

**THE DISCOURAGEMENT OF INVENTION.**

We have received from inventors not a few communications with regard to the threatened changes in the patent law, in every instance sustaining the position taken by the SCIENTIFIC AMERICAN, that the proposed increase in the cost of patents, and the limitation of the right of the patentee, would have an immediate effect in diminishing the number of useful inventions.

Touching section 11 of Mr. Wadleigh's bill, an inventor writes: "I would say that my experience, being a man of limited means, has been that it takes a long time to get a patent in paying condition. Machine shops will burn up and destroy your patterns, and you have to begin again. Your patterns want changing and simplifying, and before you get a machine ready to put upon the market you have several worthless machines which cost money and discourage a man enough without having to pay any more. It is now four years since I patented my miter box, and six years since I began to work at it; and it is just now that it is doing me any good. I am at work on another invention which I shall patent as soon as I can, if that law does not pass; if it does pass I shall have to abandon the work, for I shall not dare to incur the risk."

Another inventor, after quoting the declaration of Mr. Sargent, of the Western Railway Association, as cited by Mr. Walker before the Patent Committee—"Whenever our attention is called to a patent of value we use it, and in a few cases we are made to pay by plucky inventors; but in the aggregate we pay much less than if we took licenses at first"—goes on to say: "I have made an invention for use on railroads, which if adopted would beyond question prevent disasters now by no means uncommon—disasters wherein life and property are often largely sacrificed, and consequently the loss of large sums of money by the corporations in payment of damages, and all this loss comes out of the stockholders' dividends. The millions of travelers also on our railroads have a right to all the safeguards possible, and should not be deprived of them. I have got the model for my invention above mentioned nearly completed, and intended in a short time to apply for a patent. But the declaration of the railroad officer above quoted, coupled with the prospect that the nefarious law proposed will be forced through Congress by the machinations of parties interested in the entire destruction of the patent laws of the country, induces me to abandon the idea of taking out a patent, and I shall leave the invention where it is. I cannot afford to fight for my rights against pirates backed up by Congress, and it is highly probable that scores of useful inventions now in process of development will for the above reasons be abandoned by their authors."

In a long letter on the incentive which a good patent law offers to the inventor, in which he says that the hope of gain under the patent law has been his only incentive to invent, another correspondent writes:

"Take away the patent system, deprive thereby the inventor of his hoped for reward, and every inventor would argue in this way to himself: 'If I follow this idea up and perfect it, undergo the drudgery, disappointments, and expense, and bring a useful and valuable form out of this chaotic idea, and call the attention of the public to it, what will be my reward? I shall probably be in the position of one of the dogs of Constantinople when he finds a large piece of meat or bone and ventures to display himself in the streets therewith. His share would not pay for the trouble of finding it.' Therefore the *ci-devant* inventor would say, 'I cannot afford to spend so much time and money as would be required, simply *pro bono publico*, so I will leave it for some one who can.' And the one who is rich enough to be able to afford to spend so much for patriotic motives solely would be apt to have more tempting immediate inducements in established enterprises to occupy his attention, and invention would cease."

It is altogether likely that the attempt to modify the patent law in the interest of infringers will be renewed as soon as Congress meets again. In the meantime it will be well for inventors and all others who have at heart the industrial progress and prosperity of the country to see that their representatives do not return to Congress unwarned and uninstructed. The ignorance which many otherwise intelligent members displayed last winter with regard to the extent of the country's industrial interests, and the vital influence of the patent system upon their prosperity, was positively appalling. The risk should not be repeated.

**WHERE OUR INVENTORS LIVE.**

The geographical distribution of our inventors is, to say the least, suggestive in respect to the number of patents taken. The leading States stood, in 1876, as follows: New York, 3,914 patents; Pennsylvania, 1,895; Massachusetts, 1,298; Illinois, 1,298; Ohio, 1,195; Connecticut, 736; New Jersey, 685; Michigan, Indiana, Iowa, Missouri, and California stand close together, about 425; Wisconsin took 303; Maryland, 273; Rhode Island, 231; District of Columbia, 197; Maine, 178; Minnesota, 164; Kentucky, 163; Virginia, 145; Texas, 108; Tennessee and Louisiana, 107 each; New Hampshire, 107; the rest less than 100 each. It will be seen that New York took more than double the next in the list; while the first three took more than all the rest together. Massachusetts took more than all the rest of New England, and 200 more than all the States south of Mason and Dixon's line. The number taken in Connecticut exceeded by 120 the share of all the South Atlantic and Gulf States from Virginia to Texas. New York took more than all New England,

