

A NEW AUTOMATIC MILLING MACHINE.

The illustration represents a machine which is well worth the attention of manufacturers of all classes of goods on which hexagonal milling is an important item of expense. The machine was designed and built by James Gregory, of Bridgeport, Conn., to whom a patent was recently issued therefor. It mills the hexagonal surfaces on the different parts of steam valves and other similar work, and its operations are so completely automatic that the operator needs only to place and clamp the parts to be milled, when they are passed from one mill to another, presenting a new face or surface to each successive cutter until all the faces are milled. At the last stop, after being automatically loosened, they are taken by the jaws of an unloading mechanism, after unscrewing which the finished articles are dropped into a receptacle.

The machine has an intermittently rotary table, eight movements of which constitute a complete rotation. The table has holders to retain the hubs to be milled in their proper position during the several cutting operations on the hubs by the millers, which are stationed at equal distances apart on the frame of the machine, each serving to mill off a special surface. In the time of one movement of the table, the operator, standing in front of the machine, sets a hub upon a holder, and sets the hub at a proper angle with respect to the cutter, by means of a tool provided for that purpose, after which, on moving a handle, the table is rotated to carry the hub to the first one of six milling stations, where the cutter operates to mill off one of the outer surfaces of the hub. During the time of this milling the operator has placed a second hub on the holder, then at the front station, after which the table again rotates automatically an eighth of a turn, carrying the first hub to the second milling station and the second hub to the first station, the hubs being slightly turned between the stations to insure the proper engagement of the cutters with their successive surfaces. The operation is continued in this order, by the rotation of the table, until the six surfaces of the first hub have been milled, when the next movement brings the first hub beneath the gripping head by which its removal is effected, the operation being simultaneous with the work of the several cutters on the heads that have been successively placed in position. As the hubs are thus removed from the holders the latter are left free to be immediately supplied with additional hubs. The cutters are easily adjusted for different sizes of hubs, and the construction and operating mechanism of each of the eight holders and six cutters are substantially duplicates of each other. The operator easily feeds to the machine hubs of ordinary sizes at the rate of about three hundred an hour, and the milling is the final operation, the finish being of a superior character. The machine from which our illustration was made has been running nearly two years, a good portion of the time night and day, without other expense than the wages of unskilled laborers to operate it.

A Curious Manufacturing Establishment.

In the SCIENTIFIC AMERICAN SUPPLEMENT, No. 1079, for September 5, 1896, will be found an article entitled "An Industrial Democracy," which gives an interesting picture of the establishment for training salesmen.

Probably no industrial institution in the world offers more unique features than does this plant and the method by which the business is conducted. Aside from the manufacturing part of the business, great attention is paid to the systematic training of employes. Usually the salesman is a person who is given a sample of the article which he is intended to sell, and he is sent out among prospective buyers to work out his own salvation; but the proprietors of this manufacturing company determined that salesmen should be as carefully trained as professional men, and to this end they have devoted a great deal of time and expense. The school for salesmen is situated in the upper part of the factory, and is fitted up with a small theater, the seats arranged in a circle, and a stage is provided which represents the office of the business man or any kind of store, as a hardware store, candy store, grocery store, etc.

The man who wants to become a salesman may take up a course in this school, at the company's expense, and, while sitting in the auditorium,

he is enabled to see how a thoroughly skilled salesman approaches a probable purchaser and how he overcomes the objections which the merchant is almost sure to bring up. Then, in turn, the embryo salesman is required to take his place upon the stage and thus learn confidence and tact while he is watched by expert critics who are able to make friendly suggestions or criticisms when they are needed. The places at the side of the stage are filled with what appear to be store windows, which are utilized to display goods of various samples, so as to familiarize the salesmen with the art of window dressing, in order that they may make valuable suggestions to customers. It is little wonder that, under this system, salesmen which are turned out are able to act successfully as agents for the establishment which employs them.

The Armies of Europe.

