting dogs' used in the timber industry, compared to ring pitons. The latter were difficult to manufacture before electric welding became available.



it would have been simpler to make flat pitons with a larger inline hole for cord, rather than a captive forged ring.

There were many designs of masonry wall hooks, some with rings for hanging items on walls or tying up a horse, but wrought iron rings would not be as strong as steel, unless thick and heavy. The earlier, wrought-iron Mauerhaken weighed at least 500g each (over a pound), and were long and thick. Case hardening wrought iron made it less malleable but it still wasn't practical for thinner pitons, which were required to protect cracks on the hard limestone routes being explored in the Dolomites and eastern Alps. A round spike hammered into dolomitic limestone would shatter the rock. A flattened wrought-iron spike would have been too weak with a tendency to bend and shear. What was really missing in the early 1900s was a thin piton that was strong and light. It was only in the early 1900s with the greater availability of hardened steel sheets, strengthened by the rolling process, that narrow pitons could be developed, coinciding neatly with this early era of technical rock climbing. The first published reference to steel pitons is from Hans Barth and Alfred von Radio-Radiis during their ascent of the Guglia di Brenta in 1901.¹³

13. *Ein Rebschnurgürtel, um sich gegebenen Falls buchstäblich aus der Schlinge ziehen zu können; scharfe Dolche für meuchlerische Verwundung in Form von Prima-Stahlhaken und den von den Erstersteigern verfaßten Steckbrief in der Brusttasche.* From 'On the Guglia di Brenta', *Zeitschrift des Deutschen und Österreichischen Alpenvereins*. Bd 38, 1907.

A PITON MYSTERY

It is interesting, perhaps ironic, that it may well have been Claude Wilson who coined the term 'piton' in the *All England Series: Mountaineering*, one of the first climbing instructional books in English and a 'practical guide for would-be climbers', published in 1893. Wilson, born in 1860 near Liverpool to a Quaker family, was among the most distinguished alpinists of his generation and a president of the Alpine Club. He climbed hundreds of the most difficult summits in the western Alps, including the first guideless ascent of the Grépon in 1892. In the *Alpine Journals* of his era, pegs were generally – and often disparagingly – referred to as 'iron stanchions' because that is exactly what they were in those early days.

In French mountaineering journals up to 1904, the word 'piton' occurs frequently, but only in reference to steep spires of rock and never as a metal stanchion. The *Bulletin Mensuel* of the Club Alpin Français' refers in 1883 to the anchors on the first ascent of the Dent du Géant as 'des coins ou pointes d'acier' (wedges or spikes of iron). The French alpine journal, *La Montagne*, first refers to a piton as metal hardware in 1918, specifically a 'piton de fer' (iron spike). In a 1916 report on the north face of Mont Aiguille, *le clou* (nail) appears as a 20 cm long metal anchor. Mont Aiguille's north wall was first climbed in 1895; the 1916 climbers removed *le clou* and proudly reported they did not use it for ascent ('sans l'aide'). It is one of the earlier references to a mechanical tool used for assistance on many ascents and descents of the era, yet generally ignored in the early French mountaineering literature.

In France, pitons gained greater acceptance when the great Armand Charlet acknowledged using them in the 1929 edition of *La Montagne*: 'soon we are at the chimney with *piton de fer* [iron peg]. This piton which until now I have always disdained, I am very happy to use today.' At the time, he was making the first winter ascent of the Dru and was in a storm at 3,500m, simul-climbing with his partner up a loose and icy chimney while an avalanche of debris was falling on them.

The British especially were reluctant to publish any reference to – or admit use of – pitons as a mountaineering tool in the early days of climbing, even the amazing routes in the Alps going up in the 1930s with the aid of pitons. A Cox read this before the Alpine Club in 1941: 'The piton, indeed, is in rather a different category, for it is never used, fortunately, as a mere convenience. Undoubtedly it possesses a power for evil, and it is healthy that it should be viewed with suspicion.' (Paul Pritchard recently remarked to me that 'avoiding pitons helped Britain push bold free climbing,' and it's true).

