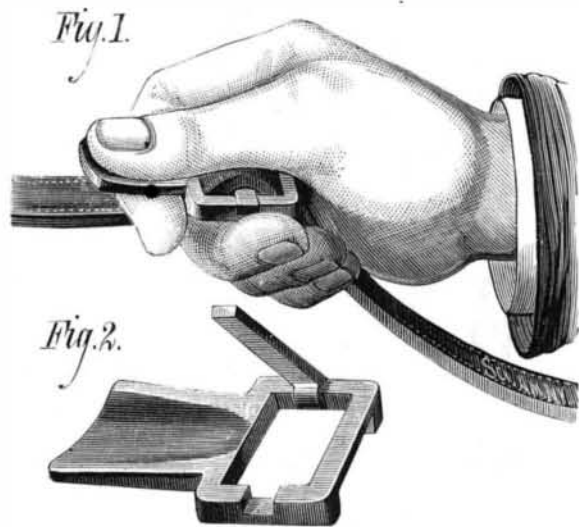


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**NEW HAND HOLD FOR REINS.**

The novel rein holder shown in the annexed engraving is to be applied to driving reins to afford the driver a strong



**POWELL'S HAND HOLD FOR REINS.**

hold upon the reins without undue pressure or cramping the hands. The device consists of a buckle conveniently arranged for attachment to the reins, and having a plate projecting from one side of it to be clasped between the thumb and forefinger, as shown in Fig. 1. Fig. 2 shows the device detached from the rein. This simple holder will add greatly to the comfort of driving, as it enables the driver to hold his reins without exertion, and it is especially valuable in cases of emergency, as it affords a firm hold that is impossible with bare straps.

Further information may be obtained by addressing the inventor, Mr. Hazael B. Powell, of Napoleon, Ohio.

**NOVEL VISE.**

The annexed engraving represents an improved adjustable vise recently patented by Mr. Fortunato C. Zanetti, of Bryan, Texas. The vise is capable of being placed and secured in any desired position to adapt it to different kinds of work, and to hold it in a convenient position for the workman. The lower end of the fixed jaw is provided with an arm projecting backward, and having a spherical socket for receiving a ball on the end of a fixed standard. The spherical socket is made in two parts, one being an integral portion of the vise, the other being secured to it by screws, and the two parts are capable of being drawn tightly down upon the ball by a clamp screw passing through one part into the other.

In the lower end of the fixed vise jaw there is a socket for receiving a standard having a convex foot which rests on the bench which supports the vise. This standard is adjustable, and is held in place by a set screw. When the vise is set in any desired position the standard is drawn out until it bears upon the bench or table, and assists the ball and socket joint in sustaining the weight and strain of the vise and the work.

Practical mechanics who are often obliged to work at a vise in an inconvenient and uncomfortable position will appreciate the advantages of this vise.

**Mystery in Mechanics.**

The Boston Journal of Commerce justly observes that there is a class of mechanics who affect great mystery about their work, and appear to imagine they can convey the impression that there is something occult or hidden in the processes they use and the materials they employ. Inventors are peculiarly sensitive about making known what they intend to do or the way they intend to do it, as though the world stood agape, ready to wonder and admire as soon as the letters patent were issued. Perpetual motion mongers are justified in keeping secret their experiments—they usually keep secret the result. But in nine cases out of ten the inventor could obtain the money assistance he requires simply by trusting his proposed improvement in detail to judicious friends, and he might with safety

