



MAIDSTONE MODEL ENGINEERING SOCIETY

Spring 2020

www.maidstonemes.co.uk

These are strange and different times, and so has called for a bit of a different newsletter this time around.

It was not a decision we as a committee thought we would have to make or a message we thought we would have ever needed to send. The message to announce **we would be suspending all club activities until further notice** as a result of the ongoing worldwide Coronavirus outbreak.

We will continue to follow Government advice and remain closed until it becomes safe again to resume operations, normal Wednesday and Sunday activities and of course public running.

I'm sure you'll be aware that all other clubs are in the same boat and have all made the same decisions at around the same time as us and continue to follow guidelines and advice to keep their membership and the public safe.

We are of course in a hobby where having to spend time at home ("workshop") can be bonus! Projects can be moved along or completed, new ones started, crazy ideas attempted or that job that you've always meant to do gets done - I know of more than a handful of members have been busy beaver away in their workshops making the most of the time. Keep going, we'll get through this as a club, and be back to normal. Stay safe, stay at home, and build things.

Your newsletter editor - Luke Bridges

Luke's Spot - Day dreaming

So, having said just above that we can spend time in our workshops - I currently don't have one to spend time in. I have a cellar with a 3D printer but that's about it.

My mind has wandered - ideas flowed, some sane, some stupid, some possible and many what if's.

Some things I've been thinking about - steam turbine loco's, scaled up locos, simpler than simple engines.

I s'pose these are all linked to a common thread of a working steam loco with as few parts as possible, made for as little as possible, not necessarily sticking to any prototype or doing anything in any kind of prototypical way or method - but none the less a working steam loco. On eBay, or Station Road Steam there are countless examples of started projects which stalled at one point or another possibly down to cost or complexity.

The two most complex bits of engine to build are the engine unit itself (cylinders, valves and valve gear) and the boiler.

To the first of those, the engine, in its most basic forms converts steam pressure and heat to motion.

Conventional cylinders and pistons controlled by deceptively simple valve gear which to work accurately must be accurately made and machined, all comprising many small, parts to high levels of accuracy.

Which brings me to breaking it down to minimal parts, can we do away with valve gear? Or even pistons/cylinders entirely? In short yes, maybe.....

In the world of garden railways its been done very successfully in the form of oscillating cylinders. A cylinder with one port at dead centre of the bore with close to the end caps, the cylinder pivots in the middle to align the ports to the steam pipes. I'm sure we've seen these on Mamod toy steam engines and garden railway locos as an example.

Could it work on 3 1/2" or even 5" gauge?

Now there are downsides, no ability to notch up and a fixed, mid length cut-off, although I've heard mention of

an idea to use a mechanical iris similar to a camera aperture, to gain limited control over cut-off, but again this is adding complexity back in.

In principle I cannot see why a 5" gauge oscillating cylinder engine would not work. Not necessarily a huge passenger hauler and most probably of narrow gauge outline.

Imagine this -

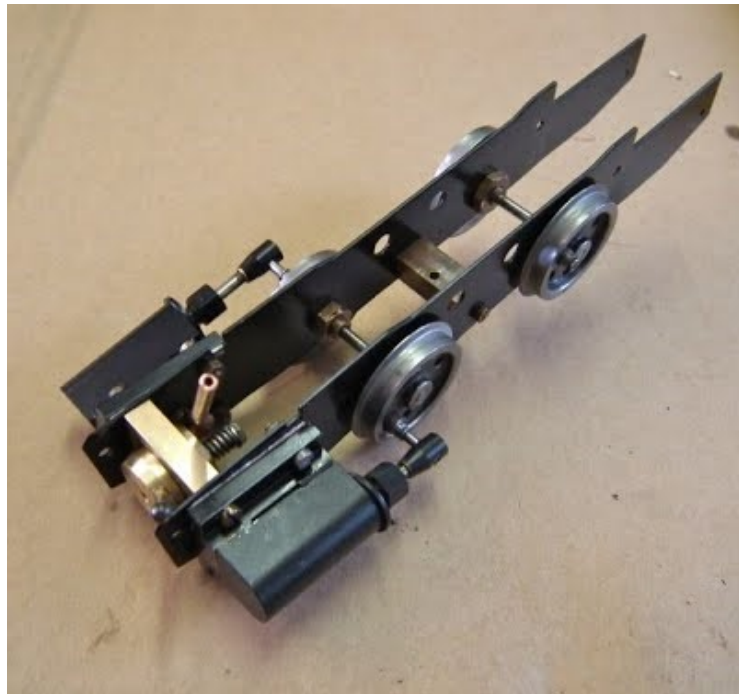


but scaled up... from 7 7/8" long to 31 1/2", 3 1/4" wide to 13" and 21" inches to chimney top, scale factor of 4.

I cant think of many examples in this hobby of scaling up by 4! I can think of a few 3 1/2" scaled to 5 or even 7 1/4". These Mamod's are incredibly simple for anyone that doesn't have one or hasn't seen one, on the next page is the entirety of the chassis - minus the buffer beams. The valve on the front controls reversing and throttle on the basic model.

Obviously there would need to be changes to the design to work under higher loads and pressures than the SM32 versions 10psi..... for a start I would add cross heads of a kind as on an oscillator all the force is through the gland/rod and piston. The original too is completely un-sprung which has given it a reputation for not liking less than well laid track.

From the boiler, the original is spirit/solid tablet fired and is a simple pot boiler, and yes whilst spirit firing has been used in the past in 3 1/2" and 5" I would tend for



a marine boiler, much like a sweet pea. The rest of the outward appearance could and would remain the same. Side tanks, cab, dome and smokebox. Even a whistle could be mounted in the same cab front location.

How useful would it be? There's a good question to answer. I've never seen (although I'm sure someone reading this could tell me otherwise) a 5" oscillating cylinder and engine running and probably for a very good reason. The only example I know of was listed on Station Road Steam incomplete. Configured as a cross compound it utilised standard piston valve cylinder block castings with the valve bore being the high pressure cylinder for each side. The pipe work was complicated and it was fitted with a De-Winton style vertical boiler. A curious thing I would love to see running!

Of course there is another engine design that requires no traditional style valve gear - turbines.

Many railways round the world have tried turbines of various types and configurations with varying degrees of success. The most famous in the UK is probably the LMS Turbomotive.

A modified Princess Royal, she was fitted with two turbines driving via quill drive to the axles with conventional con-rods on the outside. She has a large turbine for forwards and a smaller turbine for reverse. Either engaged by dog clutch - all activated and controlled by

what was set out as a reverser in the cab. By all accounts the Turbomotive performed well, was economical on coal and water, had almost no hammer blow on the track and was powerful.

Unfortunately, after a turbine failure in 1949 it was considered un-economical to repair and withdrawn pending rebuild. It was then rebuilt as 46202 Princess Anne which was involved in the Harrow and Wealdstone accident. Taken to Crewe, again un-economic to repair and scrapped. As one one-off loco was scrapped, it led to the building of another which is still with us, BR Class 8 71000 Duke of Gloucester.

There are two main types of turbine, Impulse and Reaction

The easiest way of describing them, is that Impulse is a water-wheel and reaction like a jet engine.

I've been thinking of the Impulse water wheel style turbine as being A LOT simpler in construction.

The trick with turbines is that they don't produce a lot of torque at slow speeds, so they need to be geared down and run at very high rpm's. 20000 rpm is slow for a turbine. 40000+ is more normal, but a model jet engine gets up 150000+ rpm.

Now in my head you could have a row of 2, 3 or 4 4" turbine with 1/4" square blades. each rotor has 4 jets that can be controlled to vary power and run the rotors in reverse for reverse with another 2 jets on each rotor.