In Italian, *chiodi da roccia* (rock nails) is the name for pitons. The word 'piton' in Italian can be translated into English as 'to snape', a verb meaning to bevel the end of a timber. As early rock anchors for climbing were often wood wedges as well as iron stanchions, perhaps the Italian word for piton is the origin of Claude Wilson's reference. The word 'piton' also appears in French medical journals as a small peg hammered into bone in a surgical procedure so it's also possible Wilson, a distinguished medical man, borrowed the term from the French medical profession.

There was nothing new about steel, of course. The Japanese ‘jewel’ steel of a thousand years ago could, in the hands of a great sword smith, make a blade that was diamond hard at the cutting edge, tough on the surface but more malleable in the core. But until the mid 19th century steel remained prohibitively expensive for widespread use, made in small batches with charcoal or, later, coke: the various forms of crucible steel. Solving that problem, first through the Bessemer process and then the Siemens-Martin open-hearth system would be a turning point in industrial history.

Britain was the largest global producer of steel in 1850 with 50,000 tonnes per annum. By 1900, steel was made primarily with coke and output was measured in millions of tons per year. Germany, the world’s second largest producer (after the US), was making four million tons of Bessemer steel and 1.5 million tons of Siemens steel per year. Wrought-iron production, largely from Sweden, dwindled to negligible quantities as wonders like Gustave Eiffel’s tower were superseded by marvels like New York’s Brooklyn Bridge, its steel made in Sheffield, and Manhattan’s skyscrapers. The Iron Age had given way to the Steel Age.

The wider availability of stronger, harden-able steels required blacksmiths to broaden their skills, as industrial mass production reduced demand for locally worked metal-ware. Heat-treating metal was an evolving art and new steels required adaptation to find the right blend of heating, quenching and tempering. Given that blacksmiths were forging custom-made pitons, it’s not surprising there are reports of bad ones, sometimes with the smith responsible identified in journals (on the Durreck, 1910: ‘The first wall hook – from the blacksmith in Sand – bends. Only the second “real” one holds.’).

The Modern Piton: the Fiechtlhaken

In the years prior to the first World War, a new piton design emerged, crafted from thin steel, which remains a standard design to this day. Hans Fiechtl¹⁴ (1884-1925) a contemporary of Piazz, Dibona, Dülfer, Preuss and others, was a mountain guide from Münster in North Tyrol, and is credited with the first thin piton design with a larger offset-eye. Some histories credit his invention to 1910¹⁵, but it is not until 1920 that the first published account of the Fiechtlhaken appears in the *Mitteilungen* in an article titled ‘Das Versichern beim Klettern’ (Security for Climbing), an overview of a basic protection system using rope, piton, karabiners and rope slings.

Reading the old journals it becomes clear that there was a marked increase in piton climbs – all considered ‘artificial aid’ ascents – from the turn of the century and by 1910 had become a boom. So it’s likely that some climbers had access to versatile and lightweight pitons that could be quickly tied off safely prior to the Fiechtl design, but with its offset large eye, it was

14. In 1911, Fiechtl climbed a new route on the Zsigmondyspitze using three pitons on a ‘very smooth wall’ for aid, and Fiechtl’s route on the south wall of the Schusselkarlspitze with Otto Herzog in 1913 is recognised as one of the most difficult big walls of the pre-First World War era (it is also the climb where a karabiner might have first been used on an early big-wall pendulum.)

15. The date of the first Fiechtlhaken is unclear, but there is a reference suggesting Fiechtl might have still been using traditional wrought-iron Mauerhaken on the Rofanspitze in 1908.



Fiechtlhaken, named for the innovative equipment designer Hans Fiechtl (1884-1925). These are likely not pre-First World War but typical of the pitons Fiechtl was manufacturing and sharing.

quickly realised as the most functional and became the new standard.

