

AN ADJUSTABLE WALL STUD

Technical Field

The present invention relates to wall studs and particularly to those used for
5 constructing internal partition walls.

Background to the Invention

Currently, the most popular way to build a non load bearing wall, such as a
partition wall, is using steel stud and track. First, horizontal top and bottom tracks are
10 secured in place at the desired locations of the top and bottoms of the partition wall.
Then vertical studs are installed at regular intervals between the top and bottom tracks.

Studs are obtained which have a length longer than the height of the wall to be
constructed. The studs must then be cut to length. The distance between the top and
bottom tracks is measured, the measurement is transferred to the stud and the stud is
15 cut. Depending on the levels of the floor and ceilings, this process could be duplicated
for every stud. If however the levels are accurate, one measurement is taken and every
stud is cut to the same length. The most common method for cutting studs to length is
using tin snips. The process of measuring and cutting wall studs is very time
consuming.

20 There remains a need for improved components and methods for constructing
walls.

Summary of the Invention

In a first aspect the present invention provides a wall stud including: opposed
25 mounting surfaces for receiving wall panels; a web is disposed between the opposed
mounting surfaces; first and second ends; the first end is provided on a first stud
member and the second end is provided on a second stud member; the first and second
stud members are movable with respect to one another to provide for adjustment of the
effective length of the wall stud.

30 The second stud member may be a sliding fit within the first stud member.

The end of the second stud member may be arranged to have the same
effective external dimensions as the end of the first stud member.

The end of the second stud member may include projections which provide the

same effective external dimensions as the end of the first stud member.

The wall stud may further include fixing means for fixing the first and second stud members in position.

The fixing means may include a ratchet and pawl arrangement which permits
5 lengthening of the stud, but resists shortening of the stud.

The pawl may be provided in the form of a flap that is integrally formed with the web of one of the stud members.

The ratchet and pawl arrangement may include a pair of pawls.

The ratchet and pawl arrangement may include a ratchet formation in the form
10 of a series of slots provided in the web of one of the stud members.

The ratchet formation may include two series of slots which are provided side by side.

In a second aspect the present invention provides a method of constructing a wall including the steps of: installing upper and lower wall tracks, each including a
15 trough for receiving the ends of wall studs; providing a series of wall studs according to the first aspect of the invention; adjusting the effective lengths of the wall studs to fit between the upper and lower tracks; and installing the wall studs in the tracks.

In a third aspect the present invention provides a method of constructing a wall including the steps of: removing wall studs from a wall constructed in accordance with
20 the second aspect of the invention; and readjusting the effective length of the wall studs.

Brief Description of the Drawings

An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

25 Figure 1A is a front view of a wall stud according to an embodiment of the invention;

Figure 1B is a right side view of the wall stud of figure 1A;

Figure 1C is a rear view of the wall stud of figure 1A;

Figure 1D is a left side view of the wall stud of figure 1A;

30 Figure 2A is a left side view of the lower stud member of the wall stud of figure 1A;

Figure 2B is a front view of the lower stud member of figure 2A;

Figure 2C is a right side view of the lower stud member of figure 2A;

Figure 2D is a cross sectional view along the line A-A of figure 2C;

Figure 2E is a perspective view of the lower stud member of figure 2A;

Figure 2F is an enlarged view of Detail B of figure 2A;

Figure 2G is an end view from the lower end of the of the lower stud member
5 of figure 2A;

Figure 3A is a left side view of the upper stud member of the wall stud of
figure 1A;

Figure 3B is a front view of the upper stud member of the wall stud of figure
3A;

10 Figure 3C is a right side view of the lower stud member of figure 3A;

Figure 3D is a cross sectional view along the line D-D of figure 3C;

Figure 3E is a perspective view of the upper stud member of figure 3A;

Figure 3F is an enlarged view of Detail F of figure 3A;

Figure 3G is an end view from the lower end of the upper stud member of
15 figure 3A;

Figure 4A is a cross sectional view along the line H-H of figure 4B;

Figure 4B is a right side view of the wall stud of figure 1A shown in the fully
extended configuration;

Figure 4C is a rear view of the wall stud of figure 4B;

20 Figure 4D is a left side view of the wall stud of figure 3B; and

Figure 4E is an enlarged view of detail G of figure 4A.

