The Operation of Arsenic.

Arsenic has been long and generally in use as poison and as cure, yet no satisfactory explanation has been offered for its varied effects. Almost every part of the system is subject to its blighting or healing influence; it produces no sensible effect at the place where it is received into the system; small quantities produce poisonous effects, accumulating till the fatal point is reached, while larger does taken for long periods produce a coveted freshness.

Liebig refers these effects to the readiness with which it enters into combinations with the organic matters and to its power of preserving them from decay. If they do not decay it is because they have lost that essential character of living matter, the power of undergoing transformation; hence as parts or whole they are dead.

But the preserving effect of arsenic upon corpses seems to be rather traditional and to lack sufficient foundation. Attention has not been paid in the cases recorded to the nature of the soil, and the condition of other bodies buried near by.

Two German investigators ascribe arsenical effects to the activity of oxygen atoms in connection with arsenic. The corrosive power of common iron rust is well known. The iron oxide gives off an atom of oxygen, which being in the nascent state acts vigorously upon the organic matter with which it may be in contact. But another atom of oxygen combines with the iron and is again imparted to the organic matter, this process being constantly repeated with destructive effect.

The same play of give and take occurs with the arsenic. Arsenic acid loses an atom of oxygen and becomes arsenious acid; the latter takes an atom and becomes arsenic acid again. If either acid he injected into the intestines the other is soon found to be present.

These changes, it is believed, give sufficient basis for the natural explanation of all the medical effects of arsenic.

DOUBLE TONGUE FOR HARVESTERS.

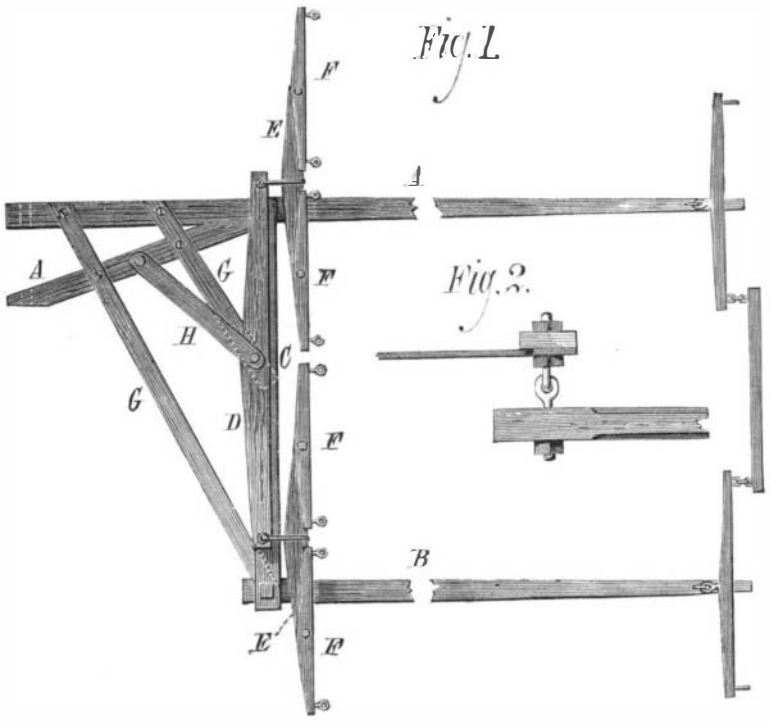
The improvements which have been made in harvesting machines, in the past few years, have made them so nearly perfect that there seems to be no room for further improvement as to their working, but so much has been added to their weight that now the great difficulty with farmers occupying somewhat hilly land is to apply team enough to do the harvest work quickly. It is impracticable to drive one pair of horses before another, as in the old reapers, because the driver's seat is so far at the rear end of the machine that he cannot reach his leaders, and has no control over them, and serious accidents happen from this cause. It is the practice of some to have a boy ride one of the leaders, while the man who manages the machine drives the rear team; but this is found to be very unsatisfactory. Others drive three horses abreast, having a relay in the field, and changing every two or three hours.

Mr. John J. Kepner, of Little Valley, Minn., having tried these several ways, and finding them all unsatisfactory, was led, in the harvest of 1879, to try driving four horses abreast, as illustrated by the engraving; and having again used the same device, improved, through the entire harvest of 1880, claims that, with this harvester double tongue, any one who is capable of driving two horses can drive four, and have them under perfect control, and do as much or more work, and do it with more ease to man and team, than can be done in any other way.