except Massachusetts, and all the South; Illinois nearly as many as all the Southern States together; Missouri and Maryland more than the rest of the South, excepting Kentucky and Tennessee; and the last two more than the Carolinas, Georgia, Florida, Alabama, and Mississippi. In the ratio of patents to population, the leading States were: The District of Columbia, with 1 to 668 inhabitants; Connecticut, 1 to 730; Rhode Island, 1 to 914; Massachusetts, 1 to 918; New York, 1 to 1,121; New Jersey, 1 to 1,323; California, 1 to 1,376; Pennsylvania, 1 to 1,859; Illinois, 1 to 1,957; and Ohio with 1 to 2,230. The proportion for the United States as a whole was 1 to 2,398 inhabitants. The southern coast States averaged about one patent to twenty thousand inhabitants.

**NOT SO MANY OUT OF WORK.**

That the financial disasters and industrial changes of recent years have thrown many operatives and laborers out of work, and at the same time have necessitated a redistribution of labor that has borne heavily upon many industrious people, is sadly true. Yet it is certain that the number of willing workers who cannot find employment throughout the country is very much less than demagogues—who want to manipulate the "labor vote"—have tried to make out. They talk of millions begging for work and groaning in enforced idleness; but no one else can discover them. The truth is that while many are doing work which they would prefer not to do, at rates below what they think themselves worth, the great majority of our working classes are well employed, and the thrifty among them find that their diminished earnings now have quite as great a purchasing power as had their higher wages (in a depreciated currency) years ago.

No small part of the failure of would-be workers to win employment is due to their unwillingness or incapacity to adjust themselves to the changed condition of the labor market. During the period of flush times and political rings, great swarms of laborers were gathered about all our cities, nominally to work upon city improvements, really to serve their employers at the polls. They were paid not so much for their intelligence and strength as for their service on election day; and subsequently, when they found it impossible to get similar work to do, too many of them showed little inclination to grapple with serious work in other occupations. Used to large wages and light work, they had no stomach for hard work and small pay, and were besides unwilling to exchange their gregarious life for the severer and less exciting life of the country laborer. Too many of them also preferred to leave their families to the care of charity while they "agitated" for public employment.

A more deserving class of more or less skilled workers came to temporary distress through the transference to the West of numerous industries formerly monopolized by the East. A large migration of Eastern mechanics and artisans was thus made necessary; and many of those who were unable or unwilling to follow their work had to suffer, though for no fault of their own, the penalty of being not wanted. But the worst is over now. To a large extent the needed readjustments have been made; industry has revived; the demand for labor is increasing; and the return to the soil of large numbers of men who ought never to have abandoned it has considerably lessened the competition in other fields of labor. Accordingly the great army of the unemployed, that demagogues talk so much about, has dwindled to comparative insignificance. Of the remnant the larger portion is manifestly composed of the tramp element, which dreads nothing so much as steady employment.

The labor census in progress in Massachusetts furnishes instructive evidence in this connection. Massachusetts is a State in which the manufacturing industry largely predominates. In its mills and factories the introduction of new and improved machinery has been general and rapid. And within late years its manufactures have been seriously crowded in many markets by the rapidly developing manufactures of the central West. Yet in Massachusetts to-day the number of persons lacking regular employment is surprisingly small. Already enough of the State has been canvassed to warrant the chief of the State Bureau of the Statistics of Labor, Mr. Carroll D. Wright, in fixing the maximum number of men without permanent employment in the whole State at twenty thousand. Of this number at least a third have occasional employment; and half the rest belong to the unsteady and thriftless class, who never work if they can avoid it. Accordingly the number of men in Massachusetts who want work and cannot get it is estimated at not more than ten thousand—a large number considered by themselves, but small compared with the whole number of workers, or with the number so often said to be out of work. In proportion to her population, Massachusetts' share of Kearney's 4,000,000 tramps should be at least 175,000. For our part we put more confidence in Mr. Wright.

