Kefir.

While during the last few years koumiss has been introduced into Western Europe, and even into America, a new drink prepared from cow's milk by a process of fermentation imperfectly understood is coming into use in Russia. This drink is kefir, and it has for long formed the chief article of diet among the mountaineers in the neighborhood of Mount Elbruz and Kasbek, in the Caucasus. It forms a thick white fluid, with a faintly acid flavor, said to resemble certain light wines. The mountaineers themselves call it "ghippo." The inhabitants of the plains near the Caucasus, and the Russian settlers, who term it kefir, kifir, or khiafar, make use of it, not for the table, but as a popular remedy for anæmia, struma, gastric catarrh, and chronic bronchitis.

According to the Moscow *Medical Gazette*, where a contribution on the subject has recently appeared, Dr. Kern being the author, the preparation of kefir is very simple. The mountaineers make it by filling a bag made of goatskin with milk; then a tenacious mass, of the size of a walnut, of a material which they term "kefir seed," and the precise origin of which is unknown, is added to the milk. In a few hours the process of fermentation sets in actively. When prepared in wooden or glass vessels, the kefir tastes better. After a lapse of twenty-four hours a weak kefir is produced; when the process is allowed to continue for three days, the kefir becomes very strong. The source of the ferment is scrupulously concealed by the Caucasian mountaineers, who, with the humor of the English cook who once sold a secret for making "fundied cheese," the "secret" being that the cheese must be fundied after toasting and before the addition of pepper, cannot be persuaded to enlighten strangers to any greater extent than in supplying a small sample of the ferment, in the form of dry, dark-brown, earth-like masses, but steadfastly refusing to say whence they are obtained. One of these fragments dropped into milk begins rapidly to effervesce, turns milk-white, and assumes the form of a mulberry, then fermentation proceeds at once. If a piece, thus transformed, be dropped into another bowl of milk, it rapidly increases in size, and also causes fermentation. Dr. Kern has carefully examined specimens of this "kefir seed," which consists chiefly of masses of zoogloea, holding together collections of a bacterium which he calls *Dispora caucasica*. The yeast-fungus, *Saccharomyces cerevisiæ*, is always found associated with this new germ. "Kefir seed" retains its vitality after remaining for months in its dry condition. Dr. Kern has a great belief in the future of kefir, which has all the virtues of koumiss, and possesses one great advantage over the latter fluid in that it is just as good when prepared from cow's as from mare's milk.—*British Medical Journal.*

Wood Finish.

The patented preparations known as wood fillers are prepared in different colors for the purpose of preparing the surface of wood previous to the varnishing. They fill up the pores of the wood, rendering the surface hard and smooth. For polishing mahogany, walnut, etc., the following is recommended: Dissolve beeswax by heat in spirits of turpentine until the mixture becomes viscid; then apply by a clean cloth, and rub thoroughly with a flannel or cloth. A common mode of polishing mahogany is by rubbing it first with linseed oil, and then holding trimmings or shavings of the same material against the work in the lathe. Glass paper followed by rubbing also gives a good luster. There are various means of toning or darkening woods for decorative effect. Logwood, lime, brown soft soap, dyed oil, sulphate of iron, nitrate of silver exposed to the sun's rays, carbonate of soda, bichromate and permanganate of potash, and other alkaline preparations are used for darkening the wood; the last three are specially recommended. The solution is applied by dissolving one ounce of the alkali in two gills of boiling water, diluted to the required tone. The surface is saturated with a sponge or flannel, and immediately dried with soft rags. The carbonate is used for dark woods. Oil tinged with rose madder may be applied to hard woods like birch, and a red oil is prepared from soaked alkanet root in linseed oil. The grain of yellow pine can be brought out by two or three coats of Japan much diluted with turpentine, and afterward oiled and rubbed. To give mahogany the appearance of age, lime water used before oiling is a good plan. In staining wood, the best and most transparent effect is obtained by repeated light coats of the same. For oak stain a strong solution of oxalic acid is employed; for mahogany, dilute nitrous acid. A primary coat or a coat of wood fillers is advantageous. For mahogany stains the following are given: 2 oz. of dragon's blood dissolved in one quart of rectified spirits of wine, well shaken; or raw sienna in beer, with burnt sienna to give the required tone; for darker stains boil half a pound of madder and 2 oz. of logwood chips in one gallon of water, and brush the decoction while hot over the wood. When dry, paint with a solution of 2 oz. of potash in one quart of water. A solution of permanganate of potash forms a rapid and excellent brown stain.—*Amateur Mechanics* (*London*).

