HOW KID LEATHER IS PREPARED.

The skins usually employed are those of the sheep, lamb, and young goat.

The skins are first cleansed by immersing them in running water for several hours (or for two days, if dry), after which they are "broken on the beam"—that is, softened and made flexible by rubbing them on the flesh side with the back of the flesh knife while spread over the "beam" (Fig. 1). Next they are hung up singly in a drying room to dry as quickly as possible, otherwise they are apt to putrefy and get spotted and tender.

The flesh side of each skin is then smeared over with cold milk of lime, prepared by agitating about twelve ounces of good lime in a gallon of water. The limed skins, placed

Beam or Stake. Flesh Knife.

back to back in pairs, are stacked thus in piles for several days, or until the hair *gives* readily, after which they are well rinsed in running water and *fleeced*. The fleecing operation consists in plucking out the hair or wool with spring tweezers and smoothing the hair side with a whetstone or rolling pin.

After fleecing the skins are rinsed, (usually) put into lime water for several hours, and then immersed in an old or weak lime water bath for about two weeks. While in this *hardening bath* they are frequently *handled*—that is, taken out, drained, and put back again.

The next operation is that of "branning," in which they undergo a steeping for several days in a fermenting mixture composed of—

Bran	2 gallons.
Water (soft)	1 gallon.

As soon as the skins sink in the liquor they are considered sufficiently *raised*, and should then be removed. The *raising* requires usually about two days in summer and four days in winter.

Next the skin goes to the *white bath*, the composition of which for one hundred skins may be—

Alum	10 pounds.
Water	12 gallons.
Salt	2½ pounds.

The proportion of salt used is increased to about three pounds in winter.

In this bath, heated to boiling, the skins are passed separately and then transferred to it in bulk for about ten minutes, when they are removed and the bath allowed to cool somewhat.

To this alum bath is then added fifteen pounds of wheat flour and afterward the yolks of about fifty eggs, and the mixture is stirred to form a smooth paste.

The skins are passed singly through this paste, then transferred to it in bulk, and allowed to remain therein for twenty-four hours or more.

This treatment makes the skins soft, whitens them, and counteracts the tendency to brittleness after exposure to air.

After this softening operation the skins are stretched upon poles in a drying loft and left there for about ten days. Next they are moistened with water, stretched, and ironed, then spread upon the beam with a clean undressed skin underneath, and worked over with the back of the fleshing knife. The finer skins are usually rubbed down with fine pumice stone powder and finished with a warm flat iron.

In some large factories the skins are put into a churn or roundabout with the alum bath and other tanning materials.

The skins, after dressing, are stretched on a tin or zinc table and receive the color (if not to remain white) from a rubbing brush, after which the surface is pumiced down, partly dried on a frame, and again stretched on the table to receive more color. These coloring, smoothing, stretching, and drying operations are often repeated three times to insure a *full* color. The skins are finally dried on hooks in dry lofts, where they can be suspended so as not to touch one another, and finally ironed.

ENGINEERING INVENTIONS.

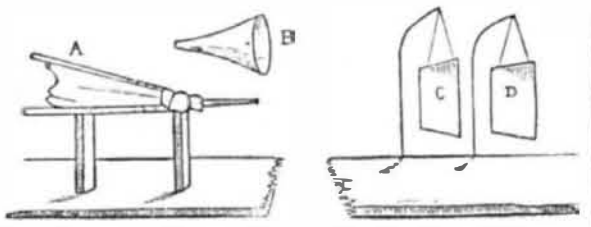
Mr. Samuel H. Terry, of Guthrie, Mo., has patented certain improvements in traction rope railways. These improvements relate to railways in which the cars are driven by a traction rope moving in a tunnel or gutter placed below the ground. The invention consists in a combination of a gutter or tunnel having its upper side closed by a cover arranged in short hinged sections, a moving traction rope within the gutter, and a car or cars provided with devices for clutching the rope and opening the sections of the gutter cover as the car passes on the track. It also consists in a gutter for the traction rope having apertures in its bottom and provided with water-ways beneath the bottom and under the cross ties, for the purpose of allowing water to pass off readily and permitting flushing to remove refuse, likewise compound hinged covering plates for traction rope gutters intersecting one another, pivoted double ended bars fitted to hold down the rope and for movement by a clutch of a passing car, means for directing and supporting intersecting traction ropes, and other devices for insuring improved efficiency generally. By the invention the difficulties experienced in operating traction rope railways at crossings and those arising from an open gutter are obviated.