**THE PARTITION OF TURKEY.**

The territory taken from Turkey by the treaty of Berlin comprises an area considerably exceeding that of all New England, or about 71,500 square miles. The largest section, Bosnia, handed over to Austria, is nearly as large as the State of South Carolina, or all the New England States except Maine. Its area is 33,000 square miles, and its population upward of 1,000,000. Austria also receives a small tract (30 square miles) at the southeastern corner of Montenegro. The last named warlike little state gets an adjoining strip of territory covering nearly 15,000 square miles,

with a population of about 40,000, an area a little larger than Rhode Island. Serbia receives the greater part of the Valley of Upper Moravia, some 3,000 square miles, with a population of 200,000. Roumania gets the Dobrudja, 5,000 square miles, and about 200,000 inhabitants, an area somewhat larger than that of Connecticut. But at the same time Roumania surrenders to Russia the portion of Bessarabia alienated in 1856, covering 3,300 square miles, and sustaining a population nearly equal to that of the Dobrudja. The new tributary principality of Bulgaria extends from Sophia and Widdin on the west to Varna and Silistria on the east, an area as large as West Virginia, 23,000 square miles, with a population of nearly 1,800,000. South of Bulgaria is the new province of Eastern Roumelia. Greece has got nothing so far, but the promised rectification of her frontier will probably advance it to a line running from the Adriatic shore, near the southern end of the island of Corfu, across Mt. Pindus to the mouth of the Salamvria river, on the Ægean Sea. At the eastern end of the Black Sea, Russia receives an accession of territory amounting to nearly 9,000 square miles, with about a third of a million people.

**ARTIFICIAL INDIGO.**

The most notable achievement in synthetic chemistry since 1868 has just been made by Professor A. Baeyer, Professor Liebig's successor at Munich. For the past twenty years he has been studying the constitution of indigo, and at a late session of the German Chemical Society he announced the completion of his task in the discovery of the last link in the chain of synthetic reactions leading to the artificial formation of that important dyestuff. This discovery ranks with that of Professors Graebe and Liebermann in 1868, by which artificial madder was substituted in the arts for the natural product, hitherto the only instance of the kind in the history of chemistry. As yet the operations involved in this synthesis are too numerous and too costly to allow their practical application in the arts; yet there is reason to expect that cheaper methods will be devised, as was the case with artificial madder products, and that before many years a new and important industry will be developed. At the same time the present occupation of many people will be destroyed, and large areas now devoted to the cultivation of indigo will have to be put to other uses.

**PROGRESS OF LABOR SAVING MACHINERY IN THE SOUTH.**

One of the most notable signs of the change which is going on in the Southern States is the increased interest shown by the people of that section in inventions and improved machinery. Northern and Western people, accustomed to daily sight and use of the numerous handy and work-saving appliances with which their homes abound, would be struck with amazement could they see the lack that exists in the South of even what are looked upon as necessities by the poor in Northern States. This is not because of poverty, as the same state of affairs exists in Southern homes, whether it be in the house of a two thousand acre farmer or a more humble proprietor.

A ludicrous illustration of ignorance in regard to house conveniences was recently seen in a place not more than two hundred miles south of Philadelphia, when a crowd of citizens were collected around a cast iron sink brought by a Northern family just settling there. Not one in the crowd could guess the object or purpose of the mysterious article, and yet most of them were very intelligent people, and one a physician and college graduate standing high in his profession.

One cause of this was that heretofore necessity did not compel the adoption of labor-saving devices. To use the expression of a Southerner, "Miss Chivalry sat in her room, and when she wanted a drink of water obtained it by ordering it brought; and it was the same thing to her whether the well was in the kitchen or a mile away, her wants were satisfied."

To show the gradual increase of interest taken in new inventions by the people of the old slave States, it is only necessary to refer to the statistics of the Patent Office. Taking simply the last six years for illustration, during the year 1871 the number of patents granted to citizens of Alabama was in proportion of 1 for every 34,400 inhabitants, while in 1877 it was 1 for every 23,418; to citizens of South Carolina in 1871 it was 1 patent for every 27,139 inhabitants, while in 1877 it was 1 for every 20,753.

Taking Tennessee as a border State, the proportion in 1871 was 1 patent for every 12,100 inhabitants, while in 1877 it was 1 for every 11,039.

