AN INGENIOUS REVERSING MECHANISM FOR MACHINE TOOLS.

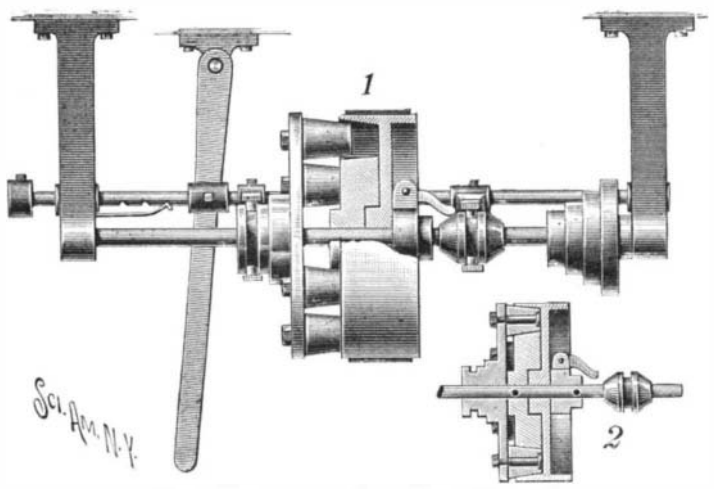
The reversing mechanism usually employed in machine tools consists of two pulleys, one driven by a straight belt and the other by a crossed belt, a movable clutch being used to shift the one or the other pulley into gear, according to the direction of the motion desired. In order to dispense with this cumbersome arrangement, Eugene E. Norton, of Bridgeport, Conn., the mechanical engineer of the American Graphophone Company, has devised an ingenious mechanism in which but a single belt is employed running continuously in the same direction.

Of the accompanying illustrations, Fig. 1 is a view of the reversing mechanism with parts in section; Fig. 2 is a section showing the operative parts in a position different from that illustrated in Fig. 1.

Upon the power shaft a disk is rigidly secured which is provided with a conical periphery. Loosely mounted on the shaft is a pulley having an interior conical flange. By means of a clutch of any desired form, the pulley can be locked to the shaft, so that the motion of the pulley is communicated to the shaft. A second disk loosely supported on the shaft is provided with a circular series of rollers which can be shifted into engagement with the periphery of the first mentioned disk and the internal surface of the conical flange of the belt pulley. The clutch and the roller disk are so connected by a movable rod that they may be simultaneously operated by a shifting lever.

When it is desired to turn the shaft and the belt pulley in one direction, the shifting lever is swung to the left, thus causing the clutch to bind the pulley to the shaft. When it is desired to reverse the motion of the shaft, the operator, by means of the lever, shifts the movable rod to the right, and thus changes the positions of the clutch and roller disk from those shown in Fig. 1 to those shown in Fig. 2. The clutch is thereby made to disconnect the pulley from the shaft; and the roller disk is reciprocated so as to throw the rollers into engagement with the pulley flange and the first mentioned disk. These rollers receive motion from the pulley and communicate that motion in the reverse direction to the shaft, through the medium of the first mentioned disk.