So the next complication with turbines at high rpm's the bearings for the rotors, withstanding speed, heat, and being steam tight - and also a decent gear box down to normal speeds of around 500 rpm. Even running at a modest 20000rpm is a 40:1 reduction, if you wanted more power and economy at 40000rpm is 80:1. Commercially made gearboxes are available, but our traction engine friends make and cut gears so even on a worm drive shouldn't be insurmountable.

Food for thought, would it work? Could any of these work? or straight in the bin.....

Chairman's AGM Report 2020

Well here I am once again typing my end of year chairman's report, and I would have put money on having only done this a few months

ago... I look back and I guess it must have been a year though, based on the amount of stuff that has been going on.

Where to start, I suppose I'll go kind of chronological through the year, but excuse me if I have missed anything, this isn't supposed to be a fully detailed recap, but a brief summary.

The end of March brought the beginning of the running season for us with a busy Sunday afternoon at the park. Not the following week we were able to put together an impressive stand at the Heritage transport show at Detling. Although not our usual 'target' audience it is nice to be able to add that small amount of variety to the show. As an added bonus, as exhibitors, those of us displaying models are able to get in for free. I would encourage any with a passing interest in cars, bikes, busses, etc to come along, either with something to display (it doesn't have to be a loco or even finished), Being that it is just down the road from us, it is well worth the day trip out.

The season passed with a successful running season, with a regular turnout of plenty of locos, and a wide variety at that. I seem to remember us losing a couple of running days due to bad weather, but these things happen. It did feel like passenger numbers may have been down a bit on last year, although I haven't yet figured out why this may be... I believe there have been more events in the park, on the other side of the lake, maybe this stops people from venturing over to find us? Who knows, do we need to look into some sort of advertising on the other side to spread the word?

Our Friday night events went well, with the speakers being well attended, evening runs, fish and chips, the quiz night was well attended as well, many thanks to Amy for putting it together for us.

There were plenty of open days and visits through the year with a number of our members visiting and making a good showing for the club. These included days out at; Romney, Gravesend, Oxford, North London, Canvey and Welling. In addition to this, a few of us got together at a private garden railway for a play day. If anybody is interested in travelling, keep an eye on the club diary pages, or have a chat with me and I can keep you updated on what's going on and where. On the other hand,

if anybody has any contacts or desires to visit anywhere in particular then let one of us know on the committee and we will see what we can arrange.

On the subject of open days, I would like to thank every member who helped out in any way to make the Open Day and Southern Fed Rally an enjoyable day for the visitors and hopefully for all of us, I know I had a thoroughly enjoyable day and had a number of compliments from the visitors. It may have been a huge effort for us, however it's not something we do every year, and as a way of celebrating our 90 th anniversary. Maybe we'll have another big event for our 100 th ?

A massive reason behind our site always being one to be proud of is our unsung heroes, throughout the year a number of our members work on maintaining what we have and improvements for the future, but I would argue most of the little bits and pieces that get done happen on a Wednesday, and the Wednesday gang are a greatly appreciated group who keep everything going smoothly.

Having had a busy year, the winter off-season has not been a quiet one for us. Work has been progressing with the instillation of a lifting platform for unloading locos from cars. I have been working on it today (at the time of writing...) and I believe it should be finished within the next couple of weeks, weather depending for conditions to weld the last few bits on. Another major job that has been undertaken over the winter months is a bit of work on the track.

The main area of concern is the joints on and off of the traverser. The main components of this have been

made, although a small amount of work is required to modify the end of the concrete beams in order to attach the new joints. Unfortunately a few other jobs have taken priority around the site, and some dire weather put a halt to any work being carried out for a few weeks. We should still have plenty of time for the work on this to be finished before the running season begins.

Squeezed in amongst this maintenance work, I was once again proud to have been a part of the club when we provided a stand for the London Model Engineering Exhibition at Alexandra Palace. We were able to once again fill the stand, with an entirely new selection of models for the exhibition. If anyone else has anything new to display, or any projects in progress, it's never too early to get your name on the list for next year's exhibition. It was pleasing to feature in the write up for the exhibition in both of the major model engineering magazines, both with favourable words about us.

It was fantastic to see so many at the club dinner last week, this is a great opportunity to meet up and share a drink and a meal amongst friends, with the addition of spouses that are not usually seen by the rest of us. This year we had around 40 attending, with some new faces and some returning faces. Thanks to all that came and made it a great atmosphere and the food being good just made the event even better. I look forward to seeing you all again, or indeed for the first time, next year.

So to the future, I would love to see you all through the year and hear or see of progress with whatever you're working on, if you have time to help out in any way at the club all the better.

July will see us host IMLEC for the first time, any help would be gratefully received, hopefully we can once again do the club proud and put on an event to meet the recent standards for the competition set by others, not to mention the high standards set by ourselves for any event that we take part in.

Well, enough from me, I'm sure you've all got better things to be doing than read my ramblings.

Best wishes and happy steaming for the coming year.



Priceless

If you've ever worked for a boss who reacts before getting the facts and thinking things through, you will love this!

A large steel company, feeling it was time for a shake-up, hired a new CEO. The new boss was determined to rid the company of all slackers.

On a tour of the facilities, the CEO noticed a guy leaning against a wall. The room was full of workers and he wanted to let them know that he meant business. He asked the guy, "How much money do you make a week?"

A little surprised, the young man looked at him and said, "I make \$400 a week. Why?"

The CEO said, "Wait right here." He walked back to his office, came back in two minutes, and handed the guy \$1,600 in cash and said, "Here's four weeks' pay. Now GET OUT and don't come back."

Feeling pretty good about himself, the CEO looked around the room and asked, "Does anyone want to tell me what that goof-ball did here?"

From across the room a voice said, "Pizza delivery guy from Domino's."

Thanks to Roger for sending this and others in - Luke

Word Search

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ENGINE
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PASSENGERS
PAINT
CHIMNEY
CAKE
STEAM
MAIDSTONE
GERTEY
BISCUITS
FIRE
FUN
MOTEPARK
CYLINDER
COAL
INJECTOR
PISTON

Chairman's Report April 2020

Well, things have taken a serious turn south since the report I wrote for the AGM. At that time we had barely heard of the Covid-19 virus that subsequently has made such a strong and unforgettable impact on the entire country... no, the planet...

In the AGM report that has been published elsewhere in this issue of the newsletter, I said that work was progressing on the traverser rail joints. I am pleased to say that with the help of a few members, over the course of a couple of weeks we had them finished just before the lockdown, which means that when the restrictions have lifted we will be in a position to be able to run straight away.

Additionally, the lifting table at the unloading bay has been installed, the vandal-proofing has been fitted and it can be locked in position. All that remains is for brackets to be made and installed so that those who have ramps that used to pin onto the end of the bay can attach in the same manner, and for an extension plate hanging over the steaming bay to be fitted, it is however usable as it is, so it will not prevent us from using the railway.

So that brings us up to speed with the progress of the winter works, so I should mention the current situation... we are living through completely unprecedented times at the moment, and it is a very



strange feeling. I myself am still working although from home, and restricted in what I am able to achieve, although doing what I can. The most I am managing to achieve in between childcare, work, housework, etc. can only be described as modest progress in the workshop. I'd be happy to chat about the current projects if anyone wants a catch-up... it would always be great to hear from you all and see you when this is over.

All that can be said is that the club premises may be sleeping for now, but I hope that all of our members are keeping safe and busy in your workshops ready for the time when we may return to the club and socialise once more.

Stay safe

Tom.

STAY HOME . STAY SAFE . MAKE THINGS

What is IMLEC?