SIMPLE CAN OPENER.

The engraving shows a very simple form of can opener adapted to all forms and sizes of cans, and capable of cutting out the entire end of the can. The opener is a plain, simple knife, with a lip to rest on the edge of the can, using the can as a fulcrum, as shown in the engraving. It will be noticed that the tool has neither joints nor adjustable parts, and is therefore not a thing to get out of order. Fig. 1 is a side view, Fig. 2 an end view, and Fig. 3 shows the opener in use.

This useful invention has been patented by Mr. Augustus

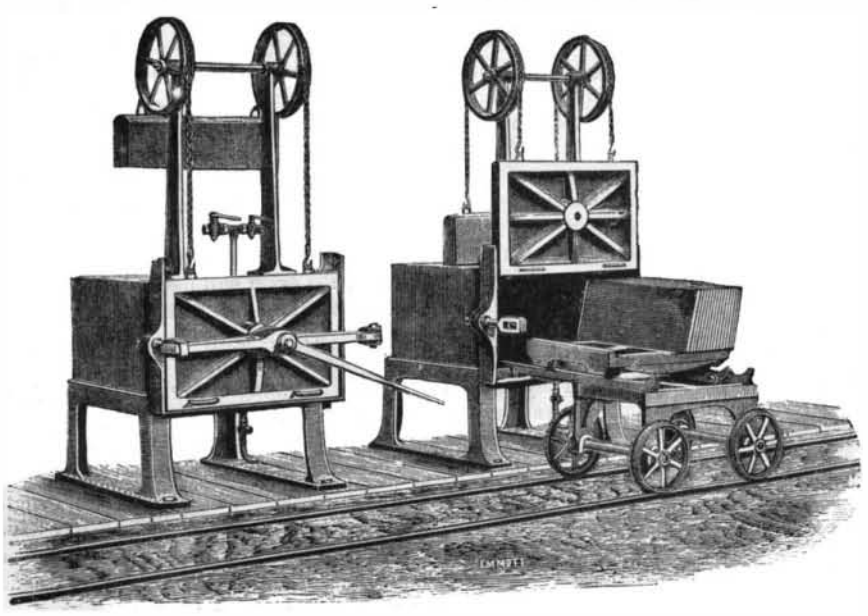
LEAVITT'S CAN OPENER.

J. Leavitt, and is manufactured by the New England Specialty Company, of North Easton, Mass., of which Mr. Leavitt is manager.

STEAM OVEN FOR CLOTH PLATES.

The illustrations given herewith represent a steam oven for use in heating iron plates used by cloth finishers in hydraulic presses. With this apparatus the plates are put inside, and after the door has been fastened steam-tight, steam is turned in and heats the plates to its own temperature. The great advantage of steam heating in this way is that perfect uniformity in the temperature of the plates can be relied on.

The door is balanced and suspended on chains, and opens the oven by lifting vertically in guides. This provides a clear front before the oven, which is not obtained with hinges. The oven, for purposes of strength, is cast from the same mixtures of metal as locomotive cylinders are usually made. To make the joint the faces of the door and oven are planed—a groove being made in the former, to contain an India rubber ring, and a tongue in the latter. The fastening of the door is made very expeditiously by means of the screw through the middle of a forged crossbar, one end of which is hinged to the right hand side of the oven, the other free end entering an eye before screwing up.



STEAM OVEN FOR CLOTH PLATES.

The most noteworthy feature, perhaps, is, says the *Textile Manufacturer*, the adoption of a wagon system of conveying the plates into or out of the oven from or to the presses. This is accomplished as represented in Fig. 2. The rails on the floor run in front of the range of presses, also in front of the range of ovens, and close to all of them.

The wagon that runs on this line carries on rails across its top a smaller carriage, that is usually locked or scotched in position. Upon this upper carriage the plates are piled when coming from the presses. They are then taken to an empty oven, and bridge pieces are laid between the oven and the lower wagon, so as to form rails for the top carriage to be run into the oven with the plates upon it. After heating the carriage the plates are withdrawn similarly. The separate handling of the plate with tongs at the oven is thus avoided, and the whole operation greatly expedited. The longer the plates remain in, up to a certain limit, the more uniformly they become heated, and the better is the finish obtained. It is, therefore, certainly better to utilize the time in heating that in the old plan is occupied in handling the plates.

Cholera.

