Edited by Foxit PDF Editor
Copyright (c) by Foxit Software Company, 2004
For Evaluation Only.

Bugsy Malone Splurge Gun

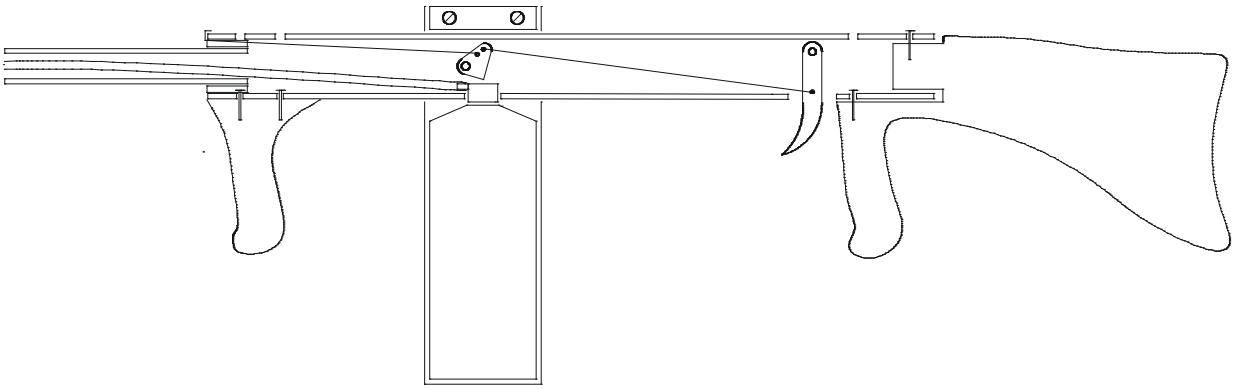


This Splurge Gun design is based on previous designs by Bob Dickason (http://www.bobdickason.co/pr_realworld/splurge/sfxsplurge.html) and Paul Young (http://www.bobdickason.com/pr_realworld/splurge/splurge_paul.html).

The gun is designed to use “Blizzard” foam, which comes in an aerosol can and is available in the UK from Smiffy’s (http://www.smiffys.com). They may also supply overseas.

The following materials were used, alternatives are also suggested:

- 18mm MDF for stock and handle. 15-20mm MDF or plywood could be used.
- 40mm plastic water pipe for the main gun body.
- 22mm plastic water pipe for the barrel.
- A “Pringles” tube for the magazine (it’s just the right size to fit the “Blizzard” can!)
- 15mm MDF for the top of the magazine. Plywood could be used.
- 9mm plywood for the trigger and cam. 6-8mm acrylic or similar plastic could be used.
- 5mm plastic tubing to carry the foam from the can to the end of the barrel.
- 1mm solid copper wire for the link from the trigger to the cam. 0.5-1mm piano wire could be used.
- 22mm pipe insulation to fill the space between the 22mm and 40mm pipes.
- M5 x 50mm pan head screw and nut – hinge pin for cam.
- M4 x 40mm pan head screw and nut – hinge pin for trigger.
- 2.5 x 15mm (No.4 x 5/8”) wood screws (or smaller if you can find them).
- 3.5 x 20mm (No.6 x 3/4”) wood screws.
- Elastic band to provide return spring for trigger.
- Black “Gaffa” tape (or “Duck” tape) to cover the barrel and magazine.
- Varnish to finish the stock and handle.



© Gary Aylward 2005 For non-commercial use only.
Derivative designs must be for non-commercial use and made freely available via the Internet.

Main Gun Body

The main body of the gun is made from 40mm plastic water pipe. See the piece-part drawings on page 7.

Several 4mm holes are drilled for the screws to hold the stock and front handle on. 6mm holes are drilled to provide screwdriver access to some of the screws. You may need bigger holes to accommodate a larger screwdriver.

A 24mm hole is required for the cap of the aerosol can, the exact size is not critical as long as it is big enough for the cap. We used a 22mm drill bit and a file. A bigger drill bit would have been better…



A 10mm x 30mm slot is required for the trigger to pass through. We drilled several small holes then finished off with a file. The slot requires a small cut-out in one side to allow the heads of the screws that hold the link wire to pass through.

