added to the solution. On removal from this bath, the dial is immediately immersed in warm water; then brush with soap rinse, and dry in hot boxwood dust. Or it may be simply immersed in dilute nitric acid, but in this case any painted figures will be entirely destroyed.

GALVANIC GILDING.—A correspondent inquires how to obtain a pure ground and color on articles gilt by galvanism, to which H. Bush, responds: The gold solution, effected by the nitromuriatic acid, after all the gold has dissolved in the glass retort, is poured into a porcelain evaporating dish, and evaporated above an alcohol or benzine flame; to render the acid entirely harmless, however, a little distilled water is added to the residue, after completed evaporation, and the operation repeated. The residue is chloride of gold, which, together with a quantity of cyanide of potassium (about fourfold the weight of the gold employed), is dissolved in boiling water, and filtered after cooling; the gilding fluid is ready.

WATCH CLEANING.—A few watchmakers clean by what is called the chemical process, to remove discoloration from watch movements. It is as follows: Remove the screws and all steel parts, then dampen with a solution of oxalic acid and water. Let it remain a few minutes, after which immerse in a solution made of one pound cyanuret potassia to one gallon of rain-water. Let remain a few minutes, and then rinse well with clean water, after which you may dry in sawdust, or with a brush and prepared chalk, as it suits your convenience. It gives the work an excellent appearance.

NON-CORROSIVE SOLDERING FLUID.—A noncorrosive soldering fluid is prepared in the following manner: Small pieces of zinc are immersed into muriatic acid to saturation, which can be known by the cessation of the ebullition; the zinc, also, being added after this point remains undissolved; add about one-third the volume of spirits of ammonia, and dilute with a like quantity of rain water. If the acid is gently heated at the time of adding the zinc, the dissolving will progress much more rapidly. This fluid causes no rust on iron or steel, and is even excellent for tinning.

HARDENING PINIONS.—"Which is the best way to temper pinions and other steel parts?" I wish to inform the interrogator that I have used petroleum for several years with the most excellent results. The steel parts to be tempered are first heated upon charcoal, in the customary manner, then annointed with ordinary washing soap, heated cherry read, and quickly immersed in petroleum, without anticipating that the latter might ignite. Steel articles heated in this manner do not warp whatever, no matter how thin, and remain almost entirely white.—B. Morjossy. *Deutsche Uhrm. Ztg.*

TEMPERING CASE SPRINGS.—Draw the temper from the spring, and fit it properly in its place in the watch; then take it out and temper it hard in rain-water, (the addition of a little table salt to the water will be an improvement); after which place it in a small sheet iron ladle or cup, and barely cover it with linseed oil, then hold the ladle over a lighted lamp until the oil ignites; let it burn until the oil is nearly, not quite, consumed; then re-cover with oil, and burn as before; and so a third time, at the end of which plunge it again into water. Main and balance springs may in like manner be tempered by the same process; first draw the temper, and properly coil and clamp to keep it in position, and then proceed the same as with case springs.

TO PREPARE CHALK.—Pulverize your chalk thoroughly, and then mix it with clean rain water in the proportion of two pounds to the gallon. Stir well, and then let it stand about two minutes. In this time the gritty matter will have settled to the bottom. Pour the water into another vessel slowly, so as not to stir up the settlings. Let stand until entirely settled, and then pour off as before. The settlings in the second vessel will be the prepared chalk, ready for use as soon as dried. Spanish whiting, treated in the same way, makes a very good cleaning or polishing powder. Some operatives add a little crocus, and we think it an improvement; it gives the powder a nice color at least, and therefore adds to its importance in the eyes of the uninitiated.

IN order to obtain a clear ground and color of the gilding, cleanliness in the process of preparing the fluid, as well as of the article to be operated upon, is unconditionally necessary; the zinc strip, also, must be kept very clean. The mat ground of the gilding is changed into a lustrous one by scratch-brushing the article after removing it from the bath, with a brush consisting of brass or German silver wire, or glass fibers, using beer. The article is next rinsed in warm water, and dried in sawdust.