The International Model Locomotive Efficiency Competition is exactly what it says on the tin. A competition open to anyone to try and score the highest calculated efficiency,

This is taken from an approximately 30 min run burning as little coal as possible for the maximum amount of work done as recorded by a dynamometer car.

The competition was started in 1969 by Martin Evans during his time as editor of Model Engineer, and except for a few years has been held annually since at different host clubs as they volunteer to host and run the competition.

There is a modest prize money and trophy that is promoted and put up by Model Engineer and it is they who co-ordinate the hosting of the competition and oversee the rules year to year.

There is a misconception that IMLEC is only for the best, and this may be due to the fact that some of the very best enter time and time again and are successful, but a glance at the running order from every year I've attended as spectator shows a wide variety of models and drivers and clubs represented.

From Sweet Peas and Maisies, Polly's to A4's, P2's and all manner of designs in between. Any design is capable of winning.

I've witnessed A4's fly lap after lap but be beaten by a Polly 3 0-6-0 tank engine down to the skill of the firing and the load chosen.

Of course an engine in good condition, well timed and maintained helps, but to my spectators eye the track conditions and picking the right load for that track and your fire is the most important call to make.

At Birmingham in 2018 for most of the competition an 3 1/2" was on top of the overall score board for all of the first day and half of the second. It was driving superbly and its load picked perfectly.

It is also true that while most entrant will opt for as big of a load as they can, often too big for their fires, not

every successful run does - and some very well scoring runs have been with a conservative load, not overly pulling the fire to shreds but making it work and burn efficiently.

Controversially the rules allow you to drop passengers during the run at any point should the load prove too much - and whilst this does give the disappointing sight of a run finishing with no load when a run misjudged - it does allow all to score and give enough breathing space for new entrant or newer engines to be put through their paces safe in the knowledge the load can be adjusted to suit on the day and during the run.

Why are we hosting IMLEC?

As a club we have a history of being represented at IMLEC over the years and interest in the event has been growing, which lead to the conversation of us hosting it. There is a small group of members that came forward to organise and put on the event - with support from the committee and the club membership, this is now happening.

(NOTE added after article was written - Since I wrote this the world situation has become unpredictable.

Conversations have been had about our IMLEC and when it shall be held and the decision has been made to continue planning for IMLEC as normal in July, however should that not be possible it would be pushed back to later in the year, perhaps September but if that too is not possible or too short notice then it will be postponed until 2021)

We have members working on a digital scoreboard, building and testing a dynamometer car, collating entries and all of the other jobs that go into preparing for IMLEC.

Closer to the time a jobs list will be available for anyone who would like to assist us in the running of the event to put their name down for.

These jobs aren't just for the regulars, or for previous IMLEC entrants or spectators - they are for everyone

and anyone. Anyone volunteering or asked to take up a role will be given full instruction on what to do and what is needed, no one need feel like they can't do something as none of us have done this before.

There are numerous videos on Youtube of previous years competitions should you wish to take a look and familiarise yourself, however these rarely show the work outside of the runs themselves as they are the highlights.

We need people to marshal the track, provide teas and coffees, have water ready to pass on the run, there are a variety of jobs for a variety of members.

If you have any further questions please ask one of us, we are all more than happy to answer. Those of planning IMLEC are Tom Parham, Andrew Hulse, Luke Bridges, Andy Bridges and Chris Hawkins.

We hope it should be an enjoyable weekend when it arrives for us all, and another feather in the clubs cap

to add to all the rest. We are a great club with great members and a great history, lets keep adding to that.

We also have an IMLEC minisite at bridges82.uk/imlec and also linked to via the club website at www.maidstonemes.co.uk

IMLEC is a very friendly event, like-minded people supporting a good honest and open competition. Everyone, participants and spectators alike all support each other and even get a ride on other runs. There is something very enjoyable about being on the back of train storming round a track and hearing it working hard the entire time.

IMLEC is of the highlights of my model engineering year and hopefully it will be a club highlight for this year and for many of you too.

Anagrams

For this occasion, Amy has come up with some anagrams for you - I'm hopeless at these, but answers are provided on the last page.

1. Agneserps Gailhun
2. molto voice
3. arrest Erv
4. Ginni renege
5. conical mutual
6. banes rig
7. mena eatlp
8. Ber mm se
9. ho pork sw
10. em sat

STAY HOME . STAY SAFE . MAKE THINGS

OBITUARY: Leonard George Connell 3rd January 1943 – 26th July 2019



Len was a very private man who spoke very little about his life. Unfortunately, I was unable to attend his funeral, and Brian Prior, the secretary of Canvey Club, kindly passed on the details of the brief eulogy to us.

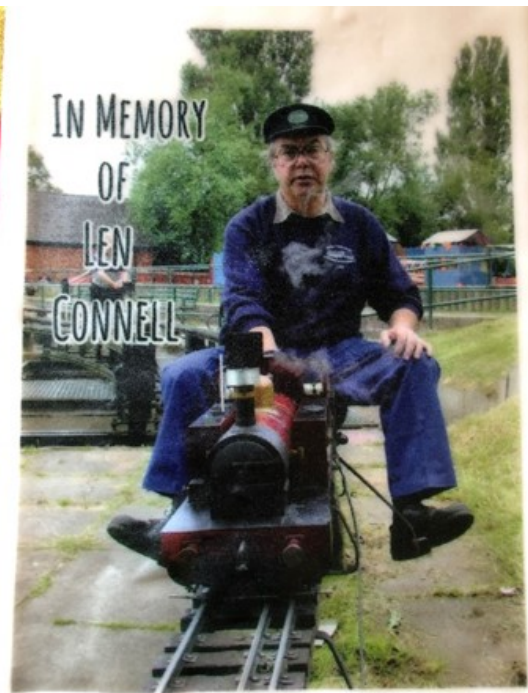
Len was born during World War 2, and lived in Forest Gate, London E7, with his mum, dad and sister, and attended school locally. He went to work at Barking Power Station. They all moved to Basildon where Len lived for the rest of his life, in the same house. His keen interests, apart from model engineering, were motorcycles, speedway and the Isle of Man T.T. Rally. He built more than ten locomotives in his lifetime. His great friend was Laurie Nicholls, and together they designed and built two dozen almost identical trolleys that they sold (John Hawkins has one, as do I).

Although Canvey was their main club, they both joined Maidstone in the late 1990s in order to join our members on our MMES one week holidays around the UK, that ran between 1999 and 2006, Sue's Holidays Including Trains (known as a S.H.I.T Week). They also came to us at Maidstone at times and occasionally ran on our track. For many years they arranged a special summer Saturday for MMES members only, to run at Canvey, and provided a super buffet lunch for us all. Sadly, Len's mate Laurie died a few years ago, but Len still maintained his membership with MMES, and was keen for us to continue our annual trips to Canvey Club, despite his diminishing health. In fact, he was in hospital a few days before our trip to Canvey in August last year from where he rang me, anxious for our visit to go ahead although he wasn't going to be there. It was a shock when he died from sepsis just a couple of days before our trip to Canvey. But we all went ahead as this was his wish; and took with us a cake in his honour for everyone to share.

Len was well thought of, and Canvey members decided to do something special at his funeral. In agreement with his sister's son and daughter,

and the vicar, Len travelled by train to his grave. A portable track was laid in the churchyard so Len's final journey in his coffin could be by train with his friends and family around him. (Funeral picture from Mile Leahy of Canvey Club.) Len was a thoroughly nice guy who will be sorely missed by all at Canvey, and those of us at Maidstone who knew him.

