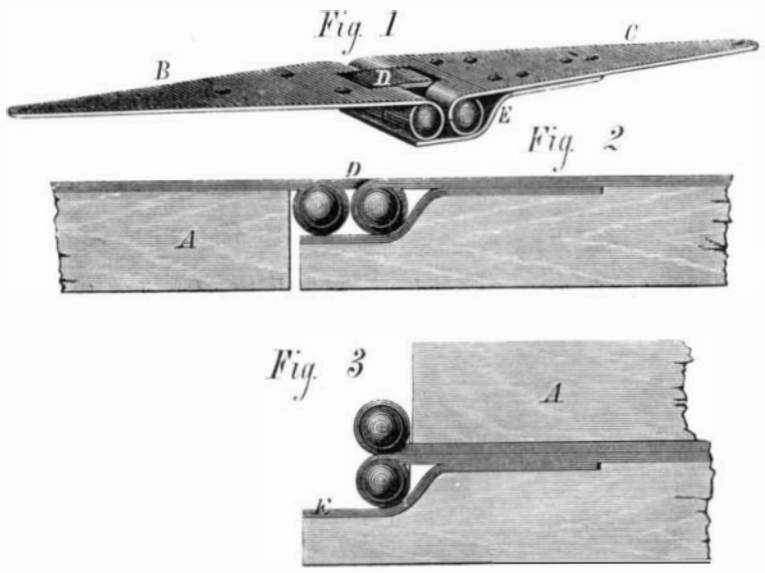
IMPROVED FLUSH STRAP HINGE.

The chief defect of the ordinary strap hinge, such as is used for hanging trap or scuttle doors, has been that the joint made by its two parts forms a projection above the floor or roof which, being very easily overlooked, proves a stumbling block and thus a cause of troublesome accidents. To remedy this difficulty, the invention shown in our illustration is devised. It consists of what is known as a flush strap hinge, so constructed as to present a perfectly smooth surface and be hardly observable when the door is closed, while it permits the latter to be swung all the way back when opened.

Fig. 1 shows the device in perspective; Fig. 2 is an edge view with the door, A, closed, and Fig. 3, a similar view with the door open. Referring to all three engravings, B and C are the straps of the hinge, on which are formed eyes, which tightly enclose the pivot pins. D, shown more clearly in Fig. 1, is a clasp, which is received in the openings cut in the parts of the straps which form the eyes, and the ends of which are bent around and move freely upon the pivot pins. It will be seen that a double joint is thus formed whereby the hinge when extended as in Fig. 1 presents on its upper portion a uniformly flat surface. E is a plate attached firmly to the strap, C, and projecting under the eye of the strap, B. Its object, as shown in Fig. 2, is to receive and support the inner edge of the closed door. Fig. 3 plainly represents the location of the different parts with the door open and also shows the movement of the hinge in permitting the door to be thrown flat back, the clasp, D, working freely around the pivot pins and eventually assuming with the latter a perpendicular position.

This useful invention, which will doubtless attract the attention of architects and builders, is manufactured by the Stanley Works at New Britain, Conn. Patented through the Scientific American Patent Agency, January 3, 1871, by J. S. Jenness, of Bangor, Maine, of whom, or by addressing Mr. A. T. Young, agent, 139 Federal street, Boston, Mass., further information may be had.



JENNESS' FLUSH STRAP HINGE.

GOLD PEN MAKING.

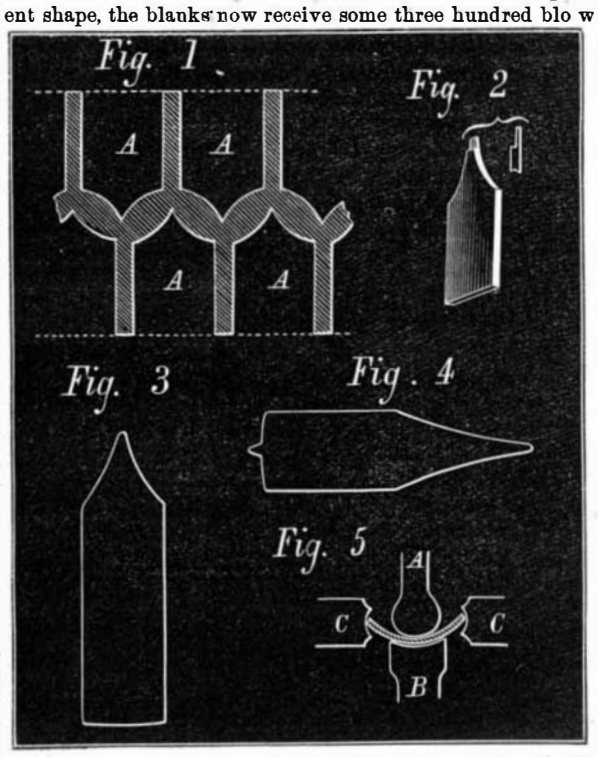
Pure gold, pure silver, and pure copper are the materials from which the alloy used in the manufacture of gold pens is made. Gold alone, from its softness, cannot be used, but combined w th the baser metals, in degrees of 14, 16, and 18 carats, it forms a composition of great hardness, durability, and elasticity.

