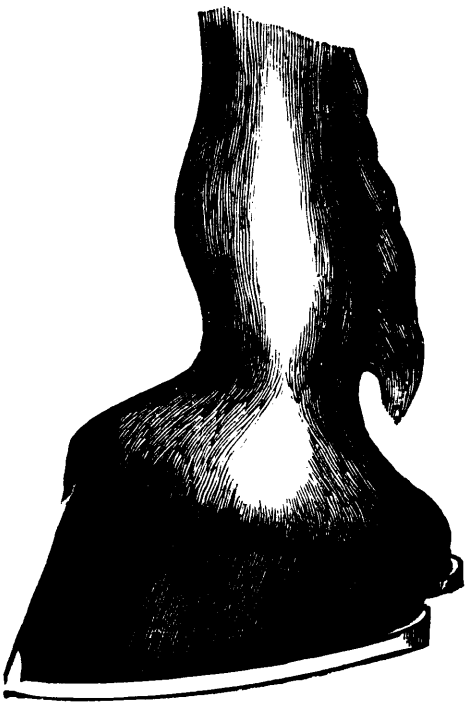
because the foot can be brought to its proper shape by cutting gradually in time.

After the cutting has been performed, a shoe should be fitted

No. 14.



so as to have the pressure on each quarter, and with heels, if the horse's heels are naturally low, in order to prevent a sudden change.

A horse should be re-shod at least once a month.

Telegraphy & Electricity.

AUTOGRAPHIC TELEGRAPHY.

Autographic telegraphy, or the process of transmitting messages in the actual handwriting of the sender, has occasionally during the past thirty years constituted the special study of scientific minds. So long since as 1850, Mr. F. C. Bakewell invented a copying telegraph by means of which autographic telegraphy was accomplished. In this instance the message was written by the sender with a gummy ink or varnish on metallic paper or tinfoil, and this paper was by the aid of mechanism used to actuate electric currents in such a way as to produce a record at the distant station by the chemical decomposition of a solution with which the receiving paper was damped. Both the written message and the paper were fixed around cylinders of similar form and dimensions, on being placed in the transmitting and the other in the recording instrument, and the cylinders were caused to revolve with corresponding velocities. Each time the gummy and consequently raised lines of the writing were crossed by a pointer under which the metallic paper was traversed in the transmitter, a mark corresponding in position was made on the prepared paper at the receiving end. It therefore followed that the sum of all the marks reproduced the writing itself. Mr. Bakewell successfully reproduced the writing in white on a blue ground, but the process failed to become one of public utility owing to the extreme slowness with which the apparatus worked and the difficulty that was experienced in maintaining uniform and synchronous motion in the instruments. In 1856 the Abbé Castelli, in Italy, endeavoured to solve the problem of autographic telegraphy in a similar manner. His apparatus was exhibited in England, and it was used practically between Paris and Marseilles and Paris and Lyons. Plans, drawings and autograph sketches were faithfully reproduced at distant places, but it was found that the apparatus had not only the defects of Bakewell's, but it was very costly and complicated. Two other subsequent workers in this direction were M. Meyer and M. Lenoir, who tried to accomplish the same results with ordinary ink. They, however, pursued their investigations quite independently of and unknown to each other. We have recently been afforded the opportunity of examining the latest example of this class of apparatus at the General Post Office, where it has been submitted to the authorities for trial. This is the invention of M. d'Arlincourt, of Paris, and its general principles are similar to those which govern Bakewell's system. The distinguishing feature in d'Arlincourt's apparatus, however, is the introduction of an extremely ingenious synchronous movement, by means of which the speed of travel of the cylinders is rendered uniform, both in the transmitting and the recording machine. The message to be sent, which may be either in the ordinary hand or shorthand, is written with a thick gummy ink upon a strip of metallic-faced paper about 12 inches long and 1½ inches deep, which is wrapped around the cylinder of the transmitting instrument. A strip of white paper chemically prepared and of similar dimensions is placed on the cylinder of the recording apparatus, and the instruments are placed in electrical connection and started. The raised writing, actuating the electric current, causes a reproduction of the original message in facsimile on the paper in the recording instrument, which may be hundreds of miles away from the other. Upon the occasion of our visit the two instruments, although in the same room, were practically placed 200 miles apart. The writing can be reproduced in either blue, brown, red, or black, according to the chemical preparation of the paper, but always on a white ground, and a number of copies can be taken from the original. In the same way, sketches, plans or drawings may be faithfully transmitted: some sketches were, in fact, accurately reproduced on the occasion of our visit. Although the apparatus is perfect in its action, it still has one drawback, which was common to its predecessors—that of slowness of reproduction. The time occupied in revolving the cylinder a sufficient number of times to allow the pointer to traverse the whole surface of the paper is seven minutes, and this rate of speed is far below that required and attained in practice for commercial purposes. The Post Office authorities, to whom we are indebted for our inspection, do not, therefore, see their way to utilise M. d'Arlincourt's ingenious invention at present. It is, however, being worked in France in fortresses and for similar military purposes, for which, in some special cases, it is exceedingly well adapted.

We present an illustration of the apparatus constructed by M. d'Arlincourt, which may easily be understood by reference to the foot-notes and to the above general description. The engravings on another page represent several writings and drawings which were actually transmitted, through the apparatus, from one instrument to the other, and which could, as we are told, have been transmitted, by the same means, a distance of two hundred miles. One of these supposed messages was supplied by a member of the Chinese Legation in Paris, who visited the Paris International Exhibition. The other drawings, probably by the hand of a French military engineer, who may have come among other visitors to M. d'Arlincourt, are such as might be made to give serviceable information during a siege, of the position of the parallel lines of intrenchments, and of the siege-gun and mortar batteries engaged in the attack of the fortress. These matters are signified by the written words, with alphabetical references, which appear on the drawing. The remaining sketches afford an exterior view, and an internal transverse section, of a gun turret erected in some land fortress, the construction of which it is desirable to explain, by a telegraphic message, to some person at a long distance, perhaps in a foreign country. It is imagined that a spy in time of war, if not a newspaper Special Correspondent, might possibly avail himself of the Automatic Telegraph to send plans or sketches of military preparations. We should much prefer to see this ingenious contrivance applied to peaceful and innocent purposes, whenever it is made ready for practical use.

a is a box containing wheelwork, driven by two mainsprings, which give motion to the metallic roller *b*. The train of wheelwork is governed by the vibrating spring *c*, in the same manner as the type printing instrument of Professor Hughes. In addition to this vibrating spring, a similar one, *d*, is fixed next to it, in the same standard, but is not in direct communication with the wheelwork. It receives its motion from the spring *c*, simply by the vibrations communicated by the latter, through the standard on which the springs are fixed. These springs are so adjusted, at each end of the wire, that their speeds are tolerably alike. The tinfoil paper for transmitting, or the prepared chemical paper for receiving, is fixed on the roller *b*. The metallic