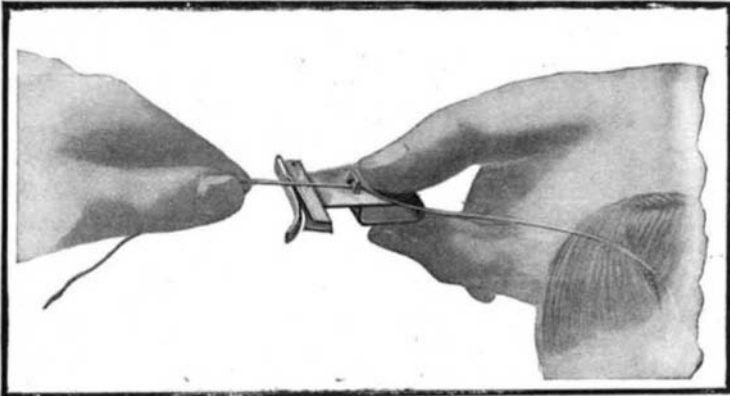




#### AN IMPROVED TWINE CUTTER.

A recent patent describes a very simple device which is adapted to be carried at the free end of a ball of twine and may be used for cutting the twine when it is desired to sever a length from the ball. The device is provided with a simple clamp by which it is held fast to the twine, thus preventing accidental separation therefrom. However, the clamp may be easily operated to release the twine when it is desired



AN IMPROVED TWINE CUTTER.

to pass a fresh length therethrough or remove it entirely from the ball. The accompanying engraving illustrates the twine cutter. It consists of a sheet-metal body of T-shape. The forward edge of the T-head is bent downward and is partly cut free of the rest of the head. The free end is bent outwardly and forms a guard for a knife blade, which is secured to the under side of the T-head. A pair of tabs projecting from the rear of the T-head are bent under and against the knife blade, to hold it in place. At the opposite end the sheet metal body is reversely bent upon itself to form a spring finger-piece, the extremity of which is reduced in width and passes upward through a slot in the main body. This extremity is bent upon itself and is formed with an aperture through which the twine is passed and which is normally drawn by the spring finger-piece below the upper surface of the body, thus pinching the twine and clamping it fast. In use when it is desired to sever a length of twine the spring finger piece is pressed to release the twine, and the latter is drawn through the aperture until the required length extends beyond the knife blade. The spring finger-piece is then released to again clamp the twine, after which the twine is cut by drawing it between the guard and the knife blade. The inventors of this novel twine cutter are Messrs. G. R. Patterson and W. E. Moen, of 3918 South 16th Street, Red Jacket, Mich.

#### ADJUSTABLE TENSION RODS FOR PIANOS.

To the compositions of Beethoven we owe the first improvements which raised the piano from its humble position as a modified clavichord to the present highly-developed instrument. In order to keep up with the pace set by the great composer, manufacturers found it necessary to increase the compass and the power of the piano. The sounding board was improved, the range was lengthened, heavier wires were used, and

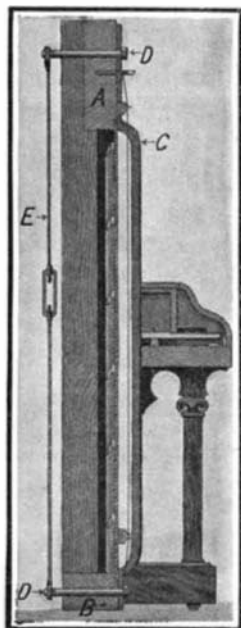


ADJUSTABLE TENSION RODS FOR PIANOS.

more strings per note. But here a difficulty was encountered. The combined tension of the piano strings was so enormous, that the frame could not bear up under the strain. Various devices were employed to remedy this defect, and eventually, in 1825, a cast-iron frame was for the first time used to support the wooden frame and prevent it from crushing.

