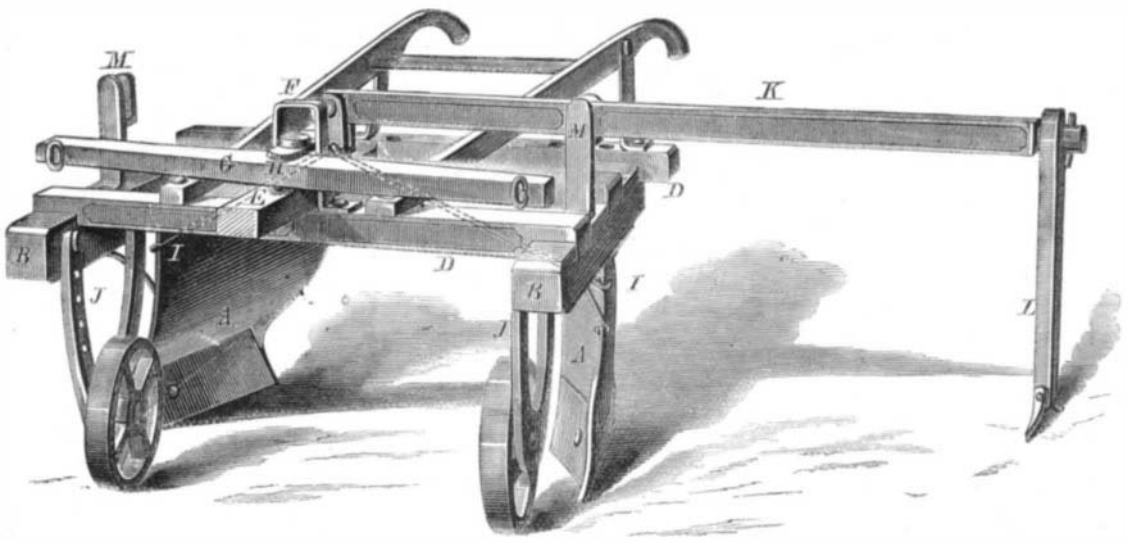
CORN PLOW AND MARKER.

The invention illustrated herewith is an improved machine for furrowing the ground for cultivating or preparatory to planting. The standard posts of the plows, A, are pivoted to the under sides of the beams, B. The latter are held in position by the cross bars, D, in which several holes may be made to receive the connecting bolts, so that the plows may be adjusted either wider apart or closer together as desired. E is the tongue which passes through the keeper, F, attached to the cross bar, D, and is loosely bolted at its inner end so as to have vertical but no lateral movement. This construction relieves the horses' necks from having to support any weight, and at the same time leaves the plows free to follow the surface of the ground. G is the double tree to the bolt of which is pivoted a double plate, H, which extends through the tongue keeper, F, and above and below the tongue. To this are secured the draft bars, I, indicated by dotted lines which communicate directly with the plows. The small gage wheels shown are pivoted to the V shaped standards, J. In the forward arms of the latter are a number of holes by means of which the position of standards and wheels may be altered so that the latter may be adjusted to cause the plows to work at any desired depth of ground. The handles are supported by a round, and also by braces on the rear cross bar. They may be inclined to allow the operator while guiding the plows to walk at the side of the row of plants being cultivated.



MEIXELL'S CORN PLOW AND MARKER.

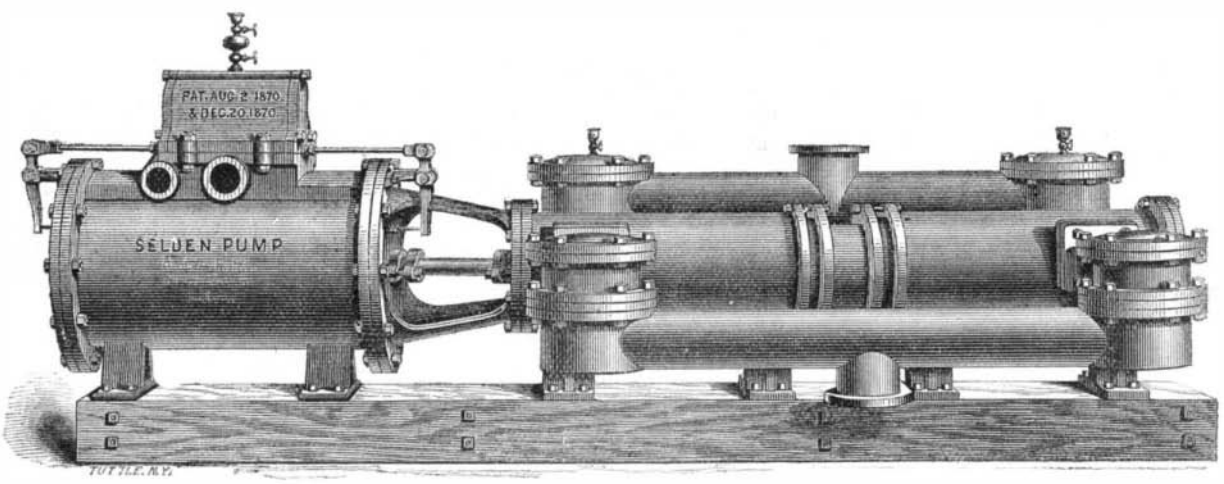
K is a long bar pivoted as shown to the tongue, so that it has a free vertical, but no lateral movement. At its outer end is swivelled a bar, L, at the extremity of which are hooks or prongs which drag along the ground. To the beams, B, are attached brackets, M, to receive the bar, K, and hold it always at right angles to the machine. The above arrangement, which constitutes the marker, may be turned to one side or the other, as the apparatus passes back and forth across the field.

