

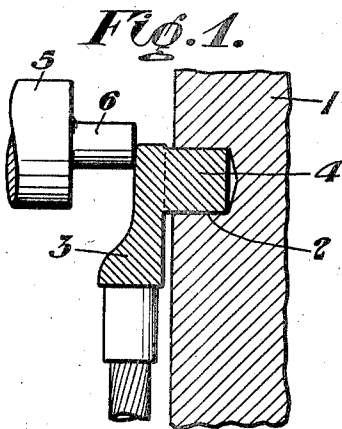
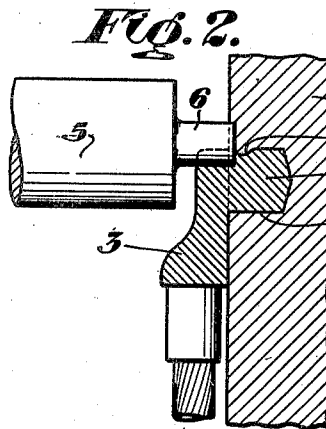
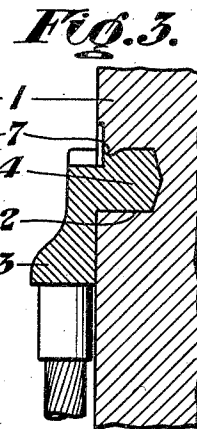
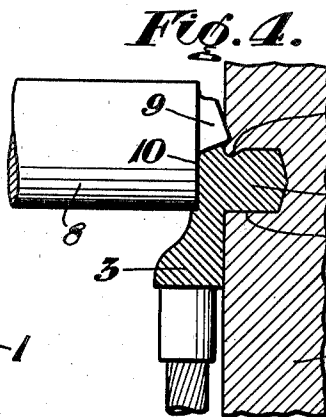
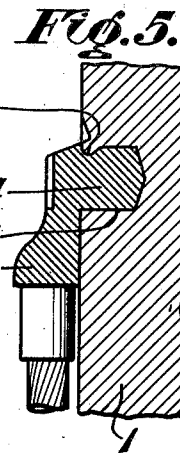
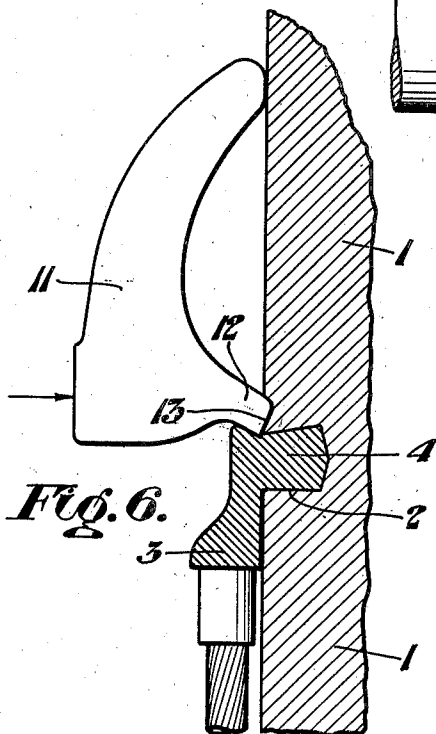
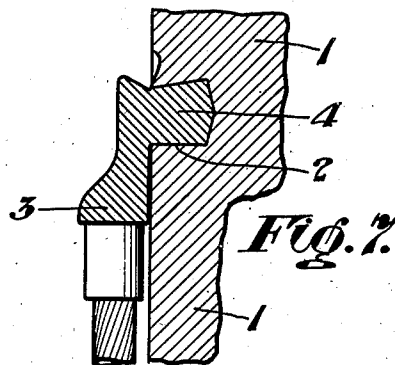
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2,095,885

APPLICATION OF STUDS

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UNITED STATES PATENT OFFICE

2,095,885

APPLICATION OF STUDS

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ter, Mass., assignors to The American Steel and
Wire Company of New Jersey, a corporation of
New Jersey

Application May 3, 1935, Serial No. 19,745

2 Claims. (Cl. 29—169)

This invention is an improved method of fix-
ing metal studs to metal bodies provided with
holes in which the studs may be fitted and is
particularly concerned with the application of
stud terminal rail bonds to railroad rails. One
of the objects is to increase the holding power
of such studs after they have been fixed to the
bodies. Other objects may be inferred.

Referring to the accompanying drawing:

Figures 1, 2 and 3 are cross-sectional views
of a stud terminal rail bond with its stud fitted
in a hole in the head of a railroad rail, the re-
spective views showing various phases of the new
method.