Sue Parham



A graduated quill stop for a Deckel FP1 milling machine

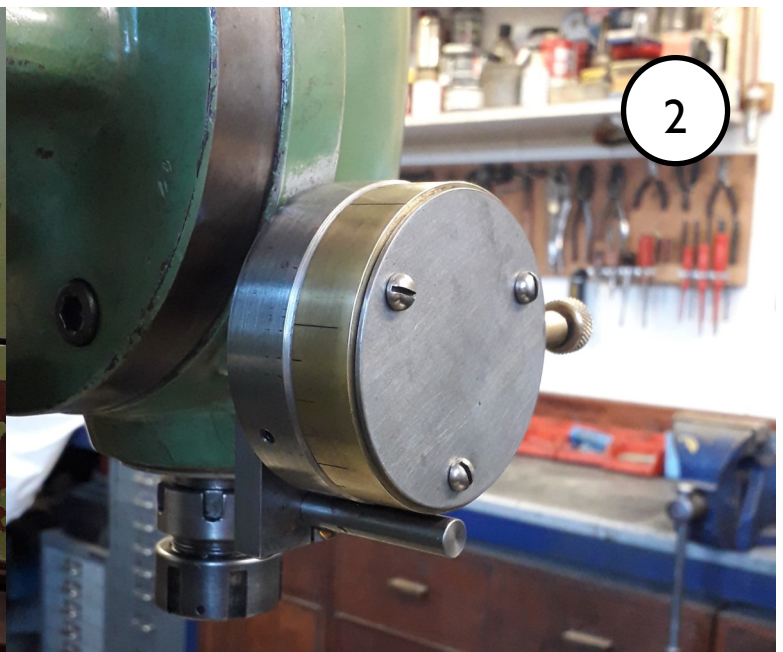
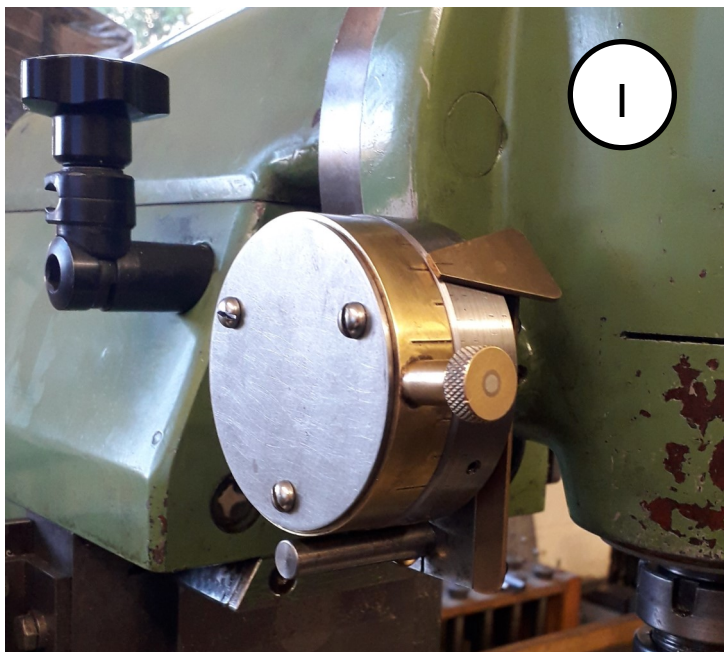
The Deckel FP1 Universal milling machine is a tool of amazing versatility. With its interchangeable high speed and slow speed vertical heads, horizontal overarm and slotting head it seems difficult to think of an machining operation of which it is not capable. Whilst building my model of the Wallis and Stevens Advance steam roller I really only scratched the surface of its capabilities and yet I found that there is one basic feature which is missing. This is the ability, using the slow speed vertical head, to drill a hole manually using the quill to a known depth, either by reading a graduated scale or down to a fixed stop. I can only assume that the manufacturers thought that in the tool room environment for which the machine is intended, there would not be the need to drill such holes with this head. The high speed head does have a graduated scale and stop available but it is intended only for use with very small drills at high speeds (from a minimum of 4000 rpm upwards) and accordingly has a restricted depth of travel. The vast majority of model engineering work does not need such speeds and in fact I have yet to use the high speed head in anger.

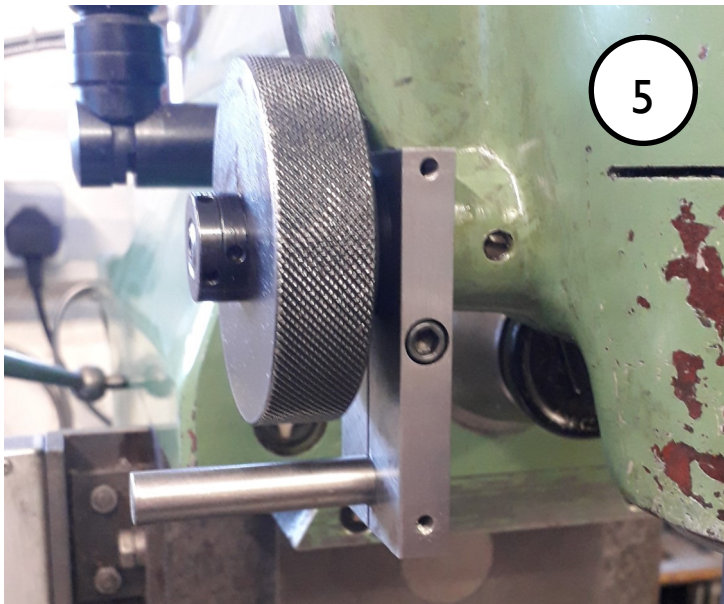
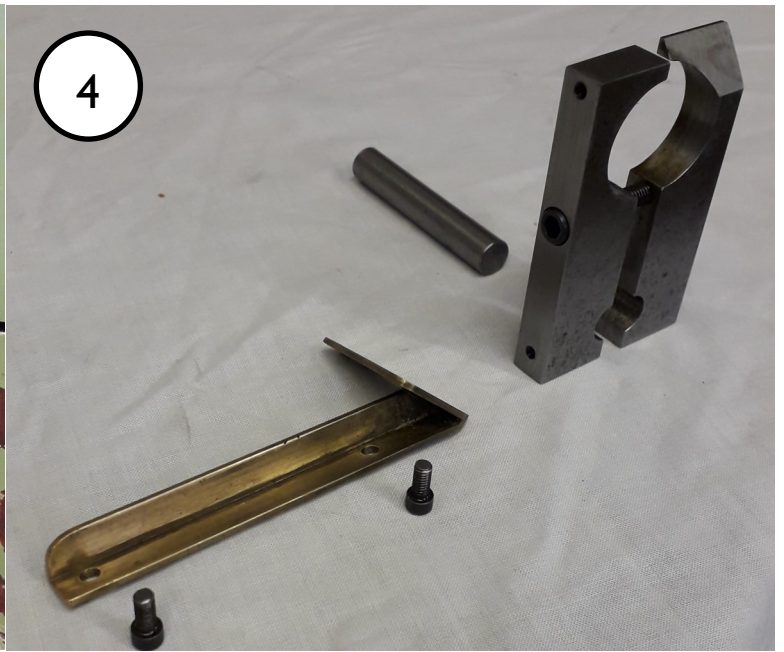
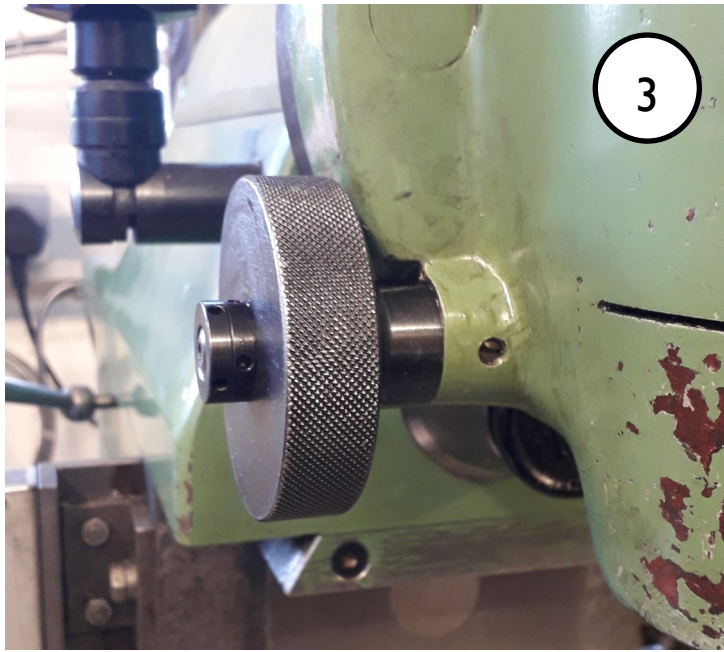
There were, however, plenty of holes on the Advance roller which required a fixed depth. One way to achieve this is to raise the table using the manual hand wheel and read the machine dial or set the table vertical stop. However the “feel” necessary in drilling with smaller drills is lost by this means. Instead I resorted to removing the plastic guard cap which fits over the vertical spindle of the slow speed head. This reveals the top