If the reader will accompany us in imagination through one of the manufactories in this city, the largest perhaps of its kind in the world, owned by Messrs. Mabie and Todd, we will endeavor to point out the many ingenious processes through which the metal, or rather the alloy, passes from the time it undergoes its first melting to its final exit into the world in the shape of finished pens.

Our attention is first called to the uncombined metals; virgin gold in little irregular shaped nuggets so soft as to be easily scratched by the thumb nail, silver in like form, and copper in odd pieces of wire and thin plate. Into a delicate pair of scales, certain portions of each of these metals are thrown. A nice adjustment of weights, a few seconds of wavering of the beam, and, the operation being finished, the contents of the scale pan are handed over to the melter. This workman we find busily engaged in blowing a small charcoal fire made in an open furnace. As soon as a fierce heat is obtained, a hole is raked in the coals and a small crucible containing the metals placed in the fiery bed. More coal is heaped on, the blast is made stronger, and we can see the crucible gradually turn white hot as the fire increases. Meanwhile, the workman is preparing his mold, two simple pieces of iron which, fitting close together on their edges, leave a space between for the shaping of a small ingot. This he places conveniently at hand, and then, with his tongs, lifts the crucible from the fire. Out flows the metal, a liquid stream of dazzing brilliancy. A moment of waiting, the mold is opened, and a dull yellow ingot lies before us; seizing it with his pincers, the melter thrusts it among the coals. This is the annealing process, and we watch the bar gradually turn to a deep cherry red. Then it is quickly withdrawn and plunged, hissing, into a bath of very weak sulphuric acid water. It cools quickly, for not a minute seems to elapse before the ingot is placed in our hands for examination. It is about a foot long, two and a half inches wide, and about three sixteenths of an inch thick. Its value is about $250. A small set of rolls, which a workman has been adjusting during our inspection of the ingot, is now ready. The machine is set in motion, and into it passes the bar of metal: once through, it is very slightly flattened but not much changed; back again, the workman tries it with his gage, but it is far too thick. It goes between the rollers again and again, until finally the before solid bar is but a thin ribbon of elastic metal. Thin, we say, but still much too thick for its final condition in the shape of pens.

Thus prepared, the gold is passed to another operative who proceeds to cut it into blanks; that is to say, he holds the ribbon under a small press, in which a punch and a die of the proper shape and size are fitted. By this means, the first crude form of the pen—the blank—is cut out in the shape shown in the engraving, A, Fig. 1. The ribbon of metal, after these pieces are removed, is more particularly intended to be shown by this illustration, the blanks being so cut out as to economize material to the greatest extent.

A quantity of blanks being completed, the next process is to fit them with so-called "diamond" points. A gold point would wear away almost immediately; even platinum is incapable of resisting the friction of constant use. Consequently the point of the pen is tipped with a very hard substance: not diamond, as is popularly supposed, for these gems could not be soldered to the gold and could only be attached by a setting which would render the pen useless to write with: but iridium, a rare grayish white metal furnished for the purpose in fine grains, costing about $150 per ounce. It is generally obtained from gold-bearing ore, and is often found in the bottom of crucibles after gold has been melted in them. It is separated from the latter metal by the action of *aqua regia* which dissolves the gold, leaving the iridium untouched. By another process, the gold thus put in solution is regained. To place the iridium point, the blank must be fitted to receive it. This is done with great rapidity by a small revolving stone which cuts a piece from the end of the blank, as shown enlarged in Fig. 2. Some twenty blanks, being thus prepared, are ranged on a table before a workman, who, with the aid of a lens, selects bits of iridium of the proper size to fit the points. These bits he places in the notches before cut, together with a drop of a solution of borax and water. Then picking up each carefully, he spreads the blanks along on a piece of charcoal, and brings to bear, by means of a blow pipe, upon every point an intense flame. The gold around the nibs is thus fused, and the borax, forming a flux, flows around and solders the iridium firmly into position. The blanks are next passed through sets of rolls until they are squeezed into the shape shown at Fig. 3, the metal, of course, being rendered much thinner by the compression. The rolls employed are steel cylinders, on the lower one of which is an arrangement whereby the iridium point of the blank is prevented from receiving any pressure, as in such case it would be crushed or broken. In their present shape, the blanks now receive some three hundred blows of a hammer, the object being to give them temper, elasticity and hardness. They are then placed under another punch which, descending, forces the metal into a die, whence it emerges shaped as shown in Fig. 4, a small projection termed a "tit" being left at the end in order to guide the pen during subsequent operations. While the pen is in this condition, the manufacturer's name, its number, etc., are stamped upon it.



