the saw by means of a coil spring, under the swing frame. The frame is pressed down, bringing the wheel in contact with the saw with one hand, and the saw turned on the arbor with the other—thus the slightest touch can be given to the tooth of the saw without injury. The position of the operator is such that he can look directly across the tooth of the saw, and judge correctly when it has received the finishing touch.

The same firm exhibit a set of self oiling saw arbors with patent self-oiling boxes, by the use of which sufficient oil can be applied to run a saw for months, and all waste of lubricators is obviated.

A large variety of

CIRCULAR, SCROLL, GIG, AND ENDLESS BAND SAWS ARE EXHIBITED,

among which we notice Grosvenor's adjustable saw bench, with both cross-cut and slitting circular saws, exhibited by J. P. Grosvenor, of Lowell, Mass., and a combined gig and circular saw, by Hassenpflug Brothers, of New York, to be worked by hand power

Beach's Patent Scroll Saw, exhibited by C. B. Rogers & Co., of New York, is one of the best scroll saws we have ever seen. Perfect tension of the saw is attained and maintained, this tension being secured by direct connection, and equalizing the power on both halves of the stroke. The saw may be run at great speed, and should either pin in the saw break, the saw stops instantly and can, in no case, be either doubled or broken.

McChesney's Gig or Scroll Saw, exhibited by Thos. L. Cornell, Birmingham, Conn., is also a very convenient machine and well made.

We were very much pleased with the Talpey's Self-feeding Hand-slitting Saw Machine, exhibited by the sole manufacturer, William H. Hoag, of New York, a most perfect-working, effective machine, requiring very little power. The power is applied from a winch, through a very simple and compact system of gearing, forming a very unique and ingenious device. This is one of the best things shown.

The Safety Band Saw, exhibited by the inventor and manufacturer, J. T. Plass, of New York, attracts much attention. It obviates all danger of injury to the operator in case of breakage. The details of its construction may be found, with illustration, on page 129, current volume, of this journal.

First & Pryibil, of New York, also exhibit an endless band saw machine, made entirely of iron except the table; a very well made and elegant machine. They also exhibit an improved gig saw machine, which for all kinds of work is probably one of the best machines constructed.

In conclusion, we may express our conviction that in the perfection of wood-working machinery, this country ranks first in the world. The machines exhibited show a commendable regard for perfect workmanship, so essential to durability in all rapid-running machines, and the display is a credit, not only to the exhibitors, but to the institution under whose auspices this exhibition is held.

ANNUAL REPORT OF THE PRESIDENT OF THE WESTERN UNION TELEGRAPH COMPANY.

In some respects, this is a remarkable document. This Company have a capital stock of $41,063,100, including sinking fund, amounting to $494,800, which deducted from the otal capital stock, leaves a balance of $40,568,300, on which a dividend was paid last July. The net profits of the year ending July 1, 1869, were $2,801,457·48, less than seven per cent on this capital.

During three years, from the commencement of 1866, the net profits of the company have been $8,015,432·06. Out of these profits, $4,134,879·10 have been expended in the construction of new lines, purchase of telegraph property, redemption of bonds, purchase of real estate, interest on bonds, sinking fund, and miscellaneous expenditures, leaving a balance for dividends of $4,044,595·34.

No one will be disposed to think these profits too large; but we have no doubt that the profits on all telegraph property in the United States might be made much larger by a general and large reduction of tariff. The present rates, while they do not afford the companies, on an average, seven per cent interest on the capital invested,—many of the smaller companies netting far less than this,—are still so high that the telegraph is not, as it ought to be, a rival to the postal system, in the transmission of messages. Until such a consummation can be approximated, large profits on telegraph property cannot be expected.

