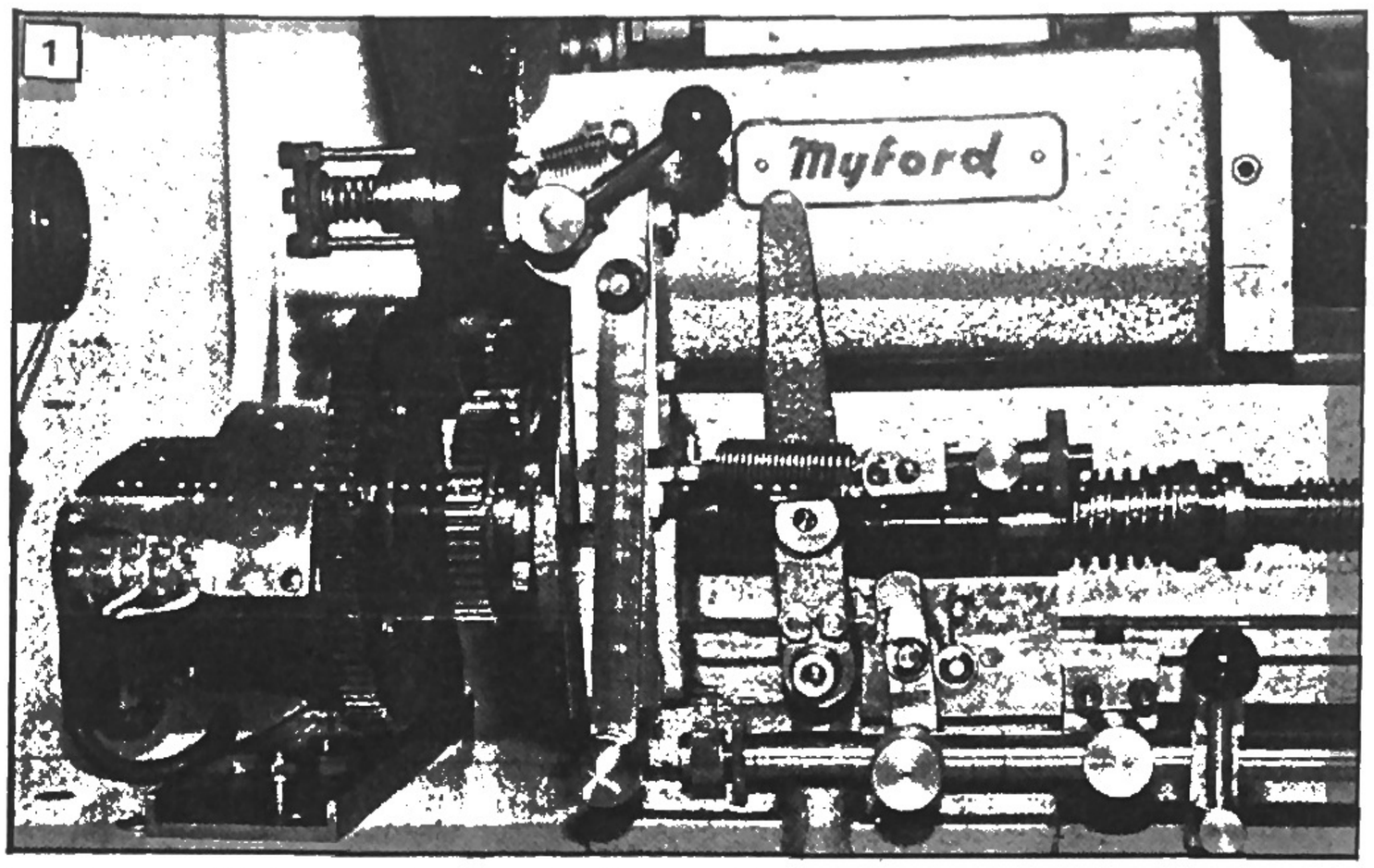
SCREWCUT

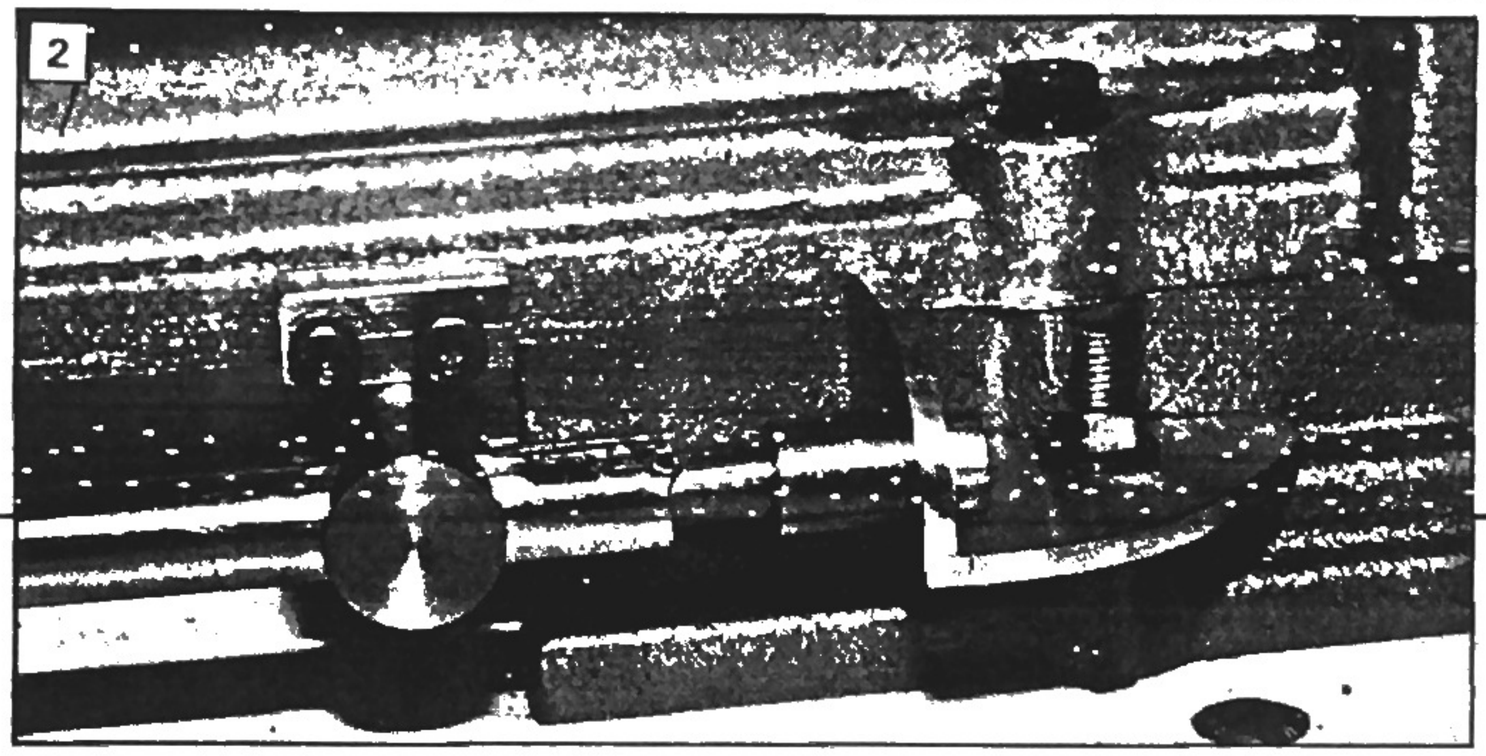
I suppose that it really started after I fitted the Dave Noble tumbler reverse control (usual disclaimer) to my Myford ML 10 Lathe. I had already modified the leadscrew clutch for automatic trip carriage control with a simple spring-loaded latch, operated by a control-rod that slides through two brackets clamped to the base of the lathe between the raising blocks. The control-rod has an adjustable stop clamped to it and a fine adjustment stop is clamped to the front of the apron. This, together with independent self-act similar to that already described in *Model Engineer* 17 August 1984. A small geared motor, slideable on a mounting platform, driving a large gear wheel (96 teeth) was mounted on the leadscrew. These extras have proved to be most useful additions, see Fig. 1.