The early Fiechtl pitons were likely cut from sheet steel¹⁶, then tapered (i.e. made thinner at the end) by hand, a hole punched, and then heat-treated to the desired hardness. To fabricate the larger holes for the eye so they could accept a thicker cord, the smith would use a stud or slot punch and then use a series of progressively tapered tools, called 'drifts', to get the hole to the desired shape and size.¹⁷ The 1920 article explicitly recommends smoothing and rounding the piton eye to ensure there were no sharp edges to damage the attachment cord.

The offset-eye piton design has two major advantages: the eye, when nailed to the hilt, provides extra support in vertical cracks, and the offset-eye design reduces 'oval-ing' of the eye when the piton is being pounded, thanks to continuous material through the centreline. Limestone cracks are hard and brittle, but also can be very undulating, so the proper hardness of the piton – not too soft, not too hard – will allow the piton to thread deep into tricky placements without shattering the rock. Fiechtl and his blacksmith figured out the optimal hardness for a good limestone piton, and shared the new design widely.¹⁸

16. Rather than forged from a billet, as later Lost Arrow designs were, though horizontal Fiechtlhaken were also forged by the early 1920s from steel billets.
17. If you wanted the hole to swell below the centre-line of the stock, as with the eye of a piton to maintain a straight top line for hammering, you would make the hole offset toward the side of the stock, in effect the bottom of the placed piton, according to modern blacksmith Mitchell Goldman, via email correspondence, 2021.
18. According to Horst Höfler, Fiechtl's early pitons were made in Münster, where he lived at the time, between the Karwendel and Wilder Kaiser ranges, where technical big-wall rock climbing began. Note Fiechtl's name is often misspelled as Fichtl in the literature. Mühlbacher is still the name of a large local engineering business.



The fatal 'double fall', illustrated in an oil painting from 1880 by Munich artist Ernst Platz (1867-1940).



US Army piton from 1950, made to Fiechtl's design.

Awareness of better protection systems increased as piton-craft became more accepted. The 1920 'Security for Climbing' article with its first Fiechtl piton image was written in response to a sad accident witnessed by the author when the second was killed after the leader fell, known at the time as a 'double fall', and mentions that finding 'pleasure in danger' is fine but only if going solo. Optimising security, especially for a belay, for a team is perfectly justified for those who value life.¹⁹ In the pre-Great War period, there were some who had developed good protection technique with pitons, and many who did not either out of principle or lack of access to the new tools, but the teams that adopted the new protection devices put up some incredible big walls. The original Fiechtl design has stood the test of time and remained popular well into the 1960s. The US Army made thousands of this design, and even today titanium versions are still available.

Flat Fiechtlhaken are good in vertical cracks, but poorly loaded in horizontal cracks. Necessity breeds invention and sometime before 1922

horizontal pitons also appeared, with the blade at a right-angle to the eye, a design generally known as 'Lost Arrows'²⁰ in Yosemite. Horizontal Fiechtlhaken are more versatile as they work for both vertical and horizontal cracks; the added torque on the blade when loaded in vertical cracks is often beneficial to its holding power. Despite the varied designs and means of manufacture, all early pitons with the characteristic offset eye became known as Fiechtlhaken.

19. The author describes the piton as a 'wrought-iron pin used as a Mauerhaken, whose head is forged into a fixed ring, combining all the advantages of strength, suppleness, and equity', but it's clearly a description of steel, not wrought iron. Climbers and authors were still mistakenly referring to pitons in this way into the 1930s and even today, calling the early mild steel pitons as "soft-iron" (they are steel not iron). Wrought iron has a maximum hardness of about c100 Brinell. I recently tested a mild steel US WWII Army piton at c200 Brinell, and the mild steels of Fiechtl's era would have been hardenable to this hardness as well. By comparison, modern 4130 chrome-moly knife-blades are equivalent to c375 Brinell.

20. To make a 'horizontal' piton from a flat Fiechtl design, a blacksmith would hold the blade of the piton over the face of the anvil with the eye of the piton pushed against its side and with repeated blows 'set down' the material with the hammer, changing the profile of the steel to be less narrower and wider, make it more suitable for a horizontal placement.



