

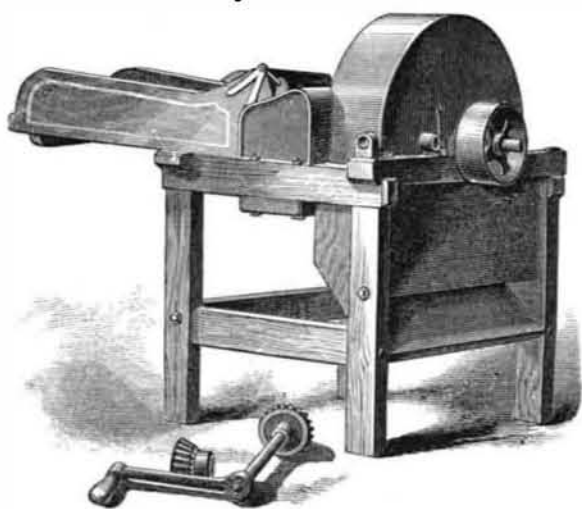
The Use of Balloons in Warfare.

The *Pall Mall Gazette* says: "It appears from the report of the result of a series of experiments to determine the utility of balloons for reconnoitering purposes recently carried on in Germany, and extending over a considerable length of time, that after repeated trials a balloon was constructed that could be packed in a comparatively small space and carried about without being damaged or rendered in any way unfit for immediate use. A second difficulty arose in providing a portable apparatus capable of supplying a sufficient quantity of gas for the inflation of the balloon whenever and wherever it might be required to use this latter. But this impediment was likewise overcome, and an apparatus was designed which could generate in from two to two and a half hours enough hydrogen to raise a balloon carrying three persons. Unfortunately, however, there has been found to be yet another obstacle in the way of using balloons for reconnoitering purposes for which no remedy can as yet be devised. From the height to which the balloons must ascend, useful observations can only be made by the aid of telescopes. The balloons must, however, necessarily be 'captive,' that is, they must be confined by a rope and prevented from drifting away, perhaps only to fall into the hands of the enemy; and it is found that when there is the slightest current of air such a captive balloon begins to rotate about its vertical axis, and this so rapidly as to prevent observations being made with the necessary accuracy and detail. Consequently the conclusion has been arrived at that captive balloons cannot at present be used for reconnoitering purposes, and that, therefore, the employment of balloons in war must be limited to carrying dispatches and information." Perhaps, however, some Yankee inventor can discover a practical method of preventing the rotation.

IMPROVED FODDER CUTTER.

The accompanying engravings give views of an improved fodder cutter, designed to reduce to a more palatable condi-

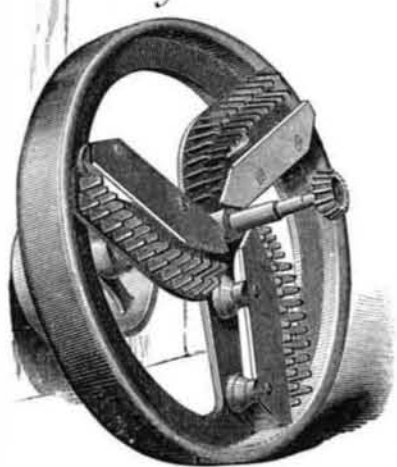
Fig. 1



tion the coarse food for stock usually found upon a farm. It is also claimed to meet the requirements of paper manufacturers, egg packers, and others, who have occasion to use finely cut material for their purpose.

In Fig. 1 is shown a view of the machine arranged with a pulley on the main shaft to receive motion from a belt. The machinery is enclosed to prevent accident or the material to be cut from coming in contact with the working parts. The circular cover over the fly wheel is independent of the frame and can be readily removed for the purpose of sharp-