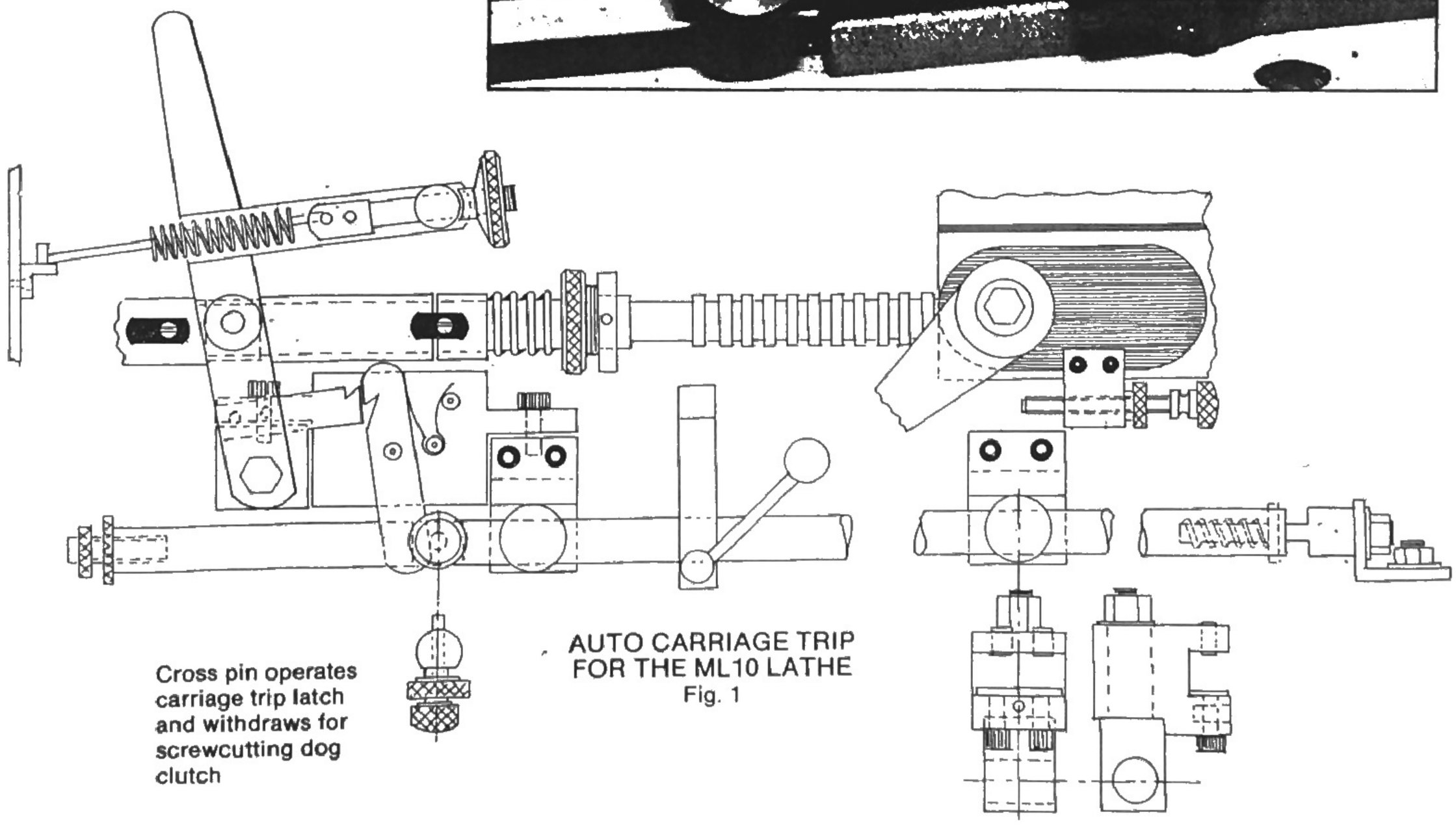
However, the tumbler reverse started me thinking about the desirability of a screwcutting single-tooth dog-clutch and the feasibility of modifying the tumbler gear along the lines of the detailed descriptions by the late Martin Cleeve in *Model Engineer* issues 7 July, 3 November, 1 December 1978, together with his book *Screwcutting in the Lathe* (Argus Books, @ £5.50 plus p&p). Interested readers are recommended to review these writings as the whole aspect is covered in extreme detail.

However, certain problems became immediately apparent:

1. The fixed 25 teeth mandrel driver gear on the ML 10, restricted any tumbler drivers to 25 teeth in order to retain the existing Imperial screwcutting data as designed. Also the driving and driven tumbler gears being the same size (25 teeth) requires the driven gear on the first quad-







AUTO CARRIAGE TRIP FOR THE ML10 LATHE
Fig. 1

AUTOTRIP

Dick Assender describes an auto carriage trip and screwcutting dog-clutch for the Myford ML10 lathe

rant stud to be at least 5 teeth larger than the driver gear on the same stud. This problem is not insurmountable but it does require the re-arranging of the published metric trains for the imperial machine. The dimensions of a 25 teeth 20 DP gear also has a distinct bearing on the size of the main spigot and thus the bore for the pull-on rod and the size of the driving dogs.

