

enough at the Pribylov Islands to show that they are thoroughly effective. As soon as the pelagic sealing became lucrative and was allowed, drawing as it did upon the principal of the estate, and thus infringing upon the preserve, the seals rapidly diminished in numbers, and at the present rate, if nothing is done to prevent it, will, without the slightest question of doubt, leave the Pribylov Islands as bare of seals as the lands about Cape Horn.

Tapping the Rock for Water.

Baron Nordenskjöld's system of boring for fresh water through the granite rocks of Sweden has now been in operation for two years. The Geographical Journal says that forty-four wells have been bored. This is not alone a question of finding water, but of the discovery of a new and important principle.

The difficulty in obtaining good drinking water at many of the pilot and light stations on the rocky islets off the Swedish coasts first induced Nordenskjöld to consider the subject. He believed from his researches in Spitzbergen that a horizontal crack would generally be found to exist in all solid rocks at an insignificant depth beneath the earth's surface. Consequently, in the Swedish rocks, he concluded that water would be found by boring to this crack. The only places where there was any prospect of such borings being undertaken were on out-of-the-way rocks and islets, where water was so much needed.

In order to solve the problem, Baron Nordenskjöld, as early as 1885, inquired respecting the saltiness of water in wells or mines near the seacoast, and collected some important information. He was told that several wells, in sedimentary strata, near the seacoast, yielded water free from salt, although the springs are at a depth of 100 to 250 feet below sea level. The information he collected, though far from conclusive, appeared to point to the fact that water obtained by boring on rocky islands would not be salt or brackish, but fresh drinking water.

Nordenskjöld, therefore, proposed to the chief of the pilot stations that he should allow an attempt at boring to be made at some suitable station. The first boring took place in 1891, on the little island of Svängen, south of Kosterfjorden. It was abandoned after reaching a sufficient depth, because a long crack was reached extending from the sea to the boring hole. It was next taken up in May, 1894, by Baron Ruuth, the General Director for Pilots, who, regardless of the unsuccessful boring at Svängen, caused a second experiment to be tried at Arko. The site selected was a flat place near the pilot station, the rock being composed of hornblende, gneiss and diorite. The results were very satisfactory. As soon as a depth of about 100 feet was reached they came to excellent water, yielding 600 quarts an hour. At first the water was a little yellow, owing to the clay in the cracks of the rock, the stone dust and oil from the boring, but it soon became perfectly clear. Water has always been found at a depth of 90 to 125 feet, and similar borings have since been carried out successfully at forty-four different places. At first the water is mixed with the clay from the cracks, the stone dust and the oil from the machine, and it is some time before all the dirty water is pumped away; but soon it becomes as clear as crystal. At Stockholm it has a temperature of about 43° to 45° F.

The boring in hard, close rock would probably have the same results in other countries. Baron Nordenskjöld is convinced that wherever hard, close rock exists, with variations in temperature and not permeable, water will be found in the same way as in Sweden, and in the same quantity, that is, from 600 to 2,000 quarts an hour, with moderate pumping. Sites for such borings could be found, for example, on many parts of the north coast of Africa, in Abyssinia, in South Africa, in Spain, and other parts of the western Mediterranean, at the foot of Mount Sinai, in Greece and Asia Minor, and in the dry watersheds of the canyons of the Colorado. In the tropics, where there are dry seasons, such wells cannot supply water for extensive cultivation. But they will spring forth, free from all bacteria and impurities, and will suffice for household purposes, for small villages and for gardens. The practical importance of Baron Nordenskjöld's discovery entitles it to special attention.

DR. ARTHUR Y. BENNETT, of Erie Co., recently read a paper before the New York State Medical Association upon "Massage as an Occupation for the Blind," in which he called attention to the large and increasing number of blind persons, most of whom are dependent upon others for their support, and said that the estimated number in this country is 56,000, of which 4,398 are in this State. In order that many of these may become self-supporting, he advocates that they be taught massage in the State institutions, being trained in the anatomy and physiology of the body before they learn the practical work. He considers that the peculiar delicacy of touch which the blind possess makes them especially fit for this kind of work.

SPINNING AND BALANCING TRICKS.

