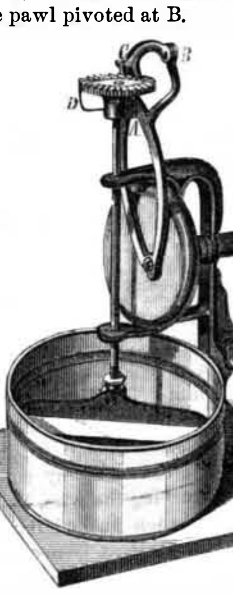
PATTON'S IMPROVED MEAT CHOPPER.

The principal peculiarity in this meat chopper is the movement by which the knife is made to strike in a different position at each stroke. This movement is ingenious yet simple, and only operates when the knife is raised to its highest position.

The knife is caused to reciprocate by a pitman connecting the fly wheel with a collar, A, placed just below the ratchet wheel at the top of the shaft which carries the knife, this shaft turning freely in the collar when not otherwise held.

The pitman extends upward from the collar, A, its upper end carrying a pawl pivoted to the pitman at B, and caused to act positively and surely by the rubber spring, C. D is a spring pawl which works into teeth cut in the perimeter of the ratchet wheel, and holds it from turning except as it is actuated by the pawl pivoted at B.



The oscillation of the lower part of the pitman past the middle vertical axis running through the pivot, A, causes the upper part to oscillate in the opposite direction, and thus operates the pawl, causing the knife to make its stroke in different positions successively.

Patented December 19, 1871. For further information address Joseph R. Piper, Harrisburgh, Pa.

Machine Forged Horse Shoe Nails.

A correspondent of the *Commercial Bulletin* has paid a visit to S. S. Putnam & Co.'s nail works, at Dorchester, Mass., which he describes as follows:

Here was a busy scene, and the utmost life and activity prevailed in every department. Between 180 and 200 hands are employed on all the different kinds of work, and more than 1,000 tuns of horse shoe nails are annually made in this factory, from the best Norway and Swedish iron, which are sold all throughout the country. The business was established in 1855. The nail factory is 260x60 feet, of both stone and brick, and the machine shop is 100x50 feet. Two steam engines, one 200 horse and the other 20 horse power, propel the machinery, three Harrison boilers are kept in constant use, and the continual clang of 100 nail machines is sufficient to almost deafen the inexperienced visitor. The monthly pay roll reaches between $8,000 and $10,000. The men work "by the pound," and earn from $2 to $5 per day.

Horse nails, from time immemorial, have been made by hand, forged out on the anvil by blacksmiths. In many parts of Europe, whole villages are devoted to this branch of business. The bundle of iron rods is secured by the head of the family, who takes it to his home; and, with the assistance of his wife and children, it is made into horse nails, and the product returned to the capitalist, generally at a depreciation of 25 per cent for waste. For many years these nails found a ready market in this country, under various brands or marks, like "G" or "A" horse nails, as they could be imported at a less cost than our own blacksmiths could make them. Of late years, however, much attention and capital has been devoted to their manufacture by machinery, and Yankee ingenuity has devised various methods to produce a nail equally as good as those made by hand.

Machines have been made, from time to time, to cut the nail from sheets or plates of iron, either hot or cold, but it has been found impossible to produce a nail so compact, firm, tough and strong, as can be made by hammering out on the anvil, whereby the grain of the iron is compacted, refined, and made more ductile and tenacious; although many nails of the former description have come into general use. Some few years since, Mr. S. S. Putnam, of Neponset, conceived the idea of forging horse nails by machinery from the red hot rod, and devoted much time and money to perfecting a machine which would make a nail equal, if not superior, to those made by hand. This invention has proved a success; prejudice and difficulties have been overcome, and nails made by this machine are now in general use all over the country.

Fight between a Cobra and a Mongoose.

The snake was a large cobra, 4 ft. 10½ inches in length, the most formidable cobra I have seen. He was turned into an enclosed outer room, or verandah, about 20 ft. by 12 ft., and at once coiled himself up, with head erect, about ten or twelve inches from the ground, and began to hiss loudly. The mongoose was a small one of its kind, very tame and quiet, but exceedingly active.