So far, all the holes described are drilled vertically through the pipe. There are two pairs of holes that must be drilled horizontally, for the screws that act as hinge pins for the trigger and cam.

The cam hinge holes are drilled on the centre line of the pipe. All the centre lines on the pipe were drawn with a pencil resting on top of a block of wood. The circumference of the pipe is 132mm, four centre lines were drawn at 33mm intervals around the circumference.

The trigger hinge holes are drilled 15mm up from the centre line, measured around the circumference of the pipe. The holes must be drilled in the horizontal plane, i.e. at an angle to the surface of the pipe. It is easier to start the hole by drilling straight into the pipe for 1-2mm, then stop and turn the pipe to the correct angle before drilling all the way through.

The pipe was covered in black Gaffa tape. Three strips of 50mm wide tape were used lengthways, each slightly overlapping. The holes show up easily and the tape can be cut away as necessary with a craft knife.

Stock and Front Handle

Both these parts were cut from 18mm MDF using an electric jigsaw. It was quite hard work and a bandsaw would be better if you have access to one.

Cardboard templates were made to make the marking-out quicker. Full-size templates are available on page 8.

3mm holes are drilled for the wood-screws that hold the stock and handle to the main body. It is important to drill these holes square so that the handles are straight when fixed to the body.

The stock and handle were sanded to round off the edges and several coats of clear varnish were applied to give the right sort of colour and some protection from wear and tear.

Trigger

The trigger is made from 9mm plywood. MDF is not suitable for such a small shape. The top of the trigger must be curved to allow it to pivot inside the gun body. The hole for the hinge pin must be drilled square otherwise the trigger will not sit straight on the hinge pin.

The trigger was sanded smooth and the edges rounded off. The holes were countersunk slightly from both sides to ensure smooth operation.



© Gary Aylward 2005 For non-commercial use only.
Derivative designs must be for non-commercial use and made freely available via the Internet.

Cam



The cam was made from 9mm plywood, but it is rather fiddly and care must be taken to avoid splitting the plywood. 8mm acrylic sheet would be a better material to use. The top of the cam must be curved to allow it to rotate inside the gun body. The hole for the hinge pin must be drilled square so that the cam operates correctly.

The cam was sanded smooth and the edges rounded off. The holes were countersunk slightly from both sides to ensure smooth operation.

Magazine Top

15mm MDF is exactly the right thickness to hold the can inside the “Pringles” tube. A 72mm diameter circle is needed. The top is fixed to the tube by four screws. 3mm holes are needed for the screws to prevent the MDF from splitting.

The magazine top was covered in black Gaffa tape and marked underneath with the gun number and a mark to show which way round it mated with the magazine. This was to make sure the screw holes lined up first time if the gun was stripped down and reassembled in a hurry backstage!

Magazine

The magazine is an empty “Pringles” tube. An appeal at school brought forth more tubes than we needed! The cut-out for the gun body must be accurate to ensure a good fit. The cutout is detailed on page 9.

The magazine was covered with black Gaffa tape and marked with the gun number on the bottom. An alignment mark was made inside the top of the tube to line up the magazine top as mentioned above.

The guns were numbered for easy identification in case of any problems.



Gun Barrel

The barrel is made from a 150mm length of 22mm plastic water pipe, covered in black Gaffa tape. This is possibly the simplest part to make!

Trigger Mechanism

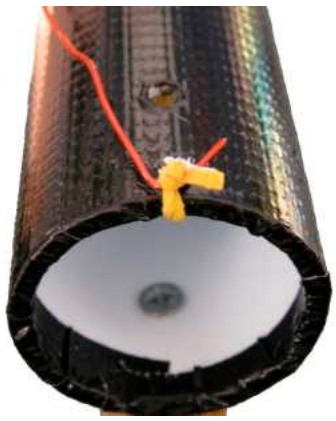


The trigger mechanism consists of the trigger, link wire, cam and return spring (elastic band). Small screws are used to anchor the link wire.

The 20mm screws are slightly too long and were cut down to length after they had been screwed into place.