2. I, most certainly, wanted to retain the use of that most useful adjunct to small lathes: the Myford mandrel handle which would dictate the limits to the overall projection of any extended tumbler reverse mechanism. Incidentally, my handle has been modified for self-eject because I considered it hardly conducive to good housekeeping practice for mandrel bearings to thump the end of the handle with a copper hammer to free the taper.

3. The operating linkage for the dog-clutch must clear the lathe spindle pulleys, and any control-rods brought to the front of the lathe, without drilling any holes in the machine, and especially not through the bed. Although Martin Cleeve had adopted this method on his ML 7, I simply could not bring myself to consider it and would rather have abandoned the project altogether if it had proved to be the only way.

4. The dog-clutch control should be incorporated with the existing carriage trip mechanism but operable independently from the leadscrew clutch. This is essential because any degearing of the leadscrew would negate the thread pick-up facility of the dog-clutch.

The more I thought about these requirements the more unworkable they seemed, until I accepted certain limitations, and then the system began to appear more manageable. From his articles it is obvious Martin Cleeve used his lathe professionally, and consequently his dog-clutch needed to be a much more substantial arrangement than the requirements for a smaller machine used purely on a hobby basis. In fact, in his book, he mentions the capability of his ML 7 to screwcut on brass 26 t.p.i. at speeds of 500 rpm which is something that I have no desire to do or even try. In my opinion far too much is made of the high speed capabilities, particularly on small lathes destined for the hobby market, and I consider the lower speed range to be far more important. Some claims seem almost absurd or over optimistic to say the least.

My screwcutting activities are usually carried out in back-gear which suits my purpose and my facilities. Trying to emulate factory practices in a small home workshop is something that usually ends in frustrations and sometimes worse.

Bearing all this in mind, I felt that it would be possible to produce a smaller version of the dog-clutch to suit the ML 10, and that a slimmed down version, (especially the main spigot), should prove adequate for non-professional use. Accordingly certain calculations were made as follows:

Gears, Mild steel, 25 teeth, 20 DP, o.d.	1.35 in.
Tooth depth	0.108 in.
Bore	0.500 in.
PB Bushes, i.d.	0.375 in.
Main spindle (silver steel)	0.375 in.
Drilled through, to clear	0.187 in.
Diameter of extended sleeve of quadrant driver	0.600 in.
Pull-on rod (silver steel)	0.187 in.
Absolute max. length (to clear mandrel handle)	3.875 in.
Absolute max. width (to clear mandrel handle)	1.500 in.
Drive dogs (made from 1BA hex. cap screws)	0.206 in.

The gears were cut, (as one and later parted), on the Dore Westbury using a home-made dividing-head built around a 72/1 precision worm and wheel from an ex-WD (Whiston) gun-sight and a commercial cutter. Obviously, hobbed gears would be preferable, but these seem to mesh quite well and are adequate for the low operating speeds. It was decided to retain the existing D. Noble tumbler reverse operating lever but dispense with the light alloy casting which is used for mounting the device and carries the spindle for the quadrant driver gear. A new one was made from mild steel (½ in. × ¾ in.) with the new extended silver steel spindle and a new mounting spigot screwed and "Loctited" in position.

The ML 10 has a substantial machined lug at the rear of the headstock which is intended for mounting a reversing idler gear when required. Obviously, any tumbler reversing device renders this lug obsolete for its intended use and it thus becomes a very convenient mounting point, not only for the tumbler/dog-clutch mechanism, but also the angle-plate bracket which is used for mounting the operating linkage. A silver steel rod extends from the angle-bracket between the tumbler reverse lever and the rear of the headstock and terminates at the front of the lathe in a lever operated spring loaded latch. An extension of the latch is operated by the carriage control trip-rod which has the operating cross-pin for the leadscrew latch locked in the withdrawn position. Left-handed threads would require the trip to be operated manually, see Fig. 2.

As can be seen from the drawings, this is not one of my strong points, but I hope that they illustrate the GA. of how the modifications have been accomplished. I suppose that the purists will say, (if they are that interested), that the anti-clockwise engagement movement of the dog-clutch control-lever conflicts with the linkage movement and, of course, this is correct. However, the arc of the crank is quite small and for all practical purposes only affects the pin that passes through the angle-

1: The modified Myford ML 10 lathe headstock as fitted a leadscrew clutch trip carriage control and geared drive motor.
2: The control rod end support and bracket mounted at the tailstock end.
3: A fine adjustment stop on the face of the apron.