Patented through the Scientific American Patent Agency, October 22, 1872, by Mr. George W. Meixell, of Hecktown, Northampton county, Pa., from whom further particulars may be obtained.

AN IMPROVED FORM OF THE SELDEN STEAM PUMP.

This machine is a recently modified form of a well known and efficient steam pump, especially applicable to the purposes of mines and water works, and arranged with particular reference to pumping water containing dirt or gritty matter.

The portions in the illustration to which attention is directed, are the device for operating the slide valve of the steam cylinder and the arrangements of the water valve chambers. It will be noticed that the valve rod emerges from both ends of the chest and at its outer extremities is connected with the short arms of levers which are pivoted to brackets on the cylinder heads. To the lower and long arms of the levers, two small rods are suitably connected, which pass into the steam cylinder. Against these the piston at either end of its stroke strikes, thus actuating the levers, and through them the slide valve. This movement is evidently positive. It is stated that the pump will not stop so long as there is steam to drive it, while there is no point at which its motion can be arrested without leaving the steam ports fully open, and thus insuring its operation as soon as steam is admitted. The advantage of this arrangement, apart from its efficiency and simplicity, also lies in the fact that the steam and water cylinders of the longest stroke pumps can be located very near together, just leaving room to pack the glands, and ensuring compactness and strength. It is claimed that the valves will discharge water of condensation without choking, and that the pump will operate with water as steadily and reverse as promptly as with steam. We are also informed that it will run under water, in case of flooding of a mine or similar casualty.



AN IMPROVED FORM OF THE SELDEN STEAM PUMP.

The combination of the two pump cylinders with the plunger between them, the latter connected directly with the piston rod, is generally understood and indeed plainly indicated in the illustration. The water valves are, it is claimed, made so large that, by lifting from three eighths of an inch in the smaller sizes to one and a quarter inches in the larger sizes of pump, they will give the full capacity of the suction and discharge pipe. We are assured that their action cannot be heard, even with the ear upon the chamber, when working under a test pressure equal to 350 feet. The point in the construction of the valve chambers to be noted is that the upper and lower chambers are cast in separate parts; and having the plate upon which is the valve seat between them, the whole being securely bolted together, should any accident occur to the seat plate it can be readily taken out and repaired or renewed, without loss of any other part. The valve seat is made of the best composition and attached to the plate, and may be replaced in a few minutes by removing the cover.

The water cylinder being some one and a half or two inches larger than the plunger gives the pump an advantage over the piston pump in raising gritty water, as the surfaces are not in contact, and are therefore not exposed to grinding and consequent leakage. The machine is designed to be placed directly at the bottom of the mine, so that it obviates the expense of the pipes, etc., attendant upon the use of a pump on the surface. We learn from the manufacturer, Mr. A. Carr, of No. 43 Cortlandt street, in this city, that a sample pump of this description has been forwarded to the Vienna Exposition, and also that he is in receipt of orders for the machine from Germany.

Slates.