When the mongoose was put into the rectangle, it seemed scarcely to notice the cobra; but the latter, on the contrary, and, putting down its head, tried hard to escape, and kept itself in a corner. The mongoose then went up to it and drew it out, by snapping at its tail and when it was out, began to bite its body, while the cobra kept turning round and round, striking desperately at the mongoose, but in vain.

When this had continued for some time, the mongoose came at length right in front of the cobra and, after some dodging and fencing, when the cobra was in the act of striking, or rather, ready to strike out, the mongoose, to the surprise of all, made a sudden spring at the cobra, and bit it in the inside of the upper jaw, about the fang, and instantly jumped back again. Blood flowed in large drops from the mouth of the cobra, and it seemed much weakened. It was easy now to see how the fight would end, as the mongoose became more eager for the struggle. It continued to bite the body of the cobra, going round it as before, and soon came again in front, and bit it a second time in the upper jaw, when more blood flowed. This continued for some time, until at last, the cobra being very weak, the mongoose caught its upper jaw firmly, and holding down its head, began to crunch it. The cobra, however, being a very strong one, often got up again, and tried feebly to strike the mongoose; but the latter now bit its head and body as it pleased; and when the cobra became motionless and dead, the mongoose left it, and ran to the jungle.

appeared at once to recognize its enemy. It became excited, and no longer seemed to pay any attention to the bystanders, but kept constantly looking at the mongoose. The mongoose began to go round and round the enclosure, occasionally venturing up to the cobra, apparently quite unconcerned.

Some eggs being laid on the ground, it rolled them near the cobra, and began to suck them. Occasionally it left the eggs, and went up to the cobra, within an inch of its neck, as the latter reared up; but when the cobra struck out, the mongoose was away with extraordinary activity.

At length, the mongoose began to bite the cobra's tail, and it looked as if the fight would commence in earnest. Neither, however, seemed anxious for close quarters, so the enclosure was narrowed.

The mongoose then began to give the cobra some very severe bites; but the cobra, after some fencing, forced the mongoose into a corner, and struck it with full strength on the upper part of the hind leg. We were sorry for the mongoose, as but for the enclosure it would have escaped. It was clear that, on open ground, the cobra could not have bitten it at all; while it was the policy of the mongoose to exhaust the cobra before making a close attack. The bite of the cobra evidently caused the mongoose great pain, for it repeatedly stretched out its leg, and shook it, as if painful, for some minutes. The cobra seemed exhausted by its efforts,

The natives said that the mongoose went to the jungle to eat some leaves to cure itself. We did not wish to prevent it, and we expected it would die, as it was severely bitten.

In the evening, some hours after the fight, it returned, apparently quite well, and is now as well as ever. It follows either that the bite of a cobra is not fatal to a mongoose, or that a mongoose manages somehow to cure itself. I am not disposed to put aside altogether what so many intelligent natives positively assert.

This fight shows, at any rate, how these active little animals manage to kill poisonous snakes. On open ground a snake cannot strike them, whereas they can bite the body and tail of a snake, and wear it out before coming to close quarters. This mongoose did not seem to fear the cobra at all; whereas the cobra was evidently in great fear from the moment it saw the mongoose.—*R. Reid, in Nature.*

ROTARY ENGINES.

Rotative engines are those in which the energy of the steam produces the continuous rotation of a shaft through the medium of a crank and reciprocating piston. Rotary engines are those in which the continuous rotation of a shaft is caused by the action of steam on a piston or its equivalent continuously rotating within an annulus or steam tight casing. Reaction and impact engines—an example of the latter is furnished by Schiele's steam fan—are also sometimes classed as rotary engines. The rotary engine is a very old invention. One was designed, for example, by James Watt. The records of the Patent Office show that at least 200 separate schemes, for producing motion by the direct action of steam on a piston, have been patented at one time or another. We have no intention of describing any one of these engines, but we may refer such of our readers as are interested in the subject, to a very able and exhaustive review of the best of such inventions, which recently appeared in the shape of a series of papers in a French technical publication, "*La Propagation Industrielle.*" The object we have at present in view is simply to explain the principles which should guide inventors who direct their attention to the production of efficient rotary engines, and to point out the true nature of the advantages which would attend the use of such machines if perfectly successful.

