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Machine for Beveling Carte de Visite Frames.

This machine is designed to accomplish a task heretofore done by hand—that is, bevel the edge of the pasteboard frame used in photograph albums. The frame is that part which receives the picture, but the reader need not look for the beveled edge as it is covered by an ornamental border. The object of beveling the edge is to allow the picture to be slipped in and taken out readily. The frame is so thick that, were it not for this precaution, the picture could not be inserted or removed.

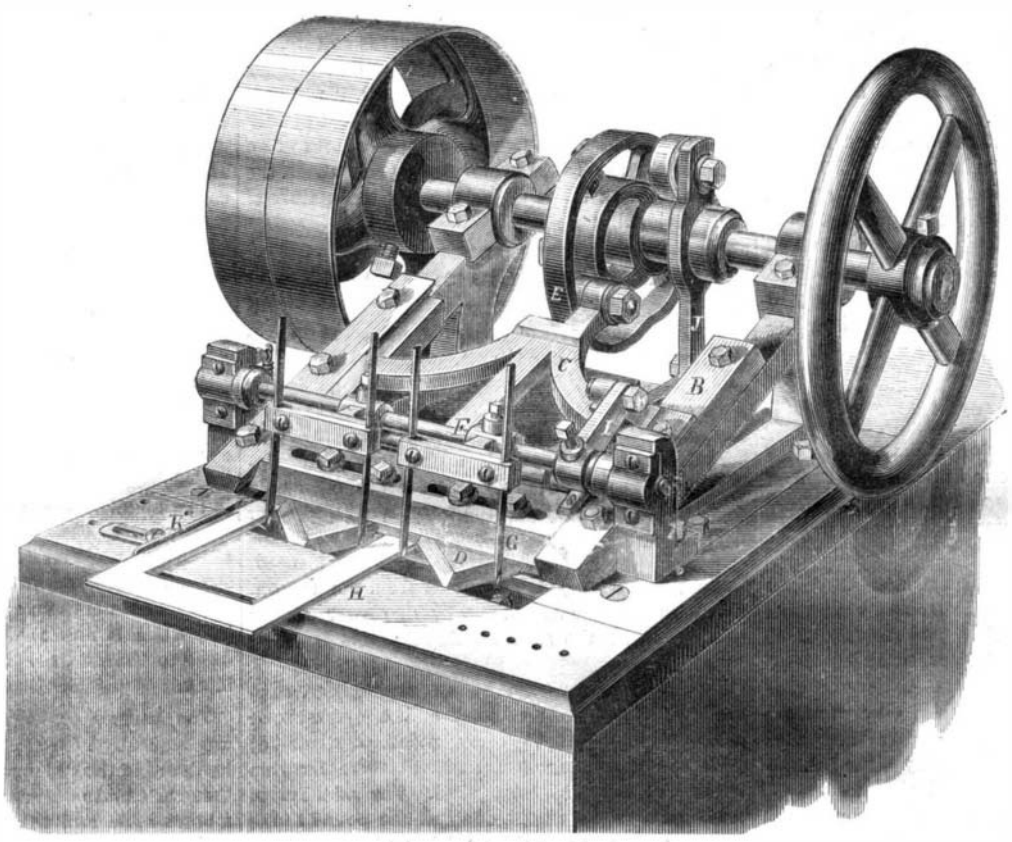
The parts of the machine are necessarily compact in order to bring it within a small compass, but it is not complicated, although it has that appearance at the first glance.

In detail it consists of a frame, A, having guides, B, which carry a slide, C. This slide is fitted with knives, D, and is worked up and down the guides by the cam, E.

In addition to this there is a transverse shaft, F, having vertical cutters, G.

The knives, D, cut or shave the bevel on the frame by placing it on the platen, as shown at H, and giving motion to the slide, C, through the pulleys. As the knives descend, the points enter first and pass through, the corners having to be cut afterward by the vertical cutters, G. The latter are operated by a dog on the slide, C, and the arm, I, on the transverse shaft. The action of these cutters is very quick, they working and withdrawing while the knives are moving down to make the bevel. The arm, J, acts on a compresser below the frame and not in sight. This detail holds the inner end of the card so that it cannot slip while being cut; a gage, K, at the side serves also to guide the card evenly. This machine is now in use in this city and is doing good service. It does the business with more efficiency and greater rapidity than several men, and can be attended by boys.

Patented through the Scientific American Patent Agency on Sept. 19, 1865. For further information address the patentee, C. T. Bedell, No. 45 Center street, New York.



BEDELL'S MACHINE FOR BEVELING CARTE DE VISITE FRAMES.

New Substance for Soling Shoes.

