

described in our columns quite recently. Perhaps, for the benefit of subscribers in foreign countries, who may not have received their numbers regularly, it may be well to say that it is a ball governor, the balls being very small, and revolving with much greater velocity than is usual, their centrifugal force being partly counteracted and balanced by a weight hung around the shaft. It is exceedingly sensitive and prompt in its action.

Sanborn's book-binders backing machine is a capital thing for the purpose. The machine on exhibition is as finely finished a piece of work as one would care to see, and it has the advantage over the one made last year, of being much stronger throughout. Mr. Sanborn also shows a book-piercing machine for power. A cam on a shaft raises a crossbeam, in a slot in which are fixed piercers at any required distance apart, and the work is done with neatness and dispatch. For binders who do not require a machine run by power, there is one of a smaller size to be worked by a treadle.

J. B. Mooney, of Cincinnati, has a machine for cutting bolts. The bolts are passed through a hollow spindle and into a pair of clamps, and the dies are so constructed as to cut with one motion. It obviates the fitting-up of dies, as a straight steel will do by putting a thread on. The barrel machinery of Smith & Gouchers must be capable of doing capital service in the oil region of Pennsylvania, if the specimens, consisting of cisterns and tanks on exhibition here, are of its production. Certainly no one could desire neater nor better fitted work than they exhibit. Steptoe & McFarlane show a tanning and a molding machine of elegant workmanship; and John Lemon, of Cincinnati, a hoisting apparatus which merits a notice. The platform travels up and down between the guides by means of a rack and pinion, while an endless belt running from the top to the bottom of the building is driven by the engine. All danger of the falling of the platform in case the belt should break is obviated, since it is sustained by the rack and pinion; and supposing that the belt shifter should fail to work when it might be desired to stop at a given point, the man on the platform can still control its progress by slacking the belt by means of an ingeniously contrived lever placed close at hand.

Attracted by a knot of persons gathered about some object of interest, I pushed my way through and found one of your foster children at its work. The machine for making stove pipe, invented by M. C. Root, of Toledo, and patented through your office, seems to be capable of doing at one operation what our tin-smiths are now doing at five. The usual routine followed in making a length of stove pipe, is, first, to turn the edge with one machine; second, to form the pipe with another; third, to make the seam by hand; fourth, to draw the end in by hand; and fifth, to put on the swedge or bead. These various details are merged into one operation by the ingenious Mr. Root. He has arranged four rollers—three in a line, and one back of them. The sheet is passed between the middle and lower rollers where it gets its edge and groove, then it goes over the middle and back rollers, and under the top one by which time the pipe has been formed, its seam flattened, been bearded or swaged, and the end contracted, which completes the operation, and turns it out as neat a joint of stove pipe as you ever saw in your life. The machine is worked by a crank and treadle, does the work of three men, and costs only \$40.

One corner of the grand saloon, up stairs, is occupied by an extensive display of carved rose-wood and walnut furniture, from the shops of Mitchell & Rammelsberg. In the very foreground of this collection of household luxuries, is a walnut arm-chair, in which the Cincinnati people hope Baron Renfrew may sit when he comes here in the course of his travels. The back is surmounted by the royal arms of Great Britain, carved in the wood, and supported by graceful columns around which are entwined various appropriate emblems. The covering is of silken damask, and in the piece which covers the stuffed back, are woven the same insignia of royalty.

William Wood & Co., of this city, make a fine show of paints, which are said to be fair samples of the articles they sell. One of the jury of award who has had this department under investigation, informs me that in quality and tone these paints are, if anything, superior to those we make in New York, and that there is actu-

ally no necessity for western men to be any longer dependent upon the metropolis for their supplies. The cases of philosophical instruments from the manufactory of James Foster, Jr., would do credit to Pike, or even old Sol Gills, that wonderful gentlemen, who, we are told by Cap'n Ed'ard Cuttle Mariner, of England, could make a watch. Mr. Foster's skill is further shown in the "chronograph" invented by Professor Mitchell, for measuring time during his astronomical observations at the Cincinnati Observatory.

T. Bass, whose sign-card hung on the heap of baskets here, shows that "they are home-made," certainly deserves credit for his selection of the willows from which the large and small baskets and bird-cages are made, as well as for the admirable workmanship which they indicate him to possess. It may well be a question for our farmers to discuss, whether it is worth our while to pay Germany and France something like a million dollars annually, for willow and willow-ware, when the articles can be produced as cheaply and good as they are abroad.