When the land is so level that three horses can handle an ordinary harvester, by using this device the capacity of each machine can be increased one-third, by simply adding to the length of the cutter bar. By removing one nut, and laying aside the movable tongue and four-horse evener, the machine can be used as a two or three horse machine. The side draught can be so regulated that the machine follows the team freely, like a wagon, or it can and should be adjusted so that it hugs the standing grain closely, so as to always cut a full swath.

The ordinary tongue, A, is connected with the harvester in the usual manner, and to it, at a little distance from its rear end, is attached the end of the crossbar, C. The connection between the tongue, A, and the crossbar, C, is strengthened by the inclined braces, G. The end of the rear or long brace is attached to the tongue, A, near its rear end. The other end of the brace is attached to the outer end of the crossbar, C. The end of the forward or short brace is attached to the tongue, A, about midway between the ends of the crossbar, C, and the longer brace. To the crossbar, C, about eighteen inches from the tongue, A, as the draught of the harvester may require, is pivoted the four-horse evener, D, by a bolt, strengthened by a hammer strap, H The rear end of the hammer strap, H, is hinged to the hound of the tongue, A. The four-horse evener, D, is provided at each end with a two-horse evener, E, which is provided with single trees, F, in the ordinary manner. The rear end of the second tongue, B, is connected with the outer end of the crossbar, C, by interlocked eyebolts, the upper eyebolt serving also to secure the end of the brace, G, to the end of the crossbar, C. With this construction it is necessary that the forward ends of the tongues should be so connected that they cannot be forced apart by the side pressure of the horses in guiding and turning the machine.

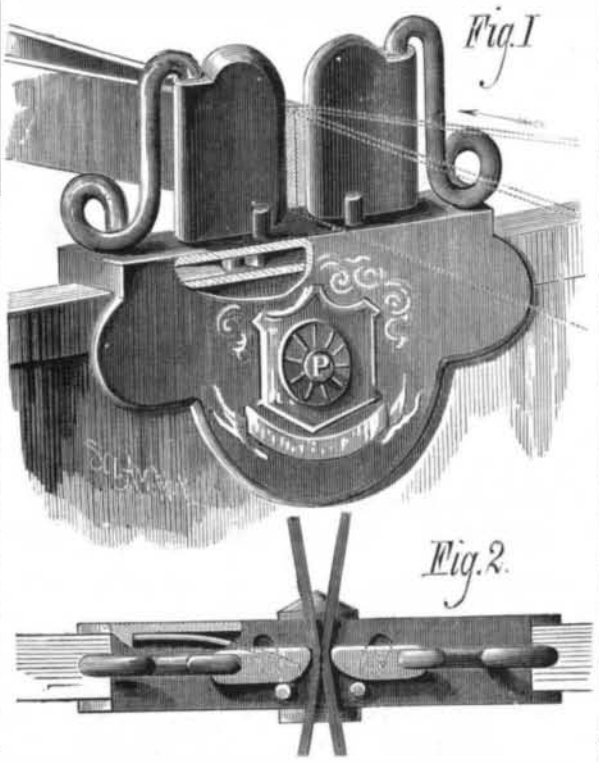
For further information address the inventor and patentee as above.



KEPNER'S DOUBLE TONGUE FOR HARVESTERS.

NOVEL REIN HOLDER.

The engraving shows an improved rein holder patented by Mr. Jonathan S. Pitcher, of San Diego, Cal., and designed for attachment to the dashboard or any other convenient part of the vehicle. It consists of two posts attached to a supporting plate, and each carrying a cam, which is pressed forward by a spring and prevented from moving too far by a stop pin. The upper and inner corners of these cams are rounded so as to permit of readily inserting the reins between them. The plate supporting the cams will generally be made double so as to clasp both sides of the dashboard, but a single plate may be used in some cases where it becomes necessary to attach the device to some support other than the dashboard. The reins are inserted in the holder by drawing them rearward between the cams and then releasing them. Any attempt to draw the reins forward will result in rendering them more secure. By pulling the reins rearward they are readily detached.



PITCHER'S REIN HOLDER.

The device will work well if one of the cams is omitted, but the inventor prefers the double arrangement of cams.

The advantage of this holder over the usual method of holding the reins will be readily understood and appreciated by those who drive, either constantly or occasionally.

For further information address Mr. W. L. Williams, San Diego, Cal.

Amyl Nitrate for Ague.