This practice is still in vogue. The wrest pins are not supported directly by the iron frame, but are driven into the wooden frame through openings in the iron plate. Hence the tension of the strings is still imposed directly upon the wooden wrest plank and bottom plank, while the cast-iron frame acts merely as a support for these planks. However, this support is only at one side of the planks, and consequently serves merely as a fulcrum for the wrest pins, which, with their outer ends under the enormous tension of the piano strings, exert a lifting force on the unsupported part of the wrest plank. In most pianos made to-day the wooden frame is braced by a series of posts glued to the wrest and bottom planks, composed of end wood pieces; but this is inadequate, as a moment's consideration will show, for the effect of the string tension at the front of the cast-iron frame is to exert a tension between the planks at the other side of the iron frame. Obviously, wooden posts, which are best adapted to resist compression, will not suffice to counteract this tension. What is needed then is a series of tension members, and this is provided by the recent invention of Mr. T. J. Howard, of Toronto, Canada, who has assigned his patent rights to the Newcombe Piano Company, Limited, of the same city. The accompanying engraving illustrates the Newcombe construction. The wrest plank shown at A and the bottom plank at B are supported by upright posts at each end, and also by a center post mortised into the top and bottom planks; in itself an improvement on the old method of gluing end wood pieces. The cast-iron plate indicated at C acts in the usual manner to brace the wooden frame against the tension of the strings, whose lower ends are looped over studs on the iron plate, and whose upper ends are secured to pins driven into the wrest plank. The cast-iron plate is secured to the wooden frame by means of tie bolts D, which pass through the bottom and wrest planks. To the rear ends of the tie bolts the tension members E are secured. These consist of steel straps arranged in pairs of opposite members, respectively connected to the top and bottom tie bolts. The adjacent ends of each pair are threaded and connected by means of a turnbuckle. The turnbuckle may be adjusted to exert sufficient tension on the top and bottom planks, to counteract the tension of the strings.

Owing to the short leverage on which the piano strings exert their tension, it may at first seem as if the use of tension rods were an unnecessary precaution. But this is far from being the case, as experience has shown. For example, the total pull of the bass strings on a standard Newcombe piano is 7,980 pounds, while the treble strings exert a tension of 30,246 pounds. The combined pull resolved in the vertical direction amounts to 37,080 pounds, or 18½ tons. It has been calculated that with a piano back 7 inches deep, the leverage is sufficient to produce a strain of 3,075 pounds on the tension rods, and by using three tension rods of ¾-inch diameter, this strain is satisfactorily withstood, or by using heavier tension rods, the depth of the piano back can be safely reduced. In the new construction the usual heavy

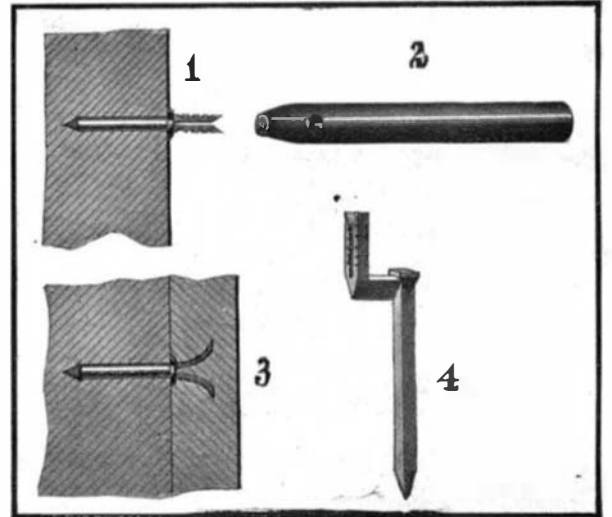


posts at the back of the piano are dispensed with, giving a more open and efficient soundboard. As the wooden frame is kept in shape by the tension rods, the soundboard will also retain its crown or convex form, thus preserving the tone of the piano. It will be noted that the invention is not a radical breaking away from recognized principles of piano building, but an extension of a principle already used in many ways, where extra strength or resistance is needed.

Polishing Paste.—Melt together 2 parts of paraffine and 6 parts of lubricating oil; then mingle with 8 parts of infusorial earth 1 part of oleic acid and a few drops of oil of mirbane are to be added.

#### A NOVEL FORM OF NAIL.

A novel type of nail has recently been invented by Mr. Charles A. Birdsall, of Holden, Mo., for use with all kinds of woodwork where a smooth finish is desired. The body of the nail is of the usual form, but the head is provided with a pair of prongs which are adapted to be driven into a piece of wood to bind it to the timber in which the main body is imbedded. The form of the nail is clearly illustrated in Fig. 1, which shows the body of the nail driven into a timber. In order to drive the nail home without bending or injuring the prongs that project from the head, a special tool is employed, which is illustrated in Fig. 2.