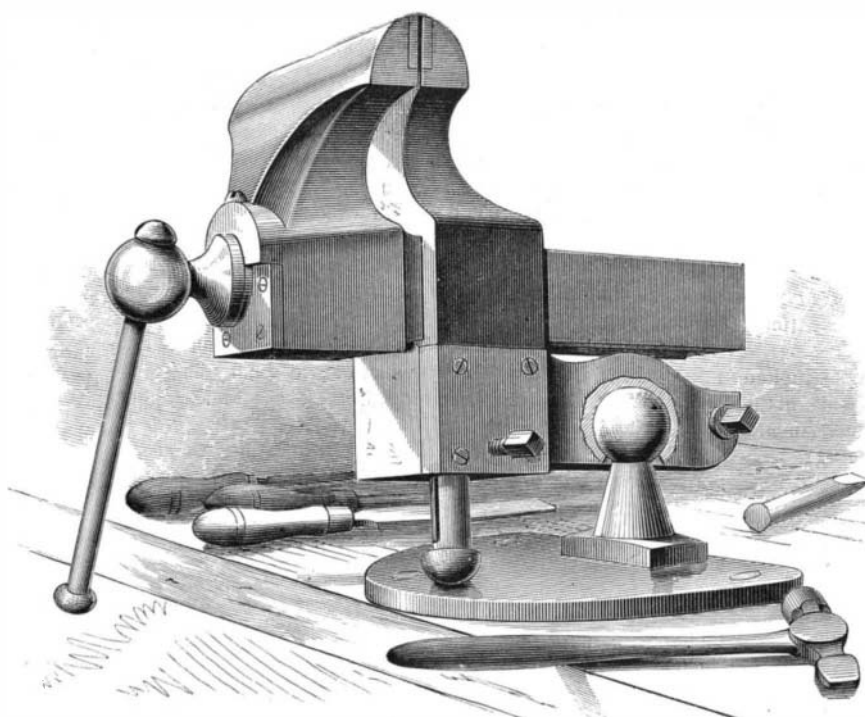
and advantage frequently take a brother mechanic into his confidence.

A short time ago a carpenter, in assisting to move some heavy machinery, had occasion to go into a room where the soldering of preserving cans was being done. He wanted to bore a hole through the floor through which to pass an eyebolt. He was refused admission until he solemnly promised not to notice the work which, with some handy appliances, was performed very rapidly. A visitor to a white lead manufactory was refused admission to a room where the pig lead was cast into sheets previous to being acted on by the acid. Yet there was absolutely no secret in it. The melted lead was simply thrown in small quantities on a sort of shovel of sheet iron, where it congealed to a thin film. The worsted braid used largely for the trimming of ladies' dresses a few years ago is as smooth as silk, without fuzziness, although the yarn is full of projecting fuzz. A certain company kept its process a great secret, but an examination of their braid under the microscope showed it was simply singed. Some temperers of steel profess a great secret in the preparation of their hardening pickle, a secret as patent as though described on a page.

There are very few manipulations or manufacturing processes which are truly secrets, and in many of these cases the secret consists in the quality of the material used, a material perhaps not readily obtainable otherwheres. If a secret process involves much mental calculation or expertness of handling, a chance visitor must have rare observing faculties if he can carry it away with him and reproduce it at will from his memory. The laws of the science of mechanics are open to all investigators, and what one man has learned of them may be learned by another man. It is an absurd and ridiculous pretension generally that assumes that one man knows alone what many are anxious to learn, that the finished article carries no suggestion of the processes through which it has passed, and that on one man's will and life depends the success of some important manufacture.

**Singular Case of Lightning Stroke.**

A paper was read at a late meeting of the Clinical Society, London, by Dr. G. Wilks, of Ashford, on a remarkable case of lightning stroke, which occurred on June 8, 1878. A farm laborer was struck by lightning while standing under a willow tree, close to the window of a shed in which his three fellow workmen had just taken shelter from a violent storm of rain. His companions found the tree partly denuded of its bark, and the patient's boots standing at its foot. The patient himself was lying on his back two yards off, and though he was fully clothed previously, he was now naked, with absolutely nothing on except part of the left arm of his flannel vest. He was conscious, but much burnt, and his leg was badly broken. The field around was strewn with fragments of the clothing; the clothes were split or torn from top to bottom, the edges of the fragments being often torn into shreds or fringes; they only showed evidences of fire where they came in contact with metal, such as his watch and the buckle of his waist belt. There were no laces in the boots. The left boot was torn and twisted into fantastic shapes, but the sole was uninjured, and there were no signs of fire upon it; the right boot had the leather much torn and the sole rent and burnt. The watch had a hole