Another obstacle to progress has been, want of uniformity in the tariff of charges in different sections of the country. On this head, the Report under consideration gives us information, not only as to the cause of non-uniformity, but the influences which tend to perpetuate it. It says:

"This peculiarity was the result of the great number of separate organizations, having tariffs upon various bases, which required adding together at the termini of two or more lines, so that, upon a dispatch, which was transmitted a few hundred miles, two or three rates were sometimes charged. For instance, a few years since, there were five telegraph companies owning the lines connecting Portland, Maine, with Cleveland, Ohio, and the tariff between these two places was ascertained by the addition of the local rates from Portland to Boston, Boston to Springfield, Springfield to Albany, Albany to Buffalo, and from Buffalo to Cleveland. The same system prevailed throughout the United States until after the consolidation of the lines made it possible to transmit messages between places thousands of miles apart without the necessity of booking or re-checking at intermediate points. This result necessitated a remodeling of the tariffs, and the work has been going on uninterruptedly ever since; but when it is considered that a complete revision of the system required a separate tariff book to be made out for over three thousand other offices, changing and equalizing the rates to more than three thousand other offices, the immense labor and responsibility incurred in the undertaking may be imagined.

"Various plans have been considered for simplifying and equalizing the tariffs, but some practical difficulties developed in all of them. The existence of rival lines, built by speculators, whose profit is in their construction, and which essay to do business at rates less than the cost of the service, necessitates the reduction of our rates upon certain routes disproportionately, and prevents the adoption of a general rate strictly proportioned to distance.

"Considerable reductions in the rates for both private and press dispatches have been made within the past year, amounting in some cases to fifty per cent, and while these abatements have taken place to the greatest extent in those sections of the country where there are rival lines, the tolls over some of these routes being less than the cost of service, yet they have not been confined to these points, the rates having been decreased at more than one thousand offices where there is no opposition. A new tariff of rates is now preparing and will shortly go into operation, based upon air-line distances, irrespective of the routes over which the lines run.

"The following inventory shows the number of stations, miles of line and wire, and amount of machinery belonging to the Company:

"The Western Union Telegraph Company has 3,469 stations; 52,099 miles of line; 104,584 miles of wire; 103 miles of submarine cables; 2,607 instruments for reading by sound. 1,334 recording instruments; 3,807 relay magnets; 4,180 transmitting keys; 132 repeaters; 19 printing instruments; 710 switch boards; 1,887 cut-offs; 1,666 lightning arresters; 14,929 cups of main battery; 7,210 cups of local battery; 9 punching machines for the 'Fast' system, not in use."

A peculiarity of this apparatus will be observed to be, that it nearly all belongs to the Morse system; but we cannot believe, with this report, that "the time will probably never come when this system will cease to be the leading system of the world." We grant that no device yet designed to supersede it has done so, and that it still is used on "95 per cent of all the telegraph lines in existence." We grant its simplicity and "peculiar adaptability to the telegraphic traffic of the country," but the man who hazards a prediction of permanency in regard to any mechanism employed in any department of industry or science in the 19th century, is certainly a bold prophet.

But we have not space to review this report further at this time. Some interesting remarks upon fast methods of telegraphy we reserve for a future number.

RETURN OF C. F. HALL, THE ARCTIC EXPLORER.

On the 26th of September, Mr. C. F. Hall returned to New Bedford, after completing the second of the Arctic explorations which were undertaken by him, for the purpose of ascertaining the ultimate fate and collecting the relics of Sir John Franklin's expedition. The method adopted by Mr. Hall in prosecuting the search, though at first sight it might appear extravagant, was, in reality, about the most likely to lead to success. Discarding the use of strongly built ships and costly equipments, he determined on a land search, trusting mainly to sledges as a sufficient means of transit, and to such food as might be had among the natives, for subsistence. He seems to have had, in early life, received no special training for an enterprise of this kind, and, it is said, that he had not even been to sea; yet, with indefatigable zeal and with an adequate conception of the magnitude, difficulties, and perils of his self-imposed task, he went to work manfully, systematically, and patiently, to qualify himself for it. He departed from New London on his first journey, which was rather of a tentative character, on the 29th of May, 1860, and returned to the same port on the 13th of September, 1862. The result was satisfactory. Besides making some geographical corrections, he found that he could endure the rigorous climate and live as the Esquimaux lived; he acquired their language and became familiar with their character and customs and, moreover, from information he then received, he was enabled to limit his field of inquiry, and even had grounds for believing that some of the crews might be still alive. In 1864 he published an account of this journey, and in the same year he set out on his second expedition, now completed.