The wire link has to be adjusted to the correct length by trial and error for each gun (unless your drilling is **very** accurate!) 205mm (between screw centres) is a good starting length. If using copper wire, it is best to twist the wire to form a loop for the screw, then solder the wire when it has been adjusted to the correct length. If piano wire is used, it will probably be sufficient just to form a loop in each end. The loops must be big enough to allow the link to swivel freely on the screw, but not so big as to slip over the screw heads. The screws should not be over-tightened, the link needs to be able to swivel.

© Gary Aylward 2005 For non-commercial use only.
Derivative designs must be for non-commercial use and made freely available via the Internet.



A thin elastic band is threaded through the hole in the cam. Several small elastic bands were tied together to make the required length. The elastic bands do not need to exert a very great force. The elastic band is anchored to the end of the main gun body by a piece of wire held in place by Gaffa tape.

Splurge Delivery System

The Splurge can is held in place by the Magazine tube. The cap on the can has a short nozzle about 3mm in diameter. The delivery tube is a 300mm length of 5mm plastic tubing, the closest fit we could find in our local DIY store. A few layers of Gaffa tape around the nozzle ensure that the plastic tube is a good tight fit.

The caps are supplied loose with the cans and are not a great fit onto the valve in the can. Be careful you don't get splurged whist trying to fit the caps!

We came up with the technique of putting the cap and tube in place, then putting the can inside the magazine and, with the gun laying on its side, carefully screwing the can into the cap and fitting the magazine, to hold the can and cap between the magazine and the cam.

Assembly Order

1. Assemble the trigger assembly.
2. Fix the front handle to the main body.
3. Thread the trigger assembly into the gun body through the trigger hole.
4. Fix the trigger in place with the M4 screw and nut.
5. Use a piece of wire to fish the elastic band out of the end of the gun body and fix it in place as described above.
6. Use a pair of long-nosed pliers to move the cam into the correct position and fix it in place with the M5 screw and nut. Make sure the cam is the right way round and the right way up!
7. Fix the stock to the main gun body. The lower screw is a bit fiddly, some Blu-Tak or similar to hold the screw onto the screwdriver works wonders!
8. Fit the can cap and tube, then the can and magazine as described above.
9. Fix the magazine top into the magazine.
10. Slip a 25mm length of 22mm foam pipe insulation over one end of the gun barrel, and insert it into the end of the main body.
11. Cover any exposed screws or screw holes with black Gaffa tape.
12. Test your gun!

We recommend testing outdoors and firing downwind. The gun will fire a jet of foam about 3-5m!

When the gun has passed the test, we recommend fixing the magazine in place with Gaffa tape to ensure that it stays firmly in place when the guns are thrown into the props box.

Troubleshooting

The trigger mechanism has proved itself to be robust and reliable in use.

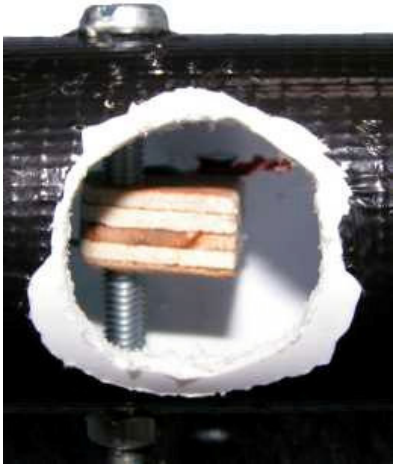
The length of the link is critical and will probably need fine-tuning for each gun you make.

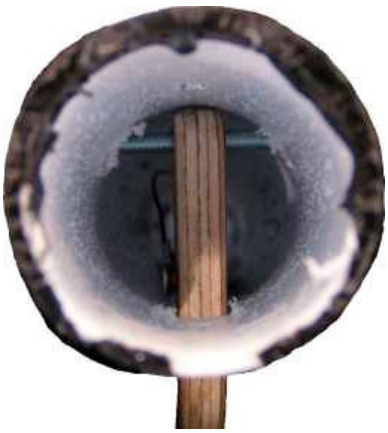
© Gary Aylward 2005 For non-commercial use only.
Derivative designs must be for non-commercial use and made freely available via the Internet.