of the spindle which disappears into the head as the quill emerges at the bottom when a hole is drilled. By holding a rule pressed onto the top of the head alongside the spindle the depth drilled can be read.

This rough and ready approach has several disadvantages:

1. The guard is there for a reason as the whole spindle rotates at up to 1900 rpm. If the rule should touch the spindle it can be flung away or fingers bruised.
2. There is no ready “zero mark”, every visible part of the spindle where there is a shoulder to sight to being an awkward fractional measure from the top of the body. This meant arithmetic for every depth required with the consequent chance of error compared to direct reading.
3. The head can rotate about its longitudinal axis such that the quill can face at any angle as far as the horizontal to either left or right. Holding the rule parallel to the spindle is even more awkward when away from vertical.
4. Observing the drill behaviour is difficult as the measuring point is so far removed from where the drill is operating and there is also the problem of parallax viewing errors.
5. For critical holes, most importantly of all, there is still no positive stop to prevent drilling beyond the depth required.





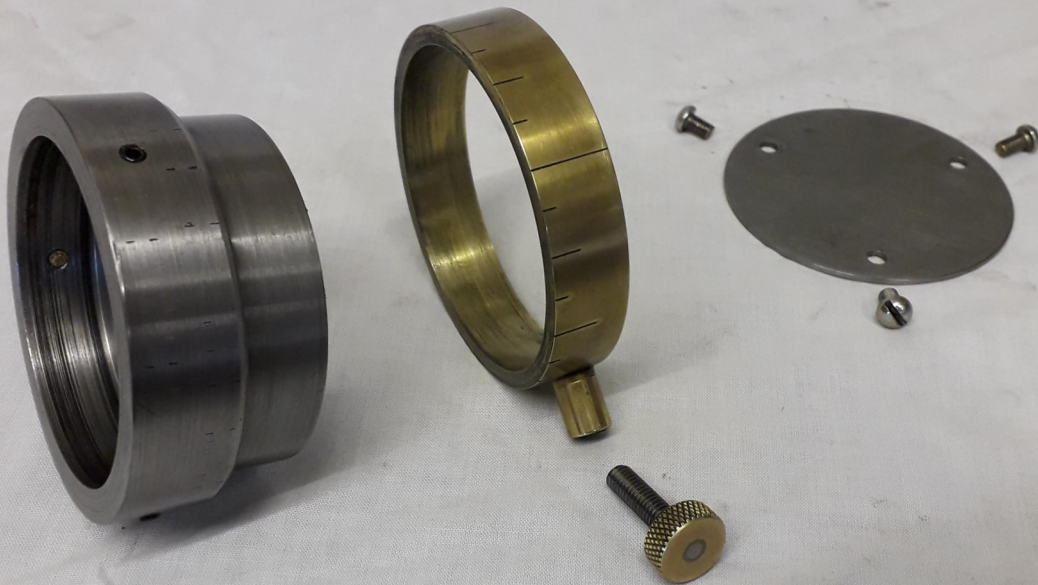
Something had to be done. The first idea was a sliding collar which would fit over the spindle and lock to it. It would then touch the head body when the appropriate depth had been reached. This would need a series of gauge blocks to set it to the correct height on the spindle. However, no graduated scale would be available and the guard would also still have to be removed and so this idea was rejected.

Eventually I decided to emulate the trusty old Warco drilling machine scale and depth stop. This operates on the shaft which engages with the rack cut in the side of the quill. A graduated ring is free turn on the shaft but can be locked to it. When it reaches a fixed internal pin further rotation of the shaft is prevented thus providing the required stop. Just less than one revolution of the shaft is possible otherwise the pin on the scale would have to pass through the stop pin. Inspired by this approach the finished job for the Deck-

el FP1 is shown Photo 1, from the front, and Photo 2, from the rear.

On the Deckel, as there is no stop, the equivalent quill down feed shaft can turn $1 \frac{3}{4}$ revolutions to drill to full depth. A multi purpose removable handle is provided to operate the quill lock, secure and release the quill draw bar and operate the quill down feed. For all three applications it simply fits on a square boss on the relevant shaft. When fitted to the right hand end of quill down feed shaft it clashes with the body of the head after $\frac{3}{4}$ of a turn. To allow the full depth to be drilled it is thus removed and refitted on the next face of the square. To prevent the quill retracting under the action of the return spring when the handle is removed a knurled wheel is fixed to the left hand end of the shaft. The user holds this whilst engaging the handle. The scale and stop mechanism would have to use this knurled handle somehow as the slow speed head is a smooth casting curved all over with no flats or bolt holes to which anything could be attached (as can be seen in Photo 3) and I was loathed to drill into a machine of such quality. I designed a divided plate which would clamp onto the body between the knurled wheel and the main part of the head. The plate was made with a large upper hole to clamp to the machine and smaller lower hole to clamp the stop bar. Between the two a cap head Allen screw was fitted to draw the two parts together (Photo 4, disassembled). The upper rear section had to be cut away severely to clear the sweep of the machine body but there was enough metal remaining to allow a secure clamp action when the Allen screw was tightened (Photo 5).