BY W. B. CAULK.

The spinning handkerchief is a great favorite with jugglers. A handkerchief is borrowed, thrown in the air and caught on the end of a whirling stick held by the juggler, when the handkerchief spreads out to its full size and commences to rapidly spin around. The secret is that in the end of the stick a needle is inserted about one-quarter of an inch, leaving the sharp end out. When the handkerchief is caught on the end of the whirling stick the needle point passes through it, thus preventing it falling off the stick, which is rapidly whirled around, and the handkerchief will spread out and spin about on the end of the stick.

Jugglers are very partial to tricks performed with eggs, and spinning an egg on its smaller end is a trick they are almost sure to perform. It is impossible to spin a raw egg; so our juggler uses a hard boiled one, and spins it on its small end in a shallow japanned tray. If the tray is kept gently moving in a small circle in

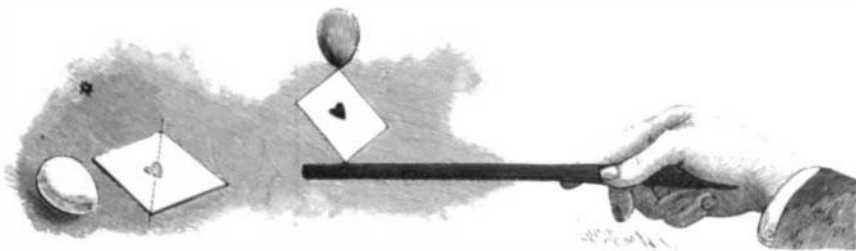


THE SPINNING HANDKERCHIEF.

the opposite direction to that in which the egg is spinning, the latter will continue to spin as long as desired.

The egg spinning trick is usually followed by a balancing trick in which a playing card is balanced upon a small wand, and an egg is then balanced on a corner of the card. This trick usually calls forth a great pretension of skill on the part of the performer, when in reality no skill whatever is required.

The wand is of ebony, or some dark wood, and about three inches from one end is a small hole. The egg is made of wood, painted white, and with a small hole in one end. The card is composed of two cards glued together, with a fine steel wire between them, running diagonally from corner to corner of the card, with the ends of the wire projecting about a quarter of an inch. The prepared egg is on a plate with several ordinary eggs, and the card is placed on a pack of common cards. The wand is held in one hand, the card taken in the other and apparently balanced on one corner on the wand, but in reality the wire point is placed in the hole in the wand. Now the assistant passes the prepared egg to the juggler, who carefully balances it upon the corner of the card, that is, slips the hole in the end of the egg over the wire point projecting from the card. A fitting finale to such a juggling act is that in



BALANCING CARD AND EGG ON WAND.

which a potato is placed on the hand of the assistant and cut in two with a sharp sword, without leaving any mark upon the skin. As a general thing, a second potato is then cut upon the throat of the assistant. This apparently marvelous mastery of the sword always brings forth great applause.

Among the several medium sized sound potatoes on a tray are placed two potatoes prepared as follows: Insert a needle crosswise of the potato near the bottom. After showing the sword to be really sharp, by cutting paper and slicing one or two of the potatoes, the performer picks up one of the prepared potatoes and places it on the assistant's hand; but apparently it does not lie to suit him, so he slices off one side of it, using care to cut away the side just under the needle and as close to it as possible, then places the potato once again on the assistant's hand. After making a few flourishes with the sword, he cuts through the potato, dividing it in half.

In striking the potato with the sword he makes sure that the sword will come exactly crosswise on the nee-

dle; consequently, when the sword reaches the needle it can go no farther, and the brittle nature of the potato will cause it to fall apart, the very thin portion below the needle offering no resistance to the separation. The second potato is then cut in the same manner on the assistant's neck. There are many other false juggling tricks, but the above will suffice to show that "there are tricks in all trades but yours."

Street Washing in Oldenburg.