**ZANETTI'S IMPROVED VISE.**

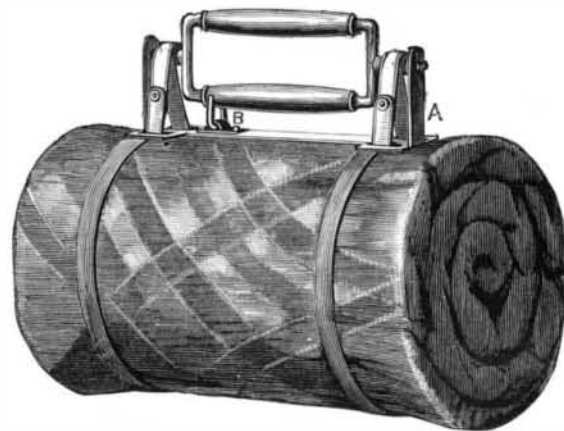
burnt through the case, and the chain was almost entirely destroyed. The stockings were split down the inner side; the hat was uninjured. The patient stated that he was struck violently on the chest and shoulders, became enveloped in a blinding light, and was hurled into the air, coming down on his back, "all of a crash," and never losing consciousness. The hair of his face was burnt, and the body was covered with burns. Down each thigh and leg was a broad crimson indurated band of burning, passing

along the inner side of the knee, and ending below the left inner ankle and the right heel; a lacerated wound, with a comminuted fracture of the os calcis. The bones of the right leg were fractured, and the tibia protruded through the skin in the course of the burn. He was discharged healed twenty weeks after the occurrence. Dr. Wilks remarked on the almost complete exemption of the nervous system and on the probability that the clothes being wet acted as good conductors, and so diverted the electric current from the great nervous trunks, thus saving the man's life.

**IMPROVED SHAWL STRAP.**

The accompanying engraving shows an improved shawl strap patented by Mr. Max Rubin, of New York city.

Two endless leather straps pass through slots in the frame, A, and through slots in the shanks of the handles. The shanks being pivoted in the frame, A, it will be seen that by



**NOVEL SHAWL STRAP.**

turning the handles the straps will be wound up, and will consequently bind whatever is inclosed by the straps. A catch, B, holds the handles in position after the straps are wound.

**MISCELLANEOUS INVENTIONS.**

Mr. James P. Bell, of Pleasant Grove, Ga., has invented an improved hame fastener, simple and inexpensive in construction; easily fastened and unfastened, and not liable to become unfastened accidentally.

An improvement in sole-edge burnishers for boots and shoes, patented by Mr. Samuel Jacobson, of St. Peter, Minn., consists of an ordinary shoemaker's burnisher, to the handle of which aspringis attached in such a manner that by means of a set screw it can be made to cover more or less of the burnishing surface, according to the thickness of the sole. The part that burnishes the upper edge of the sole is provided with a small adjustable tongue.

An improvement in sleds, patented by Mr. James H. Dennis, of Newark, N. J., consists in providing a sled frame with a hand steering device, and sweeps arranged in rowlocks.

An improved window shade attachment has been patented by Mr. Elliott Metcalf, of Findlay, O. The object of this invention is to provide a simple and effective device for suspending and opening and closing the blinds or shades known as "Venetian shades for windows."

An improved door bell has been patented by Mr. Joseph B. Richard, of Columbus, O. The improvement consists of a curved lever pivoted to the spindle of the bell knob, and which acts on a hammer that strikes the gong when the bell knob is pulled outward. The mechanism is compact, simple, and not liable to derangement.

Mr. Jesse H. Allison, of New Vienna, O., has invented an improved plaiting machine, consisting of tubular side frame, end strips, and wires, combined to form a desirable and efficient instrument.

An improvement in the manufacture of window shade cloth has been patented by Mr. Bonheim Birnbaum, of New York city. This invention relates to a new process of manufacturing decorated window shade cloth; and it is designed for producing cloth with a surface ornamented in imitation of moire antique, figured damask, watering, or any other design made by raising engraved lines on a lustrous surface.

Mr. John F. Hause, of Woodstock, Ga., has patented improvements in the construction and operation of tuyeres for blacksmiths' forges, the object of which is to procure a more perfect control of the blast, and to prevent ashes, cinders, dust, etc., from falling into the orifice of the blast pipe.

Mr. C. R. Elliott, of Golden, Col., has patented a simple and convenient device for fastening bags and sacks that may be used without sewing or otherwise permanently attaching it. This device is adapted for grain and ore bags, particu-

larly the latter; and it consists of two or more pieces of wire or links jointed together to pass around the gathered mouth of the bag, and provided with a tongue or arm, by which the jointed ends are drawn up and locked in place.

An improvement in bob-sleighs has been patented by Mr. Gilbert Hermance, of Nassau, N. Y. The object of this invention is to so construct a sleigh with knees and beams that the runners will act entirely independent of each other, and thus insure smoothness and evenness in the running of the sleigh, and prevent straining and twisting.