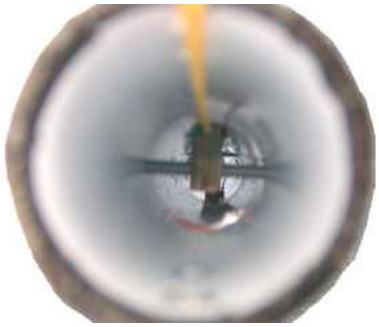
If you use copper wire, you will need to solder the loops in the ends, otherwise they will slip with over-enthusiastic trigger-pulling and the gun will cease to fire. Piano wire may be better, but more difficult to adjust.

Remember to number your guns so that a faulty gun can be easily identified. Make sure the cast know to note the gun number and report any problems, especially during dress rehearsals.

Pictures







From left to right:

The cam in position, looking up through the hole for the aerosol can cap.

Looking down the gun body, from the stock end, showing the trigger in position.

Looking down the gun body, from the barrel end, showing the cam and return spring (elastic band).

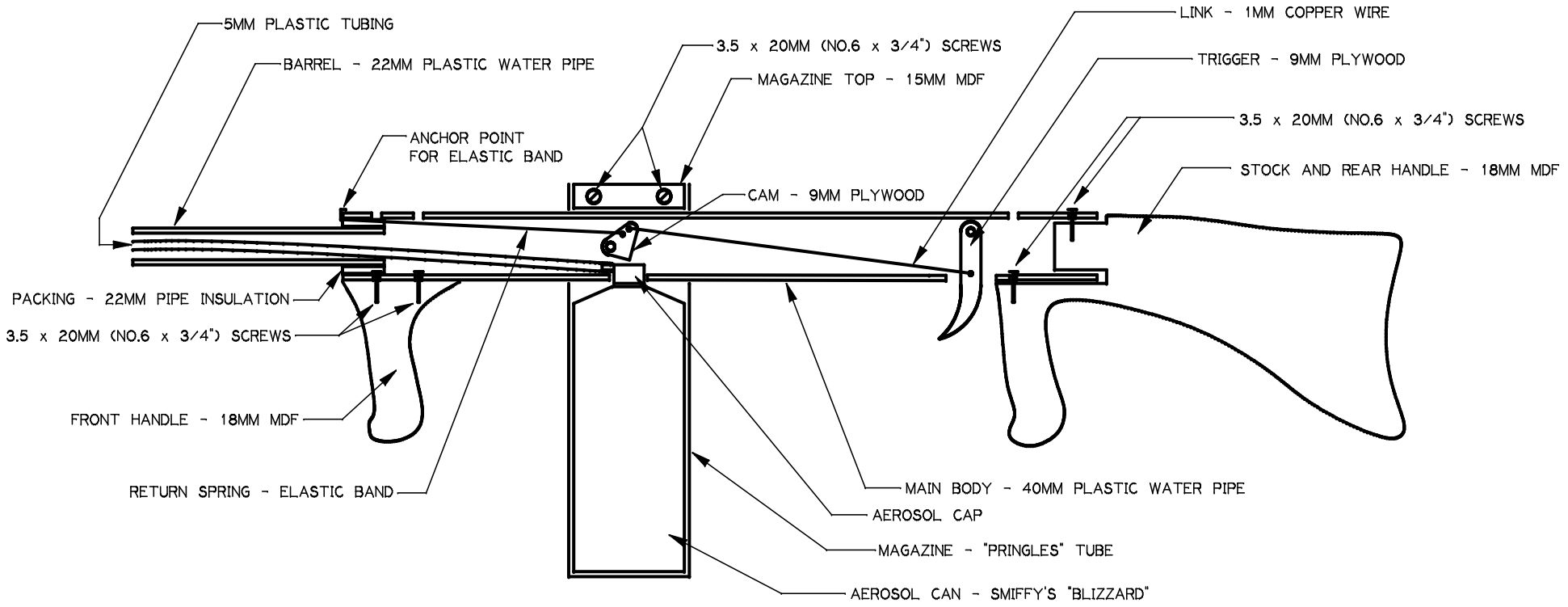


This picture shows the guns in action – everyone got thoroughly splurged!

