### Colored Films on Metals.

According to the prevailing fashion, the small metallic articles used for ladies' ornaments, such as buttons, buckles, clasps, etc., have different colored films produced on them by various methods. (Some of these are known as "oxidized silver.")

Rainbow colors are produced on brass buttons by stringing them on a copper wire by the eyes, and dipping them in a bath of plumbate of soda freshly prepared by boiling litharge in caustic soda and pouring it into a porcelain dish. A linen bag of finely pulverized litharge or hydrated oxide of lead is suspended in the solution, so as to keep up the original strength of the solution. While the buttons are in this solution, they are touched one after the other with a platinum wire connected with the positive pole of a battery until the desired color appears. The galvanic current employed must not be too strong. The colors are more brilliant if they are heated after they have been rinsed and dried.

Colored films are more conveniently produced upon bright brass by different chemicals, by painting with them or by immersion. For example:

*Golden yellow.*—By dipping in a perfectly neutral solution of acetate of copper.

*Dull grayish green.*—Repeatedly painting with very dilute solution of chloride of copper.

*Purple.*—Heating them hot and rubbing over with a tuft of cotton saturated with chloride of antimony.

*Golden red.*—A paste made of four parts of prepared chalk and one of mosaic gold.

In covering an article with any colored bronze in powder, it is first rubbed with a very little linseed oil, and the bronze dusted evenly over it from a dust bag. It is afterward heated in an iron pan to about 480° Fahr.

In recent times small articles are also roughened by dipping in strong nitric acid, and, after washing and drying, they are coated with a rapidly drying alcohol varnish that has been colored yellow with picric acid, red with fuchsine, purple with methyl violet, or dark blue with an aniline blue. This gives the desired color with a beautiful metallic luster. These latter colors are not very durable, and are used for inferior goods.—*N. Erfind.*

### GEAR CUTTING ATTACHMENT FOR LATHES.

Every machinist knows the value of a good gear cutter. It is really a necessity in every well regulated shop, but the expense involved in the purchase of a regular gear cutting engine deters many from investing in such a machine.

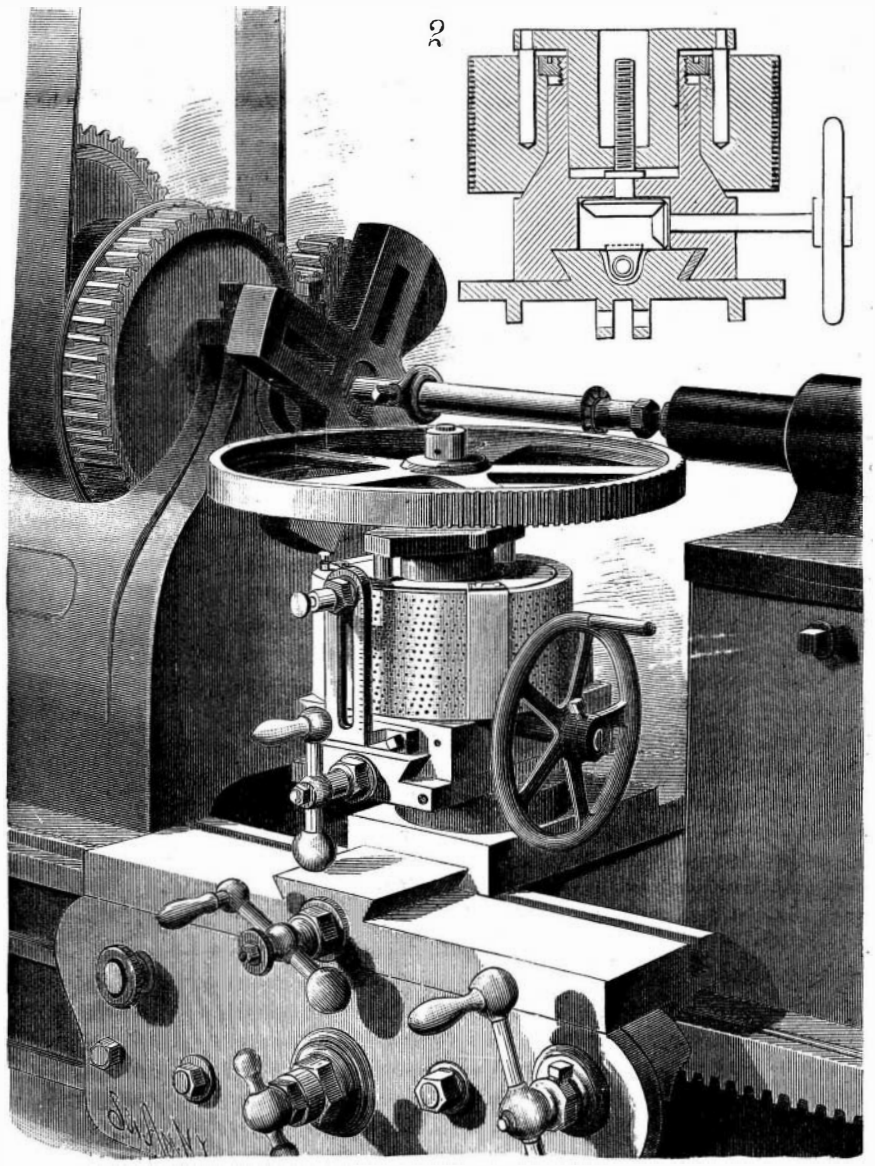
Our engraving shows a very perfect substitute for a complete gear cutter; in fact, when it is applied to a lathe—which is readily and quickly done—the lathe and the attachment together form as complete a gear cutter as can be desired. The gear cutting attachment is mounted in place of the top slide of the tool rest, or upon a base plate of its own fitted to the bed of the lathe. In the present case it is shown as mounted in place of the top slide. The index wheel is mounted upon a tubular standard, which is made conical at its lower end, and is provided with a lock nut or threaded ring provided with holes, which receive a wrench for turning the ring and tightening the index wheel. To the hollow standard is fitted a socket which carries the mandrel upon which the wheel to be cut is mounted.