Miles Greenwood for some cause or other, doubtless from press of more important business, makes a small show of his goods this year. There is a case and some loose samples of beautiful brass castings, and a new valve in the lot is both novel and excellent, but in comparison with what he might have done, his contribution to the Institute this year, is but a drop in a bucket. Mr. Greenwood took hold of Fawkes's steam plow last year, and improved it very materially, I hear. The plow-frame is now made of angle iron instead of wood, as formerly, and works much better both for raising and lowering as well as draft. The machine has been down to Mr. Sullivan's mammoth farm in Illinois, where Fawkes has contracted to break a thousand acres this season. He has finished threshing about ten thousand bushels of wheat for Mr. Sullivan, and has more work of the same sort laid out.

#### RECENT AMERICAN INVENTIONS.

##### COMPASS PROTRACTOR

The object of this invention is to produce an instrument which enables an inexperienced hand, and also a person not acquainted with the manner of making a calculation, to take the necessary observations for the purpose of determining the ship's course to a given point, or the bearings of surrounding objects, or the position of the ship from bearings; and the invention consists in the combination with ordinary parallel rules of a movable circle, graduated as a compass and provided with a semicircular opening with the exact center of the circle, marked therein in such a manner, that by the combined operation of said circle and the parallel rules, all the operations for the purposes above stated, can be made in a simple and easy manner, and without the necessity of any calculation. F. H. West, of San Francisco, Cal., is the inventor of this instrument, and he has assigned his full right to F. S. Seabury, of Stoney Brook, N. Y.

##### SADDLE TREE.

The object of this invention is to obtain a gig saddle tree, by which a saddle tree may be constructed to fit any horse, and thereby avoid injuring or galling the back of the animal, a contingency of frequent occurrence as saddles have been previously constructed. The invention has for its object the simplifying of the manufacture of gig saddles, especially those of a superior kind, and to render the same more elastic and neat in appearance, stronger and more durable than usual, the invention being applicable to all kinds of gig saddles, such as silvered and japanned seats, jocky-covered seats, &c. This invention was patented to S. E. Tompkins, of Newark, N. J.

##### ATTACHING HANDLES TO SAWS.

The object of this invention is to attach handles to a cross-cut saw in such a manner that they may be firmly secured to the saw, and at the same time admit of being readily removed when necessary, in order that the saw may be drawn longitudinally from the kerf when the log presses or binds against its upper surface, and prevents a vertical withdrawal of the same, a contingency which always occurs where the log is not supported so that its outer ends will fall when the cut is made, and this cannot always be effected, especially with large logs, which are mostly sawed on the ground. This improvement was designed by Isaac Pelham, of Ithica, N. Y.

#### REPORT OF THE TRIAL OF STEAM FIRE ENGINES AT RENSSELAER COUNTY FAIR, TROY, N. Y.

[Reported expressly for the Scientific American.]

On Thursday of last week, the principal steam fire-engine builders assembled at Troy, N. Y., for the purpose of testing the merits of their several machines, and to arrive, if possible, at some definite conclusions respecting the merits of the various plunger and rotary pumps employed by them. The day set apart for the trial was the 27th ult., and at the hour specified the several engines made their appearance on the grounds, drawn either by hand or horse-power. We have not room for the meteorological report of the Smithsonian Institute, which was taken for us, but the wind was light through the day, except at intervals, when it blew quite fresh from the West; indeed, had the day been specially selected from the year, it could hardly have been finer for the purpose. The sky was covered with sullen clouds until nine o'clock, when, having relieved themselves of a slight shower, they partially cleared away. The prizes to be awarded by the Fair Committee, of which William E. Hagan, Esq., was chairman, amounted to \$100, \$75 and \$50. In addition to these, it was announced from the judges' stand that the citizens had contributed \$200, to be awarded as the Fair Committee thought proper. Two tests of each engine were to be had—one to play from the pipe through 50 feet of hose, using such nozzles as the exhibitors pleased, for 30 minutes from signal. The other test was in the case of first-class engines, to pump, through 800 feet hose, 18 inches against time, out of a tank 15 by 22 feet in measurement, and not quite three feet in depth. In respect to the second class pumping on quantity, they were to work on the tank for 15 minutes from signal; the amount of water discharged in that time to be estimated by the judges. The exhibitors were allowed 15 minutes from the tap of the bell to get ready. At the second tap they were to start fire and play for 30 minutes, as previously set forth.