6

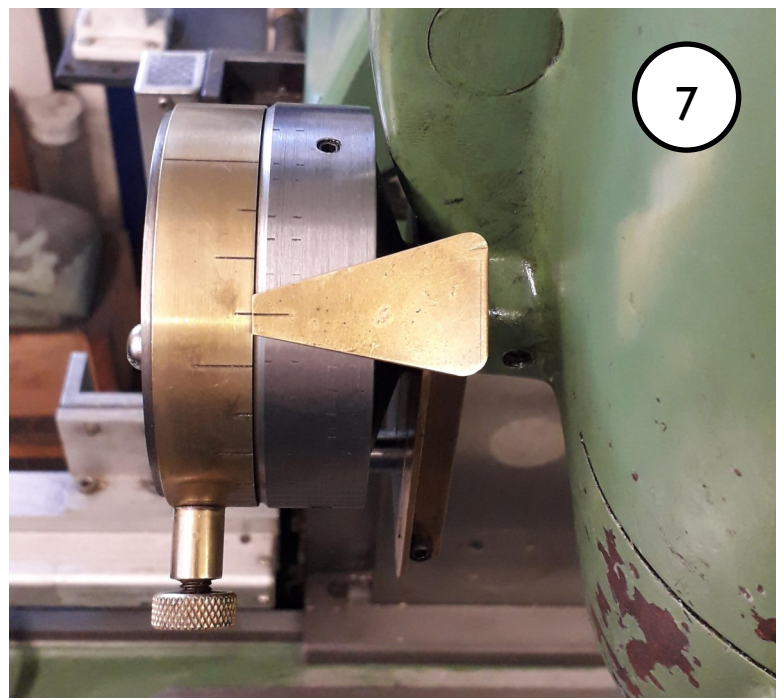


A steel ring was turned with an outer step to fit snugly over the knurled handle and was locked to it by three grub screws (Photo 6, disassembled). To prevent damage to the knurl the screws bear onto brass inserts. Although the ring appears solid it had been made of two parts as I did not have a solid piece of steel large enough for the whole job. The larger diameter ring section was heated and shrink fitted onto the smaller part and then the whole job finished machined. A second thinner brass ring acts as the scale and runs in the outer reduced step. It is held in place by a retaining plate. The brass ring has a boss soldered on which is tapped for a locking screw which bears on the steel ring below.

The graduations were engraved into the brass ring in situ, which is why there is a chamfer on the edge of the steel ring. This allowed the tip of the engraving tool to be held at the appropriate depth below the surface before commencing its cut. The tool was simply a piece of shaped tool steel held on an angle iron arrangement bolted to the table. With the quill fully retracted the first, zero depth, mark was cut by moving the table to the left. Gauge blocks between the nose of the quill and the table were used to set the depth for each successive mark to be cut. It was possible to mark down to increments of $1/16^{\text{th}}$ inch, smaller graduations having successively shorter cuts, controlled by the table traverse. An indelible marker pen was used to fill the engraved slots and these marks proved easy to read against the polished brass.

Another brass plate serves as the fixed datum against which the scale is read. It was arranged such that the datum plate is at 45 degrees to the horizontal to reduce parallax effects. This works well, as can be seen in Photo 7, taken from the normal operating position in front of the machine for hole drilling. It also allows an easy line of sight view of both the drill and scale simultaneously. The plate could have been fitted to an unused suds pump hose support on the main body of the head but this would only work with the head upright. By fixing it to a projection on the clamp arrangement the fixed datum rotates with the head. The scale, as well as the stop, thus works at any angle.

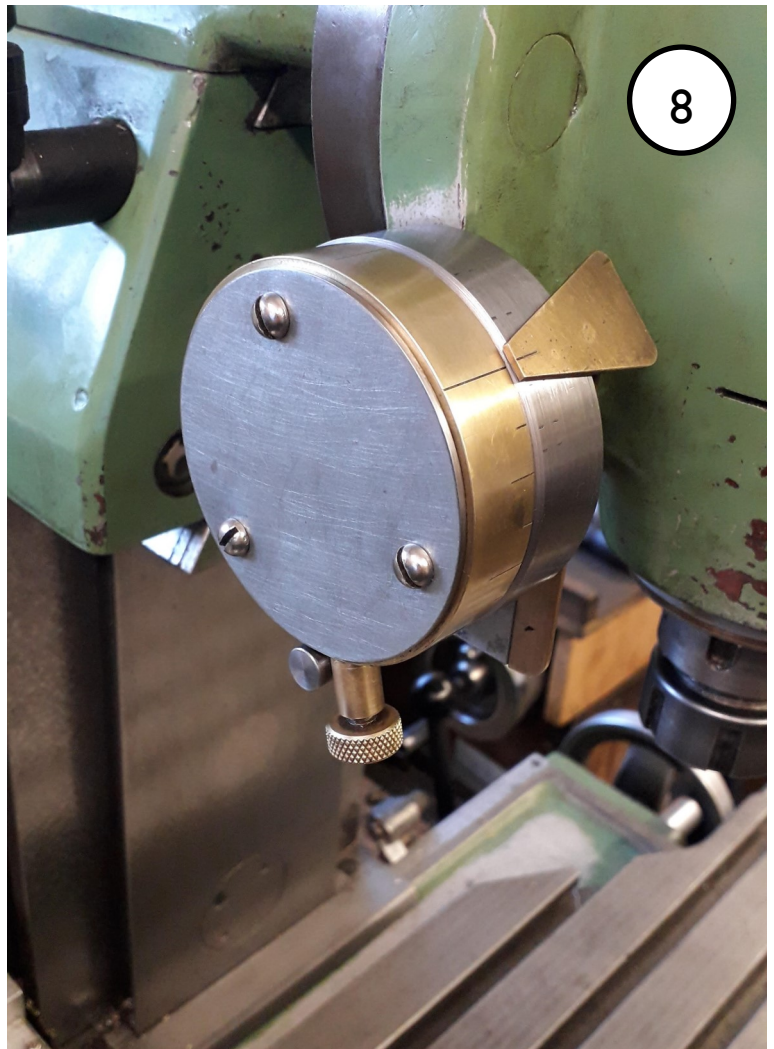
7



Because the shaft rotates $1\frac{3}{4}$ revolutions, on the “second turn around” the graduations on the scale no longer give a true reading. Thus the scale and stop are limited to a depth of 2 inches but this is adequate for most jobs. As the $\frac{1}{16}$ th inch divisions are $\frac{3}{8}$ th inch apart on the circumference of the ring, estimated readings to $\frac{1}{32}$ nd inch depth can easily be made. In Photo 7 the quill is fully retracted and the brass ring has been turned ready to drill to a depth of $\frac{3}{16}$ th inch with the stop pin knurled handle locked against the steel body. In practice the scale would be set with the drill just touching the surface of the job. Photo 8 shows the quill extended by $\frac{3}{16}$ th inch with the stop pin against the stop bar and the scale now reading zero, indicating full depth has been reached.

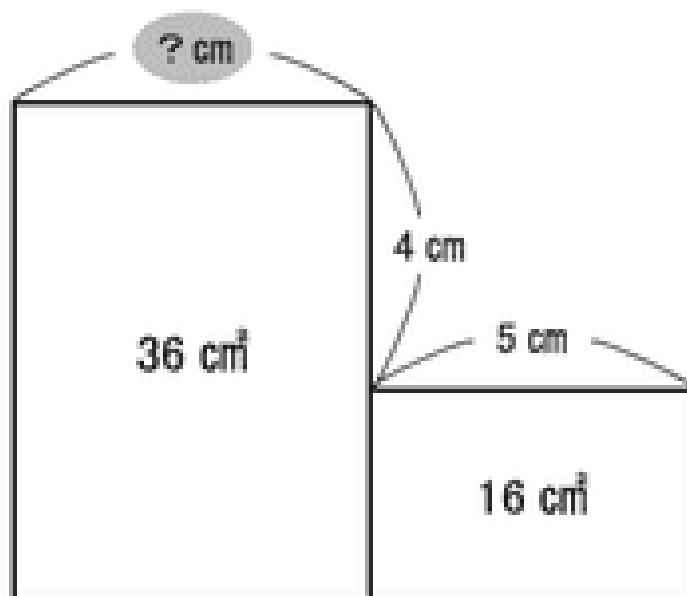
Finally, should the scale get in the way of a particular job in can be removed (or replaced) in a minute or two thus returning the machine exactly to its original state. A very worthwhile simple modification and one that sees constant use.