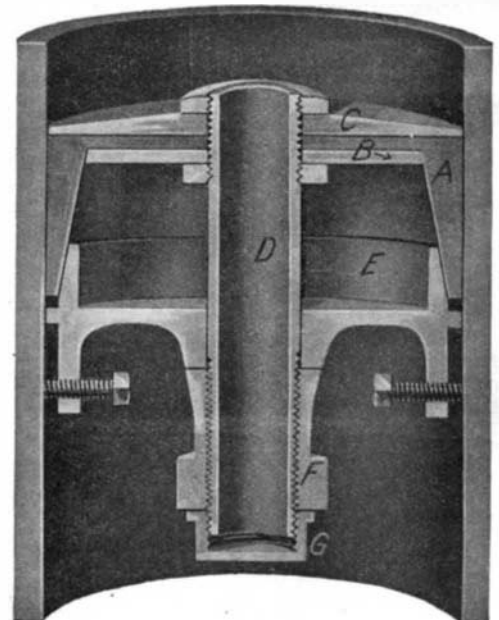


A NOVEL FORM OF NAIL.

This consists of a punch formed with a recess in one end adapted to receive the prongs. This recess is centrally divided by a cross-plate which is adapted to fit between the prongs. A transverse aperture in the punch communicates with this recess, enabling the latter to be kept clean and also serving to indicate to the workman when the prongs are set in the right position for the grain of the wood which is to be engaged by them. After the body of the nail has been driven home with the aid of the punch, the second piece of timber is applied to the head of the nail and hammered into contact with the first piece. The prongs are thus forced into the second piece and, due to the fact that they are outwardly beveled at the ends, they spread apart to the position shown in Fig. 3. The two pieces are thus securely clenched together and the prongs, being scored on their outer faces, positively prevent the separation of the parts. Fig. 4 illustrates a modified form of nail, in which the prongs extend from an offset, thus permitting the body of the nail to be driven into the timber without the use of a special tool to hold the prongs.

#### PIPE STOPPER OR TEST PLUG.

The accompanying engraving illustrates a device for temporarily stopping or closing soil pipes and the like, to permit of testing them. The plug is so designed as to insure an absolutely tight closure, and yet permit it to be quickly applied to or removed from the pipe when desired. A rubber cup A is used, which is braced by a pair of clamping plates, B and C, lying on opposite sides of the bottom of the cup. The cup is mounted on a tubular stem D, being secured thereto by means of jam-nuts threaded onto the stem and bearing against the opposite clamping plates. It will be observed that the inner side walls of the cup are tapered, and co-acting with them is a correspondingly tapered expander E. The latter is loosely mounted on



PIPE STOPPER OR TEST PLUG.

the stem, but is adapted to be driven home by means of an operating nut *F* that is threaded upon the stem. The expander is provided with lugs at each side, which carry setscrews adapted to be screwed into engagement with the pipe after the expander has been adjusted to proper position. A cap *G* serves to close the end of the tubular stem. In applying the plug to a pipe, the cup *A* is first inserted, after which the expander is mounted on the stem and, by operating the nut *F*, forced into the cup, causing the latter to engage the walls of the pipe so firmly as not only to insure a hermetic connection, but also to avoid the possibility of the cup being thrown out of the pipe by the pressure therein. The setscrews will then serve merely as an additional precaution against dislodgment. To aid in centering the expander when it is introduced into the cup, a flange is formed on its periphery which lightly engages the inner walls of the pipe. A patent on this test plug has just been granted to Mr. A. Redenbaugh, of Brown Street and Allegheny Avenue, Allegheny, Pa.

#### Brief Notes Concerning Inventions.

A new type of rifle sight and wind gage has been brought before the British military authorities. It is the invention of the Australian government architect, and is already in use in Australia. With this appliance greater certainty in marksmanship can be assured. With the existing system of sighting, in the excitement of firing the marksman is liable to move on his vernier scale either more or less divisions than his commanding officer instructs, with the result that his shot becomes useless. With this new appliance, however, every time the soldier moves the governing screw of his scale to mark one "vernier," a slight click is emitted by the sight, thereby indicating that the scale has been moved, a similar click being made for every revolution of the screw corresponding to one division of the scale. When the sight clicks as the result of a turn of the screw, it becomes locked and cannot be moved until the marksman alters the screw. Thus on the command "two to right" or "four to left," the soldier turns the screw in the required direction until he has heard the sight click twice or four times as the case may be. Moreover, the soldier