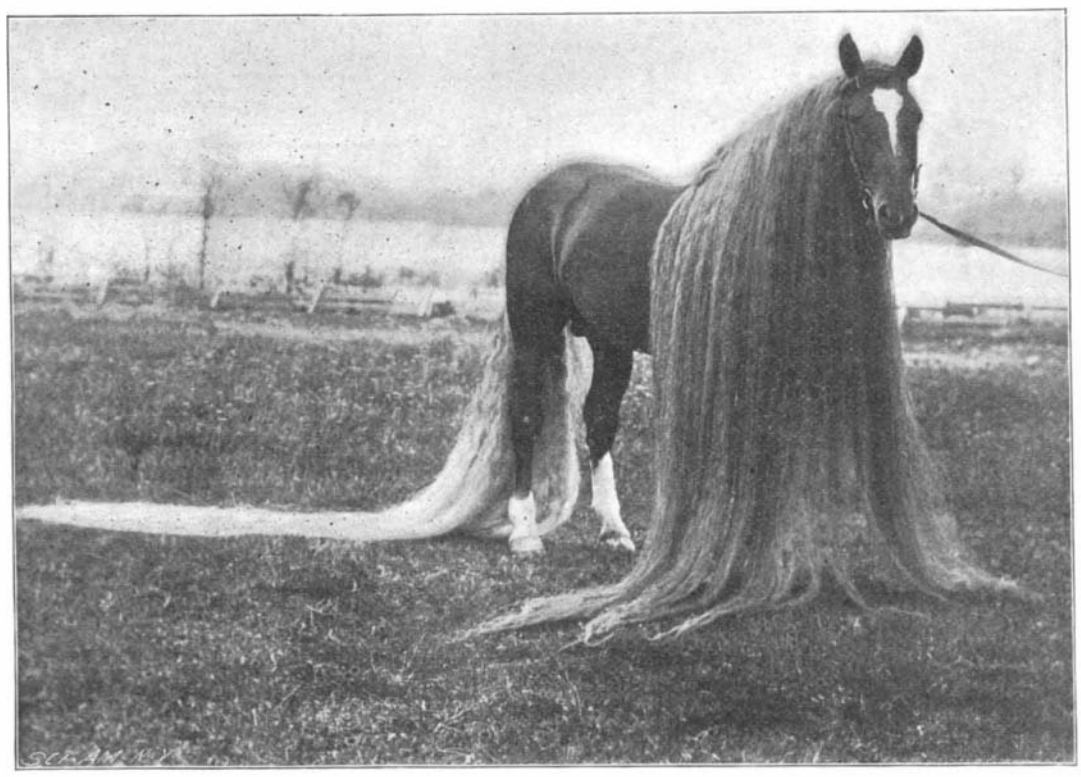
In order to lock the clutch and roller disk in place when they are in engagement with the pulley, a simple locking device is employed consisting of a spring catch which engages one of three notches in the movable rod referred to, and thus prevents the slipping of the clutch or roller disk.



NORTON'S REVERSING MECHANISM.

AN ABNORMAL GROWTH OF HAIR ON A HORSE.

Our engraving represents a remarkable growth of mane and tail on a horse. His name is Linus II., and is the son of Linus, a celebrated horse in his day. No picture can do adequate justice to his great beauty, for he has a double mane which sweeps the ground on both sides, a tail which trails far in the rear. The mane is very thick and measure 11 feet in length; the tail is even more remarkable than the mane, measuring 16 feet from tip to tip. It is, of course, impossible to account for this remarkable freak of nature, and while there are undoubtedly other cases of similar abnormal growth on record, we do not know of any horse which has been bountifully blest with such a beautiful growth of hair. We are indebted to Mr. James T. Rutherford, of Waddington, N. Y., for our photograph.



LINUS II. AND HIS PHENOMENAL GROWTH OF HAIR.

The Smell of Metals.

Prof. W. E. Ayrton says that there is a generally accepted idea that metals have smells, since if you take up a piece of metal at random or a coin out of your pocket, a smell can generally be detected. But I find that, as commercial aluminum, brass, bronze, copper, German silver, gold, iron, silver, phosphor-bronze, steel, tin, and zinc are more and more carefully cleaned, they become more and more alike in emitting no smell, and, indeed, when they are very clean it seems impossible with the nose, even if it be a good one, to distinguish any one of these metals from the rest, or even to detect its presence. Brass, iron, and steel are the last to lose their characteristic odors with cleaning, and for some time I was not sure whether the last two could be rendered absolutely odorless, in consequence of the difficulty of placing them close to the nose without breathing on them, which, as explained later on, evolves the characteristic "copper" and "iron" smell. But experiment shows that, when very considerable care is taken both in the cleaning and the smelling, no odor can be detected with iron or steel.

Metals, then, appear to have no smell per se. Why, then, do several of them generally possess smells? The answer is simple; for I find that handling a piece of metal is one of the most efficient ways of causing it to acquire its characteristic smell, so that the mere fact of lifting up a piece of brass or iron to smell it may cause it to apparently acquire a metallic odor, even if it had none before. This experiment may be easily tried thus: Clean a penny very carefully until all sense of odor is gone: then hold it in the hand for a few seconds, and it will smell—of copper, as we usually say. Leave it for a short time on a clean piece of paper, and it will be found that the metallic smell has entirely disappeared, or, at any rate, is not as strong as the smell of the paper on which it rests. The smell produced by the contact of the hand with the bronze will be marked if the closed hand containing it be only opened sufficiently for the nose to be inserted, and it can be still further increased by rubbing the coin between the fingers.

