Spindle Sync Threading:

Threading can be done by using a stepper to control the spindle speed. It is also possible to drive the Z-axis in sync with the spindle. This spindle sync threading, is easy to do and it can use the “full power” of the spindle for fast threading.
Spindle sync threading needs a signal from the spindle (index pulse) to start every threading pass at the same “spindle position”. To adjust the Z-axis rate when the spindle speed changes, a synchronization signal (synchronization pulse) is needed.
The controller software must also support spindle synchronization. I have added spindle synchronization (G33) to the GRBL-L and GRBL-L-Mega version, free available on GitHub. Read the Wiki for more information. (https://github.com/HuubBuis/grbl-L-Mega)

The index pulse can be generated by a proximity switch and a magnet. A second proximity switch and 4 to 8 magnets can generate the synchronization pulses. I have used NJK-5002C (5 Volt version) proximity switches and 12 mm neodymium magnets. 4 mm magnets will give sharper pulse edges and are more suitable. Keep the magnet for the index pulse between the magnets for the synchronization pulses.

The magnets are mounted on the spindle (extension) but you could also mount them on a gear driven by the spindle at a 1:1 ratio.