Photo-Prints from Tracings.

The most important of all photographic tracing methods is the cyanotype of Pellet, a process depending upon the reduction of an organic ferric salt to the condition of a ferrous salt by the action of light; and so far it is analogous to the platinotype. Ferric compounds react with ferrocyanide of potassium to form Prussian blue, while ferrous compounds form a white salt with the same reagent. If the prepared paper of Pellet were introduced into the ferrocyanide developer without exposure, it would become blue all over, in consequence of the uniform deposition of Prussian blue; but should any part have been sufficiently exposed to the light, the paper will remain white, owing to the complete reduction of the ferric salt to the condition of the ferrous salt. It will be thus obvious that the Pellet process will therefore reproduce a positive as a positive, and a negative as a negative, this circumstance giving it an especial value for copying tracings or drawings by direct contact printing.

The paper for the Pellet method is supplied commercially by the patentees of the process; but it is convenient for those who wish to practice it experimentally to be able to prepare their own; and the following directions will be found amply sufficient:

A solution is made of

Common salt	3 parts.
Perchloride of iron	8 "
Tartaric acid	4 "

in 100 parts of water, and this mixture is thickened by stirring in 25 parts of powdered gum arabic. The paper should be a well-sized and rolled paper, that known as cream laid note paper being the most suitable. It is easy to obtain this paper in the original sheets from a wholesale stationer.

The sheet to be coated must be laid on a drawing board, and it is desirable to fasten it down by means of two pins, after which the mixture is applied as evenly as possible with a broad camel's hair brush. This operation should be performed in a subdued light, and it is desirable to dry the paper as quickly as practicable, in order that the sensitive coating may remain as much as possible upon the surface of the paper. When quite dry, the paper may be stored away for future use.

The tracings from which copies are to be taken should consist of well defined opaque lines upon a ground of clean tracing paper or tracing cloth, and many prefer to use India ink into which a little gamboge has been rubbed. It is unnecessary for us to say anything with respect to the kind of printing frames suitable for the process; but it may be mentioned that large frames on swing stands are required in establishments where the cyanotype process is carried on commercially, as the drawings to be copied are often as much as four feet long.

In sunlight an exposure of one or two minutes is generally sufficient, and in dull weather it may be necessary to give as long an exposure as one hour. Electric light is often used for work of this character, the time of exposure varying, according to the intensity of the light, from twenty minutes to half an hour. To develop, the print is transferred *direct from the copying frame* to a saturated solution of ferrocyanide of potassium, but it is not immersed in this, being merely floated upon its face downward. In order to prevent the developing solution reaching the back of the paper, it is usual to fold back the edges so that the paper forms a kind of dish, and this dish floats boat fashion upon the developer. In ordinary cases, the development is complete in less than a minute; and as soon as the paper is once thoroughly wetted on the face, it may be lifted off the bath, as the solution adhering to the face will complete the development. A blue coloration of the ground indicates an insufficient exposure, while weakness of the lines indicates over-exposure.

The development being complete, the print is floated, face downward, upon clean water, and in about two minutes it is plunged into an acid bath containing 8 parts of hydrochloric acid and 3 parts of sulphuric acid, with 100 parts of water. From six to eight minutes is sufficient time to allow for the removal of redundant iron compounds by the acid, and all that is now required is to thoroughly wash the print with water and to dry it. Any blue spots may be readily removed from the finished print by means of a dilute solution of caustic potash, applied with a camel's hair brush; 1 part of potash dissolved in 28 parts of water answers the purpose admirably.

When cyanotype prints are to be used in the workshop as a guide to working engineers, it is an excellent plan to saturate them with white hard varnish, as this prevents the penetration of oil and the adhesion of dirt.—*Photo. News.*

Currier's Soap for Brown Upper Leather.

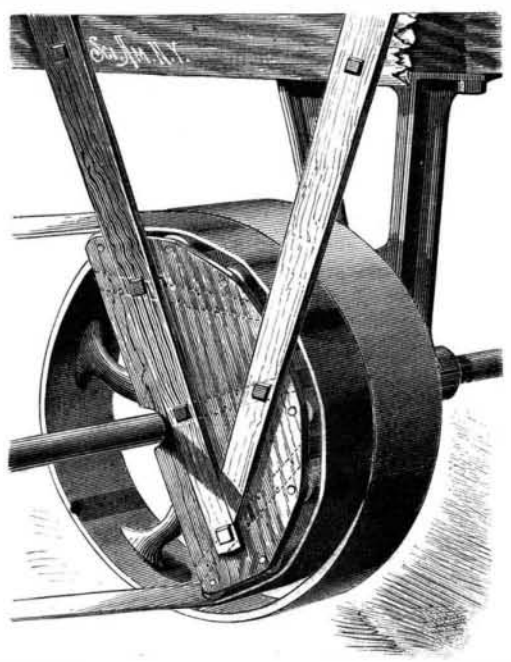
A good soap for currier's use on upper leather, says the *Gerberzeitung*, can be made as follows:

