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PROPOSED NEW SYSTEM OF WATERWORKS FOR CHICAGO.

We have received a copy of the proposal made, September 10, 1881, by Mr. Wm. Golding, M.E., of New Orleans, La., to the Board of Public Works of Chicago, for the erection of new pumping machinery for the waterworks of that city. This proposal is accompanied by engineering drawings, and taken altogether is quite a remarkable document, reflecting much credit upon the author. It illustrates a system that contains points of unusual practical excellence coupled with great simplicity and economy of construction. In our opinion it deserves the attention of hydraulic engineers and water directors in all parts of the country. The first general requisite of a good water delivering mechanism is thorough efficiency in doing its work; next, such a simplicity of construction that any moderately equipped foundry or shop can manufacture the machinery or enlargements when required, while any ordinarily intelligent engineer can set up the same and easily keep it in effective operation. All these features are fully realized in Mr. Golding's system, and will commend themselves to engineers.

In view of these considerations we have thought that our readers would be interested in the following brief review of the salient features of the system, which, with our engraving, we derive from the printed proposal before mentioned.

The general ideas of the author in designing this system are well set forth in his preface; some of them may provoke discussion; but the more they are discussed the better. They are substantially as follows:

"Principles were created with the earth. The utilization of principles forms the various branches of science. To separate and convey material is allotted to mechanics. In moving a quantity of material an equivalent is expended, which equivalent is denominated power. The mechanical combination for conveying material will be appreciated in the proportion as the useful work performed approximates the power expended. When a unit of power is expended, a unit of work is performed, but not always desirable or useful work, as, for instance, in faulty or inappropriate design, the combination may absorb largely of the power which it is intrusted to transmit.

"When a quantity of water is to be elevated, a very large combination of two or more pumps may be selected, which, as usual and proper in such design, will make but few strokes or repetitions per minute to accomplish the desired result, and will require the entire flow to and from the pumps to be started and checked at each repetition and so absorb much power, which waste of power may be obviated by adopting

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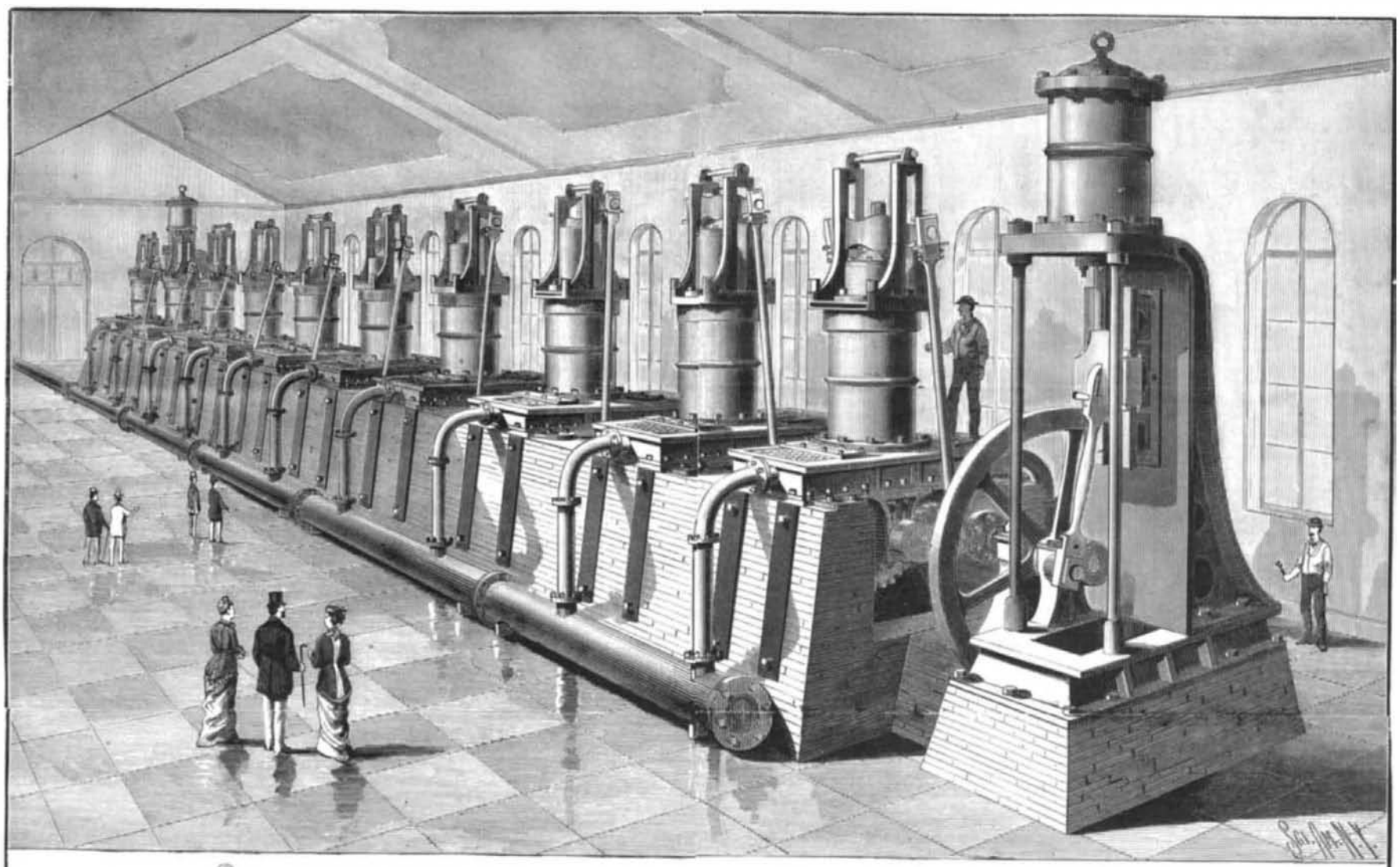

