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IMPROVED POWER PUNCH AND SHEARING MACHINE.

We illustrate herewith a new power punch and shearing machine, manufactured by Messrs. Long, Allstatter & Co., of Hamilton, Ohio. The machine is adapted and arranged for the speedy attachment of tools for the accomplishment of all kinds of punching, shearing, and bending. The jaws are constructed to accommodate blocks which are interchangeable for carrying from one to fifty punches, to make from one to five washers or nuts; or for carrying any peculiar shaped punches singly or in gangs. The hight of the punches may be adjusted to compensate for wear or grinding, and the punches and dies may be removed without disarranging the other parts. The machines are made on cores, and consequently are exceedingly rigid. All the bearings are adjustable to take up wear. The countershafts have separate caps easy of access for oiling.

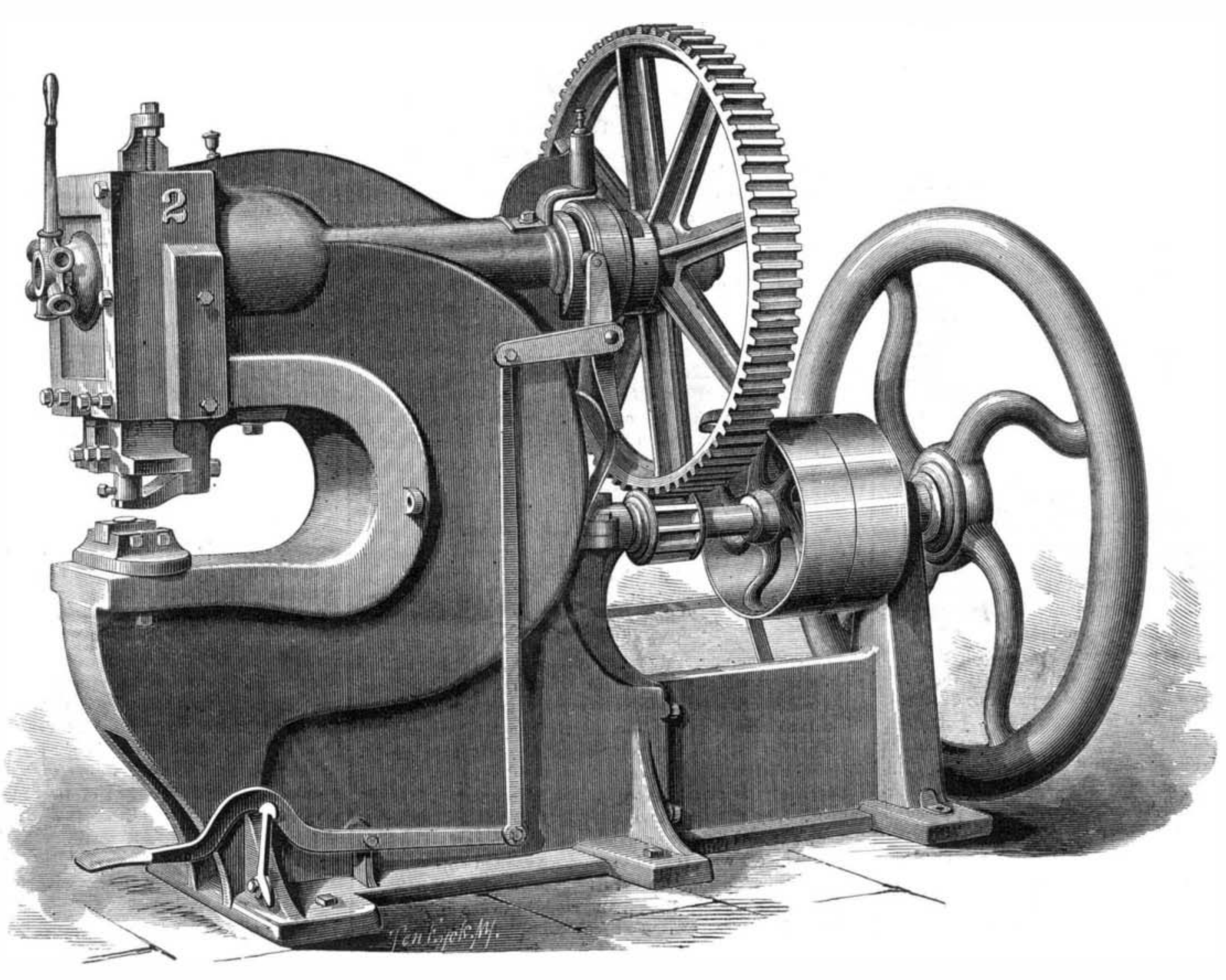
The cam works in steel pintles with steel bearings at top and bottom. It extends through the face plate, which is securely locked and bolted to the jaws of the press, and has a bearing in it for the outer end of the cam shaft, thus securing a bearing on either side of the cam, which prevents the latter bending. A hand wheel is attached to raise and lower the slide for the purpose of arranging the punches when the machine is not running.

The illustration represents a medium machine. Its ordinary working capacity is to punch 1 inch diameter through 1 inch thickness, or to cut off ¾ by 5 inches flat or 1½ inches round iron. The speed, when the machine is fed by hand, is from 20 to 40 strokes; if fed automatically, 60 strokes, per minute. Safety feed tables are attached to all sizes of the machine, when desired, also an adjustable automatic stop, which is advantageous in boiler, plow, or other kindred work This device is simple, easily adjusted, sure in its operation, and may be used or not as the nature of the work may determine.