The engines entered for competition were as follows, in the order of playing:—Messrs. Lee & Larned, Novelty Works, New York City.—Self-propelling steamer *Niagara*; weight, 11,500 lbs.; size of steam cylinders, 7½ inches diameter by 14 inches stroke; capacity of pump (Carey's rotary), 1,200 gallons per minute. Hand engine No. 5, of this city, same makers—horizontal steam cylinder, 7 inches diameter by 8½ stroke; capacity of pump, 220 gallons per minute; weight, 4,448 lbs.; with one gage of water in boiler and no water tank. *Mechanics' Own*, same makers; same size cylinder and pump; weight, 4,278½ lbs.; water in boiler; no tank. Steamer *Southwark*, Philadelphia (this engine played last), same makers—horizontal steam cylinder, 9 in. diameter by 8½ in. stroke; capacity of pump, 600 gallons per minute. Amoskeag Manufacturing Company, Manchester, N.H.—Hand engine No. 2, weight, 4,858½ lbs.; size of steam cylinder (vertical), 8 in. diameter by 12 in. stroke; size of pump (plunger pattern), 4½ in. diameter by 12 in. stroke; capacity of pump, 251 gallons per minute; no air chamber on pump. Steamer *Huron*, same makers, first-class engine—size of steam cylinders, two direct acting vertical engines, respectively 8 in. diameter by 12 in. stroke; two plunger pumps, 4½ in. diameter of plunger by 12 in. stroke; weight, without fuel or water, 6,030 lbs.; wood and water, 7,100 lbs.; capacity of pumps collectively, 600 gallons per minute. Silsby, Mynderse & Co., Seneca Falls, N. Y.—One first-class engine, rotary pump and engine (Holly's patent); weight, 6,049 lbs.; air chamber on pump; size of steam cylinders not given; capacity of pump, 600 gallons per minute.

These are all that were entered by prominent manufacturers; others were expected, but failed to arrive. We must not omit, however, to notice one machine entered for competition, which will certainly, if it grows a little, create a great revolution; this is the handwork of Charles Fichtel, of Philadelphia. Size of steamer built by Charles Fichtel, horizontal steam cylinder, 4-8ths of inch diameter by 6-8ths of an inch stroke; capacity of pump, one nut-shell. This was really the neatest specimen of workmanship we have seen for some time. The whole affair weighed but 2½ pounds, and was an exact *fac-simile* of the Lee-Larned engine, even to the Worthington pump which supplied (?) the boilers with water, whose cylinder was only ¼th of an inch in

diameter. The whole feed pump, steam and water cylinder would easily go into a small thimble. This is a working model, as we saw it in operation, throwing a stream about the size of a pin 4 feet 6 inches. Mr. Fichtel may congratulate himself on having produced the most complete specimen of skill and patience that has been seen in a long time.

The results of the playing of the engines are given below. The time given may not accord with that of the judges (owing to the difference in watches) in relation to the start, but the mean time of playing and the results—both steam and water—are derived from official sources, and is the only authentic account published.

Steamer No. 5, *City of New York*.—Lee & Larned machine.—Signal to make ready given, at 10 o'clock 25 minutes, 50 seconds; signal to start fire given at 10 o'clock, 40 minutes, 50 seconds. Engine began to work in 7 minutes 52 seconds from signal; water from pipe almost instantaneous; water in boiler perfectly cold; no fluid, grease, or anything foreign in the boiler; the average of the steam taken every five minutes was at the start 3 pounds, in 10 minutes 45 pounds—subsequently ranging from 154 to 40 lbs., on the fourth 5 minutes, this result arose from over-firing; in five minutes after, the steam ran quickly up again until they stopped with 135 lbs.; this boiler steamed perfectly free, the fuel being coal. The results obtained through 50 feet of Boyd's hose, out of 1½ in. nozzle, were 209 feet; for the first 6 minutes the wind was rather fresh, and blew the stream about some—last 4 minutes no wind whatever; auxiliary feed pump on boiler. On quantity, same engine, through 800 feet of hose; signal to start at 11.25; steam at start, 140 pounds; fuel, wood and coal; pumped 15 minutes on the tank, whose capacity was 2,459 gallons to a foot, size of tank 15 by 22 feet; stopped playing at 11.40, and lowered water in tank 1 foot and 20-100 of a foot.