There are very few treatises on the steam engine in existence which do not contain an allusion to rotary engines, but the writers, one and all, take particular pains to warn inventors that nothing would be gained by the substitution of rotary for reciprocating rotative engines. This statement is perfectly true in one sense, but it is not wholly true. There is, practically, no loss of power as a consequence of reciprocation alone in the normal steam engine; and it is quite certain that no economical advantages would, within well defined limits, attend the use of rotary engines. But it can easily be demonstrated, on the other hand, that advantages could be derived from the use of a good rotary engine which would well repay the trouble, expense, and skill required to make it. The great point in favor of the rotary engine is that it will permit large measures of expansion to be used to the utmost possible advantage, simply because it places at our disposal a piston speed without any parallel in existing engines. This will become more apparent as we proceed. Strangely enough, it is a point which has hitherto been overlooked by all inventors.

To enter on a long exposition of the defects which exist in all the usual designs for rotary engines would only prove tedious; we therefore propose to explain here the principal features of a theoretically perfect engine, and to point out the difficulties which present themselves when we attempt to reduce this theory to practice. It remains to be seen whether the admirable workmanship of the present day will enable these difficulties to be overcome.

The principal feature in all rotary engines hitherto proposed consists of a piston or its equivalent rotating in a case, the piston being of a length equal or nearly equal to the radius of the circle which it describes in its revolution. The edges of this piston must be packed in some way to keep them tight. There are three edges to be packed; the fourth is made up by the shaft. But a moment's reflection is required to show that the nearer any portion of the packing is to the center the less rapid will be its wear. The consequence is that the packing nearest the edge suffers more than that nearest the shaft, and leakage very quickly ensues. Again, the piston area in such engines is very considerable. The center of effort is not far from the shaft, and any attempt to realize a high piston speed would entail a rapidity of rotation which is inimical to the successful action of the abutment valve or its equivalent. A theoretically perfect rotary engine must have a very small piston, and the center of effort must be located as far as possible from the shaft. The two accompanying diagrams will make our meaning clear. Fig. 1 shows the old form of rotary engine;

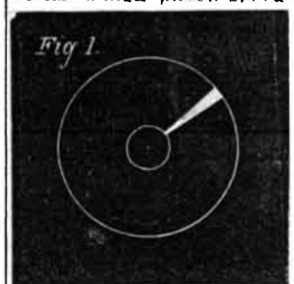
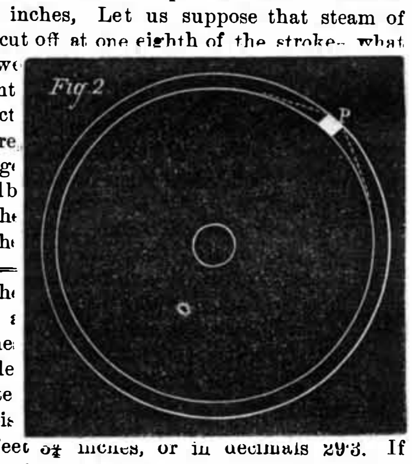