The latest account made public of his recent exploration is a letter written by himself while at Repulse Bay, to his friend, Mr. Henry Grinnell, and is dated June 20th, 1869; the leading facts in which may be thus briefly stated:

There now can remain no doubt of the fate of Franklin's companions; none of them reached even Montreal Island. Their bones lie scattered along the coast of King William's Land. Now a solitary grave was found, and again a place of encampment showed that whole companies fell and died there. What adds peculiar horror to this part of the narrative is the fact that were it not for the inhospitable and cruel character of the natives, some, at least, of Franklin's company might have been restored to civilized society. They were starved to death. The explorer considers that a summer search by a strong expedition, in King William's Land, would probably be rewarded by the discovery of the manuscript records which had accumulated during the Franklin expedition. He says that he had been informed by the natives that the records were deposited in a vault a little inward or to the eastward of Cape Victory. The refusal of his companions to abide by him, and the great probability of his meeting the fate of the gallant Crozier, alone prevented his making the summer search himself. About 150 articles, which belonged to the lost voyagers, were brought home by him, and there are hundreds of relics still in the hands of the natives. This letter closed with an account of a mutiny, on which unfortunate occasion he was obliged to shoot the ringleader.

THE NATURAL ADVANTAGES OF TENNESSEE FOR THE PRODUCTION OF IRON.

It has been the practice of many writers on political economy to regard pig iron as representing aggregated labor more than almost any other industrial product; a view which is probably correct, although superficial thinkers might be led by such a statement to overlook the importance of certain natural advantages essential to the profitable production of this most valuable material. These advantages are the existence of ore of the right quality, fuel, and limestone, so situated that they can be brought together at little cost.

Pittsburgh lies in the center of enormous beds of coal, of which her extensive iron works consume much, and waste a great deal. Limestone can be quarried and placed at the mouths of her furnaces, at small cost, but a large proportion of the ore used is brought from Lake Superior in the crude state. An air-line distance of about six hundred miles, increased by the tortuous routes of transportation to an average of, say, a thousand miles. This, notwithstanding the country all about abounds in ores of various qualities, but many of which can only be worked to advantage by the admixture of the Lake Superior ore.

If ore could now be discovered at Pittsburgh of precisely the quality brought from Lake Superior, and in an inexhaustible supply, it would largely add to the already immense mineral wealth of that locality.

It is also evident that there must be a brilliant future in store for any locality in this country, combining all the advantages named, with open avenues of communication by water or rail to the commercial centers of the United States.

Such advantages are claimed for sections in Tennessee, Northern Georgia, and Southern Alabama. A letter from George T. Lewis, Esq., published in the *Republican Banner*, of Nashville, Tenn., sets forth minutely the natural advantages of these regions, more particularly, however, of the vicinage of Nashville, and on the line of the Nashville and Chattanooga Railroad; and it must be confessed that he makes out a good case.

Assuming that the figures given by Mr. Lewis are reliable, the entire cost at which a tun of pig iron can be produced on the line of the above-named railroad, and delivered at Nashville, is $19, or $10·50 less than the same quality of iron can be made at Pittsburgh.

The following estimate of the cost of manufacturing, assuming cost of furnace to be $100,000, and its capacity to be 6,000 tuns per annum, is submitted:

Mining, loading, and transportation of 2 tuns ore	$4·00
Mining, loading, and transportation of 80 bushels coal	6·40
Quarrying, loading, and transportation of 1,000 pounds limestone	50
Superintendence, labor, etc., per tun	4·00
Wear and tear per tun	50
Interest on investment per tun	1·00
Incidentals per tun	50
	$16·90

The item $4 per tun embraces employés, viz.:

	Per annum.
1 Superintendent	$3,000
1 furnace manager	1,200
1 bookkeepeer	1,590
1 engineer	1,200
1 assistant engineer	800
1 blacksmith	1,200
1 assistant blacksmith	600
1 founder	1,200
4 filers	2,400
4 keepers	2,400
2 guttermen	1,000
2 cindermen	1,000
2 weighers	1,000
6 yardmen	3,000
Extra labor	2,500
	$24,000

Or $4 per tun.