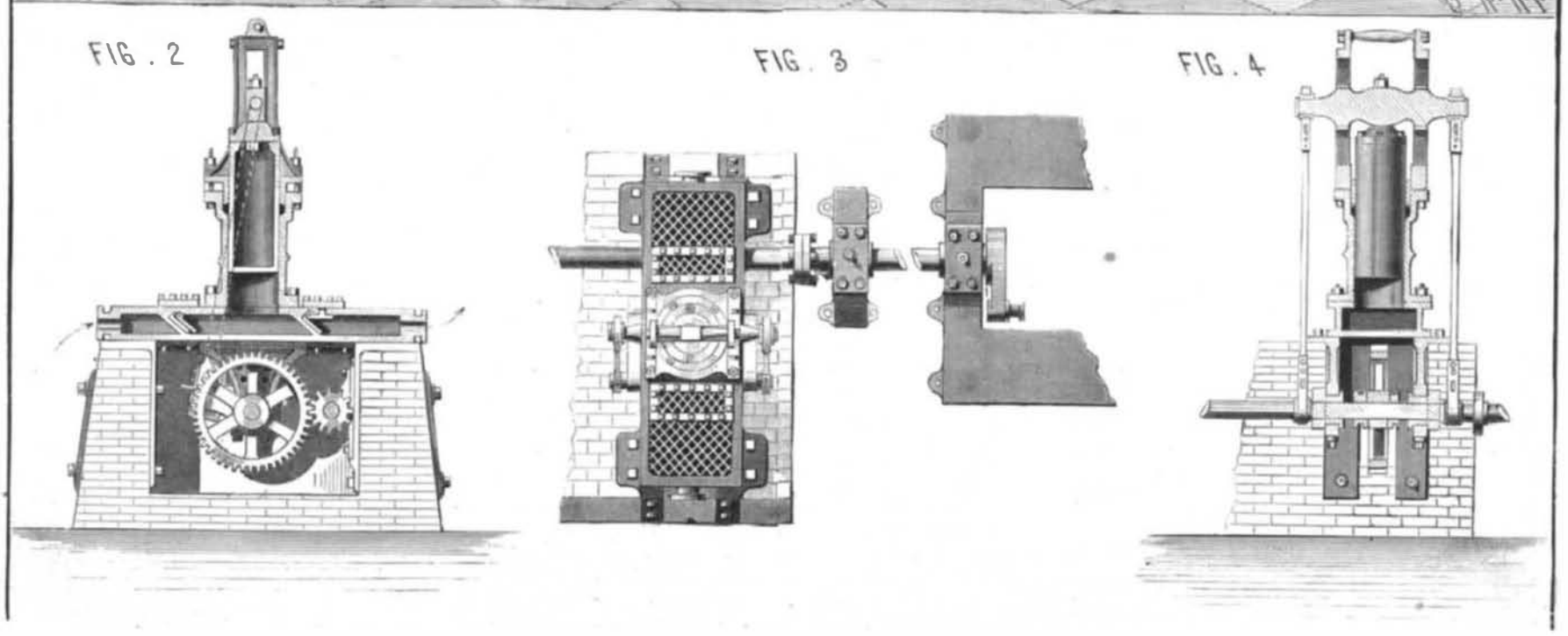

PROPOSED NEW SYSTEM OF WATERWORKS FOR CHICAGO.—WILLIAM GOLDING, ENGINEER.

tape, as it is handled, from being disengaged from the trough.