Fig. 2 shows that which we propose as being in theory infinitely superior. Let us suppose that the diameter of the outer ring in Fig. 2 is 10 feet, the diameter of the inner ring 9 feet 4 inches. The piston, P, will then be 4 inches deep, and let us further suppose that it is 2 feet wide, with semicircular ends. The area of such a piston will be in round numbers 86 square inches, Let us suppose that steam of 100 lb. pressure is cut off at one eighth of the stroke—what a stroke means we shall explain presently—and that, deducting back pressure the effective average pressure is 30 lb. Then we have for the whole pressure on the piston 86 × 30 = 2,580 lb. Now, the circumference of a circle 9 feet 8 inches diameter—that described by the center of effort of the piston—measures 29 feet 3¾ inches, or in decimals 29·3. If our engine makes sixty revolutions per minute, we shall have a piston speed of not less than 1,758 feet per minute, and



$$\frac{1758 \times 2580}{33000} = 137 \text{ H. P.}$$

Thus we have an engine occupying a little more space than the fly wheel alone of an ordinary 10 horse engine, which may nevertheless give out 140 indicated horse power with ease. Into questions connected with the arrangements required for packing such an engine and keeping the joints tight, we shall not now enter. We are dealing at present with principles, not with details, We shall, instead, proceed to examine a most important feature, namely, the means to be adopted in providing an abutment for the steam. In very many rotary engines of the old type, a simple flat-sided sliding valve is used as an abutment, and the consequence is a great loss of useful effort. Move this valve as quickly as we will, it is simply impossible to get it out of the way of the advancing piston and into position again behind the piston without leaving a very considerable space between the two. Even if we suppose the sliding abutment to have the same velocity as the piston, we find that it cannot, in such an engine as we have described, be completely closed until the piston has moved 4 inches away from it. This 4 inches represents clearance, and all clearance is waste in a rotary engine, because, unlike the reciprocating engine, there is in all rotary engines hitherto designed no compression. It is obvious that the abutment should not be withdrawn till the last moment, and that it should be replaced as quickly as possible. Suppose that the withdrawal and replacement are effected while the piston—including its own length—has moved over 2 feet; then as the piston is moving at the rate of, in round numbers, 30 feet per second, only the fifteenth part of a second will elapse while it is running over two feet; and it follows that a heavy mass of metal must be jerked out, brought to a dead stop, suffered to pause while the thickness of the piston is passing, and jerked in again through a distance of about 5 inches in the fifteenth part of one second, and this operation is to be repeated every second. We have no hesitation in saying that this is practically impossible.

But it is not impossible to contrive a form of abutment which shall be either a sliding valve or its equivalent, and yet comply with the required conditions: and it is to scheming such an abutment that inventors of rotary engines should direct attention. We may throw out the hint that, by prolonging the piston backwards and forwards, and sloping it off as shown by the dotted lines in Fig. 2, much of the clearance may be saved, and a modification of the form of the valve or abutment may also be adopted to produce like results; but in a succeeding article we shall consider this point more at length. The ordinary remedy is to provide two abutment valves, one remaining closed during half a revolution, while the other is opening and closing again; but a moment's reflection will show that this plan is only applicable to engines working absolutely without expansion, and would entail enormous waste in engines in which steam was cut off much befo e the end of the stroke, a stroke being represented by the travel of the piston from abutment to abutment.—*Engineer*.

Process of Germination.

An eminent writer upon the subject, in speaking of the action of the sun in this great work of germination, remarks: "Upon the chemical influence of the sun's rays depends the germination of seeds as well as the growth of the plants. We bury the seed in the ground and shut it out from the influence of light, but we do not place it beyond the reach of the sun's actinic influence, for that penetrates like heat to the little earthy couch where the embryo plant lies hid, and arouses it into life. Light, or the luminiferous rays of the sun, so important to the well being of the plant, is actually inimical to the excitation of vitality in the seed. How singular is this fact! A series of carefully conducted experiments has proved that seeds will not germinate in light, although supplied with heat and moisture, when the actinic rays are cut off. Deprived of the luminous rays with the actinic in full force, they spring into life with great rapidity. Seeds sown upon the surface of the earth will scarcely germinate, as soil cultivators very well know, and, on the other hand, seeds buried so deep that the actinic rays cannot reach them will certainly perish. The planting of seeds, so as to secure the proper distance below the surface, is a most important point in husbandry, as it has much to do with the early starting of the plant and the success of the crops."

Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

The Wonderful Curiosity---The Flexible Marble of Wheeling, Va.