The great advantage claimed by Mr. Lewis is the quality of the ores (hematite and fossil ores) while the coals he affirms show by analysis seventy per cent of carbon with less earthy matter and sulphur than the bituminous or "furnace coals" of Wales, Newcastle, Western Pennsylvania, and Ohio, and the limestone is of a quality unsurpassed for use as a flux.

By his showing the cost of a tun of pig iron at Steubenville, Ohio, from Lake Superior ore is $29.

The cost of a tun of pig metal made at Brazil, Northern Indiana (the ores from Iron Mountain and Pilot Knob, Missouri, and Lake Superior) is	$28·45
The cost of a tun of pig metal made at Pittsburgh, the Birmingham of America (ores from Lake Champlain and Lake Superior) is	29·50

On the other hand, the cost of a tun of pig metal in Nashville is as follows:

Mining, loading, and transportation of 2 tuns ore	$6·00
Mining, loading, and transportation of 80 bushels coal	9·60
Quarrying, loading, and transportation of 1,000 pounds limestone	1·00
Superintendence, labor, etc., per tun	4·00
Interest on investment per tun	1·00
Wear and tear per tun	50
Incidentals	50
Total	$22·60

These statements are certainly worthy of serious attention. The mineral wealth of this region has long been known, in

a vague and general way, but we have not before met with so specific a statement as the one under review. Doubtless there are many iron masters in the country who have data to test the correctness of the figures given; but should some errors be found the margin of difference is so large that some radical miscalculation could only account for it, if the advantages claimed do not fully cover it.

Granted that the statements are reliable, and it follows that the future has large things in store for Nashville, capitalists are not blind, and the iron masters of this country are inferior in sagacity to no other class of manufacturers.

HOW TO FILE AND SET A SAW.

When Dan Rice invented that famous joke about "the greatest saw to saw that he ever saw saw," certainly the saw that he saw saw bore no sort of resemblance to many of the saws which we see saw. Saws that saw one's nerves as well as the timber, screeching and gnawing through wood instead of cutting it smoothly and sweetly, that make one's back ache to witness their operation, and heart ache to witness the useless expenditure of power and labor in much of the work performed by this useful and, when properly made, filed, and set, most effective tool.

A saw is a series of cutters, arranged either in one line or in two lines, according to the work to be performed; and all saws used in wood work (and it is such of which we speak) may be included in two classes—those which cut across the grain and those which cut lengthwise of the grain. The latter class has its teeth or cutters formed so as most to resemble a narrow chisel or plane bit. The teeth of the former class may be regarded as knives which cut, or ought to cut the sides of the kerf smoothly at the same time that they force out or split off the intervening wood.

Many mechanics are accustomed to take their saws to a professional saw filer and setter, acknowledging their own inability to perform the operation as it ought to be done, and preferring to incur expense rather than use a badly-sharpened tool. There is no necessity for this, and any man of ordinary intelligence and skill in the use of tools may easily acquire the simple art of saw filing and setting.

In order to do this, the following points must be observed: The teeth in cross-cut saws ought to cut both ways in traversing through the wood, and the teeth of both cross-cut and rip-saws should be as near as possible of equal length and sharpness. The bevel on the tooth should be more acute for soft than for hard wood. In order to secure the same bevel on all the teeth of a cross-cut saw the file must be held at the same angle in filing each tooth, and if the saw has been previously well filed, the same number of strokes of the file will be required for each tooth, provided an equable pressure is maintained.

If the teeth are uneven in length, their points ought to be first leveled with a flat file, and the beveling be subsequently governed by the point. As soon as the point becomes well defined on each tooth, provided the proper bevel has been maintained throughout, the operator should proceed to the next tooth, and so on.

The saw should be filed from the handle toward the point, as in no other way can a proper bevel be obtained and maintained throughout. If a cross-cut saw be found a little high in the middle, it may still work well, but in no case should it be lower in the middle than at the ends. The feather should be taken from the sides of the teeth by a straight, flat file, or a whetstone with a plane surface, laid along the sides of the teeth, and drawn smoothly along without much pressure. This may be done after the setting.