An improved car coupling, which does away with the necessity of going between the cars to connect or disconnect them, but which admits of the ordinary coupling bolts or pins being used, has been patented by Mr. Franklin W. Haulenbeek, of Sedalia, Mo. The invention comprises a cranked rod arranged upon the end of the car above the drawhead, and having attached means for turning it from the top or sides of the car. The coupling bolt is connected by a link with the cranked portion of the rod, the turning of which raises or lowers the bolt. Said cranked rod has also attached to it a swinging guide for directing the connecting link into the drawhead, or for supporting it when entering the drawhead of an approaching car.

How to Diffuse Air Currents.

An interesting experimental apparatus, to illustrate the best mode of diffusing air currents, when introduced into apartments for ventilation purposes, was shown at the late London Sanitary Exhibition at South Kensington.

A is a pair of ordinary domestic bellows supported on uprights at the end of a base board, measuring about four feet in length; C D, a pair of suspended plates, against which the air from the bellows is directed. When the air issues from

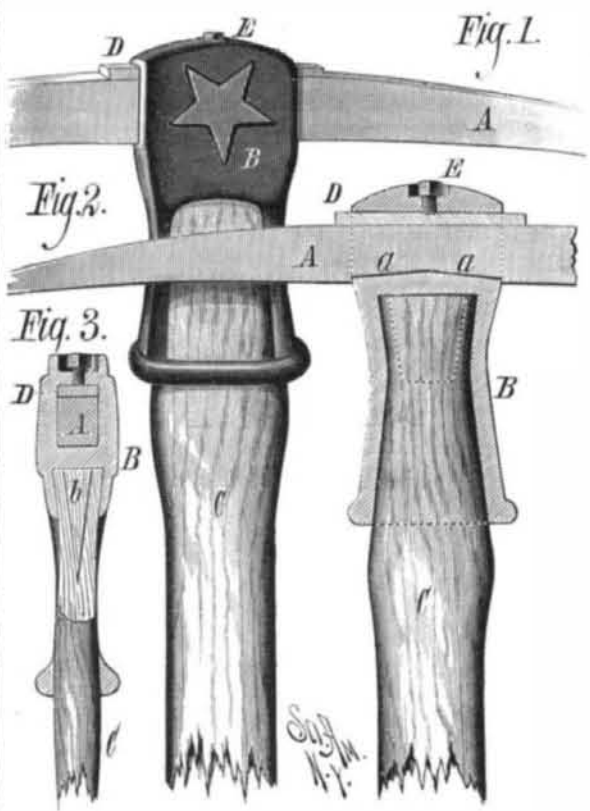


the ordinary nozzle, the plates, C D, will be violently agitated; but if the conical nozzle, B, is now applied to the bellows nozzle, the issuing air will be at once diffused and the plates, C D, will remain at rest. This experiment indicates that when cold or other air is to be delivered into an apartment the delivering orifice should be of conical form.

IMPROVED PICK.

The engraving shows an improved pick and socket head recently patented by Mr. Joseph C. Cramer, of Leadville, Col. It is made so that the pick may be readily removed from its socket and quickly replaced, so that it will always be properly balanced.

The pick, A, may be of any desired form or material, but its central portion is of such size as to fit into the socket head, B; and it is provided with a double inclined seat in the middle on the underside to fit over a support of corresponding shape in the socket head. The pick is firmly secured in place by the wedge, D, which in turn is retained by the set screw, E.



CRAMER'S IMPROVED PICK.

The handle, C, is received by a skeleton socket, and is secured therein by a wedge, which is inserted into the end of the handle before the handle is driven into the socket.

This makes a complete and durable method of attaching picks and handles. It admits of removing the pick from the handle for repairs, and also admits of the interchange of different kinds of picks in the same handle.