The agricultural State of Indiana had patents granted to her citizens in 1871 in proportion of 1 to every 4,277 inhabitants, and in 1877, 1 to every 3,734. The manufacturing State of Connecticut in 1871 had a patent granted for every 806 inhabitants, and in 1877, 1 to every 885. These facts show that some parts of the South have gained, while some Northern States have not kept up their proportion.

These signs are hopeful, and with the increase of the middle class of people, the class that uses and appreciates modern inventions for daily use, and the growth of manufacturing interests, Southern soil will produce both inventors and inventions in profusion.

ACCORDING to a Paris journal, the locks displayed in the American Department at the Exhibition are incomparably finer and more perfect in every way than anything of the kind ever before seen in Europe, at any rate in France.

**American Cotton in China.**

Speaking of the increased sales of American cotton goods in China, the British Consular report for 1876 states that "America seems bent on imitating Great Britain in her products, and has actually shipped to China large quantities of heavy cottons termed continental sheetings, but in reality a cross between a good gray shirting and a T-cloth. Although hitherto these sheetings have resulted in loss only, both to the importers and manufacturers, yet they are genuine articles, free from over-size and all the other adulterations employed in the Lancashire mills, and not being liable, therefore, to mildew, they bid fair to assert a front place in the foreign trade with China. It will be a long time, however, before it utterly supplants the British textile which it seeks to resemble. China clay and the other deleterious substances are less costly than pure cotton; the cost of production in England is far below that in America, and until lately the Chinese have always run after the cheaper commodity, as long as it possessed sufficient cohesiveness and held together under the needle, and did not fall to pieces in a shower of rain."

Now that the Chinese are learning to "run after" goods that are durable as well as cheap, the Lancashire process of loading cottons with China clay bids fair to bring its practitioners to grief. It is to be hoped that no American manufacturer will be so foolish as to follow the English example:

**NEW COTTON SPOOLING MACHINE.**

We illustrate herewith an improved spooler devised by S. F. Cobb, of Alberton, Md., who claims the said spooler can be run 25 per cent faster than those ordinarily constructed, without causing any breakage of the yarn when nearing the barrel of the bobbin, as is commonly the case with the majority of spooling machines, and thereby securing the yarn upon the spool that is usually wound off into waste; also that all knots, bad piecings, and double ends are removed by the thread guide. The spool, A, is rotated in the usual way by frictional contact with a rotating drum, B; the ends of its spindle enter vertical guide grooves in the arches and transverse frames, C, so that as the spool becomes gradually filled with thread wound thereon from the bobbin, D, it will rise in said grooves until the ends of the spindle fall into lateral recesses communicating with the grooves. The thread passes off the bobbin through the slotted guide, E, Fig. 2, which is attached to the traversing bar, F. The said guide differs from those ordinarily used in spooling machines, in that the respective arms of the same are provided with barbs or hooks, *a a*, projecting inward from their upper ends, and caused to press together by reason of their own elasticity; the object being to prevent the thread being raised or lifted out of the guide by the attendant. The frequent temptation to the attendant to thus remove the thread from the guide arises from the formation of bunches or knots in the thread, which are too large to pass through the guide, and should be broken out, and the thread neatly tied. This construction of guide effectually prevents this, and compels the operator to remove the bunch or knots and tie the thread so that it may continue to be drawn through the guide. The traversing bar, F, is arranged to work in guides formed by slotting the sides of the arches, C, to receive the bar, thus bringing the bar close to the side of the cam, H. The cam is in the form of a hollow cylinder having an endless slot which extends diagonally nearly the length of the cylinder on two sides, thus having a V shape at the points where the grooves return, or passes from one side of the cylinder to the other. An arm, G, carrying a friction sleeve, projects from the traverse bar and works in the said groove. The bar is caused to traverse a distance of the length of the spool, A, between its heads, thus laying the threads thereon evenly and perfectly. A traverse bar, F, is arranged on each side of the cam, the form of the slot causing the respective bars to reciprocate in opposite directions, and winding the thread upon two different sets of spools operated simultaneously by the same drum. The cam is secured upon a short shaft, I, by means of a set screw, so that it may be adjusted longitudinally, as required by the wear of the edges of the cam groove, or the guide, or other cause. A spur groove is formed on the outer end of the same, and meshes with a pinion, J, which forms part of the gearing by which motion is communicated to the cam shaft, and thereby to the cam itself, and likewise secures a more compact arrangement of gearing, greater economy in the manufacture of the machine, and less friction in its operation.