In twenty pounds of soft water dissolve two pounds of white curd soap, half a pound of pure beef tallow, half a pound of light resin, two pounds of glycerine, and half a pint of light train oil or vaseline. The soap is cut in small strips to make it dissolve quickly, and put in half of the water and set over a gentle fire. As soon as the soap is dissolved add the tallow, and when it all begins to boil put in the resin. The latter is added slowly with constant stirring. After boiling rapidly for a while the mass is put into a stone crock and the glycerine stirred in, after this the train oil or vaseline, and finally the remainder of the water.

This soap is applied lukewarm, slightly dried, and then polished with glass.

BELT HOLDER.

The belt holder herewith illustrated consists of a series of rollers revolving on iron axle bolts whose ends are supported in a strong frame. The rollers form a curved line identical with the face of the pulley on the line shaft, beside which the holder is placed, so that the belt can be thrown, either by hand or by some of the ordinary shifting devices, from the pulley on to the holder and back again at will. By means of braces it is supported parallel with and close to the pulley, but does not touch either the shaft or pulley. It is firmly secured to the braces, by bolts passing through both the sides and the interior stays. The lowest roller is placed inside the pulley circle, so that when the belt is on the holder it is strained less than when on the pulley. It can be used in any position, care being taken to so place it beside the pulley that the highest roller shall be at the point on the pulley where the belt first touches it when running up on it, and the other rollers shall be level with the face of the pulley. Since the belt is stationary while on the holder, it is



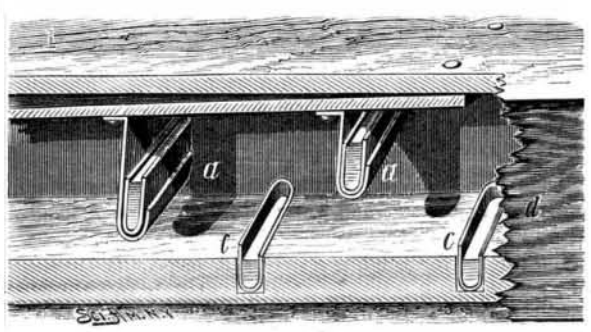
IMPROVED BELT HOLDER.

subjected to no strain or wear; the pulleys and boxes are relieved, there being no strain upon the shaft and its bearings; the belt is in a convenient position for lacing; the work of throwing off and on is simplified, as the belt is in nearly the same position as when at work.

These holders are now being manufactured by Messrs. W. R. Santley & Co., of Wellington, Ohio.

GOLD SEPARATOR.

The invention recently patented by Messrs. H. C. Walker and William Bacon, of Silver Cliff, Colorado, is intended to be applied to a sluiceway through which water and sand pass, and consists in a series of troughs set in the bottom of the sluiceway alternately with similar troughs suspended from the top. The troughs are made of silver-plated sheet copper, the strips of metal being bent lengthwise into a U-shape, one edge being higher than the other, as shown in the engraving. These troughs are set in grooves formed transversely in the bottom of the sluice, parallel with each other and a proper distance apart, so as to be at right angles to the current. The top of the sluice box is, preferably,



IMPROVED GOLD SEPARATOR.

made double, with a hinged under portion that conforms itself to the volume of water passing through. To the top are secured hangers which are bent upward at their lower ends to receive the troughs. By this arrangement the current of sand and water passing through the box, which may be the ordinary sluiceway for the tailings in mining operations, is forced to come alternately in contact with the upper and lower troughs and the fine metal is brought intimately in contact with the mercury in the troughs. A portion of the side or bottom of the sluice is made removable in order that the troughs may be removed from time to time and filled with fresh mercury. In the absence of water, dry sand can be forced through the box.

Lupinosis.

C. Arnold has extracted from lupius a shining brown solid matter, of a pleasant aromatic odor and taste. In water it dissolves slowly, forming a turbid solution. In doses of ten grammes it produces the usual symptoms of lupinosis, especially acute jaundice.