Steamer *Mechanics' Own*—Third class engine.—Trial on distance, 50 feet of hose, 1½ inch nozzle; started at 12.01, stopped at 12.31, having thrown 174 feet against a good cross breeze. This engine did not commence playing until 11 minutes from signal; cause, some obstructions in the smoke pipe unavoidably overlooked; the steam subsequently ranged from 8, 9, 12, 55, 140, 100, 105 lbs.; fuel, wood. Same engine pumping on tank, 800 feet of hose, open butt. Started at 12.38; pumped in 15 minutes 1 foot and 26-100 of a foot from tank 15 by 22 feet; steam ranging from 150 lbs. at the start to 155 lbs. at the close; fuel, wood and coal.

The next engine was No. 2 *Amoskeag*—Second class—L. H. Straw, agent; engine described previously. Started at 1.11; water from pipe in 7.30 from application of torch; no wind at all during trial; played 30 minutes through 1½ in. nozzle 160 feet 3 inches; water gage indicated 50 pounds per square inch; last minute 100 lbs.; the steam ranged from 20 lbs. at the start to 75 lbs. on the last stretch; but the average was very poor indeed, owing to an inferior quality of coal, imported from Liverpool; the mean pressure during this trial was 51 pounds. This was a single plunger pump engine. Same engine on quantity—Started at 1.55; water pressure on hose, 140 pounds; steam at the start 135, ranging to 65 lbs. at stopping; quantity exhausted from tank, 1 foot 53-100 of a foot. The steam was better during this trial, but there seemed to be a lack of fire-surface for continued playing.

Next engine—Silsby, Mynderse & Co.—One first-class machine. Started at 2.34; steam in six minutes from signal; water from pipe in 7 minutes 20 seconds threw an inch and a quarter stream 216 feet; no wind whatever; fuel used, coal. Played 26 minutes and was then ruled out by the judges; cause, joint blowing out of the steam cylinder; this machine stood steadier than any of the others whilst playing. Same engine on tank—Signal given at 3.16, stopped at 3.31, quantity discharged from tank, 1 foot 29-100 of a foot; steam ranged from 90 to 82, 60, 55 lbs. This engine should have pumped 18 in. against time from its class; but it was overlooked by the judges.

Next engine—Steamer *Huron*—First class—Built for the city of Detroit by the Amoskeag Co. Signal to start fire at 3 o'clock 56½ minutes; water from pipe in 6 minutes 30 seconds from signal; no wind during trial; distance thrown through 1½ in. nozzle, 223 feet 9 inches; during the last five minutes ran very irregular-

ly; steam ranged 23, 40, 85, 125, 130, 150 lbs.—stopped at 90 lbs. On quantity—same engine, pumping 18 inches out of tank against time; 800 feet of hose, open butt; 13.30 seconds.

Next engine—Lee & Larned's self-propeller, *Niagara*. Signal to start at 5 o'clock 11 minutes: water from pipe, 6 minutes 30 seconds, through 1½ in. nozzle; distance thrown, 208 feet 8 inches. At this point, after having played 16 minutes, the cast-steel pump shaft, 3¼ inches in diameter, was twisted off, and the engine was ruled out very reluctantly by the judges. Fuel used, wood; steam at starting, 5 pounds, ranging from thence to 120.

Steamer *Southwark*.—Lee & Larned engine. Signal at 5 o'clock 50 minutes, 30 seconds; water from pipe in 6 minutes 47 seconds from signal; whistle blown 6 minutes from signal; started with 10 pounds of steam; distance thrown against a stiff breeze, through 50 feet of hose, and 1½ inch nozzle, 172 feet; the darkness prevented us from taking the steam, but the average was not over 75 pounds. Same engine on tank through 800 feet of hose, pumping 18 inches against time, 14 minutes 25 seconds; average steam 80 pounds; 579 gallons per minute discharged from pump. This engine ended the trial.