Detailed Description of the Preferred Embodiment

Referring to figures 1A to 1D, a wall stud 10 is shown including a first stud
25 member in the form of lower stud member 20 and a second stud member in the form of
upper stud member 30. The bottom end 22 of stud 10 is provided on lower stud
member 20. The top end 32 of stud 10 is provided on upper stud member 30. Stud 10
includes front 12 and rear 14 mounting surfaces which, following installation of the
stud, receive plasterboard wall panels by affixing the panels to the front and rear
30 surfaces of the stud 10 by use of appropriate fasteners in a known fashion. The front
and rear surfaces of the stud are provided with closely spaced grooves or ripples in a
known fashion to improve the ease of engagement of screw fasteners.

A web 15 extends between the front 12 and rear 14 faces of the stud 10. Bell

mouthed service holes 16 are provided at intervals along web 15 which, when installed, are used to route cables and pipes and other conduits in a known fashion.

The first 20 and second 30 stud members are formed from galvanised sheet steel of approximately 0.7mm thickness. Second stud member 30 is a sliding fit inside first stud member 20. The stud members 20, 30 are moveable with respect to one another in a telescopic fashion under control of a ratchet and pawl mechanism which allows the effective length of the stud 10 to be increased, but resists shortening of the length of the stud 10 as will be later described. In figures 1A to D, the stud 10 is shown in its fully retracted configuration.

Referring to figures 2A to 2G lower stud member 20 is shown in isolation and includes a ratchet formation in the form of two series of slots 24. As seen best in Detail C, slots 24 are formed by punching out flaps 26 from web 25 of the lower stud member. The slots 24 are the gaps created at the lower edges of flaps 26.

Referring to figures 3A to 3G upper stud member 30 is shown in isolation and includes a pair of pawls which, as best seen in Detail E, are formed by punching out flaps 36 from web 35. The flaps 36 are dimensioned to fit into slots 24.

To assemble the stud 10, the upper end 32 of the upper stud member 30 is inserted into the lower end 22 of the lower stud member 20. The upper stud 20 member is then slid upwards inside the lower stud member 20. This movement necessitates inward compression of pawl flaps 36 which have an innate degree of springiness by virtue of being integrally formed from the steel of the web 35. When the pawl flaps 36 are aligned with the lowermost pair slots 24 the flaps 36 spring outwardly. In this position, the stud 10 is assembled and is in its fully retracted position as shown at figures 1A to 1D.

The pawl flaps 36 resist shortening of the effective length of stud 10 by engagement with the slots 24. It is possible however to increase the effective length of the stud 10 by sliding the upper stud member upwardly with respect to the lower stud member. During this movement, the pawl flaps 36 move up the series of slots 24. Whenever the flaps 36 align with a higher pair of slots 24, the pawl flaps 36 spring outwardly to engage with the slots and the upper member becomes set at that height.

The ratchet and pawl mechanism has a degree of backlash. That is to say, when the pawl flaps 36 align with a pair of slots 24 and spring outwards, the upper stud member 30 is then pushed down a short distance to properly engage the flaps 36 with

slots 24 (as shown best in figure 4E). The amount of backlash roughly corresponds to the vertical length of the pawl flaps 36.

The resolution of the degree of adjustment of the length of stud 10 is defined by the spacing of the slots 24. More closely spaced slots provide for a greater number of positions in which the stud members can be locked together for a given overall length of adjustment.

The overall length of adjustment is defined by the length of the ratchet formation, being the length of the series of slots 24. A convenient degree of adjustment suitable for constructing office partition walls would be from about 2050mm to about 2750mm.

Referring to figures 4A to 4E, the stud 10 is shown in its fully extended configuration in which the pawl flaps 36 are engaged with the uppermost pair of slots 24. As previously explained, the ratchet and pawl mechanism does not allow the effective length of the stud to be shortened again. However, should it be desirable to make the stud shorter in length, then this can be achieved by pulling the upper stud member 30 fully out of the lower stud member 20 and re-inserting it into the lower end of the lower stud again as was described for the process of assembling the stud 10. This allows the effective length of the stud to be adjusted again.