Undoubtedly one of the best methods of keeping streets clean is that of frequent flushing with water, says The Electrical Engineer, especially when the sewer outlets are so planned as to permit all the solid refuse to be washed out through them along with the water. In many cases, however, the supply of city water does not permit the liberal flow necessary for a thorough flushing, so that this luxury can be permitted only when an excess of water is on hand. The city of Oldenburg, near Lubeck, has provided an independent water supply for the especial purpose of keeping the streets washed, this being one of the numerous sanitary improvements which have resulted from the cholera epidemic of 1892 in the north seaports. In order to avoid the cost of new buildings, the pumping plant is placed in one of the electric stations where space was available, the water being taken direct from the river Hunte, the pumps being driven by belts from turbines. A system of high-service mains, altogether distinct from the regular water supply, is connected with this pumping plant, and a pressure of 65 feet head is maintained by an automatic regulator, permitting the excess of water to be returned to the river whenever the demand is reduced. This high-service pumping system supplies thirty-seven flushing hydrants, placed at such points of elevation as to permit the streets to be cleared by the slope. The hydrants are so arranged that their ordinary discharge is through openings in the curb at the gutter line, but they can also be immediately converted into fire plugs for hose attachment, either for street sprinkling or for fire engine supply. Since the river water at Oldenburg is unfit for household use, the plant above described is available only for the special purposes for which it was planned, but the expense of thus using a local supply of brackish water for purposes of street washing and fire service is so moderate that the method is worthy of consideration in other localities. The entire cost of the Oldenburg plant was less than \$7,000—that is, less than \$200 per hydrant—while the economy in street cleaning alone would soon repay this, after which the cost of operation would be much less than by any other method, not to mention the superior sanitary advantages.

Pneumatic Sleeping Cars.

Sleeping on air is the latest innovation in railway travel, says The Sanitarian. The use of compressed air for this purpose will, in the estimation of railway men, eventually revolutionize railway travel, and relegate the familiar and somewhat clumsy Wagner and Pullman sleeping cars to the background.

At present the only car completely fitted with compressed air cushions and beds is the private car of Vice President J. N. Schoonmaker, of the Pittsburg and Lake Erie Railroad. These have been found, however, to be not only practicable, but to possess so many advantages over the accommodations of ordinary sleeping and parlor cars that a number of roads are having similarly fitted ones constructed, and before long they will be in general use on many of the great trunk lines of the country.

Colonel Schoonmaker's car in appearance does not differ externally from the ordinary private car of railroad officials. The interior by day is that of a handsomely fitted parlor car. The customary chairs are seen on each side of the car, and they are covered with plush. When one sits in them, however, a marked difference is noticed from the ordinary

car chair. This is explained by the fact that, instead of the usual upholstering, the chair cushions are filled with compressed air, which lessens, in a great degree, to the occupant, the jolting and jarring of the car when in motion. During the day no one would for a moment suppose that he was riding in a sleeping car, and it is not until the day coach is transformed into a sleeper that the possibilities of the use of compressed air in this direction are fully realized.

The transformation is effected in this wise: First, the air in the chair cushions is exhausted, the light framework folded up and slipped into an opening in the side of the car. Thus all the seats in the car are disposed of and it is ready for the beds.

The panels on each side of the windows open outward like a door. On the inside of these panels is a metal track, over which is drawn a steel, springlike arrangement which supports the bed. Fitting closely against the sides of the car and concealed during the day by the closed panels is a rubber bag, folded after the fashion of an accordion.

Hard Times and Drink.

It is evident that hard times have contributed to a notable diminution in the use of all kinds of beverages, but particularly spirits. Possibly the bicycle has contributed to decrease the patronage of saloons, but, whatever the cause, the following official figures show that the consumption of alcoholic stimulants has not increased, while the use of the milder beverages has barely been steady.

PER CAPITA CONSUMPTION OF LIQUORS.