An improvement in safety-pockets has been patented by Mr. Joseph Colton, of New Orleans, La. The object of this invention is to furnish an improved pocket for carrying a watch and money, so constructed that its contents may be safe from pickpockets.

Mr. Fendal D. Thurman, of Atlanta, Ga., has patented an improvement upon the harness for which letters patent were granted to him May 20, 1879, in which a rigid yoke or collar, closed at top and open at the bottom, is connected with rigid tug hooks on the shafts, and constitute, in connection with a belly band, the only parts which are necessary to gear up the horse. The improvement consists in making the collar in two pieces, connected at the top by a flexible pad and at the bottom by a strap, and combining it with loose tugs on the shaft, which are bent inwardly at their front ends, so as to take the draught strain from the center line of the collar bars, while the belly band is connected to the loose tugs in front of their pivots.

An improvement in bale ties, patented by Mr. Ira M. Camp, of Navasota, Texas, consists of a buckle or plate made in the form of the letter C, and having opposite seats in the short bend of the letter for the looped ends of the bale band, from one of which seats there extends the curved or semi-circular arm, completing the C, and which serves both to contract the band with a cam and lever action when inserted, and to lock the buckle or plate by lapping over underneath, or through the looped end of the band on the opposite side.

Mr. Nelson Birdsall, of Ashland, Va., has patented an improved machine for sowing, drilling, or planting any kind of seed or fine fertilizer. The construction and operation of the machine cannot be clearly described without an engraving.

Mr. James A. Hill, of Davis Cross Roads, Ala., has patented an improved combined seed planter and fertilizer distributor, which is so constructed as to open a furrow, deposit guano or other fine fertilizer in it, cover the guano, drop cotton seed upon the covering soil, and cover the seed; which may also be used for opening a furrow, dropping small seeds into the furrow, distributing a fertilizer upon the seed, and covering it.

An improvement in fertilizer distributors and seed drills, patented by Mr. Adolphus F. Gibboney, of Belleville, Pa., relates to a force-feed formed by two meshing worm wheels having their axes in different planes, and one of them located within and the other outside of the hopper; also, to mechanism for shifting the position of the fertilizer and seed tubes or drills independently of the hopper; for the purpose of depositing the fertilizer and seed in rows at different distances apart; and to the means for throwing into or out of gear, and thus starting or stopping the mechanism for discharging the seed and fertilizer.

Mr. Byron B. Small, of North Lubec, Me., has devised an improved machine for cultivating and hoeing plants which is simple in construction, convenient and effective in operation, and which may be readily adjusted as the work to be done may require.

Mr. Warren Holden, of Philadelphia, Pa., has patented an improved drawing table, which is so constructed that the drawing paper may be adjusted to bring the part of the paper upon which the artist is at work close to him without exposing the paper to injury, and which will allow the artist to work upon long strips of paper and have the part upon which he is at work close to him at all times, while protecting the other parts of the paper from being soiled or injured.

Mr. Henry E. Hunter, of Hinsdale, N. H., has invented an improvement in combined galvanic and medicated pad, which consists in the combination of a galvanic battery, formed of plates of zinc, felt, and copper, and a medicated pad, so that a circuit of galvanic electricity may be incited by moisture absorbed from the patient's body, while at the same time the patient receives benefit from the medicaments contained in the pad.

Messrs. Louis A. Brument and Sigmund Goldberg, of New York city, have patented a portable balcony of ornamental character adapted for attachment upon a window sill for the purpose of giving an improved appearance to a house, and for use as a support for flower pots, etc. The balcony may remain as a permanent fixture or be removed with facility as required.

#### Cattle Raising in Wyoming.

A correspondent of a Chicago paper, writing from Cheyenne, Wyoming, gives an interesting statement of the cost and profit of stock raising in that Territory. He says that a herd of 1,000 Texas cows and 40 short horn bulls cost, at a liberal estimate, \$15,000. In five years the natural increase gives 5,000 head of cattle, old and young, worth not less than \$70,000.