Perhaps the finest Fiechtlhaken ever made, crafted by Bugatti engineers for the king of Belgium, c1930. (*Società degli Alpinisti Tridentini*)

“a piton by Hans (Johann) Fiechtl around 1920, which is in the MMM Coronas.”



**Foto: Archiv Reinhold Messner,
Messner Mountain Museum**

**Y_ROUTE in Northface of Sekarlspitze, FA: H.Fiechtl/E.Schmid, 1923
Piton from Hermann Huber Collection (found in 1964 on route)**





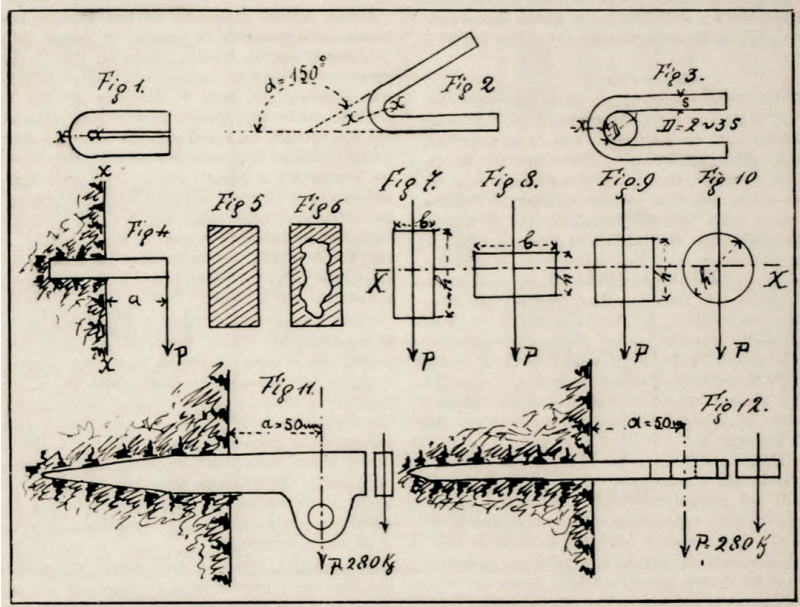
In the early 1920s, the brand August Schuster München, sold in Schuster's Rosenstrasse shop, began mass producing pitons.

Larger cracks were sometimes protected with wood wedges until the 1940s and the invention of angle pitons that required new materials, principally chrome-moly steel, and manufacturing techniques. It should be remembered that the best climbers of the early 20th century were exceptional layback, off-width and chimney experts, even by today's standards, and boldly ran it out on wider cracks and chimneys at a time when anything longer than a three-metre fall on the ropes of the day was a dice roll. Pitons were generally carried in coat pockets, and tales and tips were shared on awkward tricky placements on run-out leads: deftly placing a good anchor with one hand.

Flat pitons with welded rings were also produced in various sizes in the 1920s and beyond, but considered less versatile. They were less safe in horizontal cracks because of awkward loading on the ring and best employed as rappel anchors. Long serrated Fiechtlhaken were introduced as ice pitons. But flat and horizontal pitons with the offset eye were the two main designs for the next several decades, and both designs have ever since been referred to as Fiechtlhaken, with many variations of the blade.

Some time in the 1920s the brand ASMÜ (August Schuster München), sold in Schuster's shop on Rosenstrasse, began 'mass producing'²¹ flat and horizontal pitons with blacksmiths in Bad Oberdorf in the Allgäu mountains.

21. Hermann Huber clarifies: 'having seen the workshops in Bad Oberdorf, I can only say it was not a real industrial mass production but they must have been quite busy meeting demand. The ASMÜ pitons were more or less a monopoly in Germany for a while.'



By 1926, the design and heat treatment of thin steel mountaineering pitons had become a science.

ASMÜ's pitons were shipped worldwide, finding their way into mountain ranges all over the world – and into the history books. By the 1930s, mountaineering journals around the world were sharing the art of piton-craft; the art of rock climbing had been transformed.