	Spirits, Gallons.	Wines, Gallons.	Beer, Gallons.	Total Gallons.
1896.....	1.00	0.26	15.10	16.42
1895.....	1.12	0.28	16.08	16.35
1894.....	1.33	0.31	15.18	16.82
1893.....	1.51	0.48	14.95	18.04
1892.....	1.50	0.44	15.16	17.04

These figures are surprising, in view of a reduction in the use of spirits from one and one-half gallons to one gallon per capita in five years. Naturally, under such circumstances, one looks for an increase in the use of the milder stimulants, but, instead, we find the use of wines has decreased from about one-half to one-quarter of a gallon per capita, while the use of beer has been stationary. Whereas during the five years, 1887 to 1892, it rose from 11.23 gallons in 1887 to 15.28 gallons in 1891, a period of marked prosperity. In 1896, 71,263,000 people used less spirits than 58,680,000 people did in 1887. About 11,000,000 gallons of spirits are used annually in the arts, manufactures and medicine, so that deducting that quantity leaves about 60,000,000 gallons for use as a beverage. Barrooms show an average of sixty drinks per gallon, returning about \$4.50, thus making the nation's whisky bill in 1896, as a beverage, \$270,000,000, while in 1892 and 1893 it averaged \$400,500,000. This decrease accounts for a big loss in revenue, officially reported in 1896 at nearly \$14,000,000 less than in 1893. Foreign spirits are in favor in fashionable circles, and yet the importations in 1896, while heavier than for the four preceding years, were lighter than in 1890 or 1891.

Beer disputes with coffee the claim to be the national beverage. Twenty years ago the per capita consumption of beer was less than one-half of what it is to-day, or six and one-half gallons, against fifteen gallons in 1896. During the prosperous years 1891 and 1893 the consumption reached its maximum, rising in 1893 to 16.08

gallons, since which date it has fallen off about one gallon per capita, averaging for the three years ending with 1896 fifteen gallons per capita annually. Hard times and bicycles explain this decrease in the use of malt liquors. On the basis of 50 cents per gallon for domestic beer and \$1 for imported beer, as the cost to the consumer, we have a total expense for that item in 1896 of \$541,963,348. It is very evident that Americans are not given to a free use of wines. The consumption of domestic wines in 1896 was less than one-half the quantity used in 1888, leaving out of question an increase in population of 12,583,000 people. Less imported wines are used than formerly. In 1883 the importations were more than double those in 1896, and over 1,500,000 gallons less than in 1893. The figures ought to encourage the friends of temperance, although they may be discouraging to the wine industry of the United States. Assuming that domestic wines cost the consumer \$2 per gallon, the nation's bill in 1896 for that item was \$29,199,514. The importations of that year were valued at the custom house (plus duties) at \$10,265,465. Allowing 100 per cent profit to distributors, the cost of foreign wines for the year 1896 was \$20,530,930, which, added to the cost of domestic wines, makes the nation's wine bill for 1896 \$49,730,444.

Bringing the above items of the cost of alcoholic beverages together, we have the following as the drink bill of the American people, so far as alcoholic stimulants are concerned: Beer (domestic), \$538,662,857; beer (imported), \$3,300,531; whisky (exclusive of quantity used in arts), \$270,000,000; wines (domestic) \$29,199,514; wines (imported), \$20,530,930; grand total, \$861,693,832; estimated cost in 1892 on the same basis, \$1,000,884,277; estimated cost in 1891 on the same basis, \$934,813,314. Is not the above full of encouragement to advocates of temperance? There is a wonderful decrease in the use of ardent spirits and wines and no gain in the use of beer. A comparison of the ten years' record indicates that good times foster the use of alcoholic stimulants. If we study the tables showing the consumption of non-alcoholic stimulants, we find the same conditions governing their use. Measured by the number of gallons of the beverage consumed, coffee ranks next to beer as a popular beverage. Assuming that one pound of coffee makes two gallons of infusion, we have a year's consumption of 962,088,692 gallons at a cost of

\$120,261,086. The per capita consumption of tea does not increase; in fact, is less than it was twenty-five years ago, when it averaged one and one-half pounds, against one and three-tenths pounds in 1896. The import cost of the tea received in 1896 was \$15,585,741. The retail cost was at least double this, or \$31,171,482. It is safe to say that one pound of tea as ordinarily brewed will make five gallons of beverage, on which basis there was in 1896 a total consumption of 466,701,240 gallons, costing 62 cents per gallon, thus making tea the cheapest of all beverages in general use. The 1896 imports of crude cocoa, leaves and shells amounted to 23,276,597 pounds, valued at \$2,387,078. A large part of this is used for confectionery and other purposes than as a beverage, but it is safe to estimate that the retail cost of the chocolate and cocoa used as a beverage does not exceed \$3,000,000.