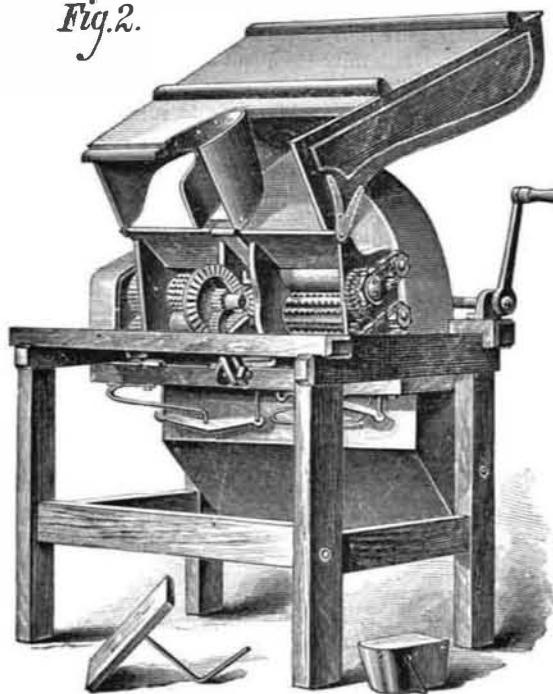
Fig. 5



ening the knives, etc. This style of machine has two feed boxes and two sets of feed rolls, both feeding to one set of knives. In Fig. 2 is given a view of the machinery and the arrangement for folding up the feed boxes for the purpose of oiling and changing the length of cut. The boxes are hinged to the top girder plates and can be folded over the machine and rested on the circular cover over the fly wheel. This can be done while the machine is in motion. The two

sets of feed rollers are driven independent of each other by means of an endless chain. This arrangement gives the feed rolls perfect freedom in adjusting themselves to the varying thickness of the material that passes between them. Tension springs are so made and arranged as to give the required pressure to the feed rolls regardless of their ever

Fig. 2.



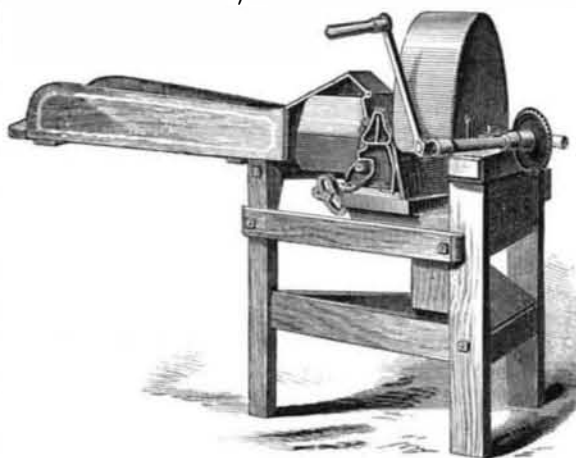
changing position. These springs press on the center at cross beams on which are hinged iron rods passing upwards and attached to the bearings of the feed rolls. A bevel wheel is attached to the fly wheel shaft which through intermediate wheels gives motion to a wheel placed on a small shaft extending from side to side of the frame. On each end of this shaft is placed a spur and sprocket wheel, which communicates motion to the feed rolls by means of the endless chains. For the purpose of changing the length of cut a spur wheel is placed on the hub of the bevel wheel and a second spur wheel engaging into it is made interchangeable, and can be changed *vice versa*, being of different diameters. Should it be desired to make more than two different length of cuts, additional wheels are added. The stationary shear or throat plates are made adjustable by means of set screws, and are provided with inclines on each end to prevent them from slipping on the edge of the knives. They are also provided with a guard on the inner end for the purpose of guiding the knives and preventing them from striking on the shears. Attached to the shears is a scraper that extends to the feed rolls and prevents the material from crowding in between the rolls and the stationary shears.

Fig. 3 represents the machine constructed with one set of feed rolls and one feed box. This style of machine embraces the same feature as Fig. 1 with the exception of cutting only on one side of the fly wheel shaft. It is arranged with a set of bevel gears and a crank to operate it by hand power. The end of the main shaft outside of the bevel gear is attached a second hand crank in case it is desired to have two operators.

Fig. 4 represents the same style of machine arranged with pulley to receive a belt for the purpose of driving it by steam or other power. A hand crank and bevel gear can be readily attached by detaching the pulley, when it is arranged as shown in Fig. 3.

In Fig. 5 is given a view of the fly wheel and the main shaft. Upon this shaft is mounted the driving pulley and

Fig. 3



small bevel pinion that gives motion to the feed gear. On this wheel is also mounted the whole cutting apparatus. The knives, three in number, are placed on adjustable supports which are provided with inclines and arranged to revolve on similar inclines on the spokes of the wheel. By a partial revolution of these inclines the knives can be adjusted to a position nearer to or from the shear plates. Two strong bolts pass through each knife as well as the supports and the spokes of the fly wheel. By this means the knives are

firmly secured in their proper position. Preceding the cutting knives are arranged, on curved bars, a series of small steel blades set closely together, so as to split and crush corn stalks, ears of corn, and all coarse material into small portions. The blades operate at a right angle or nearly so with the cutting knives which are arranged in a curved line from the center of the fly wheel.