Paul Clark



Brain Teasers

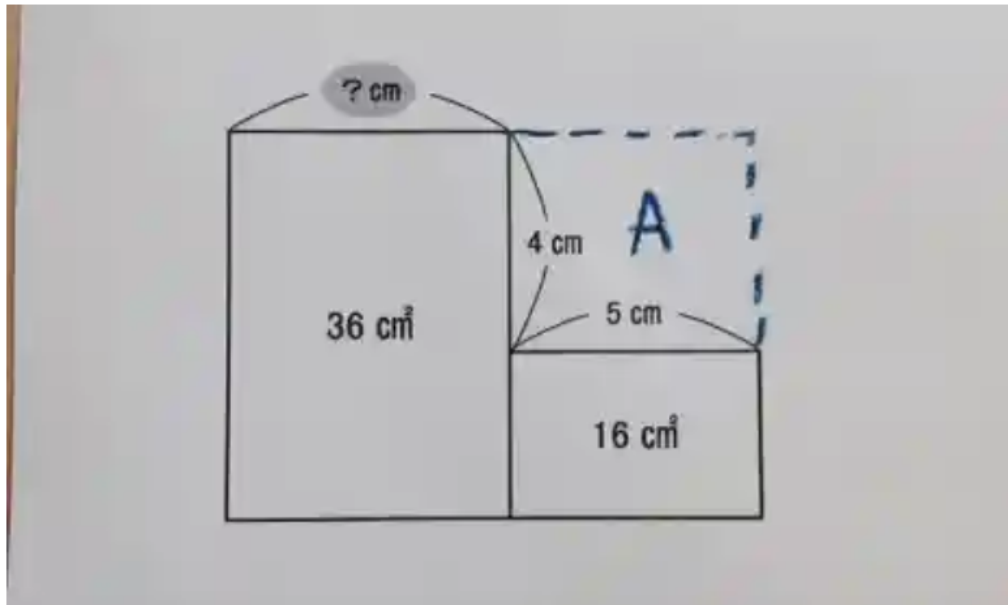
Whilst searching for things to keep my occupied, I cam across a series of puzzles for Japanese school children, have a go, first a “simple” one