To the Editor of the Scientific American:

My attention has been called to a "Wonderful Curiosity" in your issue of the 17th inst., and I deem it not improper to give you some facts which may not have been in your possession at the time you penned your comments on the *Intelligencer's* article. I am the owner of the curiosity, and know what I say when I assure you that it is a common slab, of the dimensions named, from the Portland quarries, Vermont. It was purchased at one of the marble cutting establishments of this city, like hundreds of similar specimens of the same mineral, from the same quarry, which are kept constantly on hand by all our marble cutters. It was originally sawn for tombstone purposes, and its flexibility was not discovered until after its removal from the *débris* of the burnt college edifice at Moundsville. In proof that it is marble, and not itacolumite as you have supposed, I hand you herewith, from the Pittsburgh *Dispatch*, February 8th, an analysis of the specimen, made by Professor George Hay, Q.S., Professor of Chemistry in the Western University of Pennsylvania. With the value of his opinion, you are no doubt entirely familiar. J. A. HOLLIDAY.

Wheeling, West Va., Feb. 20, 1872.

ANALYTICAL LABORATORY, 25 Diamond Square,
ALLEGHENY, Pa., February 7, 1872.

J. HOLLIDAY, ESQ—Dear Sir: I have, at your request, carefully analyzed a portion of the flexible marble slab, now in your possession and on view at 22 Fifth avenue, Pittsburgh. Its constitution is as follows:

Carbonate of Lime	97·50
Magnesia, a trace	
Silica	2·05
Water	·45
Total	100·00

The above composition and its crystalline character together proclaim it to be a true marble, and, at the same time, a pretty pure specimen of that mineral. The indubitable flexibility of the slab is its most remarkable feature. Dana states that "some of the West Stockbridge marble is flexible in thin pieces when first taken out." The slab in the possession of Mr. Holliday is about two inches thick, and is nearly as flexible as an equal thickness of vulcanized india rubber. I shall not attempt to explain the flexibility of this extraordinary slab. It may be due to a species of ba l and socket movement among the minute crystals which compose the mineral, or it may be due to molecular motion alone; I cannot tell. Certain it is, however, that the slab consists of marble, nowise different in chemical constitution from ordinary marble, and possesses an unusual degree of flexibility for marble which has been so long out of the quarry. Those who are interested in what is curious or strange in Nature should go and see this remarkable slab. I am, &c.,

GEORGE HAY, Q. S.,
Professor of Chemistry in the Western University of Pennsylvania.

The Models at the Patent Office.

To the Editor of the Scientific American:

In your issue of February 10th, you ask: "What shall be done with the models at the Patent Office?" No one but an inventor can appreciate the advantage of a fair opportunity to examine models of other inventions in his line.

To be obliged to depend upon drawings alone would add to his labor an hundred fold. As it is, he can find and examine everything of interest to him. He does not expect or wish to go over the whole collection, any more than he would wish to examine every book in a library of reference; but, being directed by courteous assistants, he can spend hours or days in the pursuit of the knowledge he desires, and save himself months of thought and labor on some invention which has perhaps long been patented unknown to him. In answer to your question, I say: Preserve them; erect new buildings as often as necessary. Invention and discovery are the life of America. Let nothing be done to impede them or make them more difficult. B.

Models at the Patent Office.

To the Editor of the Scientific American:

I am heartily glad to see you come out squarely against the costly farce of requiring to be deposited models of every invention for which a patent is asked. To see that it is a farce, an inventor has but to go and examine his own specimens after only a few years. He will find them beautifully misrepresenting his invention, as I have done, broken, parts reversed, inverted, transposed and lost. They may have been useful, and even necessary, in the early days and at the origin of the patent system in this country. Those days are past. Good drawings are easily and cheaply obtained, and if, with good and profuse illustration in drawing, the examiner is incompetent to fully and completely comprehend a machine, his place should be filled with one better qualified. Drawings do not allow parts of machines illustrated to be lost, misplaced, transposed, or substituted. Drawings do not have to be unscrewed, unbolted, taken to pieces, chipped, filed, or oiled, to make them do their work of illustration. With drawings, the different movements do not have to be examined in rotation, but may be seen, compared, and comprehended at a glance. So also with the construction of internal parts. They are more portable, occupy incomparably less space, can be arranged in more systematic and convenient order, are more accessible, less liable to injury, and cost the inventor, in most cases, much less.

