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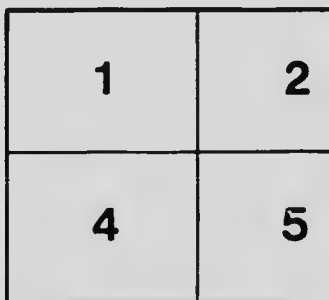
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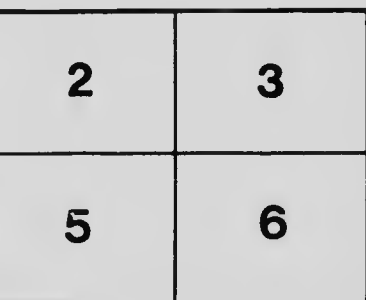
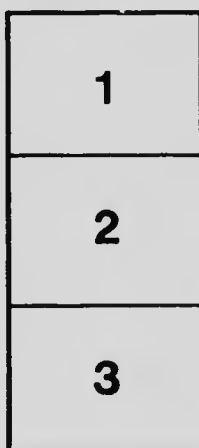
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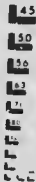
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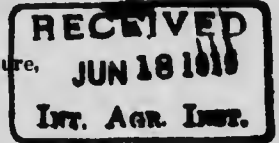
GOVERNMENT OF THE PROVINCE OF SASKATCHEWAN

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# "KNOTTER TROUBLES"

By J. MACGREGOR SMITH, B.S.A.,

Professor Agricultural Engineering, College of Agriculture,  
University of Saskatchewan.



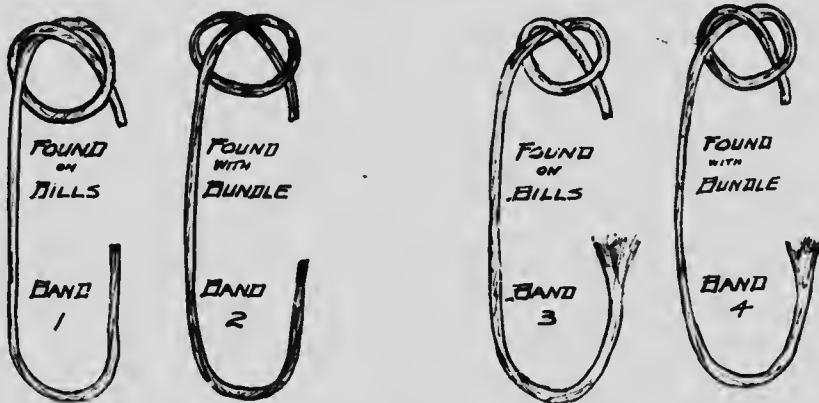
Binders ought to be overhauled now if they have not already been thoroughly gone over. While it is impossible to tell a man on paper how to operate his binder, yet there are some points which may be of assistance to him so that we will be practical and not deal on the advantages of the self-binder or some such topic. Through the courtesy of the International Harvester Company, of Saskatoon, we are able to publish some cuts showing the appearance of bands resulting from the most common knotter troubles. Too many men grab a monkey wrench and go at the knotter as if it were a stump puller or a stone boat, never stopping to think that there must be a reason, and a little careful study of these diagrams ought to prove of valuable assistance.

When a new binder is purchased, see that the paint on the bearings is cut by kerosene, and run the binder round the yard a few times till it is well oiled and in good condition for work in the field. All binders are carefully adjusted and tested at the factory before being sent out, and operators should not mutilate the knotter by the use of cold chisels, punches and hammers. A wrench, a little oil and a little good commonsense being all that is required.

There are three important adjustments: (1) the twine tension. A pull of 8-12 pounds should be enough to pull the twine from the box, and under no condition should the tension be increased in an endeavor to get tighter bundles. (2) disk. A pull of 35-40 pounds should be sufficient to pull the twine from its disk. (3) A pressure of 12-24 pounds should trip the binder and let the sheaf be tied.

If the bundle is thrown out not tied, find the reason in the following three causes: (1) Cord holder may be too loose, which allows the twine to slip on while the knotter hook is making a revolution. (2) Cord holder may be so tight that the twine cannot be pulled through the disk, and it will break. (3) The needle may not come down far enough to place the upper twine in disk. If the bundle is thrown out not tied with the twine straight, and is not in it, the knotter spring is too loose and may be adjusted. Make any adjustment carefully, and give the screw a quarter of a turn each time a change is made.

If a binder misses enough bundles to give positive assurance that the knotter head or needle is out of adjustment, stop the machine as soon as the

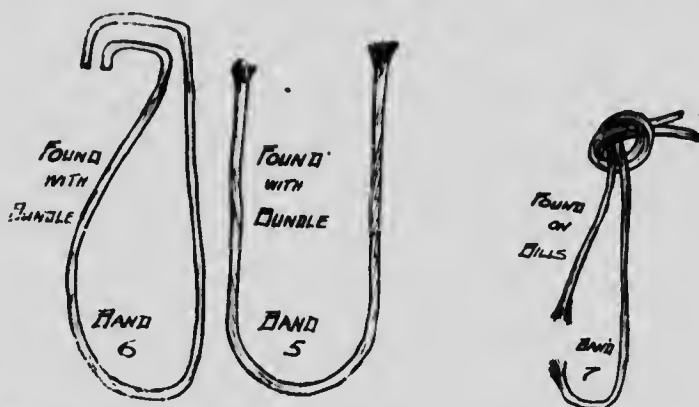


next trouble bundle is cast, find the band, and study by referring to illustrations. These show the appearance of bands resulting from the most common knotter head and bill troubles.

