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CHANGEABLE SPEEDS.

It is beyond question that our present method of changes of speed of lathes, drills, milling machines, planers, and other tools where changes of speeds are required is a crude one, and unworthy of present mechanical capability. At the best, our changes are made by moving the belt from a large driving pulley to a smaller driven pulley, or from a small driving pulley to a larger driven pulley. But each of these changes involves a positive and unalterable degree of change of speed. It must be "Hobbs or nothing."

Now there is no theoretical reason, and no mechanical impediment, or hinderance, to such an arrangement of changeable speeds, for at least some of our machine tools, as shall greatly increase their usefulness. But our machine tool builders appear to run in ruts—shop ruts—and are slow to adopt a new thing and slow to adapt an old thing.

There is in use for the potter's wheel, and also for the sewing machine, a mechanical device that will give a long range of speeds without any sudden and abrupt changes.

It is a simple device—a rotating disk twenty-four, thirty-six inches or larger in diameter, and across it from center to periphery extends a shaft feathered (with fixed key) the entire length. On this shaft traverses a sliding roll or small pulley controlled by a forked guide attached to a lever moved by hand or foot.

Suppose the disk to be 36 inches in diameter, and allow four inches for a hub. The driven wheel at the nearest point to the hub—say six inches—will have a speed (at the initial speed of 200 revolutions per minute) of 300 feet per minute. If the driven wheel comes away from the hub, or the six inches around it, to 16 inches beyond, it will have a speed of 800 feet per minute. But better than these extreme changes is the fact that any speed, from the initial 300 feet to the extreme 800 feet, can be had and be maintained.

AUTOMATIC TORPEDOES.

During a war, where it is waged partly on navigable waters, fixed torpedoes have proved, in some cases, effectual in preventing or at least delaying the approach of an enemy's ships. But the torpedo branch of naval service has long ago extended to the offensive, and there is no machinery in existence that has more certainly and abundantly proved the resources of the machinist than that which is employed in the working of the offensive automatic torpedo.

At the works of the Pratt & Whitney Company, Hartford, Conn., there is now being built, under the direction of Mr. George E. Haight, one of his torpedoes that is to be

submitted to a foreign government for approval before the award of a contract for a number of these naval weapons. This one is being made of sheet copper instead of sheet steel, the material of which most of the Lay-Haight torpedoes has heretofore been made. The engines which are to drive the propeller are six in number, or rather the engine is a group of six cylinders working synchronously with a speed that will develop about 1,000 revolutions of the screw propeller per minute.

BALDNESS.—ITS PREVENTION AND CURE.

The mode of formation and growth of the hair is now so well known that there can be no question as to the cause of baldness. It is produced by a failure of normal nutrition in the papillæ at the base of each hair follicle. Imperfect work being done in the capillaries, which are here richly distributed, the cells which constitute a hair shaft are not formed in their due proportion, the old shaft thus feebly sustained becomes loose and drops away, leaving nothing in its place.

In the same manner certain cutaneous affections may cause the hair to fall by an action on the papillæ which is but temporary; in such cases recovery, perhaps with assistance, but perhaps without it, is possible. In the great majority of instances, however, where the head is bald the failure of nutrition of each papilla has come on so gradually, and has continued so long, that the papilla no longer exists; it has passed away by atrophy; its capillaries have become obliterated, and even the follicle itself no longer constitutes a depression in the cutis, and the scalp has the smooth and shining appearance which we so well recognize.

It is easy, therefore, to see that in such a condition as this no renewed growth of the hair is to be expected, for the anatomical structure which caused its development and continued it has ceased to exist, and the countless remedies which are so freely advertised as being able to rejuvenate bald heads are utterly of no avail.

But now arises the question, Cannot the application of the various agents to the scalp, at the time when the hair is beginning to lose its hold, be of service in stimulating the follicles and papillæ into renewed and permanent vigor? To this question it is not possible, on theoretical grounds, to say no, absolutely; but in practical fact that is the only true answer to give in the vast majority of cases.

There can be little question that the continued close covering of the head with hats and caps is one very constant cause of baldness. Women, in our own communities, seldom lose their hair, except from sudden causes; and among those nations where the head is habitually left bare or but slightly covered, baldness is practically unknown.

The suggestion was some time ago made in our columns that bald heads might perhaps be covered anew with hair by "skin grafting," i. e., applying bits taken from other scalps and causing them to take root and spread. No doubt such bits might be attached, but the whole matter is merely a wild fancy without practical value. We can make "skin grafts" take hold, but it is only where the skin is destroyed and the surface raw and exposed, commonly rendered so by disease. Assuming that some person (though it is difficult to believe that such a person could be found) would consent to have his scalp peeled away in preparation for the operation, and then assuming that some other person could be found who would consent to appropriate his own scalp to cutting out the proper bits for the work, yet then the very best possible success (even theoretically) must be extremely imperfect.

The result of all seems to be that when baldness has come slowly and naturally, it has come to stay, and our only wisdom is to be content.