

in one of his servants, or better, in both—knowledge of engineering, the simpler mechanical laws, and laws of building construction, and skill in the use of the commoner tools of the engineer, carpenter and joiner.

The incoming tenant, perhaps a young farmer does well to take care to stock himself with all those implements, machines, and tools which are always quite a necessity, by purchases upon entry either from the stock of the outgoing, or at neighboring sales, where necessities can sometimes be picked up cheap, although in many cases, notably at the last Michaelmas sales, the crowds of purchasers attracted by the skillful auctioneer ran prices up to far more than the actual value of the tools compared with new and improved ones; or from the manufacturer or tool shop.

The extent of the list of tools and machines which may be counted quite necessary demands upon the size of the holding, whether stock or corn, the building accommodation and its state of repair, and upon the nature of the field boundaries and gates, etc. Moreover, a complete list of multitudinous minor tools which make up the complete tool-chest and workshop of the farm would occupy too much space here. Nevertheless, the following list—showing (1) tools, etc., which may be considered almost indispensable for the repairs and minor constructive works upon a farm of fair size; (2) those which though not a necessity, may be called highly useful additions to ordinary equipment—may be useful to those who are just stepping into the wheel at the present Michaelmas, or perhaps next Lady Day. The list is not put forward as in any way complete; I have merely included those which, from constant observance upon a large mixed and therefore representative holding, I have found worthy of inclusion in the one or the other class.

#### 1. List of

##### TOOLS INDISPENSABLE

for the repairs, etc., upon a large mixed farm:

1. Carpenter's bench (fixed or movable) with a good vice attached.
2. Saws (cross cut and bent) and jack plane.
3. Set of tools for nailing work, as claw-hammer, pincers, bradawl, etc.
4. Set for screw work, as screwdriver, etc.
5. Tools necessary for morticing and like work in timber, including mallet, chisel, auger, etc.

To the above five lots may be added all the little minor tools common to every carpenter's bag, such as squares, spokeshave, drawshave, rule, etc.

6. Grindstone and hones, whetstones, etc., necessary for sharpening cutting tools.

7. Axes and handbills.

8. Cart-jack for raising cartwheels to grease same.

9. Set of pulleys and blocks for raising parts of implements under cover for repairs.

10. Mattocks and tools for excavating for gate-post heads, etc.

11. All spanners, clamps, etc., necessary for the adjustments of particular implements and plant, etc.

##### USEFUL ADDITIONAL TOOLS

and implements for repairs, etc., on the farm:

1. Small bellows, forge; or the engine furnace will answer for most ordinary purposes, but it is important to note that no blast should be applied beneath the fire bar, which would be very destructive to them and the boiler.

2. Iron or iron-capped anvil.

3. Set of tongs for manipulating heated things.

4. Screw jack to raise weights up to five tons.

5. Circular saw and bench for steam, etc., power.

##### THE USE OF THE TOOLS.

The outfit of tools provided in the first list will allow of all those common and constantly recurring repairs which come within the ability of the farm carpenter, such as, for instance, repairs to gates, hurdles, carts and wagons, chicken coops, buildings and internal fittings, as mangers, ring-posts, etc., and partial repairs to implements and machines, such as ploughs, mowers, binders, etc.; and for these purposes the farmer must be provided with those materials necessary for such works.

Thus he must have butts, hinges, and staples, etc., for gates and doors; rings for hurdle heads, etc.; and the various replaceable and other accessories for the different implements, such as the parts of ploughs, gear wheels to drill, etc.

With the tools included in this list, too, he will be able to venture upon constructive works of a smaller kind, which may well save him many a long bill from the neighboring works or the builder and carpenter. Thus, for instance, he can, if provided with the timber, etc., cut to the necessary scantling, make his own gates and hurdles, build chicken coops and houses, and even construct the common out-buildings and sheds, etc.

When, however, he comes to enter more largely upon constructive works, and wishes to be more independent of the tradesman and works as regards repairs, he finds it well-nigh a necessity to invest in some of the tools, etc., mentioned in the second heading. Thus he may find that to repair a broken cart shaft requires a flat metal strap bent and forged to the requisite shape, with rivet holes and chamfered edges, and hot shrunk round the fracture, when he will find a furnace and forge indispensable.

He may wish to weld the broken ends of a hop or hurdle pitcher; to

straighten the bent cutter bar of the mower; or to renew the iron tyre to a wheel of some implement, or perhaps a cart. He may also, by the help of some of these accessories, undertake to dispense with the smith altogether, and shoe his own horses.

They also afford good, profitable employment for the hands on a wet day. The third implement on this list is especially useful, for the latter reason not less than for many others. Waste timber, such as old rotten posts, decayed trunks of trees, etc., may be sawn up into logs suitable as firewood for the engine boilers or the farmer's house. I have seen excellent use made of a circular saw driven by steam power in sawing up logs to 7-in. or 9-in. lengths for the purpose of floors to cart-lodges and cattle-sheds. I have been assured that it is excellent material for the latter purpose, if placed upon a solid foundation and well set in mortar and cement.

But the farmer provided with a circular saw 2 ft. 6 in. to 4 ft. diameter becomes much more independent of his landlord for timbers of the necessary scantling for a variety of purposes, such as gates, roofs, cart bottoms, etc. He is often obliged, unless provided with a saw, to send long distances to the owner's sawing pits for single items, such as fence bars, posts, etc., which may not even then have been sawn to the right size: meanwhile his cattle may be breaking out and running amuck, or one of his sheds may be lacking a roof-end.

Given such a tool, the bench firmly fixed, and a set of bench blocks for sawing to size, the farm carpenter should be able to perform all such cutting out of baulk timber, posts out of felled tree stumps, or fence bars out of larch or chestnut fence poles, which are often to be bought very cheaply in the rough state.

Good and serviceable implement or cattle sheds can be constructed out of condemned railway sleepers and telegraph poles, with corrugated iron or other material for roofs or weather sides. The sleepers, sawn to length, make very durable wall posts; while the telegraph poles can be sawn to the required scantling for all plates and roof timbers. We recently constructed a large lean-to shed for a portable engine and thresher in this way.

Not the least advantage of having a circular saw on the farm, too, is that it affords profitable employment at times when it is impossible to keep the men out on the land through wet weather. —*English Farmer and Stockbreeder.*

Aunt—Don't deny it. I heard your lips meet as I came in.

Alida—Yes, aunt, dear, it was such an accident. I was about to whisper something into Carl's ear when he at the same time moved to whisper something into my ear—and—well, he was just as sorry as I.—*Sondags-Nisse.*