The *Shoe and Leather Reporter* thus notices a new material for soling shoes which seems to be the climax of improvement in this department. It appears to be a substance of which india-rubber is the basis, but it is heavier, and has a solidity almost of iron, yet a flexibility and elasticity which render it a most perfect substance for the purpose for which it is specially offered. It is not at all of the vulcanized rubber character, though it appears at a glance like that material. As an article for soles it will undoubtedly outwear four pair of the best English leather. This substance is not to take the place of the ordinary leather sole, but it is to be applied by a peculiar cement to the boot or shoe, to which it appears to adhere perfectly. It is then pared on the edge, and the work is over. Heels are put on in the same way. The inventor says a pair of soles, worn daily, will last one year. It is patented and will soon be introduced. It has one rare and valuable disideratum. Any one possessing an ordinary shoe knife, a sandstone to sharpen it, a box of the cement, and a few pounds of this substance, can set up a shoe shop; and the regular shoe trade can make it a most profitable branch of industry.

A Tight Ship.

The *Achilles* is an iron armored vessel of 6,079 tuns, and 380 feet long. She has been afloat ten months, and during that time, I am informed on reliable authority, not as much as a wine glass of water has leaked into her; this is a circumstance unparalleled in the history of ship building, and, unless she should be run on a hard bottom there is no reason why she should not remain tight for many years. The perfection of construction is to be attributed to the following facts; that all the frames were accurately shaped, that every sheet in the whole formation was planed on the edges and accurately punched to gages, so that all holes required to correspond met mathematically correct, every rivet was put in with care and afterward inspected, and all the metal was of the best refined iron; no ordinary ship plates were used.

Such perfection in materials and workmanship is only to be obtained through good mechanical judgment and perseverance and patience on the part of inspectors. The *Achilles* was the first vessel built by the Admiralty in dry dock, and I am particular in mentioning the case because the value of the experience is of the utmost importance in iron ship building. The strength and endurance of iron ships over wooden ones is acknowledged—it only remained to be proved that they could, of any dimensions, be built perfect; the *Achilles* is the proof.—*King's Report on the Dock Yards of England.*

Pohtographic Manipulation.

INTENSIFYING VARNISHED NEGATIVES.—A good negative, in its unvarnished state, sometimes becomes so weakened upon varnishing as to be almost worthless. As a remedy several methods have been proposed for increasing the intensity of a varnished negative under such circumstances. The following is one of the best:—The film is first to be moistened with alcohol, to *slightly* soften the varnish; this is followed by pouring over the plate an alcoholic solution of iodide, containing one or two grains to the ounce, watching the effect carefully. As soon as the color of the image is changed to a non-actinic *olive tint*, the plate must be again *quickly* washed with alcohol, and finally with water and dried. It may then be re-varnished if required.

INTENSIFYING REPRODUCTIONS.—In intensifying copies of prints or engravings requiring deep black and pure white, what is called the "clearing-up process," may be resorted to for preventing the clogging-up of fine lines or fogging during the progress of intensification. This consists in flooding the iron negative with a solution of iodine in iodide of potassium, about one grain of the former to two grains of the latter in one ounce of water; the effect of this is to convert any slight deposit of silver on the shadows into an iodide, which is then to be removed by pouring over the plate a *very dilute solution* of cyanide of potassium. After copious washing, the negative is then to be intensified as usual, when the utmost density may be obtained without any deposit upon the shadows, which remain perfectly clear.

ENLARGING AND COPYING—There are several ways of copying. The most simple method of taking an enlarged copy of a positive print is by an elongation of the camera; the exact distance to bring it into focus of the required size being easily ascertained by a little adjustment of the camera. Positive pictures, however, taken from negative plates obtained by this method, are not very satisfactory if the enlargement has been carried to any extent, as the *texture of the paper* of the positive copied is *also enlarged* in the same ratio as the image, which produces in the reproduction a coarse and woolly effect. It is obvious, therefore, that whenever the *original negative* can be obtained, an enlargement from *it* taken by transmitted light will give much better results. In this way enlargements from stereotype size, up to ten by eight, answers exceedingly well. Proceed as follows:—Procure a stout base board about thirty inches