To construct a partition wall using studs 10, upper and lower tracks are installed in a conventional manner. The tracks include troughs for receiving the upper and lower ends of the wall studs. To install a stud 10 between the tracks, the stud is offered up to the tracks and the effective length of the stud is adjusted to the maximum length that will fit between the upper and lower tracks. The width of the troughs in the tracks is roughly equal to the distance between the front and rear faces 12, 14 of the stud 10. To fit the stud into place it is typically rotated slightly about the axis of its length and its ends are located in the upper and lower tracks. The stud 10 is then rotated about its length to snap into position in the troughs with its front and rear faces pressed against the front and rear troughs. Construction of the partition wall then proceeds in a conventional manner.

Referring again to figures 3B and 3D, protrusions 37, 38 are pushed out of the front and rear face of the upper stud member. These are provided to compensate for the slight size difference between the upper and lower stud members that is necessitated by one being sized to fit inside the other. The protrusions 37, 38 mean that the outside

dimensions of the second end of the stud 10 are effectively the same as the outside dimensions of the lower end of the stud in the region of the front and rear faces where they engage with the tracks.

Because stud 10 is adjustable in length, it is able to be reused, or reconfigured
5 at a later date.

Although the stud was described above in the scenario of constructing a partition wall, it can be used to construct other installations such as bulkheads.

The thickness of the wall being constructed is a function of the width of the web of the stud. Variations of studs can be produced with variously sized webs to
10 construct walls of a variety of thicknesses.

It can be seen that embodiments of the invention have at least one of the following advantages:

- A wall can be constructed without the need to measure and cut studs, thus
15 saving time and trouble.
- The stud can be readjusted in length. This allows reconfiguration or reuse of studs and thus prolongs their useful life, reducing waste.

Any reference to prior art contained herein is not to be taken as an admission
20 that the information is common general knowledge, unless otherwise indicated.

Finally, it is to be appreciated that various alterations or additions may be made to the parts previously described without departing from the spirit or ambit of the present invention.

CLAIMS:

1. A wall stud including:
opposed mounting surfaces for receiving wall panels;
a web is disposed between the opposed mounting surfaces;
first and second ends;
the first end is provided on a first stud member and the second end is provided on a second stud member;
the first and second stud members are movable with respect to one another to provide for adjustment of the effective length of the wall stud.
2. A wall stud according to claim 1 wherein the second stud member is a sliding fit within the first stud member.
3. A wall stud according to claim 2 wherein the end of the second stud member is arranged to have the same effective external dimensions as the end of the first stud member.
4. A wall stud according to claim 3 wherein the end of the second stud member includes projections which provide the same effective external dimensions as the end of the first stud member.
5. A wall stud according to any preceding claim further including fixing means for fixing the first and second stud members in position.
6. A wall stud according to claim 5 wherein the fixing means includes a ratchet and pawl arrangement which permits lengthening of the stud, but resists shortening of the stud.
7. A wall stud according to claim 6 wherein the pawl is provided in the form of a flap that is integrally formed with the web of one of the stud members.
8. A wall stud according to either of claims 6 or 7 wherein the ratchet and pawl arrangement includes a pair of pawls.
9. A wall stud according to any one of claims 6 to 8 wherein the ratchet and pawl arrangement includes a ratchet formation in the form of a series of slots provided in the web of one of the stud members.
10. A wall stud according to claim 9 wherein the ratchet formation includes two series of slots which are provided side by side.
11. A method of constructing a wall including the steps of:

installing upper and lower wall tracks, each including a trough for receiving the ends of wall studs;

providing a series of wall studs according to any one of claims 1 to 10;

adjusting the effective lengths of the wall studs to fit between the upper and lower tracks; and

installing the wall studs in the tracks.

12. A method of constructing a wall including the steps of:
removing wall studs from a wall constructed in accordance with claim 11; and
readjusting the effective length of the wall studs.