In view of a possible, but we may still hope not very probable, invasion of cholera, it may be worth while to ask ourselves, seriously and urgently, in what condition will that formidable epidemic disease find us as regards the facilities provided for its rapid extension? In the history of previous epidemics there can be no doubt we may trace the record of progressive limitation and repression by sanitary improvements. The time has now arrived when, with all our light and knowledge, we ought to have no great dread of cholera. It is, in a very special sense, a perfectly controllable *in*fection; we do not say that it is so controllable as an *af*fection. It remains to be seen whether medicine, as a healing art, has discovered any new remedy, or learnt to apply any known and tried, but not perhaps thoroughly understood, principle of therapy in relief of the malady. What, however, we do assert is that medicine, as a preventive art, in its dealings with the germs of disease, ought to be able to grapple instantly and successfully with cholera. We know that it is propagated solely through excreta, and that water is the great carrier of the infective germs. Obviously, if the excreta of a cholera patient are allowed to dry in contact with the air, they may float away in the atmosphere, and the air will then become infected; but in a primary sense it is the water to which we must look.

In any case, it has been demonstrated that, provided all the excreta from a cholera patient are instantly destroyed—not merely disinfected—the disease will not spread. The malady can no more develop *de novo* than a plant can grow without seed. It is no use waiting until the disease has effected a lodgment in our midst. If choleraic dejecta have passed into the sewers before the nature of the disease has been recognized, as is most likely to happen, the seed has been already sown broadcast, and the production of a crop of cases in some locality—it may be seemingly far from the first case, but in connection with it—will be inevitable. The only effectual safeguard against the epidemic we desire to avoid is to begin at once to destroy *all* diarrhœa stools, lest too late they may be found to have been choleraic! As a matter of precaution we ought always to destroy the stools of fever and diarrhœa. It is wanton recklessness to allow them to pass into the sewers. This is how disease is spread and perpetuated, when it should be stamped out. Whatever disinfectant we employ should be used *at once*, and of strength sufficient to accomplish the object in view. These are hints which should be reduced to practice without delay.—*Lancet.*

Small Wastage on a Large Amount of Work.

The annual settlement of accounts of the Philadelphia Mint for the last fiscal year closed July 6. Representatives of the Treasury Department have for more than a week been weighing up enormous amounts of gold and silver on hand, and arrived at the actual loss in the operations of the institution for the period named. The result of the examination discloses the fact that the wastage of gold and silver in the operations of last year were the smallest on the amount of bullion operated upon in the history of the Mint. The total amount of gold bullion operated upon during the past year was $2,210,944\frac{83}{100}$ ounces, equal to 76 tons. The total amount of silver operated upon was $45,591,338\frac{72}{100}$ ounces, equal to 1,563 tons. The gold coinage for the year consisted of $415,486\frac{56}{100}$ ounces, equal to 14 tons, the value being $7,729,982.50. The number of gold pieces struck and issued was 941,680. The total silver coinage issued weighed $10,551,908\frac{88}{100}$ ounces, equal to 362 tons, value $12,325,470.15. The number of pieces of silver coined was 18,798,076. The total minor coins issued weighed $7,315,135\frac{30}{100}$ ounces, equal to 251 tons, value $1,428,307.16. The number of minor coins was 60,951,526.

The legal wastage allowed by law on the gold operated on during the year was $32,018.33. The actual wastage was $20.77, showing the wastage on gold to be $31,997.56 less than the legal allowance. The legal wastage on the silver allowed by law was $57,293\frac{5}{100}$ ounces, equal to $57,293.05, at $1 an ounce. The actual wastage on silver worked was, 809·23 ounces, equal to $809.23, or $56,483.82 less than the legal allowance. In other words, the actual wastage at the Mint upon the operations on the precious metals was $830.12, while the legal allowance was $89,311.38.

INDICATIVE of the enormous prices paid for rare specimens of orchids, at a recent auction sale at Stevens' (London) a single fine specimen of the Cattleya trianæ alba from Brentham Park collection sold for seventy guineas, or more than $400.

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.