In short, I believe there can be no one sound argument used in favor of models, unless it be the (inexcusable) incapacity of examiners. INVENTOR, NO. 2.

A New Building Material---Bricks of Slag.

To the Editor of the Scientific American:

To call bricks a new building material is perhaps hardly correct, when every child knows that brickmaking dates as far back as the Israelites in Egypt. But bricks, like everything else, have undergone various changes in form, material, and manufacture. Whether these changes have had a tendency to improve the Egyptian brick is a question not so readily answered. The bricks manufactured by the Egyptians were intended to last for ages, and in this respect they have certainly answered their purpose. With our modern brickmakers, it is different. The inferiority in modern bricks consists principally in the bricks being made of cheap material and badly or insufficiently burnt, and the consequence is that they will not withstand the wet or the hard frosts. This principle of manufacturing an article which is to last for a limited time only is far from being conducive either to safety, durability or comfort. It is precisely with the view of meeting these all-important considerations that the material now introduced to the public has been invented and patented.

Mr. J. J. Bodmer, of London, has discovered a new method of making bricks from a material hitherto treated as refuse only, and the removal of which had to be effected at considerable expense. This material is simply blast furnace slag.

A careful analysis of the slag of a blast furnace showed a great similarity with the well known puzzolana, and this fact suggested to the discoverer the idea of manufacturing a cement by incorporating the slag with a certain proportion of lime. The very first experiment succeeded, as far as the quality of the cement was concerned. It set somewhat more slowly than Portland cement, but it attained a similar degree of hardness, especially under water. The blast furnace slag, however, had proved to be so hard that it was quite evident the manufacture of the new cement could never pay unless an improved method could be adopted to deal with the slag. In watching the slag as it flows in a half liquid or viscous condition from the furnace, the idea occurred to the inventor: "Why should the slag be allowed to form lumps and get hard? Why not subdivide it in its viscous, plastic condition?" The difficulty of reducing the hard slag was thus solved. A pair of plain rollers were put under the spout of the furnace instead of the large tub, which was formerly used to receive the slag. Sufficient speed was given to the rollers to receive and take through the whole off flow issuing from the furnace; and by giving the rollers differential velocity, the slag fell from them in the shape of thin scales or flakes. These were found to crush as easily as sugar, and by grinding such slag, together with the proper proportion of lime, the cement was obtained at a mere nominal cost. This cement, in a proportion of 2 parts to 6 parts of sand, makes the finest bricks imaginable. At iron works, slag is again used in lieu of sand; it is rolled coarser and then mixed with the cement like sand, and the bricks obtained are as hard as flint and of a most pleasing color, being that of grey sandstone. The color can, however, be varied *ad libitum*, from a light to a very dark shade. Nor is the material adapted for the manufacture of bricks only, but may be used for blocks or ornaments of every description, as the cement itself may be used in the same manner as the Portland cement. For the purpose of manufacturing blocks and ornaments, a somewhat different *modus operandi* must be observed. If the attention of the owners of some of the large iron founderies of New York or Pennsylvania could be drawn to the subject of brick manufacture from slag, they would find that this hitherto useless material can be turned to profitable account, producing a brick which would prove both cheaper and harder than any other made. A conspicuous feature of these bricks is that they resist the action of the weather, and do not crumble away like most of the clay bricks, a defect from which even the brown stone is not exempt.

The idea of using slag as a building material is not altogether an original one. When the slag is allowed to form large masses, the inside of such blocks cools very gradually and thereby attains the hardness of rock. Such blocks are used, in iron manufacturing districts in England, for foundations, sea walls, &c.