## REMARKS.

It will be seen, by examining the figures, that, thus far, the plunger pump party have the best of it, in distance, and also in quantity; but this must not be taken as evidence of the superiority of one over the other, both parties claiming, from their experience, that their respective pumps are the ones which do the best service. The hand engines of Messrs. Lee & Larned are much smaller than the one of Amoskeag No. 2 pattern, yet their engine pumped within 27-100ths of a foot as much on quantity as the Amoskeag, and beating them by 13.9 inches on distance, out of the same sized nozzle. We cannot discuss this matter at present, as at our time of going to press, the judge's verdict was not made public. The award will, however, probably be given to the rotary pump of Cary, with Lee & Larned's boiler, as regards distance, and to the Amoskeag on quantity discharged in a given time. The Silsby & Mynderse engine presents many excellent features as regards its arrangement and general construction. The boiler steamed very freely, and seemed to make plenty of vapor for an engine that took a good deal. Their stream, however, was not so solid in its body as those of other exhibitors. The committee propose to offer a premium the next year, of \$1,500, for the best steam engine drawn by hand. This is the true way to encourage inventors to step forward and try their several inventions; and we doubt not that it will result in bringing the steam fire-engine system to a degree of perfection not yet attained. Any man who looked upon the friendly strife upon that day in the field, and saw the solid columns of water flying swiftly through the hose, could not but wish that such a stream were turned upon the old hand engines, and they washed away entirely. The number of steamers multiply rapidly, we are happy to say, and each company and city is becoming more and more emulous in so good a cause. May the day soon come when none else shall be used; with every exhaust and every separate impulse of the water, they work out practical victories, and attain to greater results in the public mind than any pen or tongue could effect in a year.

## COL. JOHN C. BOYD'S HOSE.

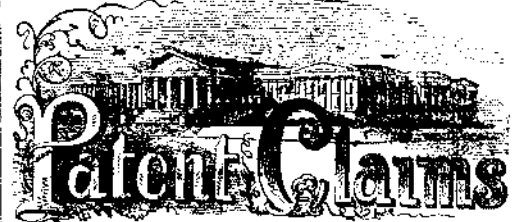
We saw this excellent hose fully tested at the trial of steamers, last Thursday, and can speak of its merits personally. Through all the tremendous strain which the steamers put upon it, even when the *Niagara* accident took place, there was not enough moisture on the outside to soil a handkerchief. It is made of four-ply cotton goods, lined with a composition, and has successfully withstood a pressure of over 360 pounds per square inch.

We desire to return thanks in this place, to Wm. E. Hagan, chairman of the committee, for a place on the judge's stand. It is wholly due to this gentleman's exertions that the affair was pushed forward with the spirit in which we have set forth.

The judges on this occasion were, Daniel Doncaster, L. A. Orcutt and J. P. Collins, Esqs.

The engines upon exhibition have all of them done much better than upon this occasion. It seems at times when the best duty is required, that circumstances will not mold themselves to suit the will.

The time of raising steam varied but 30 seconds in the whole number of engines, with the exception of the *Mechanics' Own*, whose pipe was choked, and we are pleased to be able to record so signal a success in the way of steady playing as these engines accomplished. One half hour of such work with a steamer is a worse test upon it than half-a-day at a fire, on account of the desire of all parties to do their very best, and the rapid rate of working to which the machines are subjected. The accident to the *Niagara* was unavoidable, and could not have been foreseen; we hope it may not be long before we shall have another such trial to record, with better success.



ISSUED FROM THE UNITED STATES PATENT OFFICE  
FOR THE WEEK ENDING SEPTEMBER 25, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

\* Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

30,109.—Ethan Allen, of Worcester, Mass., for an Improvement in Metallic Cartridges:

I claim constructing a metallic cartridge with a projection or lip, for the reception of the fulminate, substantially in the manner and for the purpose set forth and described.

30,110.—L. L. Alrich, of Carthage, Mo., for an Improvement in Faucets:

I claim the valve plug C, with its key-hole recess, g, and spring, G, in combination with the cylinder, F, and the faucet portions, A and B, the whole being arranged and operated by a key, in the manner and for the purposes set forth.