This machine can be seen in operation at the Alberton Mills, Md. Patented through the Scientific American Patent Agency. For further particulars address the inventor, as above.

**A NEW WORKING GLOVE.**

Ordinary gloves, such as are used in husking corn and doing other similar kinds of work, wear out first upon the tips of the fingers and thumb, and upon the ball of the thumb. To obviate this unequal wear, and to render the



TOWNSEND'S WORKING GLOVE.

glove more serviceable, Mr. Cyrus M. Townsend, of Standing Rock, Dakota Ter., has devised the glove shown in the engraving.

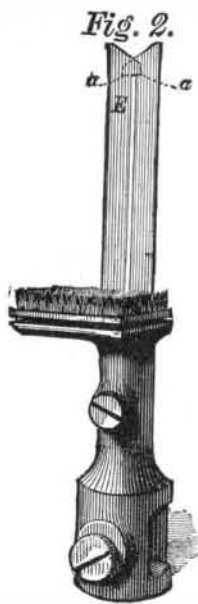
The body of this glove is of the ordinary form and materials, and to its inner or palm side are attached pieces of cloth upon which, in places subjected to the greatest wear, there are surfaces that are covered with a protecting coating of sand and rubber. Instead of applying the protective coating to the cloth in this manner, it may be applied directly to the face of the glove.

The rubber coating protects the glove and renders it waterproof at the points to which it is applied, and the sand assists materially in removing the husks from corn; it also renders the glove more effective in grasping objects of any description.

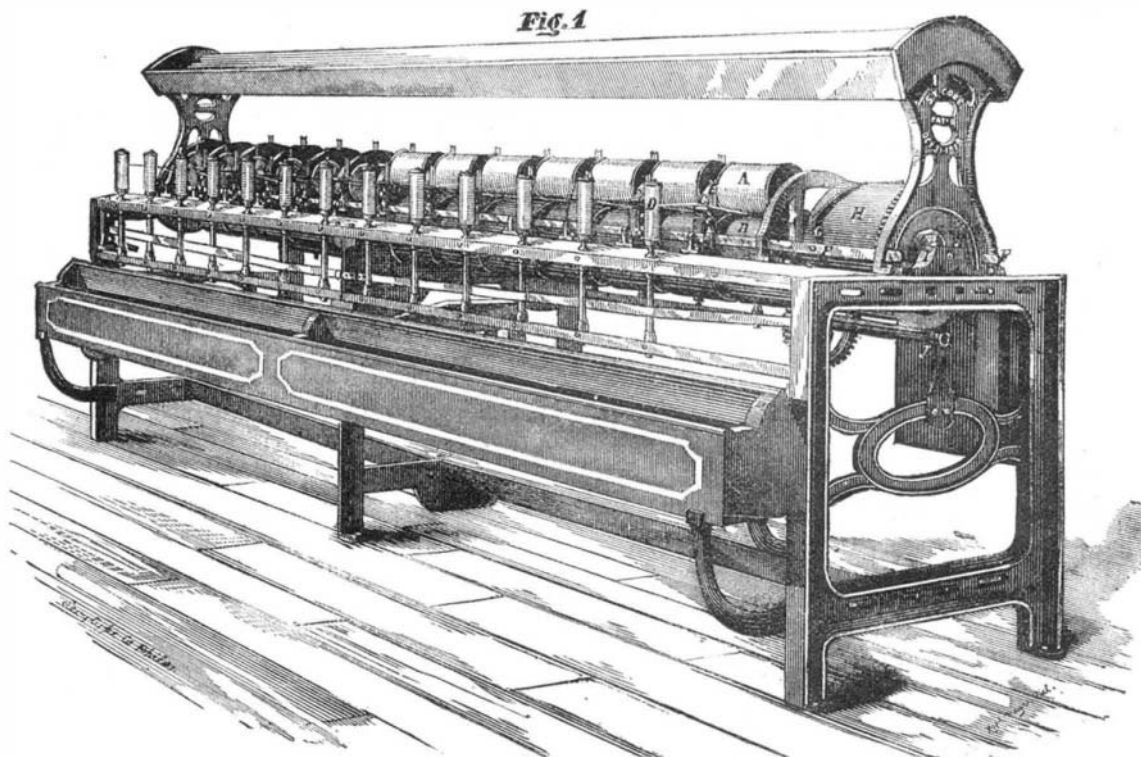
Patented through the Scientific American Patent Agency, May 21, 1878. For further particulars address the inventor, as above.