A valuable improvement in ore roasting and chloridizing furnaces, especially designed for working gold and silver ore, has been patented by Mr. Robert A. Nevin, of Silver Cliff, Col. The ore to be operated on is first fed into the higher end of an inclined revolving cylinder or furnace, and passing through said furnace is exposed to a gradually increasing temperature as it approaches the fire box of the furnace, whereby said ore is partly or wholly desulphurized. From the lower end of this furnace the desulphurized ore falls, through an inclined passage or chute in the flue which leads to the chimney, into the higher end of a second inclined revolving cylinder or furnace, and as said ore passes through said chute, chloride of sodium is introduced to mix with it and to fall with it into the second cylinder, down through which the mingled ore and salt pass, subject to a gradually increasing temperature, whereby the metallic portions of the ore are chloridized, and the ore is ready for subsequent lixiviation or amalgamation. By desulphurizing the ore before the application of the salt, the metallic portions of the ore and the chlorine of the salt more readily and thoroughly combine, thereby effecting a saving of the salt and of the metals, and, by the passage of the ore from one furnace into the other being continuous, the ore does not become cooled in the operation.

A simple but apparently practicable and effective method of holding underground telegraph wires separate from each other, and properly insulating and protecting them, has been patented by Mr. John B. Morgan, of Kansas City, Mo. In this improvement a succession of metallic boxes, preferably of rectangular form and open at both ends, are arranged in trenches at the requisite depth beneath the surface of the ground. These boxes are formed with outwardly extending flanges along their upper edges and at their ends, which flanges are longitudinally grooved for holding the leaden gaskets or seals with which covers are sealed or jointed to said boxes and with which the boxes themselves are jointed to each other. The covers are scarfed at their ends to form overlapping joints with each other, and are provided with gates for pouring in the molten lead to seal them. Before placing on the covers, however, the boxes are filled with a series of longitudinally grooved boards mounted one upon the other, and having the telegraph wires arranged within their grooves, each board as it is put in place, commencing with the lowermost one, and the wires contained in its grooves, being smeared by a brush with melted paraffine or wax. This thoroughly insulates the wires and acts as a seal between the surfaces of the boards.

Messrs. John E. Chamberlain and George W. Kemp, of Charleston, W. Va., have patented certain improvements in rope railways. This invention relates to inclined rope railways, in which coal, earth, or other material is conveyed from an elevated to a lower point in cars or baskets suspended from a pair of wire cables stretched between the receiving and discharging points at proper tension, the descending loaded car or basket on one cable causing the ascent to the loading point of the empty car on the other adjacent cable. In rope railways of this class, as previously constructed, no means were provided for preventing the bellying or sagging from the main wire cables of the check ropes connecting the suspended cars and the winding drum, which sagging would quite overcome the gravity of the descending loaded car when at a point opposite the ascending car on the adjacent cable and bring both cars to a stop, and consequently compel the use of power other than the gravity of the loaded car to lower the latter to the discharging point. This invention consists in a method of preventing the sagging of the check ropes and thereby dispensing with an auxiliary power, by supporting the check ropes on independent clevises on the main cable. These clevises are flexibly connected, whereby they will spread apart to support the check ropes as fast as the latter unwind. A chain connection is preferred for this purpose. Both of the inclined main cables of the railway are similarly provided with these traveling clevises. The invention also consists in a combination with the car having a hinged bottom, supported by a sliding locking bar and catch, of a bumper at the lower end of either inclined cable, for the bar to strike and release the car bottom and whereby the contents of the car are automatically dumped. These are valuable improvements.

Mr. Charles W. Dean, of Taunton, Mass., has patented an improved cut-nail machine. This machine is more especially designed for making hooked nails, but is also adapted for making nails of various other shapes. When in operation the nail plate is fed by hand or otherwise over a bed knife. A cutting jaw then rocks downward, and with its knife cuts a nail blank, which is instantly griped between the end of a moving die and a stationary bed die, and is held until it is headed by a movable header. The cutting jaw is provided with an offset carrying a horn, and the heading lever has also a horn. These two horns are connected by a pin which is supported at its ends in socket boxes, of which the one in the cutting jaw horn is adjustable in an elongated slot, to change the throw of the heading lever. As the cutting jaw rocks upward the heading lever is drawn inward until the point of the header is opposite the nail to be headed, when the horn of the cutting jaw tilts upward also, and by means of the connecting pin rocks the heading lever sidewise so as to bring the point of the header to bear with pressure upon the nail end. The operating mechanism is simple and not liable to get out of order, and every necessary provision is made for removing and replacing the principal working devices, also for changing certain parts to make nails of various kinds.