There is, besides, an improved pull-off, which consists of an iron lever which passes through a slot in the center of the press body. It is pivoted to the front, and arranged to be raised or lowered and fastened in place at the back by a loose pin. It can be changedinstantly to accommodate any thickness of material. This is also constructed to work automatically, and to adjust itself to unequal surfaces, pressing hard on the material and holding it firmly until the punch passes through and is withdrawn entirely, when the jaws of the pull-off are quickly raised out of the way. This method, it is claimed, prevents the machine from curving, and enables many kinds of work to be done with safety to the punches that could not be done with the ordinary pull-off. The pull-off is removed from the press by simply disengaging a loose pin.

The above manufacturers make a specialty of meeting the requirements of the trade in sizes, shapes, and the arrangement of tools for every variety of punching, shearing, and bending. They have, we are informed, accomplished the difficult task of punching all the holes in a hot horseshoe at one stroke of the puncher. The work is as accurate as if done by hand, the shoe is left perfectly true; and the holes all the same shape. As the eight punches penetrate at different angles, and are tapering, the novelty of the operation can be imagined.

The sizes of the machines range from a punch and shear weighing 500 lbs., capable of punching ¼ x ¼ of an inch, and to cut off ½ of an inch round iron, to the steam machine weighing 25,000 lbs., which will punch 2½ inches diameter through 1⅛ inches thick, or cut off 4 inches square iron cold. The jaws vary in depth from 3 to 26 inches.



POWER PUNCH AND SHEARING MACHINE.

Letters patent for parts of these machines have been granted, and steps taken for securing recent improvements.

Glass Cement.

A cement to stop cracks in glass vessels, to resist moisture and heat, is made by dissolving caseine in a cold saturated solution of borax. With this solution, paste strips of hog's or bullock's bladder, softened in water, on the cracks of glass, and dry at a gentle heat. If the vessel is to be heated, coat the bladder on the outside, just before it has become quite dry, with a paste of a rather concentrated solution of soda and quicklime or plaster of Paris.

Bones.

When a new bone finds its way into the student's hands, he observes, says Professor Elwin, some peculiarity in shape or structure in which it differs from the bones he is already acquainted with; the question naturally occurs to him: Why does this bone assume one shape in one animal and in another is modified into a different form? He may look in vain in his books for an answer to his query. And yet it is points like these which, in my opinion, make up the true science of osteology. It is through careful, constant, and intelligent observation that these enigmas are to be solved. Observation, indoors and out; close attention to the habits of the animal in question, on the one hand, and careful consideration of its anatomical peculiarities, on the other.

Take the skull of a crocodile. What do we find? Theorbits of the eyes, the nasal orifice, the passages leading to the auditory apparatus, all situated on a plane, along the upper flattened surface of the head. What, then, is the cause of this? Palpably, to allow the crocodile to remain submerged in the water, with its nose, eyes, and ears just above the surface to warn him of the approach of enemies or prey, and the rest of his carcass securely hidden beneath the waters.

Take another instance. Observe the habits of a mole. With what rapidity it burrows under ground, shoveling away the earth with its fore feet. Then look at its skeleton. We find just what we should have expected. The bones of its fore legs of astounding strength and breadth, furnished with deep grooves, which, together with its sternum or breast bone, which is furnished with a keel almost like that of the sternum of a bird, afford attachment to the powerful muscles. Its hind legs, being simply needed for locomotion, are of the normal size. So also with the birds. The size of the keel of the sternum varies in proportion to the powers of flight which each species requires, for it is to the broad surfaces of the sternum that the great wing muscles are attached. Take the skeleton of a humming bird, which spends its life almost upon the wing. We find there a keel of so vast a size that the remainder of the skeleton is reduced to insignificance in comparison.

In these researches, one is soon struck by the fact that, in the modifications in various bones, or sets of bones, in accordance with the habits of each animal, the original type is never departed from, only modified. See, for example, the paddle of a whale, more like the fin of a fish in general appearance; and yet the same set of bones which are found in the arm of a man are again found in an adapted form in the paddle of the whale. So, also, the foreleg of a horse preserves the same general plan. What is generally called his knee is in reality his wrist. It is there that we find the little group of bones which form the carpus. All below it answers to our hand—a hand consisting of one finger.

Take even a wider instance. Compare the arm of a man and the wing of a bird. Still greater adaptations have taken place, and yet the plan remains the same. We still find the clavicle or collar bone, the scapula or shoulder blade, the humerus, ulna, and radius, answering to the same bones of our arm, a small carpus or wrist, and finally the phalanges or fingers, simplified and lengthened and anchylosed to form but one series of bone, with the exception of a rudimentary thumb. It is not uncommon to find a rudimentary bone like this which, in some allied species, is fully developed. The leg of the horse again gives us a very striking example of this. There is, so to speak, only a single finger, but we find, one on each side of this little finger, two small bones, commonly known only as splint bones. These are the rudimentary traces of the same finger bones, which in the rhinoceros are fully developed.

Now osteology abounds in wonderful forms of structure like these. It is a study pregnant with pleasurable results, and is a really profitable study, and one in which each fresh student may do real solid work. It is all the little facts observed by naturalists, from time to time, all over the world, which, on being collected together, forms the nucleus of knowledge, for indeed all the scientific knowledge which we possess is little more than a nucleus, with which we are supplied.—*Science Gossip*