The socket has at its upper end a yoke carrying two vertical pins, which work smoothly in holes in the index wheel, so that the socket can be raised and lowered without turning when the index wheel is made fast by the lock nut. A screw journaled in the bottom of the standard works in a thread in the bottom of the wheel holding socket, and takes its motion through beveled wheels from the shaft upon which the crank wheel is placed. By turning the wheel, the screw is revolved, and the wheel to be cut is raised or lowered to feed it across the cutter.

Two vertical plates connected by a slotted segmental plate on the top of the index wheel are capable of being set the proper distance apart to divide any of the circles of holes into any required numbers. They serve the same purpose as the sector arms on the ordinary index plate. The stop pin is movable up and down the slotted standard so as to enter the holes of any row.

When it is desired to cut bevel gears the base plate is mounted on a pivot so that the mandrel and the wheel to be cut can be inclined at any angle. The same arrangement admits of cutting worms.

This complete and useful tool has been patented by Messrs. Brooks & Scully, of the Enterprise Machine Works, corner of Fort and Beaubien Streets, Detroit, Mich.

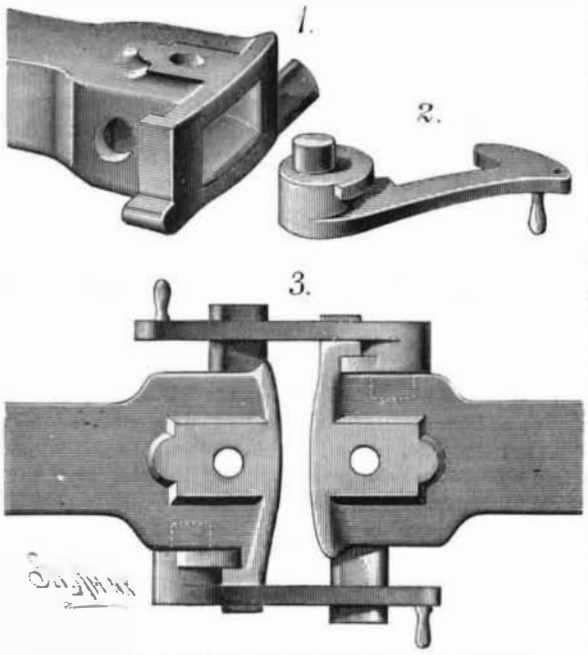



NEW GEAR CUTTING ATTACHMENT FOR LATHES.

A SAWFISH 15½ feet long was taken recently near Halifax, Fla.

### NEW CAR COUPLER.

This coupler consists of two parts only: the ordinary pattern of drawhead, but made with a horizontal bar projection on the one side, and a hole or socket on the other side, as shown in Fig. 1. This hole receives the shaft of the coupling hook shown in Fig. 2, which is made with a half collar at its base, working in a recess of the drawhead in such a way that it cannot come off. No fitting with screws,




AMBROSE'S AUTOMATIC FREIGHT CAR COUPLER.

bolts, springs, etc., is required, it is inexpensive, and the breaking of a drawhead involves no more loss than with the usual form. The coupling action is that of latching, the hook of each drawhead sliding up and dropping over the respective horizontal bar projection of the two drawheads.