PROPOSED NEW SYSTEM OF WATERWORKS FOR CHICAGO.

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a combination consisting of a greater number of smaller pumps, each arranged to follow at equal distance. It is everywhere conceded that to obtain the best result from fuel, an expansion of steam varying from four to six times must be practiced.

"Where, as in the case of moving water, the load or resistance is constant, expansion of steam upon a direct acting piston is not practicable. Where the load is elastic and the character of the work to be performed is such as will admit of varying periphery speed, the theoretical economy of expanding steam will be partially realized in practice.

"The speed of pumping machinery should be comparatively slow, and the design should be selected with a view to maintain a uniform flow through the receiving and discharging mains. Many efforts have been made to utilize the principle of expansion of steam in pumping machinery, but so far without success.

"The beam pump, with steam and water cylinder at either end, and with intermediate crank shaft and prodigious flywheel, was expected to meet all demands; but in this design the fact that, to reproduce in useful work the extra pressure given to the piston in the commencement of the stroke, *an acceleration of speed must be given to the flywheel*, was overlooked, and it has been found advisable to disengage the expansion gear on this type of pumping engine.

"The compound or double cylinder expansion is the latest effort, yet as the terminal pressure must be equal to the load, and not being provided with reciprocating rotary motion, it is difficult, in fact impossible, to discover any advantage in this complicated combination. By expansion of steam, is meant that when the boiler pressure has followed the piston, say, one-fourth the length of the cylinder, communication with the boiler is cut off and the piston is impelled by the expansion or diminishing pressure, which, providing the boiler pressure be 100 pounds, will give a terminal pressure of 25 and an average 59 pounds. If the load is greater than the terminal pressure is capable of overcoming, the machine will stop. If there be rotary motion, but insufficiently charged by acceleration, it will also stop. If there be rotary motion of sufficient weight and sufficiently charged by acceleration to compensate for the diminishing pressure on the piston, the economy of expansion will be overbalanced by the power expended in acquiring acceleration.

"When the driving engine is permitted to make a greater number of strokes per minute than is being made by the pumps, the varying periphery velocity of the engine occasioned by the varying pressure on piston when working under a high rate of expansion will be inappreciable on the pumps, thus practically permitting a realization of the economy of steam expansion."

Mr. Golding's tender to the Commissioner of Public Works provided for ten single acting plunger pumps 80 inches diameter and 4 feet stroke. The pumps will be driven by spur wheel and pinion from a continuous shaft. The pinion will be permanent on the driving shaft, while the spur wheel will revolve loose upon the pump shaft and so arranged that the pump may be started and stopped at the will of the operator. The pumps will be placed in a continuous line and connected to the pinion on driving shaft in a division of ten. The pinion shaft will be connected by coupling at either end to two duplicate engines, only one of which need be connected, yet the connections will be such that either or both may be made to operate at the same time. The pump connections will be so arranged as to receive water from a receiving main which will be arranged to pass in line with the pumps, and the discharge will be arranged in like manner. The pinion will be geared one to four with the pump so as to allow the driving engine to make four revolutions while the pump shaft makes one. This combination will be capable of supplying fifteen million gallons in twenty-four hours with seven and a half strokes per minute of pumps and thirty revolutions of driving engine.

With the pumps making fifteen strokes per minute, and the two driving engines connected and making sixty revolutions per minute, will supply thirty million gallons in twenty-four hours continuously, and will do the same with one engine by allowing the steam to follow sufficient.

The engines will be furnished with adjustable cut-off or expansion motion. Steam will be supplied by three batteries of boilers, consisting of three double flue boilers, 26 feet long and 42 inches diameter, to each battery, and furnished with the usual approved connections. Each battery will be furnished with an independent feed pump of the beam and balance wheel type. The material and workmanship of the boilers will be of the best, the mountings and appurtenances will be the same as is usual and proper in such combinations. The steam and water connections will be arranged with a view of concentrating the steam upon either engine and of conveying the feed water from either feed pump to either battery of boilers.