If the reader will examine an ordinary gold pen, he will notice that its shape is peculiar, that its middle portion is constructed on a curve of much greater radius than the upper part, while around its nibs and point the metal is almost flat. In order to change the pen from its present form—a simple flat blank—to the required shape, a very ingenious machine is used. Described briefly, it consists of a convex plunger, of a length equal to that of the pen, which fits into a concave die of steel placed beneath it. The blank being laid above this lower die, the plunger descends upon it, forcing it into the concavity of the former; at the same time two concave horizontal hammers strike the pen at either side, thus turning up its edges around the vertical plunger. A perpendicular section of this instrument is outlined in Fig. 5. A is the plunger, B, the die below, C C, the horizontal hammers, while the section of the blank is shown in position between the parts.

So far as form goes, our pen is now complete, but it is as useless as ever as a writing implement. The slit at the points is yet to be cut. This is done by very thin circular sheets of refined copper, covered with fine emery flour and oil and revolved with great rapidity. Each sheet is held by clamps, which are dressed to perfect trueness. Against the edge, the point of the pen is pressed, and in a few revolutions, it is cut through. This process requires the utmost accuracy and delicacy of perception, as the slit must be directly in the middle, a cobweb's breadth to either side ruining the pen. A steel knife fixed in a kind of hand stamp next lengthens the slit, the upper end of which is cut square by means of a rapidly revolving and extremely fine saw.

The pen now passes to the grinders. These men have before them a number of copper cylinders, of varying diameters, which are covered with a paste of emery and oil. To these the points and sides of the pens are held. As fast as a little metal is removed, the pen is tried and the somewhat tedious process is continued until the operator is satisfied that his work is complete. The inside of the pen is then smoothed with a kind of steel burnisher, and finally a cutting wheel is allowed to rotate for a second or two in the slit to remove any roughness which may remain. The pen is next polished by holding it against revolving cylinders made of circular layers of felt. The outside surface of the cylinder is composed of the edges of the layers, and is covered with a mixture of fine German tripoli and candle wax. The inside of the pen, which cannot be reached by this method, is burnished by a small revolving spindle covered with cotton and jeweler's rouge. Rubbing with Scotch hone roughens or frosts the metal inside of the nibs, and so prevents the ink flowing too rapidly to the point. Lastly, the pen is sent back to the grinder, who sets the nibs and adjusts the pen to write with perfect smoothness. Nothing now remains to be done but to pack the finished pens in boxes and send them to the market.

The bar of gold, which we first saw cast and which we valued at $250, is now made into pens worth $350, and yet over 40 per cent of the metal has been lost or unused during the processes of manufacture. The unused gold is in the form of scraps and cuttings, which are remelted. Ten per cent, however, of the entire amount of the gold brought into the factory is irretrievably lost. It is carried off in fine particles on the clothes, disappears in the machines, is blown away by drafts, and, in fact, it is hardly known what becomes of it. Every year a large quantity of metal is reclaimed from the water the workmen wash in, from their working clothes, and from the sweepings of the factory. In the establishment visited by us, where 60 hands are employed and 1,500 pens are produced weekly, eighty dollars worth of gold has been found in the dirty water during a period of six months, and it is estimated that $1,500 is yearly reclaimed from the sweepings and refuse.

Curious Preservation of a Dead Body.

At South Bend, Ind., the body of a deceased lady, buried ten years ago, was lately uncovered for re-interment, when the corpse was found to be in an excellent state of preservation. Although petrification had not taken place, the body was as perfect as the day it was placed in the coffin. The whole body was perfectly preserved, even to such parts as the tongue, which could be moved back and forth in the mouth. The expression of the face was retained and the color of the flesh was natural, except for its waxy appearance. The shroud, when exposed to the air, fell to dust.

If the chemical nature of the soil were known, and also the medicines administered during the sickness of the deceased, it is possible that the reason for this singular preservation might be ascertained. From the description given, it would seem as if it might be due to the presence of arsenic.

White Building Stone.

For a number of years, people have been aware of the existence of a valuable building stone, found between Glasgow Junction and Cave City, Ky., and have long been in the habit of resorting to its bed for the purpose of securing its rich treasures for hearth stones, window sills and step stones, and other purposes requiring a handsome and durable stone. When first taken from its bed it presents a bright gray appearance, which, upon exposure, fades to a beautiful white, slightly shaded with the faintest gray. A company has been organized under the name of the "Glasgow Granite Company," for the purpose of extensively mining and introducing this peculiar stone.

Progress of Iron Manufacturing in Kentucky.

A large furnace and nail factory is building at Ashland, Ky. The capital stock of the new company is $700,000, and nearly the entire amount has been raised. The furnace will have capacity for turning out fifty tuns of pig iron a day, to be converted into nails. Ashland and the district around it has been demonstrated, and is by iron men generally conceded, to be the place in the United States where iron can be most cheaply manufactured. It is beautifully situated on the Ohio river, with an excellent harbor, and is a fine site for a large city.