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INCREASE YOUR PROFITS

Repairing and Renewing Broken Equipment in Time.

Handy Hints for Repairing Machinery, Harness, Gates and All Other Breakable Farm Equipment—If Work Is Done Before Spring Rush Many Valuable Hours Will Be Saved at a Time When Delay Spells Greatest Loss.

(Contributed by Ontario Department of Agriculture, Toronto.)

THE time for a systematic overhauling of the farm equipment is at hand. Repairing at home means saving in two ways—a saving of expense and a saving of time.

Before attempting to take a machine apart it is well to thoroughly look over it to gain a clear idea of the general arrangement and location of the parts. Machines with few parts or parts whose relations are quite obvious, do not require to be marked, but machines whose parts are numerous and similar in size and in appearance should be given distinctive marks—similar marks being put on adjoining parts. These marks may be centre-pops arranged in devices so: ., .., .:., ::, or letters stamped upon surface of the parts where there is no frictional contact.

In the stress of a busy season a broken tooth of a gear can be fixed up in a few minutes, and if properly done gears so repaired will often last an indefinite time—often many years. Chip and file the broken tooth down to the root. Draw centre line of tooth across width of rim. Drill the required number of holes, according to width of rim. A pin of wrought iron stock may be driven gently into the holes and filed to shape to match the other teeth. A better job may be made by tapping the plugs into the rim (Fig. 6).

To mend harness by sewing procure a couple of strong needles, a ball of high-grade flax shoe thread (No. 8), a ball of cobbler's wax, a straight and bent awl, and a clamp to hold the work. The clamp can be made from two oak barrel staves (Fig. 1). The thread should be made in length and strength according to the work to be done. For light work from 3 to five strands will suffice, for medium, like lines and girths, from 6 to 8 strands; and for heavy stitching, as tugs and breeching, it will require from 9 to 15 strands.

Break the thread by rubbing it down upon your knee, with your right hand, and give it a sudden jerk. It should break in a long ragged end. The ends should be placed together so as to form a long tapened point. Hold strands together in your left hand. With wax in right hand draw it over the ends a few times, enough to keep them together. Now throw strands over a nail, draw ends even, twine the end in left hand over forefinger, and rub the other end down on the right knee with the right hand. When well twisted rub on more wax. Thread a needle on each end, draw the thread through the eye for about two inches. Bend back the points of the thread and twist them well into the body of the thread (Fig. 1a).