A special feature, too, is the machinery used in the process of brickmaking. The cement and the sand or coarse slag are shovelled into their respective receivers or hoppers, and at the other end of the apparatus, the finished bricks rise to the table, from which they are wheeled away and piled up to set and harden in the open air. The manufacture of bricks from blast furnace slag is covered by letters patent taken through the Scientific American Patent Agency.

Messrs. Bodmer & Co., of Hammersmith, London, are now manufacturing these bricks, and would like to correspond with parties in the United States with a view of introducing the manufacture here. Should any of the American iron manufacturers be present at the great annual meeting of the Iron and Steel Institute in London, in March, 1872, they will have every opportunity to see the process in actual operation.

[The above communication is from a valued correspondent in London, describing a novelty in brick which was patented in this country, and which was briefly referred to in these columns at the time the patent was issued.—ED.

The Davenport Tricks Again.

To the Editor of the Scientific American:

Now that Messrs. Vander Weyde and Patton are about explaining the operations of the Davenport brothers, I hope they will make their explanations as brief, exhaustive, and comprehensive as possible, for the benefit of science. I was once one of a committee of three, chosen to investigate these performances. We proceeded in the following manner: First, we placed eight inverted glass tumblers upon the platform; upon these we set the legs of two light benches, and upon the benches we set up their cabinet, made of thin black walnut boards. We then with strong hemp cords made first two turns around one wrist of one of the brothers, and tied him with a strong square knot; and then tied the other in the same manner. We then pinioned their hands and arms firmly behind their backs, then ran the ends of the rope through holes in the seat, and drew their feet back and secured them firmly to the seat, winding the ropes around their legs and knees, and fastening with a strong square knot, leaving no slack rope anywhere. We also tied their heads back to the cabinet. We then made them open their hands, and placed in each a good teaspoonful of wheaten flour, taking great care that not a particle be dropped inside the cabinet; then, closing their hands, we sewed the ropes and knots through and through with strong linen thread. When thus secured, we placed a speaking trumpet, three or four bells, a violin and guitar in the cabinet, and closed the doors, hooking the two outside doors, the middle door being bolted inside instantly after closing. Immediately the instruments began to be played upon, all together; a hand and half of a naked arm were thrust out through a hole near the top of the middle door, swinging a bell for several seconds, and throwing it upon the floor. Then another hand and arm thrust out the speaking trumpet. This time I seized the hand near the wrist and did my best to hold on to it by pulling downward, but with a power greater than my own, it drew back into the cabinet with a loud grating noise as it rubbed on the edge of the board under the weight of my grasp. The hand was warm, but it left no marks of skin or blood upon the sharp edges of the opening. Immediately after, a head and neck rose through another opening in the top of the cabinet and was plainly visible for several seconds to all the audience. After these things had been going on some time, the doors were thrown open, and we made an examination of things within, but we could discover no change in the tieing of the brothers, the flour still being in their hands as we left it, and no marks of it upon anything in the cabinet. We then proceeded to close the doors a second time; one other of the committee closed the door at the right. While I was fastening the door at the left of the cabinet, a hand struck me with great force upon the left shoulder; I instantly turned to see who did it, and the hand appeared to vanish over the shoulder of one of the brothers. The hand was seen and the force of the blow plainly heard all over the hall; we threw open the doors, but no change could be found in the condition of our ropes or prisoners. We then closed the doors again, and, inside of four minutes, they were thrown open and the brothers stepped out, still holding the flour in their hands undisturbed, the ropes lying upon the floor of the cabinet, but their marks deep in the wrists of our "no longer prisoners."

These things were performed in the presence of at least 250 witnesses in New Haven, Conn. Now, Dr. Vander Weyde says he has performed certain tricks repeatedly and "done everything the Davenports did," etc. If he will come to New Haven and perform everything the Davenports did, under like conditions, and give us a satisfactory scientific explanation of the *methodus operandi*, as he calls it, I stand ready to hire a hall and pay all expenses, and pay him well for his trouble, for the benefit of science.

New Haven, Conn. GEO. T. CALDWELL.