can always tell immediately when his rifle is upright, as the "ladder" sight in this device is always vertical. In allowing for wind force, too, the marksman need not twist his rifle in the slightest. Instead, by turning the screw the ladder containing the V sight is moved until the "barleycorn" at the end of the gun barrel is in the correct position. One feature of the device is that it can be easily and quickly removed when desired, its removal rendering the rifle useless, while the sight is not liable to damage when on the march, being carried in a small case in the pocket. The efficacy of the instrument, and its influence upon more accurate shooting, have been strikingly demonstrated by the results of the Victorian Rifle Association, whose aggregates since the adoption of the sight have been higher than before.

When the Prince of Wales visited a block of artisans' tenements that had been erected by the municipal authorities of one of the London boroughs, he suggested that an immense advantage might be bestowed upon the tenants by designing a range the fire in which could serve for either or both of two adjacent rooms, thereby dispensing with the necessity and expense of maintaining two fires, which is at present incurred, the range being requisite for the cooking of the meals and the other for the living room. The Prince's suggestion was accepted by the architect, Mr. C. S. Joseph, who has now succeeded in designing a double fireplace especially for the equipment of such dwellings for the laboring classes. The invention is of a simple character. In the division wall separating the living room from the kitchen one flue is placed, and the fire grate comprises two combined grates, the one being of the ordinary open type for the living room, and the other a closed range for cooking and heating purposes. The combined grate is divided by a shutter which slides up and down in the center between the two sections of the grate. If a fire is desired only in the range or open grate the shutter is lowered, thereby shutting off the unrequired section; if the fire is required in both rooms, then the shutter is left open. Should the fire be required only in the open grate, the shutter is raised upon the completion of cooking. By a simple movement the fire burning in the range can be discharged into the required open

grate, and the dividing shutter again lowered. The arrangement for operating the shutter is simple, and can be easily manipulated from either of the two rooms. The successful embodiment of the royal idea has resulted in still another useful boon for tenants. The stove has been provided with a small boiler, by means of which a supply of hot water can always be maintained, whether the fire is burning in the open grate or range. This enables each tenant to have a bath fitted with both hot and cold water in his own tenement, instead of using the facilities for this purpose that are provided in one quarter of the building for all the tenants. For economizing space the bath has been provided with a portable cover, so that it may be used as a table. The invention has been greatly appreciated by the tenants of the buildings, and it will be generally adopted for all future tenements.

A new type of telegraph receiver has been devised by Mr. Ernest Oldenburg, a well-known English electrical engineer, the most noticeable feature of which is its extreme sensitiveness, the faint impulses of a pocket battery being easily detected. This receiver, to which the name "capilliform" has been given, is based upon the capillary action of mercury in a vertical tube under the influence of electric impulses, on somewhat similar lines to the capillary receiver employed in the Orling-Armstrong system of low-tension wireless telegraphy. The influence of an electric current upon the surface tension of mercury, and consequently the form of its meniscus, has long been known, and the success of the "capilliform" receiver as devised by Mr. Oldenburg depends upon the ingenious methods he has adopted for magnifying the impulses, and contriving the device in such a way that it can be utilized as the receiving instrument of an ordinary telegraphic installation. It is anticipated that the instrument will be of great utility for those phases of work where a delicately sensitive receiver is required, more especially in connection with submarine and etheric telegraphy, since it responds to far fainter currents than any appliance at present in vogue, a small fraction of a volt being quite sufficient to operate the instrument. Moreover, the complete apparatus is confined within such small limits that it can be carried in the pocket.

#### RECENTLY PATENTED INVENTIONS. Pertaining to Apparel.

**SAFETY-PIN.**—R. DOUGLAS, New York, N. Y. One purpose in this invention is to provide a construction of safety-pin whereby the device may be turned end for end, taking the material from the pin or thrust member thereof onto its body member, thereby preventing the device from leaving the material even should the pin or stick member leave the head of the device, since when the latter is reversed it cannot be withdrawn unless returned to its initial position.