Five men, including the foreman of the ranch, are sufficient to take care of 4,000 cattle. A good foreman can command \$75 per month. An ordinary herder receives \$35 per month. The cost of necessary ranch buildings is trifling. The total expense of a herd of the number above mentioned

for five years may be placed at \$35,000, this including a contingent loss of five per cent of the cattle, leaving a net profit of \$40,000 on the \$15,000 invested five years before. The cattle business in Wyoming is very large and rapidly increasing. At the commencement of 1879 there were in the Territory 277,000 head, of an average value of \$15 per head, making a total value of over \$4,000,000. From various points in Wyoming there were shipped in 1878 some four thousand car loads of cattle, worth in Chicago \$3,000,000. During 1879 a considerable advance was made in the number shipped, the larger part of the shipping being done in the last quarter of the year.

#### Correspondence.

##### Fire from Steam Pipes.

To the Editor of the Scientific American:

What tests and experiments have been made regarding the liability of woodwork being fired from contact with steam coils? I wish to learn if such experiments go to show that liabilities from fire are greater where wood is in contact with steam coils.

D. E. SMITH.

Community, Oneida, N. Y.

The following reply to the above article has been furnished us by Mr. Wm. J. Baldwin:

To the Editor of the Scientific American:

In answer to D. E. Smith, Oneida Community, N. Y., I will say fourteen years' observation has led me to the conclusion that it is utterly impossible to fire wood, or even touchpaper or tinder, with steam in pipes up to any pressure of steam at maximum density—i. e., not superheated—that can be carried on any ordinarily constructed boiler.

Why do not the wooden lagging of steam engine cylinders, portable boilers, and large steam pipes on steamships, etc., take fire? or the dust that accumulates on steam coils in woodworking machine shops? Simply because the temperature of the steam pipe is not sufficiently high, and that the lowest temperature capable of doing so is between 500° and 700° Fah.

But some will hint at conditions and make use of the words "concentration of heat" and "spontaneous combustion."

Heat of this description cannot be concentrated, and is not capable of making anything hotter than itself, and spontaneous combustion has no place in our consideration, other than, if we are dealing with substances that are likely to fire spontaneously, heat will assist them, whether from steam pipes or any other source.

No one imagines they can light a stick against a boiling kettle (temperature 212°), but many will say, How would it be if I had 100 or 200 pounds of steam, it would be so much hotter then? It will be hotter. The following table shows the increase in temperature for each 100 pounds in pressure (above atmosphere) up to 400 pounds. Let them judge for themselves:

Pressure.	Temp. Fah.	Increase temp.
1 lb.	214°	
100 lb.	338°	124° 1st 100
200 lb.	388°	50° 2d "
300 lb.	422°	34° 3d "
400 lb.	448°	26° 4th "

Respectfully,

WM. J. BALDWIN, Heating Engineer.

Elmira, N. Y., January 1, 1880.

#### Boxwood in Russia.

Boxwood grown in the forests on the shores of the Caspian Sea is, says the *Gardener's Chronicle*, a large article of trade with Russia. This wood reaches Astrachan and Nizni-Novgorod in the spring of the year, where it is sold during the fair. Last year the quantity so sold was about 130,000 poods, being about 80,000 poods in excess of other years. It is pointed out in a recent report that the increased demand for this boxwood, which is used for shuttle-blocks, indicates increased prosperity among Russian manufacturers.

On the subject of boxwood the acting British Consul at Tiflis writes: "Bona fide Caucasian boxwood may be said to be commercially non-existent, almost every marketable tree having been exported. Such exorbitant terms are demanded by the government for the right of cutting in one or two remaining Abkhasian boxwood forests as virtually to bar their acquisition." He goes on to say that having personally visited these forests he is in a position to assert that their real value has been considerably exaggerated, most of the trees being either hollow or knotted from age, and much of the best wood having been felled by the Abkhasians previous to Russian occupation.

The boxwood at present exported from Rostov, and supposed to be Caucasian, comes from the Persian provinces of Mazanderan and Ghilan, on the Caspian. What has been said respecting boxwood applies equally to walnut burrs, or "loupes," for which the Caucasus was once famous, 90 per cent of which now come from Persia. The walnut trees of the forests along the Black Sea, which are extraordinarily numerous, and afford excellent material for gunstocks, do not, from some climatic peculiarity, produce burrs, which are only found in the drier climates of Georgia, Daghistan, Persia, etc. The immense quantity of walnut timber in the forests on the Black Sea is mostly unavailable from the complete absence of roads or means of transport, and the dearth and scarcity of labor.

