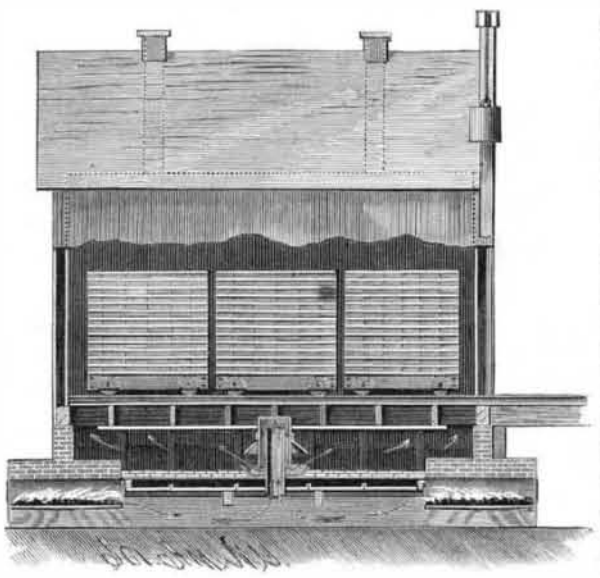
LUMBER DRIER.

This kiln is designed for drying lumber by the direct application of heat obtained by the combustion of fuel in a suitable furnace. The kiln consists of a framed structure provided with a sliding door, through which the lumber is introduced and removed upon cars running upon properly laid rails. Cold air flues are connected with the lower part of the kiln, and carried up on the outside to a level a little above the top of the roof. The smoke flues in the top of the kiln pass



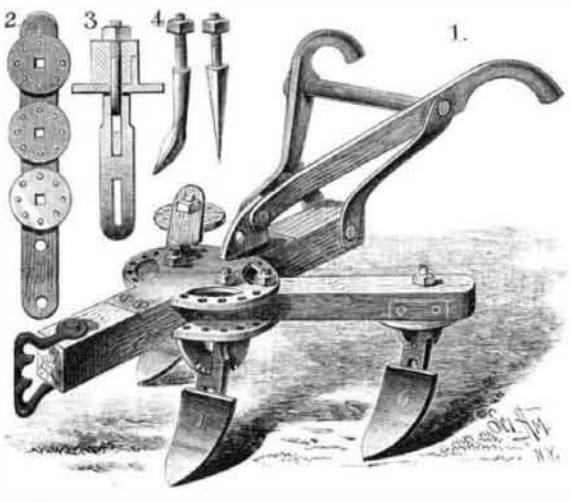
DUKE'S LUMBER DRIER.

through the roof, and carry off all the waste heat, smoke, and vapor from the lumber. In the lower part of the kiln is the furnace, which is fired from the outside at both ends. A curved iron plate covers that part of the furnace within the kiln; over this plate is an air space formed by a flat plate. Connected with the furnace is a flue extending upward into the kiln. Just above the furnace, and surrounding the flue, is a pan containing water. Over the top of the flue is a hood, reaching nearly to the surface of the water. A guard plate is secured round the hood, so as to cover the exposed portion of the pan. The hot air and gases given off from the furnace pass up through the flue and are deflected downward on to the surface of the water; sparks fall into the water, while the hot air ascends in the direction shown by the arrows into the interior of the kiln. The guard plate serves as an additional protection to throw the sparks into the water, and also prevents the pan from being filled with any rubbish falling from above when the kiln is being filled with lumber.

This kiln is the invention of Mr. O. A. Duke. Further particulars can be had from Messrs. Bivings, Duke & Co., of Clanton, Ala.

COMBINED PLOW, CULTIVATOR, AND HARROW.

Secured to the upper and lower sides of the central beam are two plates, the side parts of which are made semicircular and are formed with a series of holes near their edges, and also with holes at the centers of the circles to receive bolts which hold the side beams; by



COMBINED PLOW, CULTIVATOR, AND HARROW.

removing the outer bolts the side beams can be swung upon the inner bolts, as pivots, into any desired position, where they can be secured by replacing the bolts. The standard of the center plow passes through center holes in the plates, and is held by a nut screwed on its upper end. The side standards pass through circular plates held to the lower sides of the outer ends of the side beams and through the beams, and are held by nuts. The standards, Fig. 3, are made in two parts, hinged to each other near the lower sides of the beams; the lower parts are curved forward to bring them into proper position to receive the plows, which are held by bolts passing through slots in the ends of the standards. Near the edges of the circular plates are holes to receive the ends of curved bars which pass through the upper ends of the lower parts of the standards. The lower edges of these bars have teeth that support the lower parts of the standards. With this construction the pitch of the lower parts of the standards can be readily adjusted. The ends of the curved center bar are inserted in holes in the lower plate. The handles are constructed as shown.