A rip saw will be found to work better in all kinds of wood if filed a trifle beveling, although in perfectly straight-grained wood it will work well if filed straight across. This bevel is best given to the teeth of these saws after they are set, the file being held at right angles to the teeth. Hard wood requires more bevel in the teeth of a rip saw than soft wood.

The setting of a saw is a matter of great importance. A large proportion of the power required in working a saw is caused by the friction of the plate on the sides of the kerf, and it is the object of setting to lessen this friction by increasing the width of the kerf. The making of saws thinner at the back than at the cutting edge is sound in principle, and saves much power that would otherwise be expended in friction.

A difference of opinion prevails among mechanics about the best way to set saws, some maintaining that the hammer and punch are superior to any of the patent setting tools now in use. A series of experiments which we saw performed some years since convinced us that the hammer and punch were imperfect tools for this purpose, although there is no doubt that the principle of the hammer and punch, as applied in some of the saw-setting tools which have been invented, is the best. A tooth bent and set by a blow will remain where it is put. This, on the contrary, cannot be said of teeth which are bent by sets which act on the lever principle. Nevertheless, we have seen saws very perfectly set by the latter kind of tools. Whatever means are adopted uniformity is the object to be secured; the amount of set required being dependent, of course, upon the nature of the work the saw is intended to perform, and therefore a matter to be left to personal judgment.

APPLICATIONS FOR EXTENSION OF PATENTS.

Horse Power.—Samuel Pelton, of Chester, Ill., has applied for an extension of the above patent. Day of hearing Dec. 6, 1869.

Cotton Seed Planter.—A. W. Washburn, of Yazoo City, Miss., has applied for an extension of the above patent. Day of hearing March 7, 1870.

THE TORPEDO PATENT CASE.

IMPORTANT DECISION IN THE U. S. CIRCUIT COURT BY JUDGE GRIER.

E. A. L. Roberts vs. *The Reed Torpedo Company* et al.—Within the last few years the production in oil wells has been greatly increased by lowering down into them large iron flasks containing from 6 to 10 pounds of gunpowder or nitro-glycerin, and then exploding the mass by means of a percussion cap on the top of the flask, on to which cap a weight was dropped from the top of the well.

It was established by proofs in the case that most remarkable results had been produced in the oil region by the introduction of the torpedo by Mr. E. A. L. Roberts, the plaintiff. Thus in the Eureka well, which was producing only three barrels a day, a Roberts torpedo was exploded, and its production was increased to 180 barrels a day, Hyner well was increased from 2 to 30 barrels per day, Keystone well from 5 to 175 barrels per day, Nelll well from 3 to 80 barrels per day. Tarr Homestead well was increased 65 barrels per day Keystone well from 15 to 200 barrels per day.

These were only a few out of numerous cases where Roberts had succeeded. The annual production of oil due to the use of the torpedo was admitted by defendants in their argument to already have reached several millions of dollars. After Roberts had succeeded in introducing his invention a man named Reed, of Titusville, united with a former agent of Roberts, named Marston, and set up a claim as a rival inventor to Roberts.

They organized the "Reed Torpedo Company," the object of which was to devise and sell to oil men torpedoes at a low rate, and to defeat Roberts' patent. The defendants based their claim upon certain trials made by Reed of torpedoes in 1863. The defendants did not deny that they were infringing the Roberts patent, but insisted that it was void by reason of what Reed had done.

The plaintiff contended that Reed was merely an unsuccessful experimenter, who had abandoned his torpedo as worthless before Roberts' patent was issued.

The oil men united with defendants to defeat the patent, and raised a large fund. They were represented at the argument by Charles M. Keller, of New York, Hon. S. A. Purviance, and B. F. Lucas. Roberts, the patentee, was represented by Bakewell & Christy, of Pittsburgh, and George Harding.

Judge Grier yesterday delivered the following opinion, deciding in favor of the validity of plaintiff's patent, and granting a perpetual injunction:

OPINION.

As I write with difficulty I can only state the conclusions to which my mind has come after a careful examination of this case.

The complainant has exhibited a patent dated 25th April, 1865. This is *prima facie* evidence of a good title, and puts on the respondents the burthen of proof that the patent is void or worthless.