long and twelve wide; to the sides or top of this affix slips of wood, raised about an inch or so above the level of the board throughout its entire length, within which the camera is made to slide. At the *lens* end of the latter is affixed a dark box of sufficient length and diameter, within which is made to slide an *inner* box about three or four inches long, with a groove at one end to receive the plateholder, which should be provided with frames to receive the plates of the required size. By this simple arrangement we are enabled to adjust the focus without much difficulty, and by sliding the negative plate nearer to, or further from, the lens, we get either an enlarged or diminished positive copy, as may be required. When required for use, a negative plate is placed in the holder, and the camera so placed that a *bright light* from the north or toward the zenith, is made to pass *through* the negative to the lens in the camera attached, by which is found an image on the ground glass. By a little care in focussing, we are now able to get a perfectly-defined image of the negative, when having introduced a stop with an aperature sufficiently small to produce the sharpest image to be obtained with sufficient illumination, the ground glass is replaced by the sensitised plate, which is exposed and developed in the usual manner. The image so obtained is a transparent *positive*. We now *repeat* the process, removing the original negative from the frame, which is replaced by the *transparent positive*, from which we obtain a printing negative of the required size. Negatives from which enlargements are required should be sharp and well defined, and as free from blemishes of all kinds as possible, as any defect in the original will, of course, become more apparent in the enlarged copy. The negative for enlarging is best if *unvarnished;* it should be soft and full of detail, as almost any amount of density may be produced in the copy by careful manipulation in the development and intensification. Transmitted positives may also be taken in direct sunlight, but in that case it must be *diffused* by first passing *through ground glass.* NOTE.—When copying paintings or engravings, it is best to focus with the *full* aperature of the lens that part of the picture which is about *one-fourth* of its diameter from the outer edge; a stop of the requisite size is then inserted, when the copy will be equally defined in all its parts.

HINTS ON LANDSCAPE PHOTOGRAPHY.—The best effects of light in a landscape are secured when white or light grey clouds are driving past the sun; these always give much reflected light, throwing detail and transparency into the deepest shadows. Brilliant effects may often be secured, when taking a view, by a *momentary* exposure during direct sunlight, without destroying the harmony of the picture. The principal object to be focussed should never be exactly in the *middle* of the picture, but more or less on one side. In the case of streets or avenues, these should pass up the picture obliquely; never in straight lines. The horizon should never cut the picture into two equal parts; in a level view, about one-third the hight of the picture may be allowed, and two-thirds when mountains and hills are in the background. As a rule it is best to keep the camera about as high as the head of the operator, especially when *water* is introduced in the view; for unless the lens is kept high enough to look *into it*, the reflection of surrounding objects will be lost.

HINTS ON PORTRAITURE.—When taking portraits care should be taken to cut off from the lens all light from extraneous objects. The best aspect for an operating room for portraiture is one facing the north or northeast. At one end the top and one side should be of glass; a little beyond this the sitter should be placed so that the vertical light is made to fall on an angle of about forty-five degrees; the face of the sitter should be turned toward the darkest side of the room. A screen covered with white paper or calico will be found useful, by shifting which as required the *depth* of the shadow on the side turned from the direct light may be regulated. The lens should be made to work with a moderately large aperature, if we obtain clear definition, by which greater relief and vigor is secured. The sitter should be so placed that all parts of the body are as nearly equi-distant from the lens as possible, as those parts nearest the lens always suffer a certain degree of enlargement and distortion. In portraiture it is almost necessary that we should work with a rapid lens to secure good impressions; and with a lens of moderately short focus we may expect to obtain more brilliancy from a less extent of hazy atmosphere, often interposed between it and the sitter. In regard to the best hight of the camera from the floor, it is recommended as a rule to bring the lens about opposite to the *chest of the model.* For giving perfect equality of definition this is somewhat too high; but on the other hand, if the lens were placed lower, the face would be rendered as if the observer were *looking up* at it; and a somewhat unnatural and unartistic view of the features obtained. When a plain background is used, it should be darker than the *lightest* shadows and lighter than the *darkest. Striking* accessories should be generally avoided, as they tend to distract attention from the principal figure and face, in which the chief interest should be concentrated.

DRESS.—For ladies, silks and satins of various shades, as reflecting much light, are to be preferred; dark woolen fabrics avoided. Open white lace upon a dark ground has a good effect, but *plain* white or light muslins should be avoided. When taking album portraits we should observe a *fixed* distance between the camera and the sitter, in all cases so arranged as to give a certain definite scale to the pictures, suggestive of truth as regards stature. If four-tenths of an inch is allowed in the picture for every *foot* in hight of a standing figure, it will be a good proportion; and if we cut the finished picture so as to leave about a fourth or three-eighths of an inch below the feet, the varying space above the head will give a tolerably just idea of the stature of the individual.

HARDENING SAWS AND OTHER ARTICLES.

Saws and springs are generally hardened in various compositions of oil, suet, wax and other ingredients, which, however, lose their hardening property after a few weeks' constant use: the saws are heated in long furnaces, and then immersed horizontally and edgeways in a long trough containing the composition; two troughs are commonly used, the one until it gets too warm, then the other for a period, and so on alternately. Part of the composition is wiped off the saws with a piece of leather, when they are removed from the trough, and then they are heated one by one over a clear coke fire, until the grease inflames; this is called "blazing off."