**Public Heating by Steam.**

Auburn contemplates the introduction of the Holly system of steam heating, and at a recent meeting of citizens to consider the project some very interesting statements were made by Mr. Holly and others relative to the working of the system in Lockport last winter. To test the system financially



Spooling Machine Guide.



NEW COTTON SPOOLING MACHINE.

some three miles of main pipes had been laid through sparsely settled neighborhoods, and several houses heated by steam. Each consumer contributed the amount of his previous year's coal bills, and the amount reimbursed the company for expenses.

This was thought a thorough test, since in a thickly settled district the system would work more economically and profitably: the extreme mildness of the winter, however, may have been an element worth considering. The mains ran up hill and down, and the loss from condensation was small, less than three per cent on a mile of pipe when the full capacity of the main was used; the water so formed was carried along with the steam into the houses, where it was collected, with that from the service pipes, in reservoirs, giving a supply of pure soft water for domestic purposes. The cost of fitting up a house of "good average size" with radiators, pipes, etc., ready to be heated by steam, was one hundred and thirty-five dollars. The cooking done by steam heat was highly commended.

**Lighter and Keener Tools and Implements.**

As implements made of steel are lighter, stronger, and keener than those of iron, so are they better adapted to use by manual labor, by horse power, or by the power of water and steam. A man walks easier with light shoes, light clothes, and spends his time more directly upon the work before him in proportion as there is less labor between himself and that work. Give a man an iron ax, and he, besides becoming discouraged, finds his blows to tell less efficiently and with less precision than when there is an edge of sharp steel between his hands and the tree. The same applies with all kinds of blunt, unscientifically shaped implements. A hoe of right inclination will go under and lift the soil while another will drag over it. A lipped drill will go under the grain of a Bessemer steel rail, while such a drill as is ordinarily used in boring cast iron will only operate to render the fibers more compact, and will have about the same difference of effect in boring as a blunt and a sharp edged ax do in cutting. Every carpenter knows the difference in a properly and improperly filed saw, and in two different lipped augers. A sloping plowshare will scour and run lightly under the soil, while a blunt one will clog and drag through it with difficulty. The same is true of the cutting edge of a turning tool for iron, wood, or steel, or the plane for either of these.

With the discovery of a process for cheaper steel, it is practical to give a very much diminished weight of metal in carriages and carts as well as in railroad cars and any other machinery requiring strength and lightness. The chief success of American manufactures in competition with the older nations, where labor is cheaper and manufacturing longer and more economically established, is their lightness, strength, and peculiar adaptability to the labor they are to perform.

A ditch digger handling a shovel weighing but five pounds and lifting five pounds of dirt will work with much more animation and to much more purpose than if raising five pounds of dirt on a shovel weighing ten pounds. The same is true in all mechanical appliances and powers, whether of a pump, a steam engine, a water wheel, or any other. The cost of raising dead weight is often the difference between failure and success.

**New Mechanical Inventions.**

An improved Double-acting Pump has been patented by Henry J. Humphrey, of Grundy Center, Iowa, and Luther C. Humphrey, of Augusta, Wis. This invention relates to double-acting lift and force pumps, and it consists in a barrel containing two double pistons, the rods of which pass through slots in the side of the barrels, and are connected with a lever fulcrumed at the top of the pump stock.

George J. Kautz, of Emporium, Pa., has patented an improved Device for Rolling and Turning Logs in saw-mills. The log is rolled by the engagement of teeth with its outer surface, and the bar which carries the teeth is constantly drawn forward into engagement with the log by a weight.

Gaylord Bell, of Cheyenne, Wyoming Ter., has patented an improved Driving Attachment for sewing machines, lathes, scroll saws, and other light machinery, by which the same may be run evenly and effectively by the pressure of the foot, avoiding dead centers, and the possibility of running backward so as to break the thread.

Wilhelm Meissner, of New York city, is the inventor of an improved Music Box, having a cylinder provided with pins and a screw wheel. The cylinder, when rotated, operates a set of hammers which strike upon the plates of a "metallophone," and produce clear bell tones.