I need not repeat my remarks in the case of Goodyear *vs.* Day (2 Wall, C. C. Rep. 289), but now adopt them as affording a rule of decision which applies clearly to the present case.

As the infringement of the patent is admitted, the only question will be as to the validity of complainant's patent of April 25, 1865.

"It was after speculation had been reduced to practice," and after repeated experiments, that the complainant succeeded in overcoming the prejudice and ignorance of the people on the subject, and persuading the public that his invention was useful; after he had established its great utility and value; and "when his genius and patient perseverance, in spite of sneers and scoffs," were completely successful, that Reed, who had before made experiments on the same subject, and was wholly unsuccessful, imagined that he had the best right to the invention, and after purchasing one or more of complainant's torpedoes, he applied on the 1st of November, 1867, for a patent for substantially the same combination of devices or machines contained in complainant's patent. On the 15th of the same month the respondents formed themselves into a company or corporation called "The Reed Torpedo Company," for the purpose of pirating the complainant's invention and supporting the expense of litigation, and thus defraud him of its fruits. They have persevered, even after the preliminary injunction very properly granted by the District Judge.

Let a decree be entered for complainant for a perpetual injunction, and a master appointed to take an account according to the prayer of the bill.

R. C. Grier, Circuit Judge.

Note.—The passage referred to by Judge Grier in his former decision, 2 Wallace, p. 256, adopted as applicable to this case, was as follows:

"It is usually the case, when any valuable discovery is made, or any new machine of great utility has been invented, that the attention of the public has been turned to that subject previously, and that many persons have been making researches and experiments. Philosophers and mechanicians may have in some measure anticipated in their speculations the possibility or probability of such discovery or invention; many experiments may have been unsuccessfully tried coming very near, yet falling short of the desired result. They have produced nothing beneficial. The invention, when perfected, may truly be said to be the culminating point of many experiments, not only by the inventor, but by many others. He may have profited indirectly by the unsuccessful experiments and failures of others, but it gives them no right to claim a share of the honor or the profit of the successful inventor. It is when speculation has been reduced to practice, when experiment has resulted in discovery, and when that discovery has been perfected by patient and continued experiments, when some new compound, art, manufacture, or machine has been thus produced which is useful to the public, that the party making it becomes a public benefactor and entitled to a patent.

"And yet when genius and patient perseverance have at length succeeded, in spite of sneers and scoffs, in perfecting some valuable invention or discovery, how seldom is it followed by reward! Envy robs him of the honor, while speculators, swindlers, and pirates rob him of the profits. Every unsuccessful experimenter who did or did not come very near making a discovery now claims it. Every one who who can invent an improvement, or vary its form, claims a right to pirate the original discovery. We need not summon Morse, or Blanchard, or Woodworth to prove that this is the usual history of every great discovery or invention.

"The present case adds another chapter to this long and uniform history."—2 Wallace, C. C. Reports, p. 299.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

Bolt Feeder.—Oscar Van Tassell, Naperville, Ill.—This invention has for its object to furnish an improved device, by means of which the flour or meal is fed faster or slower to the bolt, as may be desired, and which shall, at the same time, be simple in construction and easily operated.

Spring Bed Bottom.—D. M. Bye, Roanoke, Ind.—This invention has for its object to furnish an improved adjustable spring bed bottom, which shall be simple in construction, strong, durable, and elastic in use, which can be readily attached to any bedstead and which can be made and sold for a comparatively small amount.

Plow.—J. C. McVutt and A. B. Furman, Strattonville, Pa.—This invention has for its object to furnish an improved plow, which shall be so constructed and arranged as to be of lighter draft, and more efficient in operation than the plows constructed in the ordinary manner.

Wheelbarrow.—B. W. Tuthill, Oregon City, Oregon.—The object of this invention is to construct wheelbarrows with metallic frames, metallic boxes, or trays, and also with certain improvements in the construction and arrangement of the hubs of the wheels, all designed to provide cheaper and more durable wheelbarrows than when made of wood in the common way.