The composition used by an experienced sawmaker is two pounds of suet and a quarter of a pound of bees-wax to every gallon of whale-oil; these are boiled together, and will serve for thin works and most kinds of steel. The addition of black resin, to the extent of about one pound to the gallon, makes it serve for thicker pieces and for those it refused to harden before; but the resin should be added with judgment, or the works will become too hard and brittle. The composition is useless when it has been constantly employed for about a month; the period depends, however, on the extent to which it is used, and the trough should be thoroughly cleaned out before new mixture is placed in it.

The following recipe is recommended; twenty gallons of spermaceti oil; twenty pounds of beef suet is rendered; one gallon of neat's-foot oil; one pound of pitch; three pounds of black resin.

These last two articles must be previously melted together, and then added to the other ingredients; when the whole must be heated in a proper iron vessel, with a close cover fitted to it, until the moisture is entirely evaporated, and the composition will take fire on a flaming body being presented to its surface, but which must be instantly extinguished again by putting on the cover of the vessel.

When the saws are wanted to be rather hard, but little of the grease is burned off; when a milder, a larger portion; and for a spring temper, the whole is allowed to burn away. When the work is thick, or irregularly thick and thin, as in some springs, a second and a third dose is burned off, to insure equality of temper at all parts alike.

Gun-lock springs are sometimes literally fried in oil for a considerable time over a fire in an iron tray; the thick parts are then sure to be sufficiently reduced, and the thin parts do not become the more softened from the continuance of the blazing heat.

Springs and saws appear to lose their elasticity, after hardening and tempering, from the reduction and friction they undergo in grinding and polishing. Toward the conclusion of the manufacture, the elasticity of the saw is restored principally by hammering, and partly by heating it over a clear coke fire to a straw color: the tint is removed by very diluted muriatic acid, after which the saws are well washed in plain water and dried.

Watch springs are hammered out of round steel wire, of suitable diameter, until they fill the gage for width, which at the same time insures equality of thickness; the holes are punched in their extremities, and they are trimmed on the edge with a smooth file; the springs are then tied up with the binding-wire, in a loose open coil, and heated over a charcoal fire upon a perforated revolving plate; they are hardened in oil, and blazed off.

The spring is now distended in a long metal frame, similar to that used for a saw blade, and ground and polished with emery and oil, between lead blocks; by this time its elasticity appears quite lost, and may be bent in any direction; its elasticity is, however, entirely restored by a subsequent hammering on a very bright anvil, which "puts the nature into the spring."

The coloring is done over a flat plate of iron, or hood, under which a little spirit-lamp is kept burning; the spring is continually drawn backward and forward, about two or three inches at a time, until it assumes the orange or deep blue tint throughout, according to the taste of the purchaser; by many the coloring is considered to be a matter of ornament, and not essential. The first process is to coil the spring into the spiral form, that it may enter the barrel in which it is to be contained; this is done by a tool with a small axis and winch handle, and does not require heat.

The balance-springs of marine chronometers, which are in the form of a screw, are wound into the square thread of a screw of the appropriate diameter and coarseness; the two ends of the spring are retained by side-screws, and the whole is carefully enveloped in platinum-foil, and tightly bound with wire. The mass is next heated in a piece of gun barrel closed at the one end, and plunged into oil, which hardens the spring almost without discoloring it, owing to the exclusion of the air by the close platinum covering, which is now removed, and the spring is let down to the blue, before removal from the screwed block.

The balance or hair-springs of common watches are frequently left soft; those of the best watches are hardened in the coil upon a plain cylinder, and are then curled into the spiral form between the edge of a blunt knife and the thumb, the same as in curling up a narrow ribbon of paper, or the filaments of an ostrich feather.

In hardening them they are heated by being drawn backward and forward through an ordinary forge fire, built hollow, and they are immersed in a trough of plain water; in tempering them they are heated until the black red is just visible at night; by daylight the heat is denoted by its making a piece of wood sparkle when rubbed on the spring, which is then allowed to cool in the air. The metal is nine-sixteenths of an inch thick, and some consider five-eighths the limits to which steel will harden properly, that is sufficiently alike to serve as a spring; their elasticity is tested far beyond their intended range.

Great diversity of opinion exists respecting the causes of elasticity in springs; by some it is referred to different states of electricity; by others the elasticity is considered to reside in the thin blue, oxidized surface, the removal of which is thought to destroy the elasticity, much in the same manner that the elasticity of a cane is greatly lost by stripping off its silicious rind. The elasticity of a thick spring is certainly much impaired by grinding off a small quantity of its exterior metal, which is harder than the inner portion; and perhaps thin springs sustain in the polishing a proportional loss, which is to them equally fatal.

It has been stated that the bare removal of the blue tint from a pendulum spring, by its immersion in weak acid, caused the chronometer to lose nearly one minute each hour; a second and equal immer-