The side beams can be arranged as shown in Fig. 1, or one or both can be swung forward, according to the work to be done. When the plow is to be used as a cultivator, the side beams, Fig. 2, are used. The shanks of the cultivator teeth, Fig. 4, pass through the circular plates, which, in this case, are held from turning by pins which enter holes in the plates, so that the teeth can be adjusted as the position of the beams may require. When used as a harrow, side beams are employed, having holes to receive the harrow teeth shown in Fig. 4. It will be seen that, no matter in what position the plow may be adjusted, it will be firm and strong.

Additional particulars concerning this invention can be had by addressing Messrs. C. Audirsch and W. W. Strickland, of Gurdon, Ark.

Axial Change of the Earth.

On the last day of the year, the earth was in perihelion, or at its nearest point to the sun. At that time, the distance between the two bodies was about three million miles less than during our northern summer, in July. Though the earth now receives six per cent more light and heat, the northern part of its axis being turned away from the sun gives us the cold of winter. There is, however, a greater equality of temperature—bad as we are apt to call it, when the daily range may be from forty to fifty degrees—on account of this proximity of the earth and sun in winter and their distance in summer. In the southern hemisphere, the extremes of temperature would be almost unbearable under the present regime, were the land disposed as at the north; for there the conditions are reversed, and the sun is nearer in summer than in winter. The effect, however, is largely counterbalanced by the great predominance of water in that hemisphere. Less marked extremes are possible in the presence of such large bodies of water than would be the case at our own land-engirdled North. But the present order of things is not permanent. Nature is never stationary, and after some thousands of years the orbit of the earth will be changed. Other things being equal, the extremes of heat and cold in the northern hemisphere will then be unprecedented.

ADJUSTABLE DOUBLE BEDSTEAD.

The bedstead is provided with four hollow legs open at the top, and united by the head and foot pieces and the side rails; within these legs are sliding posts united by end pieces and side rails, which pass through vertical slots in the legs when the upper bed is lowered. In the foot piece of the main bedstead a drum is journaled; mounted on the shaft of the drum at the outside of the foot piece is a ratchet wheel provided with a handle for turning it. Secured to the bottom of each sliding post is a rope; all four ropes are carried over suitable pulleys to the drum, which is formed with four grooves, one for each rope.

When the bed is not in use, the upper section rests upon the lower; if but one person is to occupy it, no change is necessary. But if it is to be occupied by two persons, the drum is revolved, and, winding up the cords, the sliding posts are lifted up and out of the top of the legs. Latches in the hollow legs engage with racks on the sliding posts, and hold the upper section at any desired elevation. A cord passes from each latch to a slide in the foot board; by pulling this slide all the latches may be withdrawn to release the sliding legs and permit the upper section to be lowered. This double bedstead only requires the space now taken by a single bed; it can be quickly adjusted at any desired height, and the upper section can be easily lowered. The mechanism is so simple as not to be liable to disarrangement.

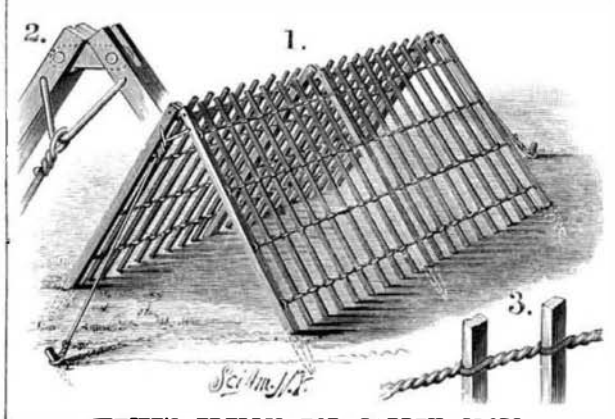
This invention has been patented by Mr. A. T. Schlichting, of 1986 Third Avenue, New York city, who will furnish all further information.

A Fortune for a Patent.