All the metals enumerated above, with the exception of gold and silver, can be made to produce a smell when thus treated, but the smells evolved by the various metals are quite different. Aluminum, tin, and zinc, I find, smell much the same when rubbed with the fingers, the odor, however, being quite different from that produced by brass, bronze, copper, German silver, and phosphor-bronze, which all give the characteristic "copper" smell. Iron and steel give the strong "iron" smell, which again is quite different from that evolved by the other metals. In making these experiments it is important to carefully wash the hands after touching each metal, to free them from the odor of that metal. It is so necessary to wait for a short time on each occasion after drying the hands, since it is not until they become again moist with perspiration that they are operative in bringing out the so-called smell of metal.

That the hands, when comparatively dry, do not bring out the smell of metals is in itself a disproof of the current idea that metals acquire a smell when slightly warmed. And this I have further tested by heating up specimens of all the above mentioned metals to 120° Fahrenheit, in the sun, and finding that they acquire no smell when quite clean and untouched with the hands.—Chem. News.

A New Primary Battery.

A young Frenchman has invented a primary cell, says The Electrical Review, which is said to give 13 amperes at 2 volts for a longer time than the ordinary bichromate cell or the Bunsen cell. Its essential characteristic is that a vanadium salt or vanadic acid is contained in the exciting fluid or in the substance of the negative or positive electrode. Such an element consists preferably of an external vessel containing a solution of 20 parts of Na Cl to 100 parts of water, in which an amalgamated zinc rod is dipped; an inner porous jar for the reception of a carbon plate, and which is filled with a mass of powdered manganese oxide and fused vanadic acid. This jar contains also a solution of sulphuric acid, vanadic acid, and hydrochloric acid. Ten per cent of sulphuric acid may also be added to the Na Cl solution in the external vessel. The depolarization is very energetic on account of the combined action of the hydrochloric acid, the oxygen, and the chlorine. Moreover, the reducing effect of the hydrogen is regulated by the presence of the vanadic acid, since this passes into hypovanadic acid, and is immediately again oxidized to vanadic acid by the hydrochloric acid, while the hydrochloric acid liberates an equivalent of chlorine and four equivalents of oxygen. An addition of ten per cent of bichromate of potash to the acidified solution increases the output. Special cells have been designed for application to motor cars.

ACCORDING to The American Architect, the city government of Boston is considering the question of establishing a public crematory much after the model of the one in Père la Chaise, in Paris, where the bodies of persons who die in public institutions, leaving no friends or relatives, are, as a rule, incinerated, and where cremation can also be performed for other persons whose families desire it.

A Royal Arctic Explorer.

The Duke of Abruzzi, the nephew of King Humbert, of Italy, has started for the Polar regions. He proposed to go straight to Franz Josef Land on the steamer "Star of Italy," to penetrate as far as possible, and finally when frozen in to make a rush for the Pole with sleighs. He hopes to be back in Rome in June, 1900.

End of the Keely Motor.

Mr. Kinraide, of Jamaica Plains, Mass., has abandoned all work on the Keely motor, and will ship back to the Keely Motor Company all the machines and manuscripts left by Keely. Mr. Kinraide was on terms of some intimacy with Keely, and it was thought that he might discover, if possible, some virtue in the motor. The exposure of the frauds which Keely perpetrated in his Philadelphia laboratory, which we have already illustrated, has helped to induce Mr. Kinraide to abandon the whole matter.

The Current Supplement.

The current SUPPLEMENT, No. 1220, has many most valuable and interesting articles. Prof. Wilson's important work entitled "Prehistoric Art" is reviewed at considerable length and the conclusion will be published in the next issue. "The New Treptow-Stralau Tunnel under the Spree" is described. The Maxim Smokeless Powder Controversy includes interesting letters by Dr. Schüpphaus, Hiram S. Maxim, Hudson Maxim, and F. H. McGahie. "The Extermination of the Mosquito" is an important article. "Toilet and Medicinal Soaps," with processes and formulas, completes the number.

Contents.

(Illustrated articles are marked with an asterisk.)