The pumps are to be of the most primitive and simple design, consisting of a bucket plunger and a hollow base containing ordinary suction and discharge valves. The plunger has a cross head projecting through guides attached to the top of the pump, and having at each end a connecting rod carried by a crank on the shaft below.

In our engraving the larger view shows the complete system. Fig. 2 is a vertical transverse section of one of the pumps; Fig. 3 is a plan view; and Fig. 4 is a vertical section in the direction of the shaft.

The cranks of the several pumps are arranged relative to each other, so that they occupy different positions in the circle. This arrangement renders the flow of water continuous, and brings a practically constant load on the engine, enabling power to be applied to pumping as advantageously as to steam propulsion or manufacturing.

The material, workmanship, appurtenances, and general arrangement of the boilers will be made to conform to the United States Government inspection. The workmanship and material of engines, shafting bearings, and pumps will be in every particular first-class.

DECISIONS RELATING TO PATENTS.

United States Circuit Court—Southern District of New York.

LORILLARD & CO. *vs.* DOHAN, CARROLL & CO.—TOBACCO PLUG PATENT.

Reissued Letters Patent No. 7,362, dated October 24, 1876, granted to Charles Siedler upon the surrender of original Letters Patent No. 158,604, dated January 12, 1875, for an improvement in plug tobacco.

Wheeler, J.:

The decisions in *Lorillard vs. McDowell* (11 O. G., 640) and *Lorillard vs. Ridgeway* (16 O. G., 123) upon the question of the identity of the reissue with the original affirmed.

The force of English letters patent as references are overcome by evidence showing that the domestic patentee made the invention before the date of the filing of the foreign specification.

The use of screws, nails, coins, and other similar things pressed into the surface of the plugs at certain stages of the manufacture to identify some particular plugs to the manufacturers themselves, and not to go out into the market with the plugs, does not anticipate a mode of marking and identifying each separate plug of tobacco as being of a particular quality, origin, or manufacture, by tin labels or tags, having a desired inscription upon them, and prongs extending backward from their edges, pressed into the plugs in the last porcesses of manufacture, with their faces even with the surface of the plugs, where they would be held by the prongs and the surrounding tobacco.

Decree for injunction granted.

United States Circuit Court.—Southern District of Ohio.

WATKINS *vs.* CITY OF CINCINNATI.—LAMP BURNER PATENT.

Matthews, Cir. J.:

Reissued Letters Patent No. 7,706, being a reissue of patent granted Louis Fischer, March 30, 1869, for improvement in vapor burners, *Held* valid and infringed by burners known as "Globe burner" and "Champion burner."

The Fischer patent held to cover vapor burners having a tube or passage arranged to conduct a portion of the oxygenized vapor from the mixing or gas chamber to a point below where the commixture takes place, in order to heat the fluid in the lower part of the chamber.

Various prior patents distinguished from the Fischer and held not to embody the invention described and claimed in it.

United States Circuit Court—District of Connecticut.

FITCH *et al. vs.* BRAGG & CO.—SNAP HOOK PATENT.

This is a bill in equity founded upon the alleged infringement by the defendants of Letters Patent granted May 16, 1865, to Charles B. Bristol and others, assignees of said Bristol, for an improved snap hook. The patent is owned by the plaintiffs.

Shipman, J.:

When the claims of a patent are susceptible of various meanings, that construction will be adopted which, in view of the state of the art, limits the patentee to and gives him the full benefit of the invention he has made.

The general terms and sometimes special words in the claims must receive such a construction as may enlarge or contract the scope of the claim, so as to uphold that invention, and only that invention, which the patentee has actually made and described, when such construction is not absolutely inconsistent with the language of the claim. (*Estabrook vs. Dunbar*, 10 O. G., 909.)

When there is a new and beneficial result attained by a new arrangement of the parts of a combination, there is a new combination, although the action of certain elements may remain unchanged.

When in a snap hook the claim was for a combination of spring and recessed tongue, the recess being so located that by reason of the new location of the spring the hook was made cheaper and easier to clean, *Held* that it was immaterial whether the action of the spring had been improved or not, provided that there is a benefit which is the result of the new combination.

Effects of Pilocarpin on the Color of the Hair.

Dr. D. W. Prentiss, of Washington, D. C., gives an account of a remarkable change in the color of the hair from light blonde to black, in a patient while under treatment by pilocarpin, the case being one of pyelo-nephritis; the other being a report of a case of membranous croup, treated by pilocarpin, in which there was also a slight change in the color of the hair.