Another one answers to be same question: After having evaporated the dissolved gold to a proper consistency, add the point of a knife full of bicarbonate of soda, and a clear and handsome gilding will be obtained.

The employment of essences in cleaning watches is rapidly growing in favor among watchmakers. They are to be obtained at many of the material dealers, together with full instructions in regard to their use. The objects are left in the solution for a few minutes, in order to allow all adhering matter to dissolve; but they must not remain too long, as certain quatities of benzine, etc., are apt to leave stains. Dry the pieces on removing them, and finish by passing over a fine brush that has been charged with chalk, and subsequently rubbed on a hard crust of burnt bone. This will produce a brilliant surface on either gilding or polishing brass. The following composition, the ingredients of which can be obtained at any drug store, has been strongly recommended: 90 parts by weight of refined petroleum, and 25 parts by weight of sulphuric ether. The objects are immersed for several minutes; indeed, they may remain for a much longer period without danger, and on removal from the bath are found to be clean and bright. It must not be forgotten that many of these essences are liable to ignite with the mere proximity of a lamp.

—We give a few condensed rules to be remembered by the workman when regulating a watch to positions commensurate to its motion, or the experience or estimation of the workman:

1. Make the balance pivots flatter or rounder.

2. Let the balance jewel holes have only the necessary thickness of the hole

3. Make the balance pivots weaker, according to circumstances, and insert new and smaller jewel holes in the place of the old ones.

4. Centre the balance spring truly, or, according to circumstances, fasten and lay it thus that by the handing of the watch, the spring operates in such a manner upon the balance as to raise it, whereby the friction within the jewel holes is lessened.

5. Change the balance spring with another one of the same strength, but with more or less coils.

6. Change the fastening point of both, so that the balance spring is lengthened or shortened, and the points of fastening stand at a different angle to each coil.

7. In a watch with Bréguet spring, make the outer curve longer or shorter.

8. Put in another balance of a larger or smaller diameter or weight.

9. In a cylinder watch, give the balance a point of gravity.

Keep these rules uppermost in your mind, when engaged in regulating, and always remember at the same time that the operation offers many difficulties, only to be conquered by a prolonged experience, observation, and a careful study.

SCIENCE NOTES.

DAINTY JEWEL WORK—They used to do some very dainty work in olden times in the way of jewelry, if one can take the historian's word for it. In Elizabethian times one Mark Scaliot constructed a lock of eleven pieces of iron, steel and brass, and a chain of forty-three golden links was attached to the same, and this being placed around a flea's neck, lock and chain and flea weighed only a grain and a half of gold. Surely such a miracle of skill was worth preserving for posterity. Oswald Nothingerus once turned 1,600 d.ehes of ivory which all went into a peppercorn, if, indeed, we may believe contemporary writers. They were shown to Pope Paul V., who counted and verified them himself, by the aid of a magnifying glass. Father Ferrarius, a Jesuit, would not be outdone, and he made twenty-five wooden cannons, which went into the same compass.

REMARKABLE DISCOVERY.—A remarkable discovery, the result of which may be of importance, has been made by Mr. Spring. In 1850, Faraday discovered that two pieces of ice, strongly pressed together, very quickly adhered and formed a homogenous mass, although he considered this property as a peculiarity simply belonging to ice, and his theory is still explained thus in mathematical and philosophical classes. But Mr. Spring has found out recently that the most diverse bodies behave in a similar manner, when submitted to the same process. He took fine powders and submitted them, in a steel mould, to pressures varying from 2,000 to 7,000 atmospheres; under these conditions, the iron filing was transformed into a solid block, not showing the least traces of granular structure when examined by the microscope. At 5,000 atmospheres, lead became fluid, and zinc gave blocks of a crystalline structure. This discovery may perhaps be used for molding metal without reducing it to fusion.