Drawings

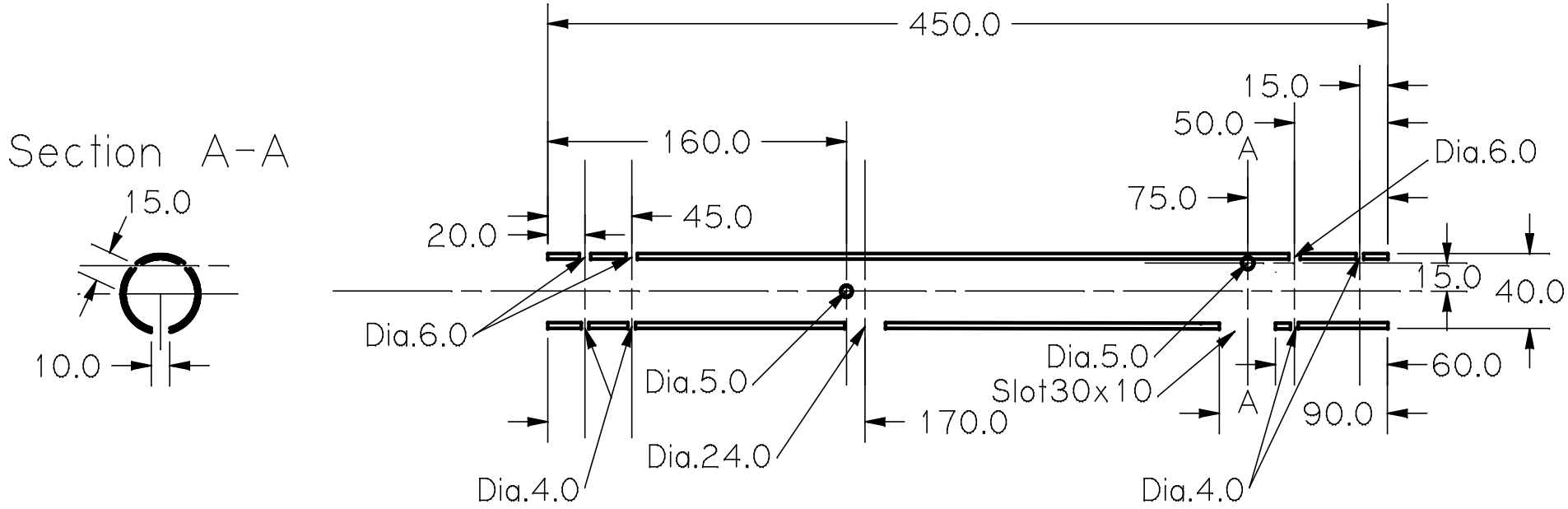
The following pages show the general assembly of the gun and dimensioned drawings of the parts.

© Gary Aylward 2005 For non-commercial use only.
Derivative designs must be for non-commercial use and made freely available via the Internet.