A fine, sound texture is the most desirable among the properties of a slate, for, the expense of slating being very greatly increased by the boarding whereon it is placed, if the slate absorbs and retains much moisture the boarding will soon become rotten. But a good slate is very durable. Its goodness, says the *Building News*, may readily be judged by striking, as a piece of pottery is struck. A sonorous, clear, bell-like sound is a sign of excellence, but many pieces of the slate should be tried before such a conclusion is arrived at. Port Madoc slates have a sharp, clear ring, and the slates, though much thinner than Bangor, will bear throwing on the ground without fracture, while the latter often break in the mere handling. The color also is some guide, the light blue sort imbibing and retaining moisture at a far less degree than the deep black blue sort. The feel of a slate is also some indication of its goodness. A good one has a hard and rough feel, while an open and absorbent slate feels smooth and greasy. The best method, however, of testing the quality of slate is by the use of water in two ways. The first way is to set the pieces to be tried edgewise in a tub of water, the water reaching about half way up the hight of the pieces. If they draw water and become wet at the top in six or eight hours, they are spongy and bad; and as the water reaches less up them, so are the slates the better quality. The other method is to weigh the pieces of slate and note their weights. Let them then remain twelve hours in water, and then be taken out and wiped dry. Those that on re-weighing are much heavier, than they were previous to their immersion, should be rejected. Where the character of a slate quarry is not known, these experiments should always be made.

Improved machinery has of late years been invented for sawing and smoothing the slabs of slate. One is a machine for hollowing out blocks for sinks, etc., by means of cutters secured to the ends of revolving shafts. Mr. Matthew's apparatus for cutting and dressing slate consists of a frame provided with arms, cutters, toothed wheels, etc., in such a way that the cutters may be raised by a lever and let fall again with a sudden blow, and this in such a manner as to work the slate out into either plain or fancy surfaces. Besides, billiard tables, pavements, cisterns, walls, partitions and numerous other articles connected with the building and furniture trades are now, and have for some time past been, made of this substance.

New Magneto-Electric Machine.

We have had an opportunity of witnessing the trial of a magneto-electric machine, which appears to be likely to give satisfactory results, says the *Engineer*. It consists of a row of modified horseshoe electro-magnets, surmounted by another row of inverted similar electro-magnets, the poles consequently being face to face, but of course separated by a space. In the central space there revolves a drum carrying the armatures, one armature being supplied to every pair of magnets. The armatures are simply rings or hoops of soft iron, surrounded by a number of helices containing wire. The ends of the wires of each helix are brought down to the shaft of the drum, each insulated from the other, and thence the currents are collected in the usual way. Pieces of iron attached to the poles of the magnets partly embrace without touching the armatures. In the machine in question there were three armatures, one of which was sufficient to excite all the magnets by means of the induced current, as above described, and the other two were sufficient to provide a powerful current, which gave an excellent light in one of Mr. Ladd's lamps. The power required to drive the machine was about 3½ or 4 horse.

Water in Kansas City.

A correspondent of the *Evening Post* says: "There are few instances of more rapid growth in the marvelous settlement of the great West than that of Kansas city, the extreme frontier town of Missouri. In 1865 it had five thousand inhabitants. Today it has forty-two thousand. It is the central point of a spider's web of railroads running to the utmost extremities of the land. Nine railroads come together here, over which fourteen different companies run their trains. These are coming and going all the time—to the lakes, to the Ohio, to California, to the Gulf of Mexico.

"The town is exceptionally well built of brick. The streets are wide, though all up and down hill, and handsomely laid out, and are well lighted with gas. Three or four daily papers keep the town informed of what is going on.

"Among the many causes for amazement that the stranger in one of the Kansas city hotels will have, during the first twenty-four hours of his sojourn, not the least staggering will be the sight of the water with which he is expected to perform his ablutions. He takes up the ewer and pours out a fluid as black as ink. He cannot believe his eyes. It is an absurd mistake somehow, an accident, and he rings his bell. Quickly comes a negro, who assures him that this is the regulation water of the establishment, that everybody washes in it, that there is no other than it but well water, which is so hard that it is impracticable for washing altogether.

"The water has come from the clouds in the form of rain, and been collected in cisterns. Now the fuel used by the people of Kansas city is a soft bituminous coal, furnished abundantly at from $3 to $5 a tun, which fills the air with sooty flakes and coats the house tops with a black deposit. The rain water takes this up before running off into the cisterns, and holds it in solution, necessarily assuming its hue.

"Every effort has been made by intelligent and far-seeing capitalists to secure water, but in vain. Upon the assurance of a geologist of good standing that the drip of the land from the Rocky Mountains promises water at a considerable depth, the Kansas city railroad company bored for it, at a point near Kit Carson, and did not get it fourteen hundred feet below the surface. There they stopped. They have not relinquished the hope of finding water, however, elsewhere."

We wonder if some of the ingenious readers of the SCIENTIFIC AMERICAN cannot discover some plan of clearing the Missouri, which flows near Kansas city, and thus solve the water problem. If not that, they can certainly invent stove attachments for consuming smoke, so that the small supply of water enjoyed will no longer be filled with soot.

THE first public library at Athens was founded in the year 526 B. C.