Bringing the above items into one group, we find that the United States consumed in 1896 alcoholic and non-alcoholic stimulants to the value of \$1,016,126,400, as follows: Alcoholic drinks, \$861,693,832; non-alcoholic stimulants—coffee, \$120,261,086; tea, \$31,171,482; cocoa, \$3,000,000; total, \$1,016,126,400. The above represents a yearly per capita expenditure for beverages of \$14.31 for the 71,000,000 inhabitants of the United States, or 4 cents per day. Evidently hard times have cut down the appetite for beverages of all kinds, and render distilleries hazardous industries. Breweries and coffee mills are far better property. The statistics above have been secured by The American Grocer.

Necessity of Cover During Sleep.

The object is simply this: Nature takes the time when one is lying down to give the heart rest, and that organ, consequently, makes ten strokes less a minute than when one is in an upright posture. Multiply that by sixty minutes and it is six hundred strokes. Therefore, in eight hours spent in lying down the heart is saved nearly five thousand strokes, and as the heart pumps six ounces of blood with each stroke, it lifts thirty thousand ounces less of blood in a night of eight hours spent in bed than when one is in an upright position. As the blood flows so much more slowly through the veins when one is lying down, one must supply then with extra coverings the warmth usually furnished by circulation.—Popular Science News.

RECENTLY PATENTED INVENTIONS.**Engineering.****REVERSIBLE ROTARY ENGINE.**—

George W. Smith, Petersburg, Ill. The cylindrical body of this engine has sets of inlet channels arranged diametrically opposite each other, the abutments for each set being formed with angular ports, those of one set standing in an opposite direction to those of the other set. A piston turning in the cylinder has piston heads against which the motive agent acts, and a reversing valve connects either set of channels with the motive agent supply, so that by merely shifting the reversing lever the engine can be rotated in either direction. The engine is designed to be of simple and durable construction and very effective in operation.

GAS ENGINE.—Clinton Guyer, Muncy,

Pa. This invention provides a construction according to which the speed of the engine is fully under the control of an automatic governor, the engine taking only such charge of gas or gasoline as the work requires, and the gas and air being admitted in proper proportions. A combustion cylinder in which are sparking devices communicates with the piston cylinder, a mixing cylinder communicating with the combustion cylinder, and a gasoline container having a valve-controlled communication with the mixing cylinder. There is an air-controlling valve on the mixing cylinder and a valve-controlling shaft operated by the crank shaft, a cam on this shaft engaging a fulcrum lever having connection with the valve in the gasoline container, there being means for regulating the throw of the valve.

INCREASING EFFICIENCY OF COMPRESSED AIR.—John McIntyre, Jersey City, N. J.

Instead of heating compressed air as heretofore, previous to its entering the motor, this invention provides an apparatus comprising a casing in which is a combustion chamber and a vapor chamber, both having their bottoms in free communication with a condensing liquid, there being a valved igniting chamber connected with the top of the combustion chamber, and the products of combustion passing through the liquid to reach the vapor chamber, an outlet pipe from which connects with the motor. The motive agent thus produced is of the same volume as the compressed air originally supplied, but its heat units and moisture are considerably increased at but slight expense for the oil or gas used.

SAFETY STOP FOR HOISTING ENGINES.

—James E. Richards, Calumet, Mich. In raising and lowering cages in mines, this invention provides a safety stop to automatically control the admission of the motive agent, the brake mechanism and the reversing lever, in case the speed of the engine is not checked before the cage reaches the landing. A screw rod on which travels a nut is driven from the engine in unison with the movement of the hoisting cable, and a tripping arm is adapted to be raised by the nut and moved in engagement with the governor or other movable part driven from the engine, the tripping arm controlling a device connected with the admission valve, the brake mechanism and the reversing lever.

HOISTING APPARATUS.—William J.