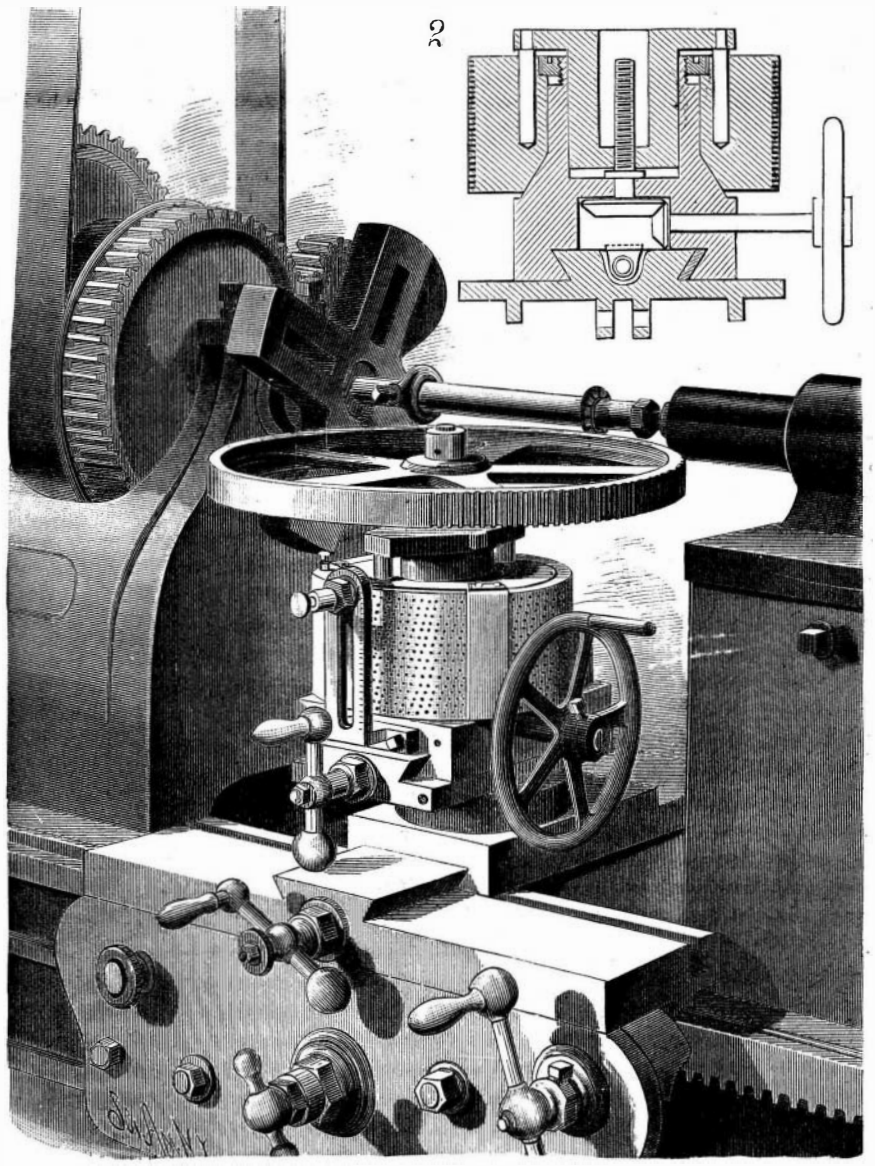
Our engraving shows a very perfect substitute for a complete gear cutter; in fact, when it is applied to a lathe—which is readily and quickly done—the lathe and the attachment together form as complete a gear cutter as can be desired. The gear cutting attachment is mounted in place of the top slide of 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.

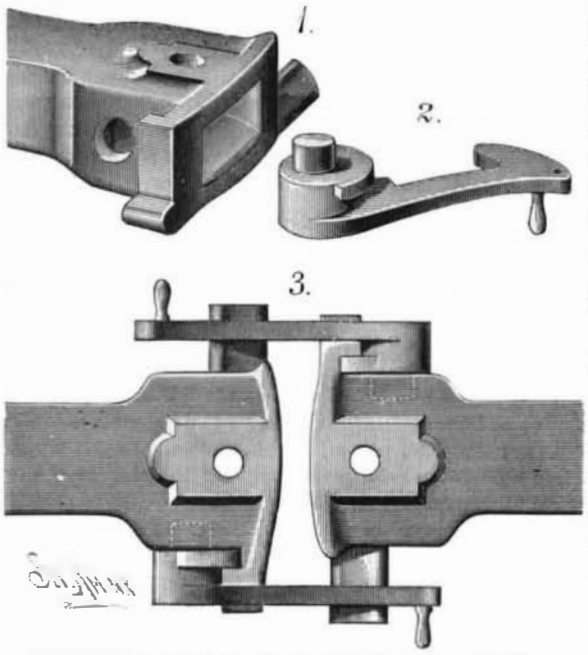


NEW GEAR CUTTING ATTACHMENT FOR LATHES.

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.