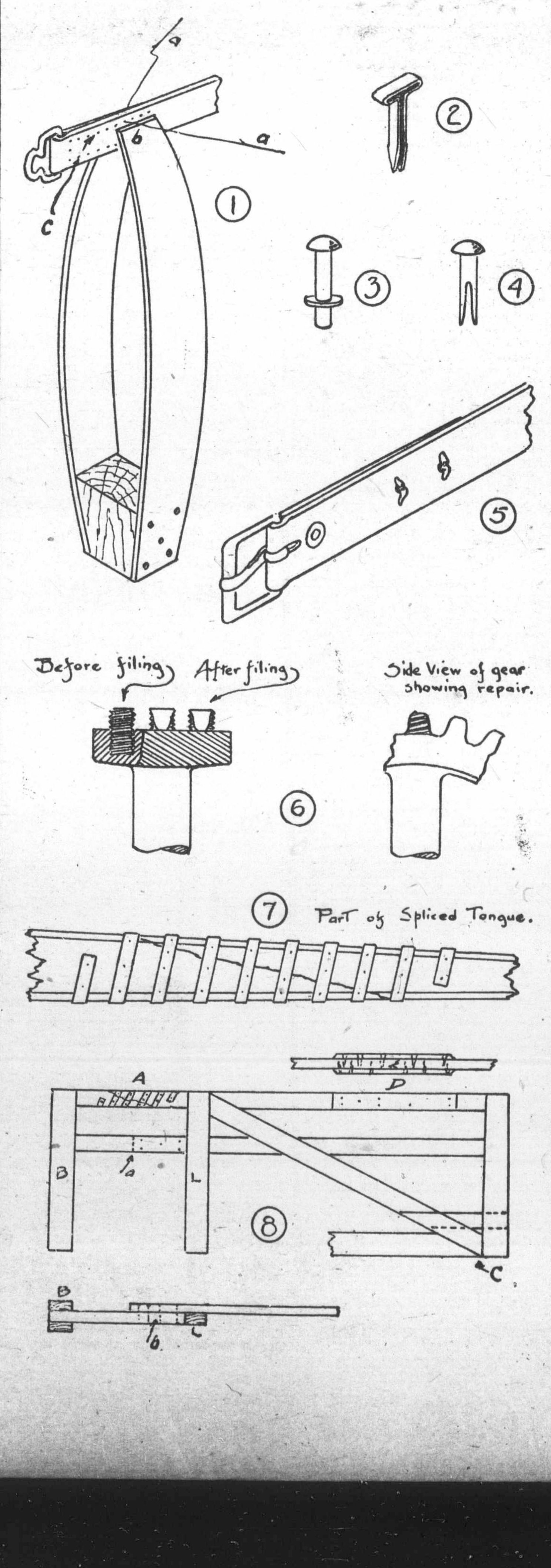
Pierce a hole in the work with a straight awl and insert a needle into the hole drawing the thread halfway through (Fig. 1b). Pierce another hole and pass a needle through for two or three inches. Through the same hole draw the other needle. With a thread in each hand pull them both quite tight. Repeat. Keep stitches straight and uniform in length (Fig. 1c).

For joining two pliable surfaces together in emergency there is, perhaps, nothing so handy, so strong and so neat as a rivet. An assortment of rivets should be kept on hand, both of soft iron tinned and of solid copper (Figs. 2, 3, 4). The split end clincher rivets are suitable for leather or stout woven material, as saddle girths and head halters; iron or copper flat head washer rivets may be used for leather, cloth, thin metal and for even thin strips of wood (Fig. 5).

The wagon is an important factor in the daily routine work of the farm, and should be kept in good running order, but it requires special consideration and experience to profitably repair the wheels, for unless the proper taper and "gather" is given to the spindle, and the axle set the right way, it will result in a hard-running wagon, the wheel grinding on the collar or nut instead of playing easily between them. The farmer, however, can attend to loose spokes, tires and hub bands, checked hubs, etc. After renewing the broken parts and tightening up tires and loose skeins, clean the wagon thoroughly, fill the checks with some good filler and give the whole a coat of paint. This will preserve the wood and prevent shrinking. A broken shaft or tongue may be efficiently spliced with hoop iron as shown in Fig 7. The iron can easily be bent round close by fixing one end first and then pulling it over with one hand and tapping it with a hammer at the same time.

Assume a broken rail of a gate, hay or stock rack. The old bar or rail is sawn off about a foot from the down rail L as shown by dotted line in sketch 8a. A short piece of new stuff is then driven into the mortice in the head (B) and cut off the right length; the two are then nailed together as shown at 8b in part plan. If broken at A (Fig 8) the splicing may be made as shown in sketch by wrapping hoop iron round it, or by nailing on each side strong strips of hardwood as at D (Fig. 8).

One of the first places for a gate to get rotten is at the junction of brace and bar or back caused by wet lodging there. The only way to fix this is, as shown at C (Fig. 8) by nailing strip of hardwood firmly to brace as low down as bottom rail will allow.—Prof. John Evans, O. A. College, Guelph.



HISTORY OF DYNAMITE

IT WAS INVENTED BY NOBEL, A SWEDISH SCIENTIST.

Some Facts About the Way In Which It Is Manufactured To-day—Careful Enforcement of Rules In Plants Results In Lower Accident Rate Than That of Many "Safe" Industries.