The *Mechanical Engineer* says that Benjamin Lauth, Sr., the inventor of the process of making nail plate out of old steel rails, has sold the right of his patent to five Eastern firms. Mr. Lauth claims that by his process at least $10 per ton can be saved on the manufactured product, as compared with the present methods of production. Mr. Lauth will receive $150 per day for one year and $300 per day for the remaining sixteen years of the life of the patent.

TRELLIS FOR GARDEN CROPS.

The portable garden trellis here illustrated is for use in growing peas, tomatoes, and other crops requiring support; it may be folded up and put away when not needed. The view, Fig. 1, indicates two continuous sections, composed of independent side frames, inclined toward each other and united at the top. Each frame has a picket at each end and intermediate bars or wires arranged parallel with the pickets, but of less length, so that when the pickets are driven into the ground the bars will only come to the surface. The pickets and bars are united by any number of rows of wires. The upper ends of the pickets are hinged together, as shown in Fig. 2. When set up, the trellis may be held firmly by ropes attached to the upper ends of the end pickets, and secured by stakes driven into the ground. In applying the trellis to supporting peas and beans, the



WHITE'S TRELLIS FOR GARDEN CROPS.

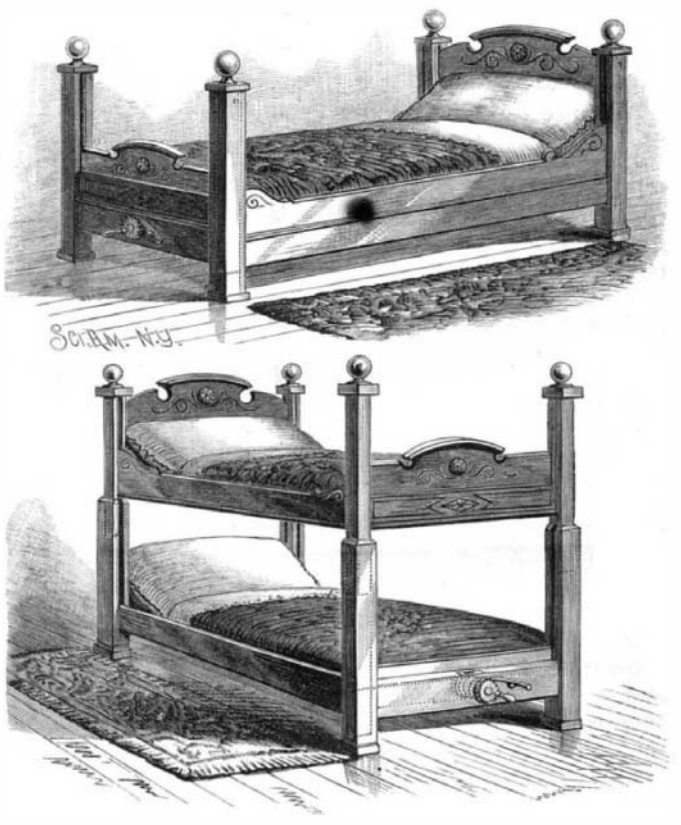
plants will be inside, while tomatoes should be outside of both the opposite frames.

The use of this trellis, which has been recently patented by Mr. Wm. A. White, of Staatsburg, N. Y., will enable the grower to produce a larger crop from the same amount of ground than by the use of pea brush or stakes, and will also keep the vines and fruit in a cleaner condition.

The Causes of Sudden Death.

The recent sudden death of Vice-President Hendricks, followed so soon by that of William H. Vanderbilt, naturally invites inquiry into the causes which produce these startling effects.

An editorial in the *Medical News*, of Philadelphia, states that disease of the vascular system—the arteries and veins—is most frequently responsible for this mode of death. The greatest strain in the case of those subject to mental anxiety or excitement is borne by the circulatory system; and the slow and unsuspected course of the disease gives no warning in most instances, and death ensues either from a rupture of some of the large vessels near the heart, or, as in Mr. Vanderbilt's case, one of the more important blood vessels in the brain proves to be the weakest link in the chain, and death from apoplexy results.



SCHLICHTING'S ADJUSTABLE DOUBLE BEDSTEAD.

The *Daily News* of Philadelphia, referring to the article in the *Medical News*, adds: "There is no treatment which will prevent this class of sudden deaths, and physicians are powerless to avert its onset. All they can do is to advise a calm, unexciting mode of life, with freedom from worry and anxiety. Such advice is very easy to give, but as difficult to follow as would be a suggestion that it is not advisable to die at any given time."