Feeding Apparatus for Carding Machines.—A. A. Dow, Glenham, N. Y.—This invention consists in providing the toothed or spiked feeding strap, on the short side of the said feeding device, with operating devices having "positive" movements; also, in providing the rollers of the traveler, which lays the roping, with means for operating them positively.

Press.—W. J. McDermott, Covington, Tenn.—This invention relates to improvements in presses for hay, cotton, and the like, and has for its object to provide a simple and convenient arrangement for changing the application of the power when the resistance increases to give a greater force the speed being decreased.

Stop Valve.—John Paterson, Troy, N. Y.—This invention comprises a pair of sliding valves, suspended from a screwed stem working up and down in a chamber at the ends of two pipe connections, and a cam arrangement between the saw valves, by which, when they have arrived at their seats on the ends of the said pipes, they are pressed down tightly thereon, and which releases the said pressure as soon as the valve stem is raised a small amount in the direction for opening the valves.

Corn Husker.—Elihu Field, Geneseo, Ill.—This invention consists in the arrangement of the shank of a bent pointed metallic instrument, to be held in the hand so as to pass in a straight line across the inside of the fingers and terminate in a bow for taking in the three fingers, beginning with the little finger, leaving the fore finger free for independent action with the thumb.

Heating Furnace.—A. L. Otis, Normal, Ill.—This invention consists in certain improved arrangements of the covers of horizontal furnaces, calculated to secure the heating of the air as much as possible before passing off through the conducting pipes; also, certain improvements in the construction of the valves of the furnace, calculated to give out more heat by radiation and by convection; also, certain improvements in the arrangements of the grates, and, also, certain impovements in means for heating the air previous to supplying the fire.

Shaft Coupling.—Edward G. Shortt, Carthage, N. Y.—The object of this invention is to provide an improved mode of coupling shafts together, and comprises a pair of curved wedges, a sleeve, a pair of set screws, and radial pieces in the shafts, which are used by placing the wedges, which have semicircular grooves propelling the shafts, on the two sections to be joined together, and placing the sleeve over them, to which they are fitted, and then screwing the set screws through the side of the sleeve into conical recesses in the said wedges, to clamp them tightly between the shafts and the interior wall of the sleeve.

Rat Trap.—J. Ward Fifield, Franklin, N. H.—This invention consists of a double walled vessel, which may be either square or round, with inclined passages between the walls leading from openings in the exterior wall near near the bottom of the interior chamber, through other openings in the inner walls, the interior openings being provided with doors which open readily inward to the animals seeking ingress, but close effectually against their efforts to get out.

Locking Whip Socket.—W. S. Hill, Manchester, N. H.—The object of this invention is to combine with a whip socket, for carriages, a lock with a swinging hasp, similar to padlocks, in such a way that the hasp may be locked around the whip above the buttons, or enlargements at the ends, when not using it, to prevent it from being wrongfully taken away, and so that when driving and requiring it for use, the hasp being unlocked may be opened for readily inserting the whip in the socket or removing it. The invention also comprises an arrangement of leather, or other flexible substance, with the hasp and the lock to prevent chafing the whip.

Heater.—Edmund Schwiedter, Hoboken, N. J.—The object of this invention is to construct a heating apparatus, in which the smoke will be to a very large degree consumed, so that with a comparatively small quantity of fuel a greater degree of heat can be obtained.

Multiple Embroidering Machine.—Hermann Berger, Martinalen, Switzerland.—The object of this invention is to construct an embroidering machine, which can be used on gauze, or other fabric, in such manner that one or more pairs of curtains, or other articles, can at once be embroidered thereon with the design in reverse. Thereby a very large amount of labor is saved, as in the machinery heretofore in use but one single piece could be treated, and as for the reverse position required on every pair of curtains new designs had to be gotten up.

Cloth and Hat Brush.—Joseph Marshall, New York city.—This invention relates to a new brush, which, when used on broadcloth, silk, felt, and other fabrics, will very thoroughly free the same of all dust and other impurities, and impart a polish to the surface to which it is applied. The invention consists in arranging a velvet, plush, or other cushion within the bristles, which form the outer part of the bush. This cushion will aid in removing impurities, and will, at the same time, polish and lay the fibers on the brushed surface.