Dr. Saunders, of Indore, India, reports in the *Indian Medical Gazette* a number of cases of ague successfully treated with nitrate of amyl. He asserts that in every instance the disease yielded quickly and permanently to the amyl treatment. He mixed the drug with an equal part of oil of coriander to make it less volatile and to cover its odor, and administers as follows: Four drops of the mixture, or two of amyl, are poured on a small piece of lint, which is given into the hands of the patient for him to inhale freely; he soon becomes flushed, and both his pulse and respiration are much accelerated, and, when he feels warm all over, the inhalation is discontinued, as the symptoms continue to increase for some time afterward; a profuse perspiration now sets in, which speedily ends the attack, though in some cases the cold stage merely passes off without any hot or sweating stage.

American Society of Civil Engineers.

The thirteenth annual convention of the American Society of Civil Engineers will begin in Montreal, June 15. Arrangements have been made to have such of the members as desire to do so meet at Niagara Falls, on Saturday, June 11, and examine the new suspended structure of the railroad suspension bridge and the re-enforcement of its anchorage. A paper on this subject will be presented at the convention by L. L. Buck, Member A. S. C. E., the engineer in charge of the work.

After spending Sunday at Niagara the party will proceed to Toronto, and after a short stay at that city, will go to Montreal by a steamer, on Lake Ontario, passing on Tuesday the Thousand Islands and the Rapids of the St. Lawrence, and arriving at Montreal the evening before the day of the opening of the convention.

The following papers are announced for presentation during the convention: "Re-enforcement of the Anchorage and Renewal of the Suspended Structure of the Niagara Railroad Suspension Bridge," L. L. Buck; "The Stability of Tunnels in River Silt," Ashbel Welch; "Repairs of Masonry," O. Chanute; "Experiments upon Strength of Wrought Iron Columns," T. C. Clarke; "On Weights and Measures," Charles Latimer; "Comparative Economy of Light and Heavy Rails," Ashbel Welch.

RECENT INVENTIONS.

An improvement in gates has been patented by Mr. Alfonzo P. Campton, of Rohnerville, Cal. The object of this invention is so to construct a gate and its attachments that it can readily be opened by a person approaching on horseback or in a vehicle.

An improved dynamo-electric machine which is adapted for use for various purposes, and particularly for electroplating and analogous arts, has been patented by Mr. Hans J. Müller, of New York city. The invention is an improvement in the class of machines in which a series of armature coils are attached to a shaft rotated by power suitably applied, so that they rotate between fixed and opposing field magnets, and thereby generate the current. The invention consists in combining a relay and a resistance with a series of rotating armatures and fixed field magnets, whereby the reverse or secondary current (originating in the bath of plating solution) is caused to pass through the magnets in the same direction as the main current. The relay regulates the permanent charge of the machine.

A bracelet, combining strength and flexibility, capable of easy adjustment to the arm, and incapable of becoming accidentally unclasped, has been patented by Messrs. Leon P. Jeanne, of New York city, and Paul Jeanne, of Greenville, N. J. The bracelet is made of a narrow thin strip of metal wound closely and spirally about a chain and provided with a novel device for adjusting and fastening the bracelet.

An improvement in that class of rocking chairs in which the seat and back rock upon a platform against the tension of a spring, has been patented by Mr. William E. Buser, of Chillicothe, Ohio.

An improved hame loop has been patented by Mr. Alpheus Arter, of New Lisbon, Ohio. The object of this invention is to furnish a convenient means for adjusting the strap by which two hames are connected together at the top.

An improved convertible valise has been patented by Mr. Mahlon Loomis, of Washington, D. C. The object of this invention is to provide for use of travelers an improved form of valise which shall not only be adapted for containing apparel, toilet articles, etc., like an ordinary valise or traveling bag, but also for suspension vertically from the back of a car seat or other support within folding panels or shelves, may be lowered for use in taking lunch, or playing games, etc.

An improved wheat steamer and drier has been patented by Mr. Cyrus T. Hanna, of Pittsburg, Pa. The invention relates to a process and apparatus for steaming and heating grain and feeding it to the grinding stones hot, so that it may be ground while hot, so that a better article of flour may be produced.

Mr. Hans J. Müller, of New York city, has patented an improved dynamo-electric machine. The object of this invention is to provide a new and improved dynamo-electric machine, which is so constructed that a series of separate and independent currents can be produced, of which one is used to excite the field magnets and at the same time perform work in the external circuits, while the other currents perform work in the external circuits only.