THE manufacture of dynamite was first undertaken on a small scale in 1863-65 by Alfred Nobel, a Swedish scientist. The first manufactured, while extremely crude and dangerous, was wonderfully effective when used under advantageous conditions. Its composition was of nitroglycerin and guhr, which is ordinarily described as an earthly material like Fuller's earth. It is in reality the shell remains of tiny animals and might be described as the "fossilliferous skeletons of diatomaceous infusoria." Whatever its name, this fine material was used to absorb liquid nitroglycerin to form dynamite.

The early processes of manufacture were very crude, as all mixing and handling were done by hand. Both production and use were limited, as the blaster of that date preferred to use blasting powder, with which he was more familiar, and which he considered safer and more reliable.

The principal objections to the dynamite of that day arose from the fact that the dynamite was extremely sensitive; the guhr did not absorb and hold the nitroglycerin securely, but allowed it to leak out, thereby causing many accidents and the inert or inactive nature of the guhr reduced the effective strength of the explosive.

The real value of the new explosive was soon demonstrated, and much experimental work was begun in an effort to overcome the objectionable features. Among the accomplishments in this connection have been the substitution of active dopes or absorbents for inactive guhr, which played no real part in the explosion. This introduced a variety of materials, the principal of which were wood pulp and nitrate of soda, both of which enter into combustion with the explosive material used and add greatly to the effectiveness of the explosive. The wood pulp absorbs the liquids and at the same time is consumed in the explosion while the guhr which it replaces was not.

Further progress in the art of manufacture introduced nitrate of ammonia as an economical substitute for part of the nitroglycerin.

In comparatively recent years low freezing dynamites were developed, principally by the introduction of certain nitrated coal tar derivatives.

All these changes brought about many improvements in dynamite and made it better suited for various kinds of work. To-day there is a class or type of dynamite suited for every kind of blasting, and the process of manufacture has been perfected to a very high standard.

A dynamite plant differs absolutely from all other factories. There are no large or expensive single buildings, and practically every operation is conducted in small isolated structures, heavily barricaded in order to protect other parts of the plant in case of an explosion.

Two classes of materials — liquids and powders (solids) — are used in making dynamite, and many processes are required to properly prepare and mix them.

The non-explosive solids after being thoroughly tested, dried and screened are transported to buildings known as "dope" houses, where they are weighed and mixed in the correct proportions and amounts. The normal mixing of dynamite is about 600 pounds, and only enough dope or absorbent is weighed at one time to make this amount.

Included with the absorbents are other materials, which act as a stabilizer to prevent chemical changes after the manufacture is completed.

From the dope house the dope is taken to the mixing wheels, which are large rubber-shod wheels revolving in a wooden bowl. The dope is placed in the bowl and the wheels run for a few revolutions to get it evenly distributed, when the nitroglycerin together with any other explosive materials of a liquid or a solid nature, are added. The wheels are then set in motion and kept running until the materials are thoroughly mixed. The dynamite is now complete and ready to be packed into cartridges.

On another line or unit of the plant automatic machines have been busy cutting heavy paper from large rolls, printing the brand and strength of the dynamite on each piece and rolling it into shells or cartridges, each of which is coated inside and out with a thin film of paraffin.

In the "punching" house these are placed in large machines that fill each with the proper amount of dynamite and crimp the open end securely. Each cartridge is then inspected.

The next step is into the packing house, where the finished cartridges are packed in strong paper-head wooden boxes, each of which has been carefully marked beforehand. The dynamite is then sent direct to the outgoing cars or to the storage magazine for future shipment to various parts of the world to perform its mission in the industrial upbuilding of the world.

On a well regulated plant every effort is made to keep each batch or mixing up to the highest standard of quality and uniform in every respect. To do this many unique and elaborate types of testing equipment are needed and each lot of dynamite is required to pass the most exacting tests.

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