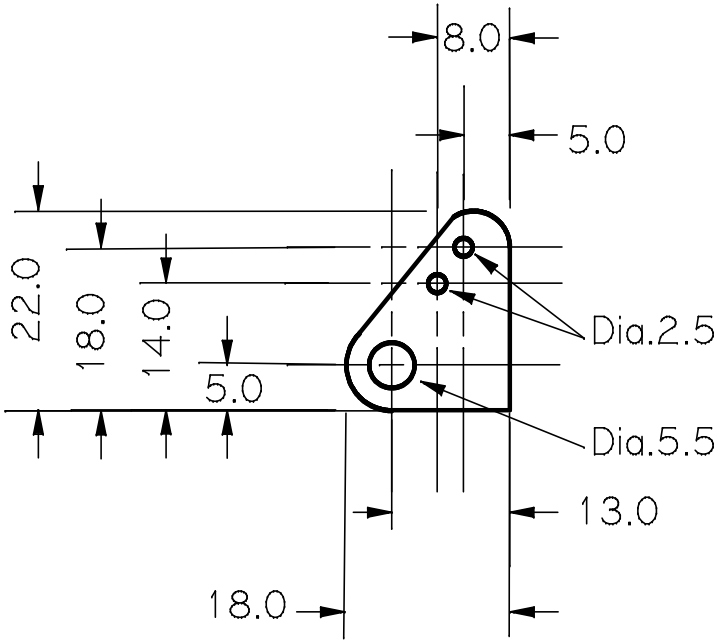


Bugsy Malone
Splurge Gun

(c) Gary Aylward 2005
For non-commercial use only

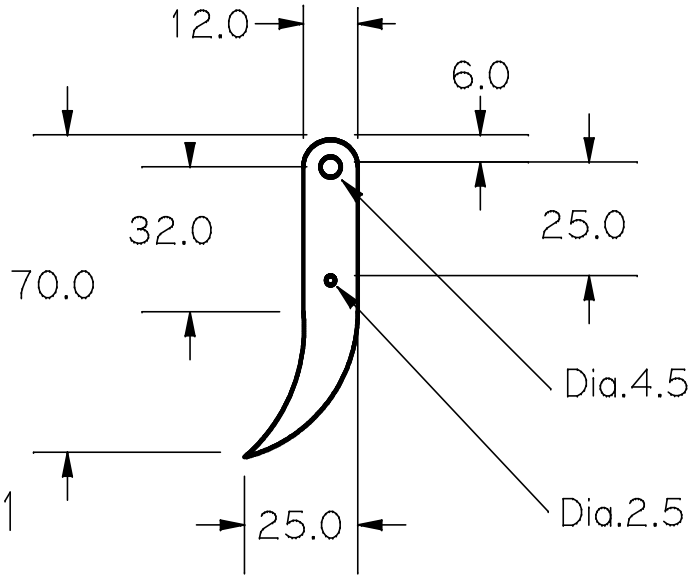


Main Gun Barrel (40mm plastic tube)