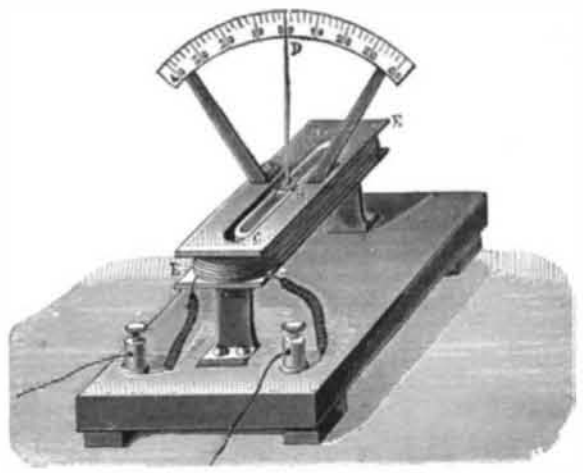
Fig. 1 shows the socket handle complete. Fig. 2 is a longitudinal section, showing the internal form of the socket head; and Fig. 3 shows the manner in which the wedge is introduced.

Further information in regard to this useful invention may be obtained by addressing the inventor as above.

NEW GALVANOMETER.

Horseshoe magnets are stronger and more permanent than bar magnets on account of the proximity of the two poles, and they are more powerfully affected by the current.

These considerations led M. Deprez to employ them in a



M. DEPREZ'S NEW GALVANOMETER.

galvanometer, but on account of their form he was obliged to modify the galvanometer bobbin.

The accompanying engraving represents the arrangement adopted.

In the interior of the bobbin, E E, there are two small horseshoe magnets, A B, B C, exactly alike, and joined together at B, with similar poles opposed to each other. Each magnet may be regarded as an aggregation of an infinite number of very small bar magnets, parallel to the line upon which the horseshoe magnets are joined. When the wire of the bobbin is traversed by the current these imaginary bar magnets tend to assume a position perpendicular to the plane of the bobbin.

The advantages which result from this mode of construction are:

1. A more energetic action than that which would be developed by a bar magnet of the same weight and construction as the two horseshoe magnets.

2. The inertia is very much reduced, and consequently the rapidity of the indications is greater.

3. It admits of greater inclination than the bar magnet without removing it from the influence of the bobbin.

This system suspended vertically by a filament of silk constitutes an apparatus superior in sensitiveness and rapidity to the ordinary galvanometer. It is easy to render it astatic, and its magnets may be made of sewing needles.

Correspondence.

Effect of Varying Air Pressure on Hydraulic Rams.

To the Editor of the Scientific American:

In the SCIENTIFIC AMERICAN of October 22, 1881, an article by Mr. Baldwin Latham appeared on the "Influence of the Weight of the Air on the Flow of Springs," and as the subject had some analogy to one in which the writer had made similar observations it was read with very great interest. We allude to the working of a hydraulic ram under variations of atmospheric pressure. The variation of the stream thrown by a ram was first observed, and why the variation should exist was then made the subject of observation. It was demonstrated that in damp or cloudy weather a full unbroken stream was ejected, while in fair, clear days the stream was full of air bubbles and unsteady in its working. This led to observing the change daily, and the variations could be told twenty four hours ahead with unvarying certainty. Thus any one who has a hydraulic ram has a miniature signal service of his own, and can predict the state of the weather twenty-four hours ahead by observing its workings.

YPSILANTI.

Heating Tires by Petroleum.

To the Editor of the Scientific American:

In your paper of November 5, question three, by W. A., says: "I am in business here, and am under considerable difficulty regarding the best mode of heating tires for carts and other wheels."

Now I would say that here is a new field for inventors to employ their genius, as I know that crude petroleum of the value of two or three cents will supply sufficient heat for the purpose of heating one large tire in ten minutes—that is to say, should an apparatus be properly constructed of cast iron.

OLD MECHANIC.

P.S.—No inventor should experiment with a tire heater unless he is the possessor of two hundred dollars, which he can easily part with for that purpose.

Boston, November.