A double coupling is thus made without the attention of a brakeman at all, as 50 or 100 cars can be coupled by merely backing the engine, the hooks always resting in horizontal position ready for coupling. Its simplicity prevents its getting out of order.

A link and pin can also be used in the ordinary way, and with the same facility as at present. The coupling can also be arranged to uncouple from the sides or top of a car if so desired. This invention has been patented by Mr. Thomas H. Ambrose, of Port Hope, Ontario, Canada.

IN Krupp's great gun manufactory, at Essen, compressed carbonic acid is used for the manufacture of what ice and seltzer water may be required by the workmen.

### Renovating Old Oil Paintings.

In cleansing old paintings that have become dingy with soot and coal dust, substances are frequently employed that injure the painting by acting on the lighter and more delicate tints and shades.

Von Bibra has discovered a method which, according to Wieck's *Gewerbe Zeitung*, is both safe and rapid.

The painting is first removed from the frame, and the dust and smoke brushed off with a pencil or feather. After this it is washed with a sponge dipped in well water. It is next covered with a thick layer of soap; shaving soap is the best for the purpose, because it remains moist and does not dry on. After the soap has been on eight or ten minutes it is all washed off with a strong brush or pencil, adding a little water if necessary. The soap that still adheres is rinsed off sufficiently with water, and the picture left to dry.

When completely dry it is further cleansed with nitro-benzol. This chemical preparation is also known as nitro-benzine, artificial oil of bitter almonds, essence of mirbane, and is a yellowish, oily (*very poisonous*) liquid, with a powerful smell of bitter almonds. It is formed when coal-tar benzol is mixed with fuming or concentrated nitric acid under suitable precautions. The nitro-benzol is poured into a dish or soup plate, and a clean linen rag dipped in it, and passed over the painting. This quickly removes all the adherent dirt. This linen rag must be frequently exchanged for a clean one. When the rag remains clean after going over it repeatedly, the cleansing is finished.

If the colors look dull after going over it the last time and letting it dry, it is given a thin coat of the finest olive oil, and after a while must be varnished with a good, quickly drying varnish.

It is claimed that the dirtiest oil paintings, when cleansed as above described, acquire their original colors and freshness.

### Patents in the United States.

There is no country more favorable for the inventor than the United States. By wisely-framed patent laws, which are vastly preferable to bounties, inventive genius is stimulated to action, and the cost of obtaining patents is so light as to debar few from the privilege. In this respect the United States presents a marked contrast to England, whose patent fees are much higher than our own. In England the cost of patent protection for fourteen years amounts to about $875, whereas America protects her patentees for seventeen years for the sum of $35. An English trade journal not long ago asserted that England was getting somewhat behindhand in her struggle for manufacturing supremacy, owing to the excessive cost of obtaining patents in that country, and pointed to the United States as an example worthy of imitation in this respect. Perhaps the American has a keener insight into the requirements of the age and a greater versatility of resources than his English brother, but these traits have surely been developed through patent legislation.

It is unnecessary to touch on that phase of communism which opposes the granting of patents, or at least wishes to restrict the time of such to insignificant periods which will not recompense the inventor. Of course it is but a simple act of justice to secure to the inventor the result of his brain labor, as well as to the workman in other fields of industry the result of his hand toil. One apparently simple, yet important, tool used in shoe manufacture required seven years to perfect. The inventor should certainly receive remuneration for his time and application. Patenting may be considered a kind of technical education, and though inventors may produce thousands of worthless articles, yet there is sufficient gold out of the dross to make our patent system worthy of all encouragement.—*Manufacturers' Gazette.*

### Swelled Rifle Barrels.

A board of officers, with Capt. Greer as president, has tested a lot of rifles at the Springfield armory to determine the cause of the bulging of the barrel, which occasionally occurs in practice. They find it due to the fact that the muzzle has been stopped by sand, caused by resting the muzzle in wet sand, or in dry sand after the gun has become foul from firing. This arrests the passage of the ball, so that the pressure is increased at the point of swelling. It is curious that sand produced this result where wooden plugs, driven in tightly and swelled by steam, failed to do so.

A NEW lighting appliance has been invented by M. de Khodinsky. He directs a jet of coal gas and of oxygen on a specially prepared prismatic pencil of magnesia. The coal gas and the oxygen arrive at the point of combustion by two separate pipes inclosed in the same tube.