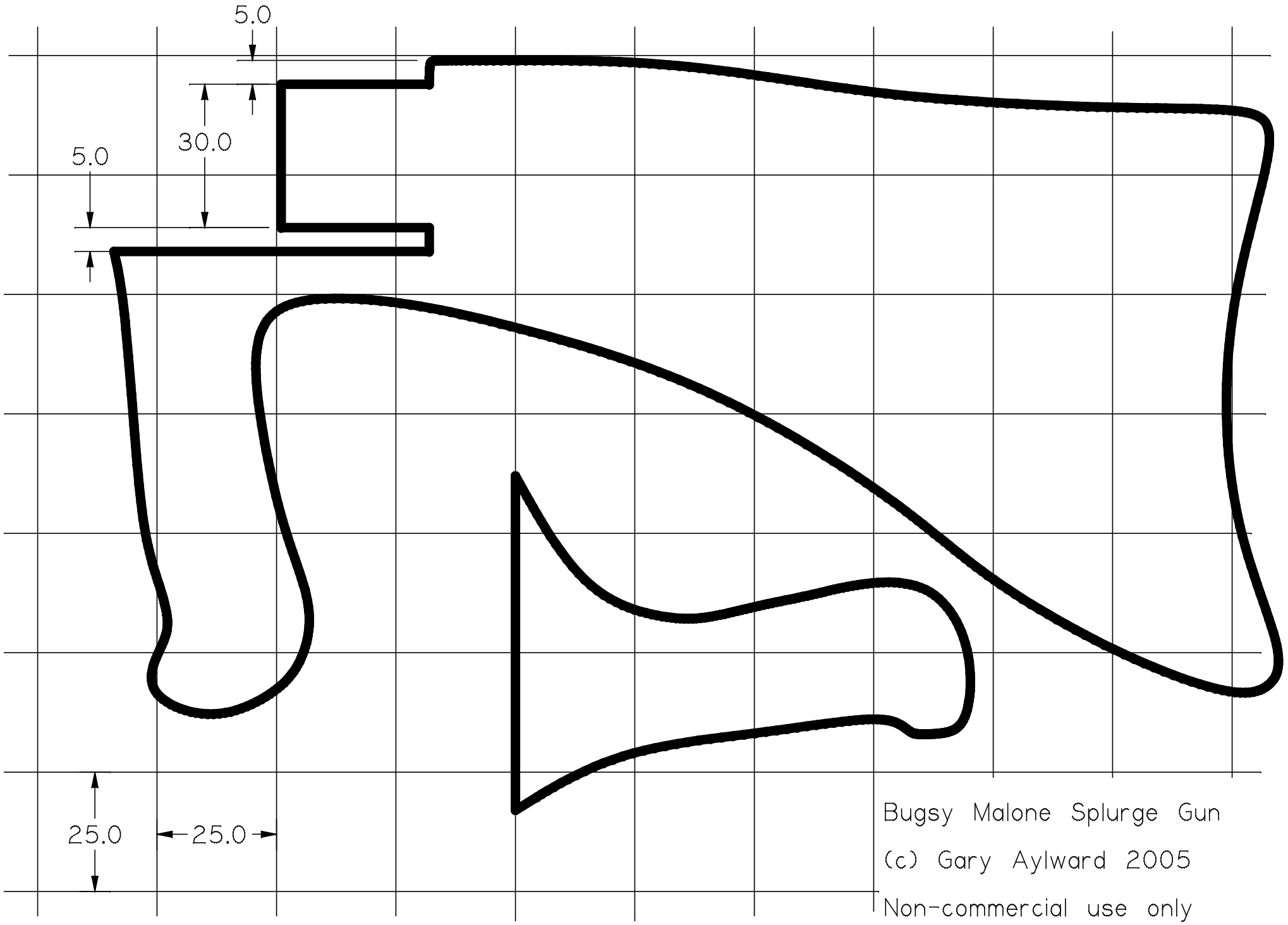
Cam (9mm Plywood) - 4:1

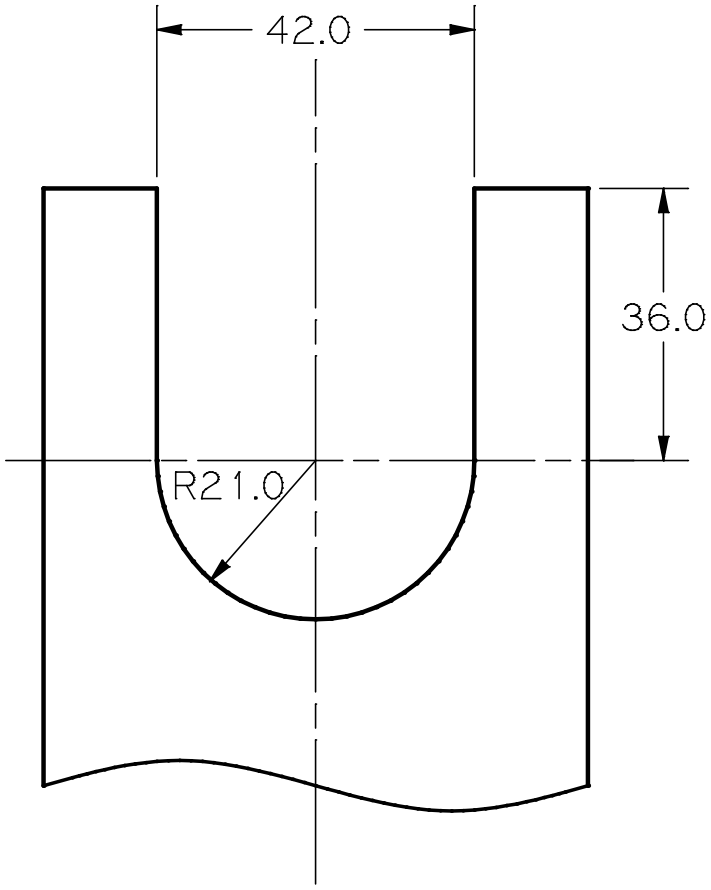
Trigger (9mm ply) - 2:1



Bugsy Malone
Splurge Gun

(c) Gary Aylward 2005
For non-commercial use only


5.0
30.0
5.0
25.0
25.0
Bugsy Malone Splurge Gun
(c) Gary Aylward 2005
Non-commercial use only



Detail of cutout in Pringles can.