An editorial article in the London Spectator has the following characterizations of the armies of continental Europe:

"The vast armies of the Continent, which seem on land so irresistible, have all, like our own small army

there is no proof that the cause of the evil, be it economy of supplies or corruption in their distribution, or a certain want of cheeriness which is deep in the Slav character, has as yet been removed. The Russian army, irresistible in defense of Russia, is not, as the last war with Turkey proved, equally formidable in offensive operations. The Austrian army, though splendidly organized, and with perhaps the finest cavalry in the world, thinks in too many languages, has too many kinds of patriotism, and is governed too exclusively by a caste which has often failed in developing enthusiasm in the soldiers it educates and commands. The Italian army has not the confidence which comes from a history of victory, and its history in Abyssinia seems to show that, while it will face anything, its leaders are unaccustomed to separate responsibility, and depend on the commander-in-chief, who may or may not be equal as a strategist to his position. Finally, the French army, with its new and complete organization, its hundreds of thousands of brave men, and its ardent generals, is still embarrassed by certain sources of weakness. The supply departments are still, it is believed, infested with jobbery in the management

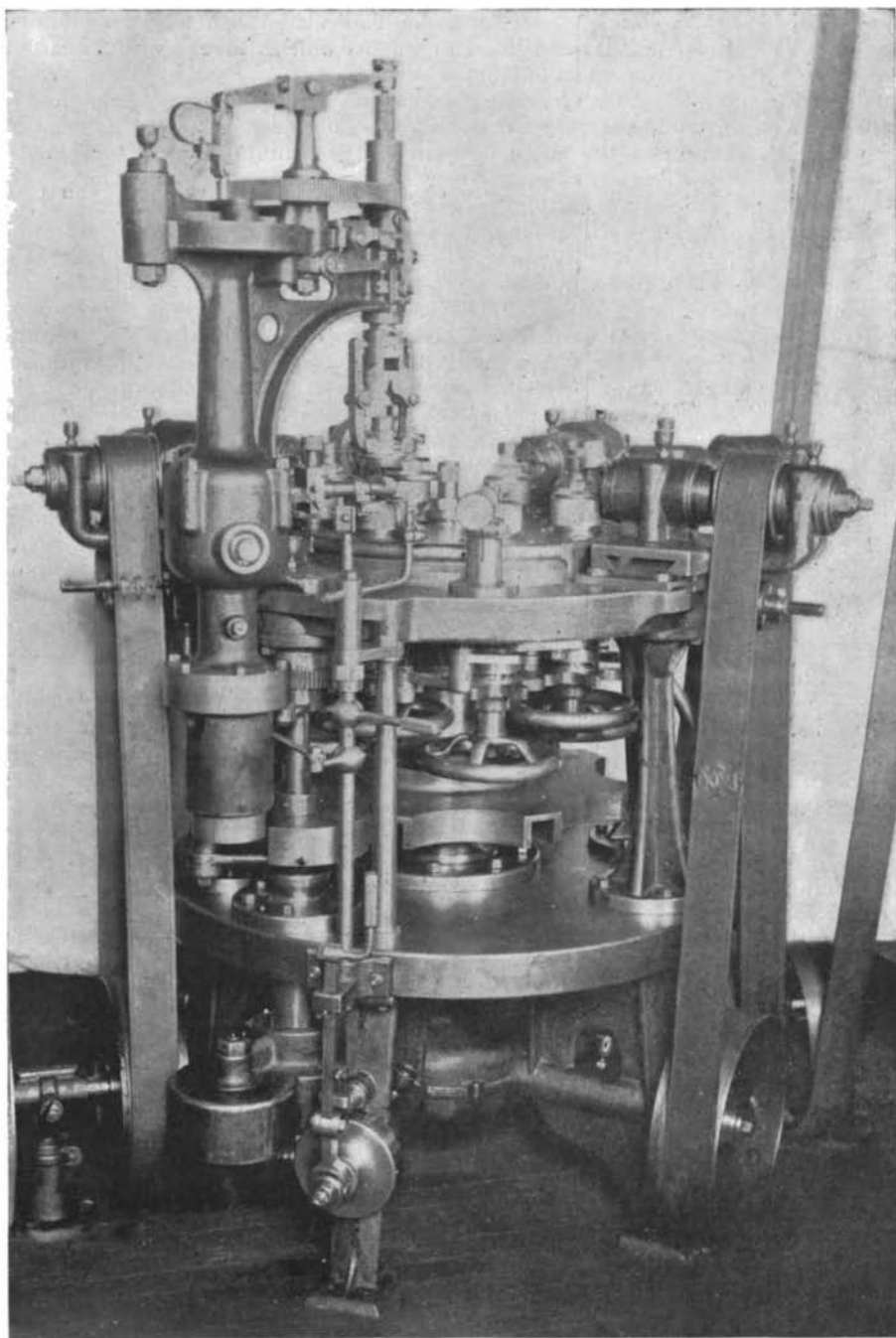
of the great contracts, the huge mass of officers still includes many who are inefficient, and the Minister of War, General Billot, has recently made a speech to a syndicate of military journals which reveals with amazing frankness some other mischiefs. Very short service does not quite suit the genius of the French people, who, quick to learn and eager in combat, are not equally ready to perceive the necessity of machinelike discipline. It takes them time to learn perfectly to obey, or, as General Billot puts it, we must remember 'the fact that the temperament of the German nation is more naturally inclined to those ideas of discipline and obedience which are not possessed by our young Frenchmen, so intelligent, so brilliant, but—let us confess it—so giddy and thoughtless. And while we must ever bless the French revolution, which has so thoroughly made us men and citizens, I cannot help remarking that, from a military standpoint, the revolution has made the task of the instructors of the army a very heavy one—the task of subjecting to the yoke of discipline men for whom the idea of liberty has become a dogma.'

