Another non-trivial presentation of the trivial group

$G = \langle a, b, c \mid bbab^{-1}a^{-1}, ccbc^{-1}b^{-1}, aaca^{-1}c^{-1} \rangle$
$= \langle a, b, c \mid aba^{-1} = b^2, bcb^{-1} = c^2, cac^{-1} = a^2 \rangle$

Then: $aba^{-1} = b^2$, so $(aba^{-1})^{-1} = ab^{-1}a^{-1} = b^{-2}$,
so $ab^{-1} = b^{-2}a$. Also,
$b^2a = ab$, so $bab^{-1} = b^{-1}(b^2a)b = b^{-1}(ab)b^{-1} = b^{-1}a$.
Also,
$b^2ab^{-2} = b(bab^{-1})b^{-1} = bb^{-1}ab^{-1} = ab^{-1} = b^{-2}a$.

Similarly, $c^2b = bc$, so $cb = c^{-1}bc$, and $c^2bc^{-2} = c^{-2}b$.

Then: $cac^{-1} = a^2$, so $b(cac^{-1})b^{-1} = b(a^2)b^{-1}$. But
$b(cac^{-1})b^{-1} = (bc)a(bc)^{-1} = (c^2b)a(c^2b)^{-1} = c^2(bab^{-1})c^{-2}$
$= c^2(b^{-1}a)c^{-2} = (c^2b^{-1}c^{-2})(c^2ac^{-2})$
$= (c^2bc^{-2})^{-1}c(cac^{-1})c^{-1} = (c^{-2}b)^{-1}c(a^2)c^{-1}$
$= b^{-1}c^2(cac^{-1})^2 = b^{-1}c^2(a^2)^2 = b^{-1}c^2a^4$
and
$b(a^2)b^{-1} = (bab^{-1})^2 = (b^{-1}a)^2 = b^{-1}ab^{-1}a = b^{-1}(ab^{-1})a$
$= b^{-1}(b^{-2}a)a = b^{-3}a^2$,
so $b^{-1}c^2a^4 = b^{-3}a^2$,
so $c^2 = b(b^{-1}c^2a^4)a^{-4} = b(b^{-3}a^2)a^{-4} = b^{-2}a^{-2}$.
So $c^{-2} = (c^2)^{-1} = (b^{-2}a^{-2})^{-1} = a^2b^2$.

Then $bc = c^{-1}(cb)c = c^{-1}(c^{-1}bc)c = c^{-2}bc^2$
$= (a^2b^2)b(b^{-2}a^{-2}) = a^2ba^{-2} = a(aba^{-1})a^{-1}$
$= ab^2a^{-1} = (aba^{-1})^2 = (b^2)^2 = b^4$,
so $c = b^{-1}(bc) = b^{-1}(b^4) = b^3$.

So $b^6 = c^2 = bcb^{-1} = bb^3b^{-1} = b^3$. So $b^3 = 1$, so $c = 1$.

Then $a^2 = cac^{-1} = a$, so $a = 1$;
and then $b^2 = aba^{-1} = b$, so $b = 1$.

Consequently, $a = b = c = 1$, so $G = \{1\}$.