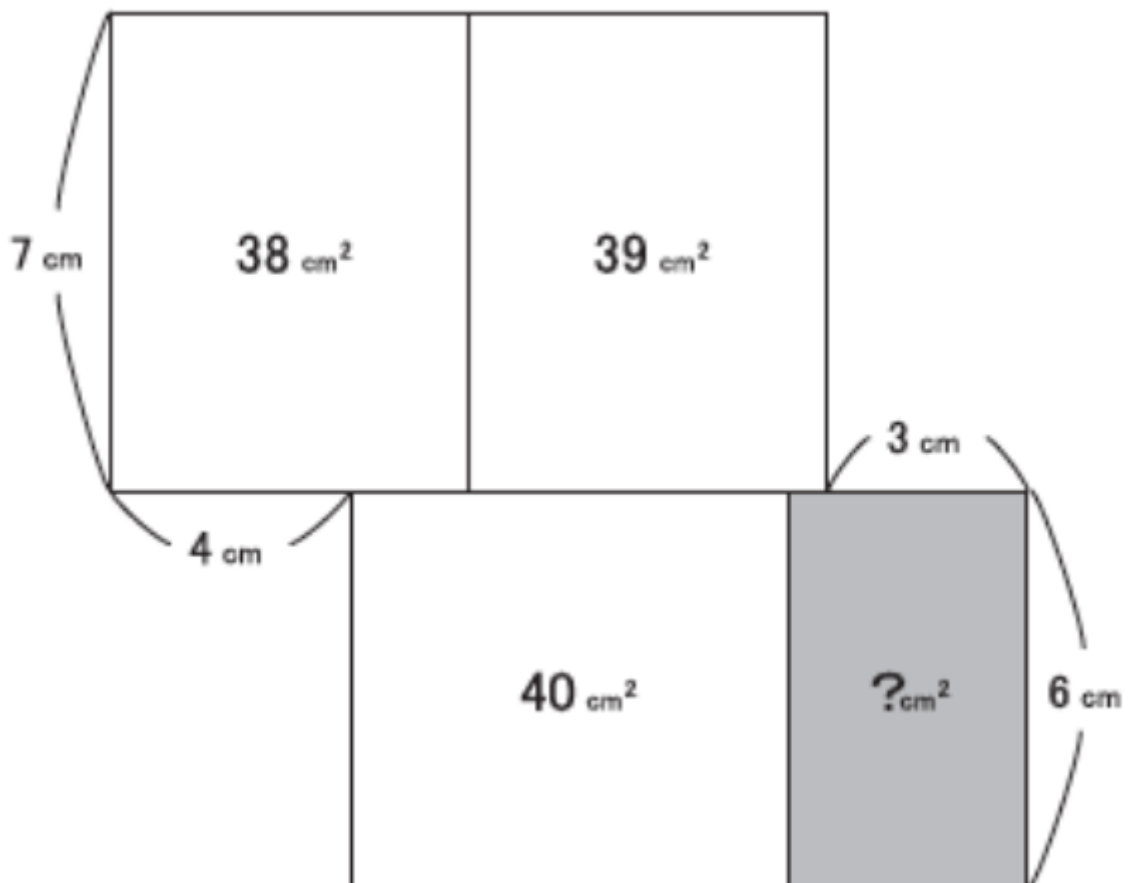
and its solution

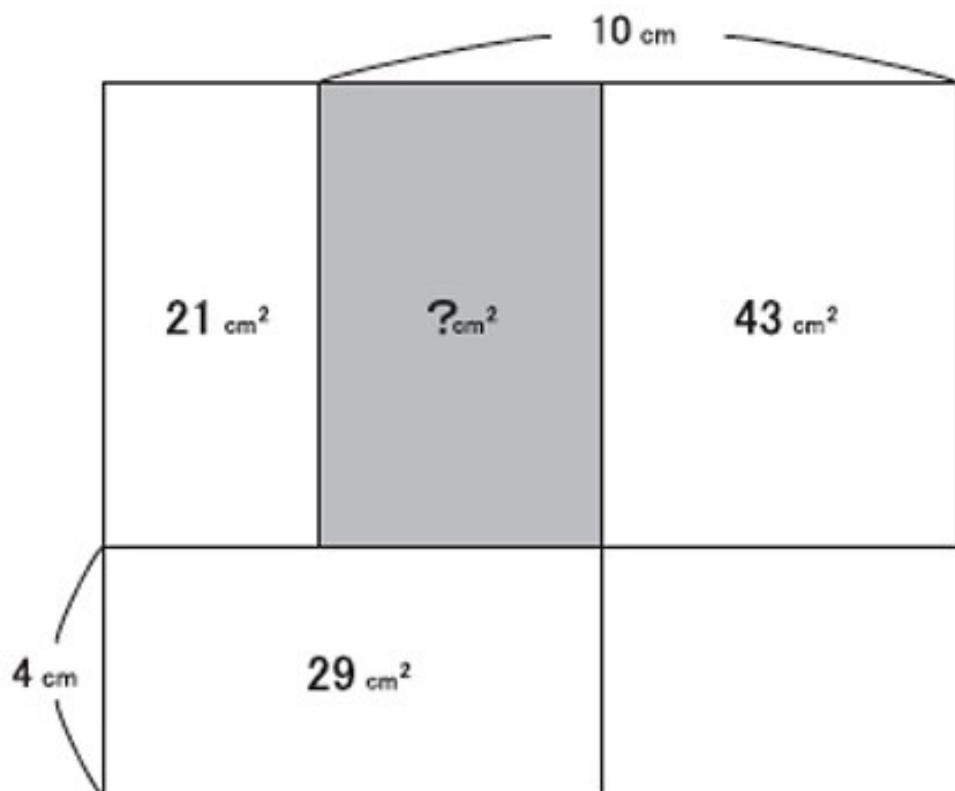
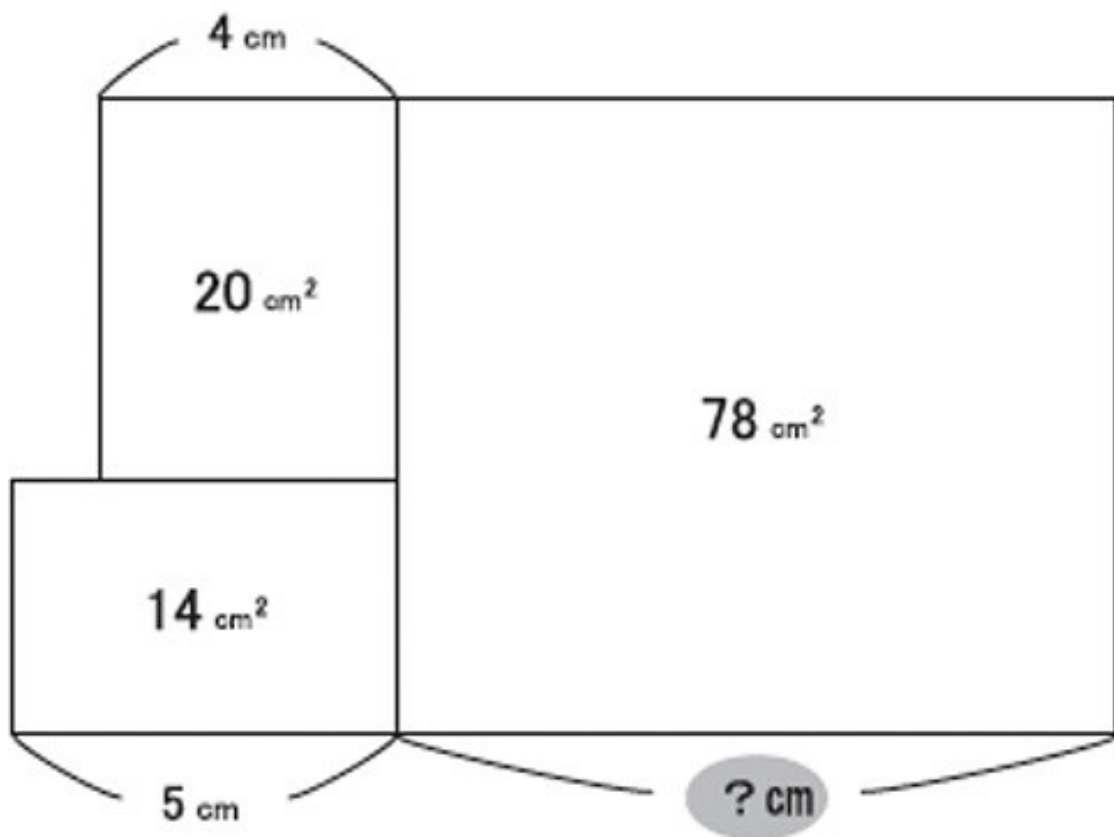
Meanwhile, here's how to solve the very first one.

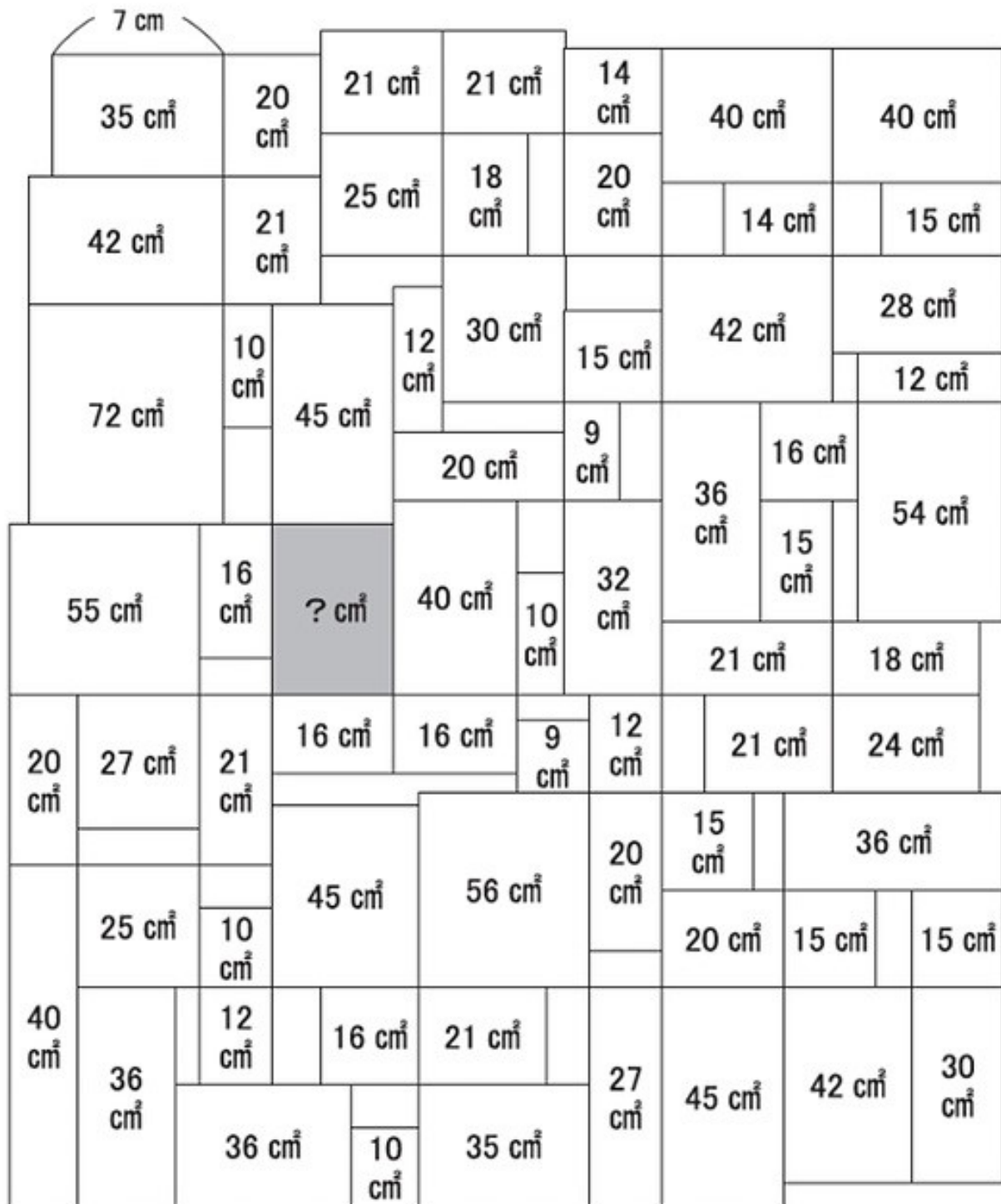
The trick is to complete the large rectangle, as below. We know that the area A must be 20cm, since it is 4×5 . Which means that A + the rectangle below it has area $20 + 16 = 36\text{cm}$. This area is the same as the large rectangle on the left side. Since they share the same height, they must share the same width - so the missing value is 5cm.



Simple right? Here's a few more







These were all sourced from <http://inabapuzzle.com/> - using google translate - its all in Japanese

A

nd there we have it. Easter edition 2020 - a bit different for very different times and circumstances. As you'll appreciate there isn't much in the way of normal club news at the moment, but hopefully before too long we'll be back to some kind of normal. Stay safe. Stay home. Make things.