

MECHANICAL BOXTHORN HEDGE CUTTER

ance, and the structure must be sufficiently rigid to prevent undue loss in transmitting driving power to the cutter bar.

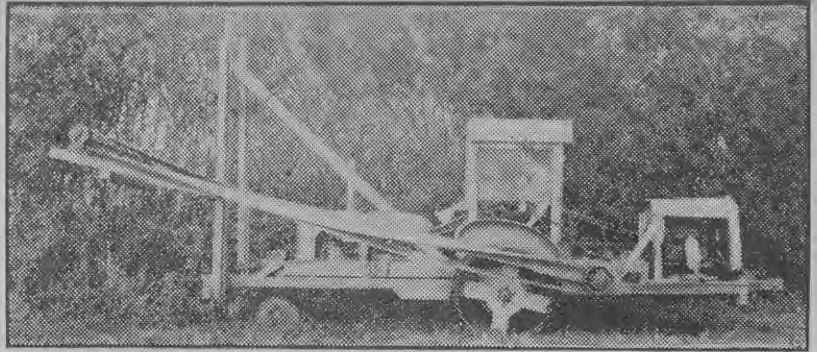
Because of the very heavy work asked of the machine in dealing with some of the massive boxthorn shelter belts, a separate engine for driving the cutter bar is preferred. When the tractor pulley is used it is not possible to reduce the forward speed of the machine while maintaining the speed of the cutter. In dealing with very heavy growth it is often necessary to reduce the forward movement to a minimum while the cutter bar slashes at tough, resistant branches. For ordinary hedge trimming direct drive from the tractor side pulley is quite satisfactory, but such machines have difficulty in dealing with the really old, overgrown hedges which on many farms are developed as main shelter belts.

Efficient Home-made Cutter

On the farm of Mr. A. E. Luscombe, Kapuni, a typical South Taranaki farm (see "Journal of Agriculture" for April, 1945), practically all the fences on the 174 acres are of live boxthorn. There are more than 6 miles of such hedges, and the annual expenditure to keep them in reasonable order by hand cutting has been a considerable item in the farm budget. Mr. Luscombe was one of the first to take up the problem of designing a machine for this work, and he has developed an efficient plant.

Construction Details

Platform: A strong wooden frame is built round the tractor and rigidly bolted to it. The tractor thus forms



Side view of machine cutting a boxthorn hedge. Note tractor wheels providing central pivot.

a pivot on which the machine can be swung and driven in any direction. The tractor can be driven out of the framework and readily detached from the machine when required for other work. The tractor used is a 17-horsepower model on steel wheels, and the platform is 24ft. long by 8ft. wide, made from good seasoned 4in. x 3in. rimu with special hardwood members where extra strength is required.

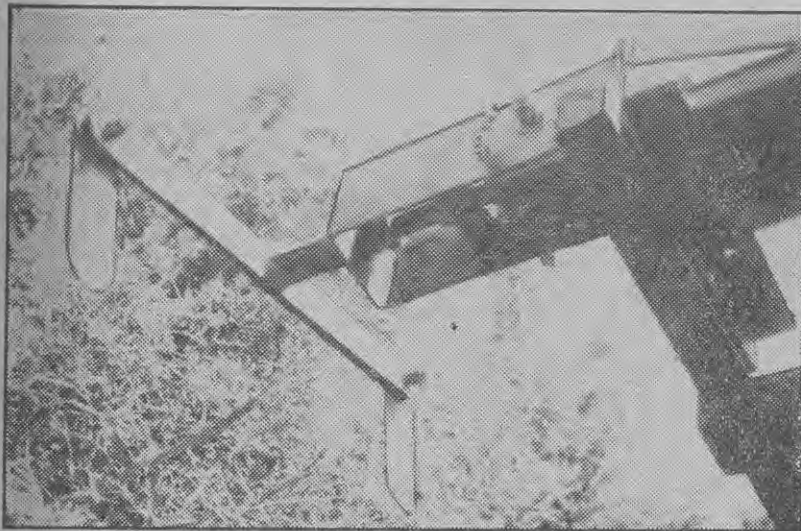
Cutter bar attachment: The cutter bar and drive mechanism is carried forward of the tractor on two 17ft. stays, one on either side of the tractor and fastened at the rear to sockets on the power take-off shaft. The forward ends are adjustable up and down for height of cutting on two strong uprights rigidly stayed to the frame. By means of a winch the stays carrying the cutter bar and shaft can be raised or lowered to any position; the machine can cut down to the ground or to a height of 15 or 16ft.

Drive shaft: A 9ft. steel shaft is attached to a crossbar at the end of the two arms by three brass bearings. At one end is the pulley for a belt drive and at the other is the cutter bar, driven by a worm drive. The attachments at either end of the drive shaft are interchangeable so that the cutter can be used on either side of the tractor to deal with corners and cutting past power poles.

Cutter bar: A strong flat steel bar about 4ft. long is attached to the end of the drive shaft by a universal joint which can be locked to hold the bar in any position from perpendicular to an angle approaching the horizontal. Most side cutting is done with the bar perpendicular, but to trim the top of a hedge the bar can be fixed to revolve almost horizontally, giving a slightly-sloping cut to the top.

Blades: The cutting is done by two steel knives, 11in. long and 3in. wide, suspended on a short stud on the cutter bar and free to revolve on a special brass bearing fitted into the end of each blade. This arrangement saves breakages and wear on the blades. With the cutter bar revolving at 1,800 to 2,000 revolutions a minute, the blades are held in line with the bar by centrifugal force, and they hit the hedge branches with considerable force. Being hinged, however, and free to revolve, they bend back if the first stroke is not sufficient to cut through the stem, coming back into position again for the next stroke.

Power drive: Power for the cutter is supplied by a second-hand 20-horsepower car engine mounted on a platform at the back of the frame. The gearbox is included, and in second gear the engine gives the necessary speed to the drive. The driving pulley is mounted on a short shaft from the engine, and the 5in.-wide drive belt to the pulley on the end of the cutter arm shaft is 17ft. long, giving smooth, positive drive without loss of power. The throttle is operated from the tractor-driver's seat.



Propellor blade shaft with swivel-connected steel knives in position for cutting.