#### Telegraph Wires in New York City.

An elaborate examination of the telegraphic and telephonic systems of wires in this city has been made by Mr. R. D. Radcliffe, with a view to the working out of a plan for laying the wires underground. On a large map of the city Mr. Radcliffe has made the location of every telegraph instrument in the city, whether Western Union, the Atlantic and Pacific, the Gold and Stock, the Police, the Fire Department, the Bell Telephonic, the American District, or what not, and from a study of this map he has perfected a plan for consolidating the lines of the city, which he thinks is entirely practicable. His plan is to have three great trunk lines running north and south—one through Third avenue, one through Sixth avenue, and another through Ninth avenue. From these trunk lines lead branch lines east and west through every second street, the wires being taken from the trunk lines and conducted on poles to the place desired. He does not advocate laying these branch lines underground unless there are more than twenty of them in the same street, and he does not advocate laying telephone wires underground, for the location of telephones is liable to constant changes. He finds that, under his plan, instead of 9,000 or 10,000 telegraph poles now standing, 1,500 or 1,600 poles will serve every instrument in the city in a complete and economical way.

In explaining his plan to a *Sun* reporter, Mr. Radcliffe said: "The greatest number of wires that would have to be conducted through one trunk line is 841; and they would run across Broadway, from the main building of the Western Union at Broadway and Dey street, and down John street. Of these 841 wires, 583 will go down town to the great commercial centers, and 258 go up town on the east side, decreasing in number, of course, as wires are led out to the side streets, until the trunk line reaches the Harlem bridge at 130th street with only 49 wires. The route of this trunk line would be down John to Pearl street, and thence up town, following the line of the elevated railroad. The 583 wires that run down town would be conducted by a series of underground trunks, terminating at the Produce Exchange, on Pearl and Whitehall streets, with 72 wires.

"The center and western trunk lines would start together at the main building, with 330 wires, and run down Dey to Church street, where 190 wires would turn up Church street and follow the line of the Metropolitan Elevated Road to Fifty-third street. The other 140 wires would continue down Dey to Greenwich street, and then turn up town, following the route of the west side elevated road. At Fifty-third street the center trunk line will have only 20 wires. These I would run across to the west side trunk, which at Fifty-third street will contain 57 wires. These 69 wires will then be conducted up town on the west side to 125th street, where the trunk will contain only 15 wires, which there leave the trunk and follow the line of the Hudson River Railroad north.

"Many of the wires of the west trunk leave it at Fifty-fifth street and cross the Hudson River in cables, and then go to the lines of the different railroads.

"Below John street, and on the east side of Broadway, there are more instruments than in any other part of the town, but they cannot be reached by the same system of trunk lines and branches that can be used up town. That whole territory must be covered by underground systems, and the proper disposition of the lines has given me much trouble, but I think I have solved the problem."

Touching the mileage of wires in the city and their probable increase, Mr. Radcliffe said: "My data was ascertained several months ago. There were then in this city 1,148½ miles of Western Union wires; 290½ miles of Atlantic and Pacific wires; the Gold and Stock Company had in their stock interest department 151 miles, and in their private line department 1,330 miles; the Bell Telephone Company, about 500 miles; American District Telegraph Company, 300 miles; Fire Department, 702 miles; Police Department, 90 miles; Law Telegraph, over 100 miles, and American Union, about 30 miles—making in all 4,662¾ miles of telegraph wire in New York city.

"I find that the Western Union and Atlantic and Pacific Companies, the companies that do a commercial business, have not increased their mileage more than 20 per cent in the past two or three years, and that the local companies are increasing their mileage very rapidly. For instance, the American District Telegraph Company, started in 1872, has placed 300 miles of wire in seven years, and is growing an increasing ratio yearly. The Bell Telephone Company placed its first telephone in September, 1878, and at the end of another year will have added, at their present ratio of increase, 1,000 miles more to their 500 miles. The growth of the private department of the Gold and Stock Company is at the rate of 40 miles a month now. Judging from these data, I conclude that the trunk lines ought to have a capacity of 1,000 wires each to meet the demand that the increase in the telegraphic business is going to make in the coming ten years."

#### Samuel S. White.

In the death of Samuel S. White the dental profession loses one of its most efficient promoters, and the public at large a most respected and useful citizen. His business career has been remarkable, both for its success and its highly honorable character. Of late years Dr. White, in addition to his manufacture of artificial teeth, which he carried to the highest excellence, has given much attention to the improvement of dental machinery, implements, and furniture.