Experiments in Military Ballooning.

A series of experiments are being made at Shoeburyness by the officers of the ordnance department and the superintendent of experiments at the school of gunnery on the one hand and the officers of the school of military ballooning at Aldershot on the other, says Public Opinion. A captive balloon was sent up over the Estuary of the Thames, attached by a cable of about 700 yards to a boat loaded with ballast, which was set adrift on the water. The weather was somewhat boisterous, and the morning dull and hazy. The field piece was placed on the marsh land beyond the school of gunnery, from where the firing took place. The distance or range was ascertained to be about 4,000 yards. The gun was worked by the staff of the school of gunnery, under the direction of Major Hickman, R.A., assist-

ant superintendent of experiments. Shrapnel shell was used, and good practice was made from the first. On the sixth round, however, excellent elevation and direction and distance were obtained, and the shell was observed to burst almost immediately over the balloon. After oscillating for a few seconds, the balloon was observed to be collapsing, and then it gradually fell. Its descent was slow, and, as far as could be judged, had the car contained any occupants, it is possible they would have sustained but little, if any, injury had the balloon fallen on land. When it was seen that the balloon had been injured and was descending, the boat to which it was captive was picked up and towed to land, and the balloon was packed up and later in the day sent back to Aldershot. It was impossible to ascertain the extent of the injury which was done to the balloon itself, but the wicker car appeared to have sustained little or no damage. The experiments were at once suspended, and a report was drawn up and forwarded to the war office.

On the western bank of the Nile Medinet Habu has been disincumbered of the rubbish under which it was buried and now stands out in all its magnificence.



THE GREGORY AUTOMATIC MILLING MACHINE.

[the English], their points of weakness, differing in each state, but still well known to those who pass their lives studying their qualities. The German army is, as a fighting machine, probably the most perfect of all, but as Count von Moltke said, it has never been tested by retreat; it rests on universal conscription, which sweeps the unwilling as well as the willing into the military net, and it is of necessity commanded by the Emperor, who must take part in the campaign, and who may or may not be competent to choose rapidly among the best plans, or to select the generals most competent in actual warfare. It is difficult even to imagine the total defeat of the wonderful machine, worked up as it has been for thirty years, but its real trial would come when it had to conquer in another and greater Zorndorf another Russian army equal in numbers to itself, and resolved to perish on the field. The Russian army, matchless in numbers and perfect in obedience and courage, is composed of underfed men, who, either from that cause or some special physical liability, perish when in movement in astounding numbers, and, once outside Russia, have a positive habit of dying. Army after army of Russians has withered away in the Caucasus and the Balkans, and