**HOSE-SUPPORTER.**—L. C. STUKENBERG, Browns, Ala. One of the objects of this improvement is the provision of means to support the hose at diametrically opposite points, especially avoiding the use of metal or other parts that would be uncomfortable to the wearer. It keeps the sock smooth and tight around the leg, ankle, and foot.

#### Of Interest to Farmers.

**MUD KNIFE AND SHIELD FOR HARVESTER-WHEELS.**—W. D. TAYLOR, Hartford, Kan. The invention consists of a knife-blade disposed adjacent to the edge of the wheel-tread and parallel to the vertical plane of the wheel and a shield projecting laterally from the knife to prevent mud, straw, or trash being carried upwardly by the wheel and also to prevent these materials being carried above the knife and deposited on the driving mechanism of the harvester.

**COMBINATION INCUBATOR AND BROODER.**—VERONICA HARTNETT, Sutton, Neb. In the operation of this invention when the chicks commence to hatch the brooder is placed in position on the incubator and the chicks as hatched removed thereto, thus utilizing all the waste heat from the lamp in warming the brooder. The heating pipes are arranged above the egg-trays, and in the brooder the heating-pipes are above the chicks. Space between the walls of the boiler provides a dead-air space, thus diminishing the loss of heat by radiation from the boiler-walls.

**GRANARY.**—E. G. WARE, Emporia, Kan. The object here is to produce a granary, which is formed of a plurality of matched parts which may be quickly assembled to form the complete structure or disconnected if the structure is to be moved to another place. While the granary is in its nature portable, a further object of the invention is to construct the parts so that it may readily have its capacity adapted to the particular requirements under which it is to be used.

#### Of General Interest.

**RANGE-FINDER.**—H. C. PERCY, Natchitoches, La. This patentee employs in connection with a sighting telescope means for computing the sides of a triangle having a known

base line. This consists of a triangular frame having a base line adapted to be brought into coincidence with the known base line, the sides of the triangle being movable into positions corresponding to those of the triangle with respect to the known base line. In connection with the frame there is provided a bar for computing east or west departures, the bar being arranged parallel to the base line with its center in line perpendicular to the center of the base line; graduations each side of center indicating east and west departures.

**ILLUMINABLE SPECULUM.**—R. H. WAPFLER, New York, N. Y. The invention is more particularly employed for examining cavities in various parts of the human body. It relates to means whereby focal range of the cystoscope is modified in such manner that the particular length of the tube used for the sight barrel may be varied to suit different conditions and whereby the clearness of the image brought to view is greatly increased.

**FENCE-POST AND SOCKET THEREFOR.**—W. L. WELCH, Jamaica, N. Y. The post proper is particularly intended and adapted for use for attachment and support of clothes-lines, and the latter may be conveniently secured to or hung upon the cross-bar of the post proper. It is an improvement in that class in which the post proper is supported in a metal or other socket fixed in the ground by cement or otherwise.

**CLOSURE FOR BOTTLES, ETC.**—J. W. HULL, San Antonio, Texas. The object in this case is to produce a simple, cheap, and efficient closure which can be readily applied to the bottle and which cannot be removed without evidence of such fact. Owing to the ductibility of the metals used and the different relative thickness of the edge and body of the stopper, the stoppers can be readily locked into the groove in the bottle-neck and form a hermetic seal at that point.

**WELL-BUCKET.**—J. F. HOLMAN, Neosho, Mo. A drilled well-bucket is employed of special construction at each of its ends, by which the same is prevented from encountering any part or parts of the joints between the superposed sections of the lining of a well either in lowering the bucket within or elevating the same from the well. It is constructed entirely of a single piece of metal or other suitable material, and formed to work in a well without hindrance or obstruction to its movements up or down.

**STEP-LADDER.**—H. B. FORBES, Ogden, Utah. The invention consists of novel sheet-metal brackets forming the union between the ladder-steps and its front legs, combined with a sheet-metal bracket for connecting the upper ends of the legs with the top board, also affording means to which the rear legs of the ladder are pivoted. The front and rear legs are adjustably connected together by strips, adapting the legs to be folded when not in use.

**CALENDAR-CHART.**—J. B. LINDSEY, Lockwood, Mo. The purpose of the invention is to provide a calendar device or chart so arranged that the number of days from a given date to any other date in the past or future and maturity dates can be readily and expeditiously found and accurately read in days. Twelve charts or leaves are provided and attached to the board in such manner that they may be removed when desired.