**Band 1**—Found clinging to the bills with the free end cut off square. This indicates that the twine disk is too loose and the twine tension is too tight, and has probably resulted from the operator's attempt to make a tight bundle by screwing down the twine tension. The twine is pulled from the disk instead of from the twine can when the needle advances, and a single knot is tied at the needle end of the band. Loosen the twine tension. If the trouble is not abated, tighten the disk spring slightly. Do not attempt to affect the tightness of the bundle with the twine tension or any adjustment of the knotter spring.

**Band 2**—Similar to band 1 in appearance, but found with the bundle instead of on the bills. This condition may result from any of the following causes: (a) Disk too loose but twine tension perfect. When the knotter bills revolve in a properly adjusted head it will be noticed that they must pull a little twine from the disk in order to form a loop about themselves. If the disk is too loose, the disk end of the twine will be pulled entirely out of the disk by the bills, which then proceed to tie a simple knot around this free end. When the bundle spreads as it is cast, the slip noose pulls out. Tighten the disk spring.

If the trouble cannot be overcome by tightening the disk spring, inspect the disk for wear, and if badly worn it must be replaced. If band 2 occurs regularly with each fourth, fifth, sixth or seventh bundle, look for wear in one notch of the disk. (b) A very loose or broken twine tension may be the cause for the twine not being stretched tightly across the bills.



**Band 3**—This band is found on the bills, with the free end ragged and crushed. The twine tension is too tight and the disk is also too tight. When needle advanced the twine broke at the disk before the tension would give. As with band No. 1, the bills tied a simple knot which is not stripped from the bills. Loosen the twine tension. If this does not remedy the trouble, loosen the disk spring slightly. Note that this band is distinguished from band No. 1 by the condition of its free end.

**Band No. 4**—Similar to band No. 3, but found with the bundle instead of on the bills. The twine tension is perfect, but the disk spring is too tight. The behavior of this band is similar to band No. 2, excepting that the band is broken at the disk instead of being pulled out of the disk by the bills. See discussion under band No. 2. Loosen disk spring.

#### MISCELLANEOUS TYING TROUBLES

The operator should not fret because a loose bundle is cast occasionally, and it is entirely impractical for him to stop to look for trouble until he is sure that he has it.

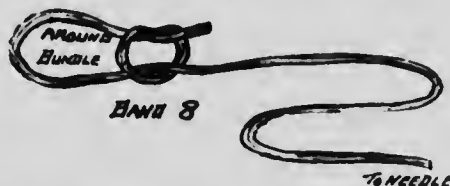
To avoid a complication of tying troubles, great care must be exercised to get a new knotter head frame into the exact position of the old head. In other words, care must be taken to get the flattened portions of the disk and bills pinions just close enough to the cam wheel so that these pinions will not permit lost motion and will not cut into the cam wheel.

**Choking Down.**—Sometimes in heavy, tangled grain, and often in flax, the head cannot discharge a bundle and the whole machine is stopped by "choking down." The remedy is found in adjusting the head to tie a smaller, looser bundle, and in loosening the tension on the compressor spring. An old or broken knotter may fall at the critical moment, therefore, order your repairs early.

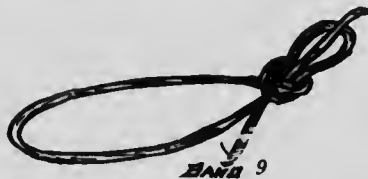
**Band 5**—This band is found with the bundle and has both of its ends crushed and ragged. The twine tensor is perfect, but the disk is very tight. The trouble is usually the result of the operator's tendency to overdo adjustments by giving the disk spring set screw one or more complete turns, the disk being so tight that it refuses to yield twine to the bills, which simply break both ends of the band at the disk as they revolve.

**Band 6**—Found with the bundle, and both ends are bent, showing that the knot was formed, but not completed. The following causes may have been responsible for the trouble: (a) The knotter bill spring may be too loose and the bills have, therefore, failed to pull the ends of the band through the loop into a knot, or (b) the bills being worn, may have failed to hold the ends until the knot was pulled sufficiently tight. Tighten the bills spring. If this does not remedy the trouble, new bills and the bills shaft will have to be supplied.

**Band 7**—This band will sometimes result when the bills are very tight and the machine is producing very loose bundles. It results from the stripper pulling the band up from below the breast plate instead of pulling the knot off the bills. Loosen the bills spring slightly. If this does not remedy the trouble the machine will have to be set to tie a tighter bundle. This trouble may also result from a badly worn cam roller on the stripper arm. If this cam roller has become worn lopsided, the stripper arm may not be forced far enough to pull the loop off the bills and the band will be broken, as shown by the discharge arms forcing out the bundle. Supply a new stripper arm complete.



**Band 8**—With this trouble a slip noose is tied around the bundle and the twine extends from the cast bundle to the eye of the needle. The needle has failed to place the needle end of the band in the disk, due to the following: The eye of the needle may be badly worn back and the needle cannot advance far enough to carry the twine to the disk. Such extreme wear is due to operator's attempt to make a tight bundle by tightening the twine tension. If the needle does not carry a special wearing piece, which can be renewed, a new needle will have to be supplied. The needle point on most machines protrudes slightly above the deck when the needle is at rest. Such position is correct.



**Band 9**—This is a perfect band and perfect knot. It is shown here with trouble bands because so many farmers think that the knot is imperfect, and complain because it is an apparent waste of twine. The bow knot simply includes in the bow and the short piece of twine which is cut loose and lost by those machines which tie a hard knot. The bow knot is not the cause for a material loss of twine, and there is strong indication that it will stand the shockers' handling better than the hard knot.