[This invention is an improvement in faucets wherein a key is used to open or close the faucet. It consists in operating a plug or valve that is fitted into a cylindrical chamber projecting up from the top of the faucet, so that it may be moved up and down, but which will not turn in the cylinder; said plug being seated in such a manner in the faucet tube and acted upon by a spring that the flow of liquid can only be obtained by using a key adapted to the faucet.]

30,111.—G. B. Arnold, of New York City, for an Improvement in the Manufacture of Ruffles:

I claim, as a new article of manufacture, the ruffle or plaited fabric made as described; that is to say, the fabric to be plaited or ruffled being operated upon so as to be ruffled by the feeding device, and fastened by the stitching apparatus of a sewing machine at one and the same operation, when no binding or foundation fabric is employed.

30,112.—G. B. Arnold and Alfred Arnold, of New York City, for an Improvement in Sewing Machines:

We claim, first, in a sewing machine, the employment of the separator, C, or its equivalent, for the purpose of separating two pieces of cloth, E and F, and thereby protecting F from the action of the gathering mechanism, substantially as set forth.

Second, Gathering cloth and stitching or fastening the gathers on a sewing machine, by the combined action of the single feeding device, A, presser foot, B, and separator, C, or their equivalents, substantially in the manner described.

Third, Regulating the length of the stitches in the production of a gathered fabric, by changing the position of the separator, C, or of C, and the presser foot B, relatively to the forward extremity of the path traversed by the feeder, A, substantially as set forth.

30,113.—J. C. Baldwin, of Waterville, N. Y., M. D. Baldwin, of Brantford, C. W., and Robert Brayton, of Buffalo, N. Y., for an Improvement in Preserving Hops:

We claim the described process of preparing and preserving hops, substantially as set forth.

30,114.—G. S. Ball and Wm. H. Nauman, of Dayton, Ohio, for an Improvement in Seeding Machines:

I claim the arrangement and combination of the feeder, A, the indicator, D, graduated arc, E, slides, B, B, and cut-off, F, the whole constructed and operating as set forth.

30,115.—Benj. Barnard, of Farmington, Ohio, for an Improvement in Seeding Machines:

I claim the arrangement of the plates, n h g j, slide, v, screw, a, a', and bars, K L, and rod, M, as and for the purpose shown and described.

[This invention consists in an improved seed-distributing apparatus, the mode of constructing and arranging it, together with gages for regulating the depth of the planting of the seed, and agitators for preventing the choking of the seed in the seed-boxes, the parts being so arranged, whereby an exceedingly simple and efficient machine is obtained for the purpose specified, and one not liable to get out of repair or inoperative by use.]

30,116.—G. E. Beach, of Jersey City, N. J., for an Improved Railroad Switch:

I claim, first, So hinging and connecting two rails, R C, or J K, in a continuous series that their positions may be shifted, for the purpose of guiding a train upon another track without breaking their continuity, substantially as set forth.

Second, I claim the fixed bearings, m, m, in combination with the forked bar or rod, P, and the hinged continuous rails, B C, and J K, substantially as and for the purpose described.

Third, I claim, in combination with the hinged continuous rail, or rails, B C J K, the employment of the tongue or tongues, E G, operating together, substantially as and for the purposes described.

Fourth, I claim, in combination with the hinged continuous rails, B C J K, and tongues, E G, the spring or springs, R T, or their equivalents, arranged substantially as and for the purpose set forth.

30,117.—S. A. Black and F. C. Ford, of Erie, Pa., for a Substitute for Railroad Frog:

We claim the arrangement of the levers and bars set forth, in combination with the piece, c, of the rail, supported upon the chair and operated as described.

30,118.—J. H. Boyd, of Baltimore, Md., for an Improvement in Saddles:

I claim the application to the cantle of saddles of an india-rubber roll, as described.

30,119.—T. E. C. Brinly, of Louisville, Ky., for an Improvement in Cultivators:

I claim the combination and arrangement of the plow beam, A, provided with removable feet or standards, D C F, and the two pairs of adjustable rings or arms, H H N M, provided respectively with the shares, J, and teeth, L, as and for the purposes set forth.

[The object of this invention is to combine the plow, harrow and cultivator in such a manner or by such an arrangement of parts that the device may be used in any of the capacities aforesaid by a very simple adjustment, and made to work under any of its adjustments equally as well as those implements intended for any of the above named purposes separately.]