These machines are manufactured in various styles and sizes from a small hand power cutter to a large power machine requiring steam or other power to drive it.

For further particulars relative to the sale of rights, territory, or the sale of machines, address the manufacturers, Joseph Dick & Bro., Lock Box 33, Canton, O.

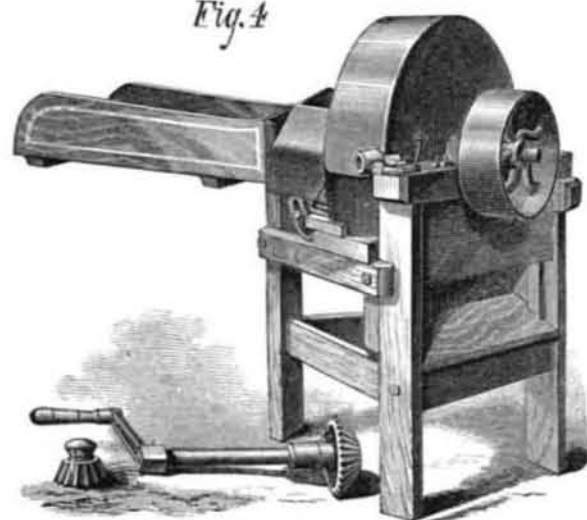
Foreign Textile Improvements.

Certain modifications are announced as made in the Swiss needle embroidery machinery, by M. L. Marliere, for embroidering of furniture stuffs, and new applications of gold and silver work. There is no change in the main parts of the machine, but the number of needles and cards is largely increased. Each of the new machines measures 4.50 meters by 3.50, and has 450 nippers, or 650 when they hold and let go the needles by mechanical pressure on the nippers, which arrive in the opposite direction at the back of the material underhand and then seize them again by means of a to-and-fro movement which the attendant gives to the carriages.

M. L. Neveu has introduced a new method of weaving galloons, etc., with thick wefts. He so arranges his loom that two shuttles pass at the same moment from the opposite sides of the loom, each carrying half as many threads as are required for the weft, which thus become thoroughly united, and produces tissues of the same thickness as by the ordinary process.

A French engineer has introduced the covering of weaver's reeds with nickel by electro-plating to preserve them from oxidation; the leaves may be acted upon before mounting,

Fig. 4



but the inventor recommends the coating of the complete reed.

Another inventor has produced imitations of Utrecht velvet in flax, hemp, and jute.

Sacks without seams are being made by Mr. Cerfont in ordinary looms, we are told, with two warps, one above the other, and a single shuttle which passes through both warps; but we are not told how this is managed without complication. The sack is finished by weaving the two warps together.

An improved loom is reported, the invention of M. Gulcher, for three or five shuttles as required, the principal features being a new arrangement for withdrawing the brake lever during the changing of the boxes, rendering the operation simple and safe, and improved movement of the jacquard.

A teazel machine called "velvet pile engine," invented by M. Fecken, is said to produce a remarkably downy pile; its peculiarities are described as working with rolling instead of fixed teazels, and mounted on oblique spindles, some in one direction and some in the opposite, which are described as gliding and rolling over the surface of the cloth without tearing the wool, and producing a pile finer than can possibly be got up by any other method.

The application of the continuous principle to metallic dividing engines is thus summed up by M. Nockin, the inventor. "The apparatus consists: 1. Of a dividing cylinder, into which penetrate the saws, and which cylinders are covered with leather or other material; 2. Endless metallic card bands working in grooves of the cylinders; 3. Circular saws assisting in the division; 4. A circular brush; 5. Disks which detach the material from the cylinders; and 6. Drawing cylinders."

A Novelty in Competition.

The Ayr (Eng.) Town Council, in the competition for the new town hall, intend to give a premium of £25 to each architect whose design is rejected, while the accepted design is paid for in the usual way. It is barely possible that this may prove a somewhat costly competition for the town of Ayr.

MESSRS. KOHLER & SILBERZOHN, Sheboygan, Wis., are the manufacturers of the improved feed cutter illustrated in our last issue. Parties desiring information will address them as above.