How Canes are Made.

Comparatively few understand how and where the material is gathered, or the process of its manufacture into canes and umbrella handles. The Chicago *Times* furnishes some information on these points. According to that paper, many of the canes are of imported woods, some from the tropics, China, and the East Indies. The celebrated Whongee canes are from China, where they are well known and celebrated for the regularity of their joints, which are the points from which the leaves are given off, and the stems of a species of phyllosiachys, a gigantic grass, closely allied to the bamboo. The orange and lemon are highly prized and are imported chiefly from the West Indies, and perfect specimens command enormous prices. The orange stick is known by its beautiful green bark, with fine white longitudinal markings, and the lemon by the symmetry of its proportions and both prominence and regularity of its knots.

Myrtle sticks possess also a value, since their appearance is so peculiar that their owner would seldom fail to recognize them. They are imported from Algeria. The rajah stick is an importation. It is the stem of a palm, and a species of calamus. It is grown in Borneo, and takes its name from the fact that the rajah will not allow any to go out of the country unless a heavy duty is paid. These canes, known as palm canes, are distinguished by an angular and more or less flat appearance. Their color is brownish, spotted, and they are quite straight, with neither knob nor curl. They are the petioles of leaf stalks of the date palm. Perhaps the most celebrated of the foreign canes are the Malacca, being the stems of the Calamus sceptonum, a slender climbing palm, and not growing about Malacca, as the name would seem to indicate, but imported from Stak, on the opposite coast of Sumatra. Other foreign canes are of ebony, rosewood, partridge, or hairwood, and cactus, which, when the pith is cut out, present a most novel appearance—hollow, and full of holes.

The manufacture of canes is by no means the simple process of cutting the sticks in the woods, peeling off the bark, whittling down the knots, and sand papering the rough surface, and adding a touch of varnish, a curiously carved handle or head, and tipping the end with a ferrule. In the sand flats of New Jersey whole families support themselves by gathering nanneberry sticks, which they gather in the swamps, straighten with an old vise, steam over an old kettle, and perhaps scrape down or whittle into size. These are packed in large bundles to New York city, and sold to the cane factories. Many imported sticks, however, have to go through a process of straightening by mechanical means, which are a mystery to the uninitiated. They are buried in hot sand until they become pliable. In front of the heap of hot sand in which the sticks are plunged is a stout board from five to six feet long, fixed at an angle inclined to the workman, and having two or more notches cut in the edge. When the stick has become perfectly pliable, the workman places it on one of the notches, and, bending it in the opposite direction to which it is naturally bent, straightens it.

Thus sticks, apparently crooked, bent, warped, and worthless, are by this simple process straightened; but the most curious part of the work is observed in the formation of the crook or curl for the handles which are not naturally supplied with a hook or knob. The workman places one end of the cane firmly in a vise, and pours a continuous stream of fire from a gas pipe on the part which is to be bent. When sufficient heat has been applied, the cane is pulled slowly and gradually round till the hook is completely formed, and then secured with a string. An additional application of heat serves to bake and permanently fix the curl. The under part of the handle is frequently charred by the action of the gas, and is then rubbed down with sand paper until the requisite degree of smoothness is attained.

Photographing on Linen and Silk.

A Detroit photographer says: "There is this feature about photographing on linen: You can *wash and boil* the work and it won't come out. There is some special interest shown among society people just now on this subject, because of some napkins used at the banquet given to Henry Irving, the actor, before he left London. His photograph was on each one, and of course it was intended as a souvenir for the guest to take away with him. The silk or cambric is printed from the negative. There will be a rage for it if it once gets started, and people will have photographs printed on their curtains and tidies, and in handkerchief corners. The face of a beautiful young lady on the corner of a gentleman's handkerchief would be much more attractive than a monogram or initial letter. It would be just the thing for hat linings and bands." The Detroit *Free Press* suggests that not the least of the advantages of such photographing would be that the wash would be promptly returned if the missing pieces were to haunt the wretched laundress with a vision of her customers.

Illumination of Steam Boilers.

The lighting up of the interior of steam boilers was long ago suggested. It has lately been carried into practical operation by the Patent Steam Boiler Company, London. They arrange lights within the boiler in such a way that the cascades, currents, and miniature whirlpools of the water may be clearly observed. It is believed that useful information will be derived from the observations touching the cause of priming, the best modes of separating steam from the water, etc.