Figures 4 and 5 are similar cross-sectional
views showing various phases of a modified form
of the new method.

Figures 6 and 7 are further similar views show-
ing a further modification of the new method.

More particularly, Figure 1 shows a cross-sec-
tional portion of the head of a rail 1 in which
a hole 2 is formed. This hole must be relatively
shallow so as not to materially weaken the rail.
The terminal 3 has its stud 4 fitted in this hole,
the latter being of less depth than the length of
this stud. Therefore, when a compressive force
is applied to the outside of the terminal 3 in line
with the stud 4 the latter will be expanded in the
hole 2 due to the resulting longitudinal applica-
tion of force to the same.

According to the new method the compressive
force is not only applied longitudinally to the
stud 4 so as to cause it to expand in the hole 2
but force is also applied to the rail head 1 adja-
cent the hole 2 so as to cause the metal of the
rail to flow toward the stud and penetrate the
same.

The above forces may be applied by any suit-
able tool, such as the concussive tool 5 having a
reduced striking end 6 which is illustrated by
Figures 1 through 3. In this group of figures,
Figure 2 illustrates the tool 5 as it appears while
striking the terminal 3. It will be noted that the
reduced end 6 is aimed so as to strike the end of
the terminal and thus cause expansion of the
stud 4 in the hole 2. Furthermore, it penetrates
the end of the terminal and a portion of the head
of the rail 1 which is adjacent the hole 2. This
causes the metal of the rail to flow into the stud
4, as at 7. Figure 3 shows the terminal after it
has been thus fixed to the rail head 1. It will
be noted that the stud 4 is not only expanded in
the hole 2 but is locked in place by the metal
of the rail which has penetrated the stud.

Figures 4 and 5 show the same terminal, but

show a tool 8 which has a striking end 9 pro-
viding a face that angles away from the end of
the terminal 3 and a flat face 10 which can
strike the end of the terminal in line with the
stud 4.

When this tool 8 strikes in the manner indi-
cated by Figure 4, its flat face 10 applies a com-
pressive force longitudinally to the stud 4. Sim-
ultaneously, its striking end 9 penetrates the
head 1 and, because of the angular face of this
end 9, applies force to the head at a position ad-
jacent the hole 2 and in a direction which angles
toward the latter, so as to cause the metal of the
rail to flow and penetrate into the stud 4. Figure
5 illustrates the result obtained by the use of this
secondly described tool, it being noted that here
again the locking effect is obtained.

Figures 6 and 7 are further views of the termi-
nal 3 with its stud 4 positioned in the hole 2 in
the rail head 1. At this point it should be under-
stood that stud terminal bonds are generally
made of softer metal than is the metal of the
railroad rail. Such is assumed to be so in the
case of the elements illustrated by Figures 6
and 7.

In Figure 6 it may be assumed that the termi-
nal 3 has been applied to the head 1 by pressure
applied to the terminal so as to cause expansion
of the stud 4. The next step, therefore, is to
provide the locking action. For this a tool 11 is
used, which is in the nature of a bridge provid-
ing a striking end 12 having an angular face 13.
When this tool is arranged as shown, it is struck
a blow so as to apply sufficient compression to
the relatively harder metal of the rail head at a
position adjacent the hole 2 which causes this
relatively harder metal to flow, whereby the metal
tends to flow into the relatively softer metal of
the stud. Figure 7 illustrates the final result ob-
tained, the displaced metal of the rail again pro-
viding the desired locking.

Throughout the foregoing it is to be understood
that various applications of pressure described
may result either from a concussive force or from
the slow application of a force such as is ob-
tained by a press. Furthermore, in all cases the
force used should be sufficient to cause the metal
of the rail to flow as has been described.

We claim:

1. A method of fixing a rail bond terminal stud
in a recess formed in a railroad rail when said
stud is longer than said recess is deep, including
forcing said stud longitudinally against the end of
said recess so as to expand said stud and ap-
plying force to the surface of said rail adjacent

said recess so as to force the rail metal to flow towards said stud and to penetrate the latter.

5 2. A method of fixing a rail bond terminal stud in a recess formed in a railroad rail when said stud is longer than said recess is deep, including forcing said stud longitudinally against the end of said recess so as to expand said stud and

simultaneously applying force to the surface of said rail adjacent said recess so as to force the rail metal to flow towards said stud and to penetrate the latter, whereby to lock said stud against any tendency to leave said recess.

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