Webster, Oakdale, Pa. This is an improvement in apparatus for use in connection with the drilling of wells, there being a continuously driven shaft and means by which the hoisting drum may be readily thrown in and out of gear with the shaft. Two aligned shafts are ar-

ranged in stationary bearings, one of the shafts being slidable in its bearings, and clutch members are carried by the contiguous ends of the shafts, to be engaged and disengaged by the sliding movement of the slidable shaft. Means are provided for so sliding one shaft, and on this shaft and moving with it is a brake collar to engage one of the bearings upon the disengagement of the clutch members.

GENERATOR.—John O. Morris, Rich-

mond, Va. This is a device to be arranged in the ash pit door, to supply mixed steam and oxygen under the grate bars of the furnace. The entering flue has a funnel-shaped outer mouth through which a supply of air is drawn, and in one side of this funnel is a steam jet nozzle, while in the flue, in the rear of the nozzle, is a mixer, composed of wheels arranged to be acted on and turned by the steam. Three wind wheels are used in the flue, arranged in a manner to efficiently draw in the air and mix it with the steam to most effectively promote combustion.

CONDENSER.—Albert Hoberecht, En-

sauada, Mexico. For condensing the vapors from steam or other generators, this invention provides an apparatus in which the condensing chamber may have baffle plates, air circles and side draught flues, a vapor drum encircling a cold air pipe in the condenser proper, to which leads an air inlet pipe, while a vapor pipe leads from the drum into the air inlet pipe. A graduated siphon nozzle enables the operator to readily control and regulate the passage of vapor to the condenser proper, according to the pressure indicated by the gage or the discharged products of condensation.

Railway Appliances.**REFRIGERATOR CAR.**—Andrew J. Mc-

Arthur, Gainesville, Fla. This car has an interior casing, affording air spaces at the top, bottom and sides, and arranged in the sides are woven wire ice receptacles to be filled from openings in the car roof. Coiled pipes have communication with the ice receptacles and siphon pipes connected with the coil pipes lead through the bottom of the car, drip pipes connected therewith being extended upward and downward. The arrangement is such that the pipes may be easily and quickly cleaned, while the cold air will be evenly distributed throughout the car, rendering it especially advantageous for the transportation of meats and other perishable articles.

CAR COUPLING HOSE HANGER.—Ben-

jamin S. McClellan, New Orleans, La. This invention relates to a former patented invention of the same inventor, providing for the holding in proper position of the coupling ends of the uncoupled hose, preventing it from kinking and cracking, and sealing the opening to exclude dirt, etc. A chain, connected to the under side of the car coupling, is attached to a clamp on the free end of the hose, and on the clamp are bearings for a bolt forming a pivot for a lever carrying a conically shaped valve adapted to engage a gasket in the open end of the coupling member when the latter is disengaged from the other member, whereby the coupling member will be automatically closed when the members are disengaged.

Electrical.**TELEPHONE TRANSMITTER.**—David

A. Fleming, Indiana, Pa. According to this invention the

pressure upon the diaphragm and the distinctness of transmission are designed to be regulated with great nicety by a novel pressure or tension device. A tube or channel is mounted to turn adjacent to the diaphragm and inclined relatively to the axis of rotation, the tube being mounted to turn without affecting the fastening of the diaphragm, while loose conducting material, such as carbon or metallic balls, is placed in the channel to engage the diaphragm. The construction affords means of simple and ready adjustment for obtaining the required pressure on the diaphragm.

POTENTIAL REGULATOR FOR DYN-

amos.—Allen A. Tirrill, Whitefield, and Phill S. Tirrill,

Groveton, N. H. This governor provides for automatically regulating the voltage on the supply wires, to always maintain an even potential under the varying demand from the starting and stopping of motors or the throwing in or cutting out of electric lights, etc. It consists of two vertically arranged solenoids, the cores of which are loosely connected to each other and to a pair of levers, there being a spring for pulling down the inner ends of the levers, and two contact points, one carried by the levers and the other by an adjusting screw. The invention is distinguished by the means provided for balancing the solenoid core and adjusting the sensitiveness of the contacts of the field magnet shunt, which is very necessary to the automatic regulation of the potential.