**WINDOW.**—S. U. BARR, New York, N. Y. In the present invention the object of the patentee is the provision of a new and improved window which is simple and compact in construction, completely air-tight and dust-proof, and arranged to permit the convenient opening or closing of the sash. By the arrangement of the packing warping of the sash is avoided.

**ATTACHMENT FOR HORSESHOES.**—J. W. BUCK, New York, N. Y. Mr. Buck's improvement relates to an attachment for horseshoes, the principal objects thereof being to provide means for preventing slipping, said means being attachable over an ordinary horseshoe, and to provide means for securing it properly in position and adjusting it upon the hoof of the horse.

#### Heating and Lighting.

**BURNER.**—P. MISCHKE, East Rutherford, N. J. The object of the invention is to provide a burner arranged to prevent the undesirable backflash, especially when lighting the burner, and to insure a proper mixture of the gas and air, and hence the production of a powerful flame. It relates to gas-stoves, incandescent gas-burners, and like devices in which a mixture of gas and air is burned.

#### Household Utilities.

**DEVICE FOR SUPPORTING FOWLS.**—H. M. VANDERBILT, Suffern, N. Y. One object of the inventor is to provide simple means to support in an elevated position a fowl with its breast down during the roasting period, thereby admitting of the uniform circulation of heat about it and its retention in a convenient shape, also to make provision for the adjustment of the device, enabling it to be used for fowls of varying sizes.

**COMBINED SINK, BATH, AND WASH TUB.**—W. J. MINNS, New York, N. Y. The purpose here is to provide a structure especially adapted for use in a small flat, tenement, or apartment house where there is little available room for necessary single plumbing and wherein in a single article will be combined a sink, a bath, and a wash tub, each adaptation being as perfect and as convenient for use as a series of equivalent independent devices.

**DOUBLE-ACTING WINDOW-SHADE.**—M. ECKER, Boston, Mass. The object of the invention is to produce a construction and ar-

range of parts which will enable the shade to be quickly moved into any position before a window and to enable the shade to cover any portion of a window, extending upwardly from the bottom or downward from the top.

**BEATER OR MIXER.**—E. J. SCHURMANN and T. R. SCHURMANN, Chenoa, Ill. In this patent the invention has reference to machines capable of use as egg-beaters, cake-beaters, cream-whippers, or churns, and the object of the invention is to provide a device wherein all of the operating parts, save the crank, are completely inclosed during the operation of the device.

#### Machines and Mechanical Devices.

**MACHINE FOR CORING AND SLICING FRUIT.**—P. HANSEN, Jersey City, N. J. One purpose in this case is to provide a machine for simultaneously coring and slicing apples in such manner as to be rapidly and cleanly accomplished and so that the slices will be of uniform thickness. Another is to provide a machine in which the operations will be automatically done and so timed that there is no danger of mishap to the fruit and so that but one attendant, a feeder, is required.

**ROCK-DRILL.**—F. E. GLAZE, Victor, Col. The drill is more particularly intended for use in boring or drilling rock. The object had in view is to provide or construct boring and drilling tools with means rendering them self-cleaning—that is, adapting them for removal of the dust and chippings during operation thereof.

**MECHANISM FOR OPERATING AWNINGS.**—W. O. CALMAR, San Francisco, Cal. The object in this instance is to provide a simple construction for locking the gearing to hold the awning in any desired position. The device is applicable either on the right or left side. Ratchets and other devices are dispensed with, and the spring-pressed block entering the crank-aperture from the inside locks the gearing in the simplest manner.

#### Prime Movers and Their Accessories.

**AUTOMATIC CLUTCH-COUPLING FOR SHAFTS.**—J. E. THOMAS, New London, Wis. The invention pertains to shafting; and the object is to produce a coupling adapted to be placed in driving-shafting which will be ineffective when the driving-shaft is rotating at low speed, but which will come into operation automatically when the speed is sufficiently increased.

#### Pertaining to Recreation.

**PUZZLE.**—C. C. HAYHURST, Barberton, Ohio. The invention relates to puzzles in which one or more balls and devious runs or pathways are employed for conducting the balls from a starting-point to a goal. The object is to provide a puzzle which is simple in construction and arranged to require considerable skill on