TROLLEY GUARD.—Heridan J. Vogler

and Alfredo Flores, San Antonio, Texas. A pair of spring-held but yielding guards, according to this invention, is arranged one on each side of the trolley wheel, the guards being bowed or loop-shaped and hung on the axle of the trolley wheel. The guards hold the wheel on the wire but yield in passing under the cross supporting wires without damaging the latter. The guard may be used with the ordinary trolley pole, and works equally well in going either forward or backward.

Bicycles, Etc.**AIR PROPELLED BICYCLE.**—David A.

Moore, Harvey, Ill. This wheel has no chain or other gear, the pedals being used to operate an air pump, the air compressed by which is conducted to a specially constructed rotary engine arranged about the center of the rear wheel. To each side of the frame, near the saddle, is pivoted the upper end of an air pump, a flexible tube from which leads to the motor, while the lower end of the piston rod, at its junction with the pedal, is jointed to a swinging arm which vibrates about a rear coupling pivoted to the frame, the pump cylinders also swinging about their pivotal connections with the frame at their upper ends.

BICYCLE HANDLE BAR.—Joseph D.

King, Menominee, Mich. To facilitate adjusting the handle bars of a machine to suit the convenience of the rider, and locking them in such position against accidental release and change, a construction is provided by this invention according to which an annulus at the upper end of the stem has interior locking teeth adapted to be engaged by dogs, in connection with a thimble and interior tube connected with the two handle bars, the dogs being attached to toggle links from which a connection extends to a spring-pressed thumb lever on one of the handle bars. The handle bars may be readily adjusted when the machine is in motion.

BICYCLE TOE CLIP.—Samuel Halligan,

Perth Amboy, N. J. This invention provides a pedal clip in which a body portion connected with the return section is weighted, there being means for conveniently adjusting the clip on the pedal. When the clip is in position on the pedal it automatically assumes and maintains a horizontal balanced position, enabling the rider to quickly locate the toe in the clip, and the entire device is simple and inexpensive.

Mechanical.**RATCHET DRILL.**—Jacob Racich, New

York City. The mechanism of this drill is adapted to rotate the drill while the handle is being moved in either direction, and is of greater power than that ordinarily employed. An operating lever is pivoted at one side of the axis of the drill, double pawls being pivoted on opposite sides of the center line of the lever, threaded sleeves engaging the drill socket and a back pressure foot, and a toothed feed wheel being connected to the latter. A telescopic rod is connected to the handle and the back pressure foot, a slotted arm being carried by the outer section of the rod, and a pawl adjustably pivoted in the slot engages the feed wheel. The drill may be set at the feed desired, considerable variation in which is provided for.

SAWING MACHINE.—Anderson W.

Brown and James Meiklejohn, Rhinelander, Wis. These inventors have devised a machine designed for sawing down trees and for sawing the logs into desired lengths. The saw carrying frame is adapted to swing on the bearings for the operating shaft, which may be rotated by hand or other power, such shaft standing vertically to saw down a tree and the saw being formed of sprocket links constituting an endless saw passing over sprocket wheels carried by the frame. The saw being held horizontally, the forward run cuts into the tree, the feeding being effected by swinging the frame inward, while to cut a felled tree into lengths the frame is swung downward to bring the lower run of the saw into engagement with the log.

SQUARE, PLUMB AND LEVEL.—William

Moore, Long Island City, N. Y. This is a combination tool for the use of bricklayers and masons, the tool being so constructed that it is possible to use it upon work which is out of the perpendicular, for leveling purposes, it being provided that an arm may be projected from the body of the tool at any desired angle and held in the position to which it is adjusted, the arm, together with the body of the tool, when one is at right angles to the other, constituting a regular carpenter's square.

PIPE COUPLING.—Edward J. Mallen,

New York City. For pipes having flat sides, more especially, this coupling is designed to firmly connect the ends of the pipe sections to form a stiff airtight joint and give an ornamental appearance to the pipe. The invention consists principally of a strip of sheet metal having near its middle a pocket for the reception of a filling, preferably of wood, the ends of the strip being adapted to be engaged by the sides of the pipe and the inner sides of the pockets, which form receiving grooves for the ends of the pipe to be jointed.

Miscellaneous.**LITHOGRAPHIC COLOR PRINTING.**—

Louis C. G. Lesage, Paris, France. In order to facilitate