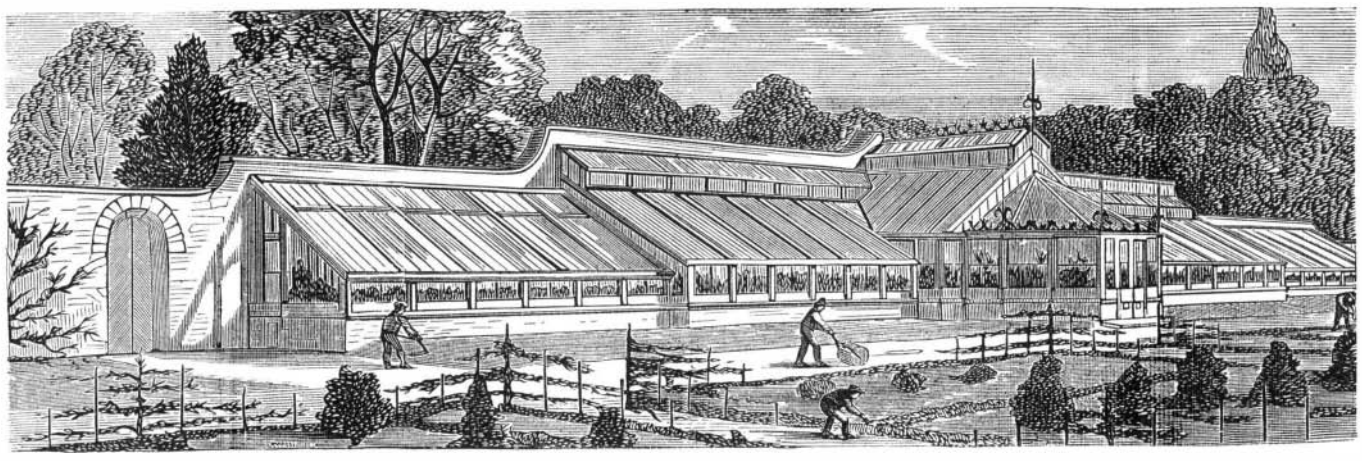
GREENHOUSES AND HOTHOUSES.

The long winter of our Northern and Middle States tries the patience of our gardeners, and renders doubly acceptable any hints and directions for the construction of greenhouses, wherein plants can be nurtured till the advent of spring; and where propagation can be carried on, so that a large supply of plants, both for flowers and fruit, may be ready for planting out as soon as the frost leaves the ground. Where the horticultural operations are extensive, the plan shown in our Fig. 1 is perhaps the best that could be adopted. The buildings can be constructed of any required size, and the heat is well confined to the back of the house by the brick wall. Flues are builtin the wall with furnaces at the ends; or steam or hot water pipes are used for heating. Grape vines are usually trained under the sloping roof, and thus enjoy the maximum of light and sunshine. The wall is very handy in a fruit garden, even when not covered with glass. Fruit on trees trained against a brick wall (as shown on the left of Fig. 1) ripens much earlier; indeed, in England peaches and nectarines will hardly ripen at all in ordinary seasons unless the trees enjoy the reflected heat from a wall, which, by the way, should be painted black.

Fig. 1



RECENTLY CONSTRUCTED HOTHOUSES.

Gardeners who devote much time to the cultivation of the grape will find the glass frames, shown in our Fig. 2, economical and efficient. The timber used in making them is small in quantity, and the glass is well placed to ripen the fruit. Air is readily admitted to the vines by raising the glass frames, the hight of which can be adjusted by the attachment shown in the engraving, which displays the construction so clearly that no further explanation is necessary.

Another convenient form of glass frame is shown in Fig. 3; it is especially suitable for use on hotbeds. Being of little depth, the sun's heat is concentrated by the glass on the rich earth of the well manured bed; and the frames, which are well suited to cucumbers, melons, and early tomatoes, are so constructed as to slide open for purposes of ventilation.

Winter is the time when people are most apt to feel the need of a greenhouse; and if they do not construct one then, they usually get their plans perfected, and begin building in the early spring. We have published illustrations of more elaborate and expensive greenhouses than the one represented herewith; but we have seen none in which the arrangement is better, and the cost of construction less, than the one shown in Fig. 1. While Fig. 2 and 3 present no special novelty, they are each well adapted for the different purposes for which they are intended, and can be built cheaply.

PLANT VASES FOR INDOOR DECORATION

The votaries of floriculture are now turning their attention indoors, and inquiries as to proper and tasteful modes of parlor and dinner table decoration are beginning to reach us. The usual way of keeping plants in houses is to place them in vases or tazzas, of wood or pottery, although some are now made in bronze or iron, of very handsome designs; terra cotta is also employed, and, although cheaper than metal, is capable of equally effective ornamentation. Filled with a light earth, and covered with the moss called sphagnum, hardy and half hardy plants will thrive well in these vases; care must, however, be taken not to water them too profusely, as (there being no way of escape through the bottom of the vase for superfluous water) too much moisture will rot the roots.

The accompanying illustration represents a bronze tazza, ornamented with well known decorative plants. The margin is fringed with *isolepis gracilis*, used expressly to tone down the harshness of the metal work. Two or three plants of the palm-like curculigo, says a correspondent of the English *Garden*, from the pages of which we select the engraving, are placed in the center; and these, by furnishing bold and graceful foliage, contrast well with the horizontal lines of the tazza below, while their cool and deep-toned greenness forms a pleasing contrast to the character of the stand itself. Heaths and similar hard wooded plants are added, and with good effect.

Fig. 2

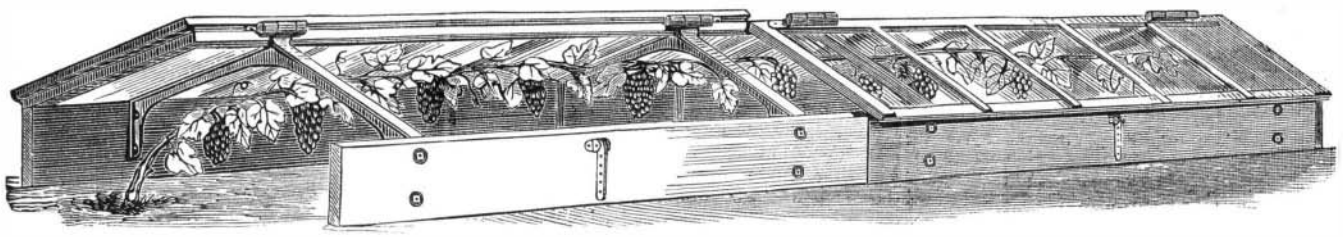
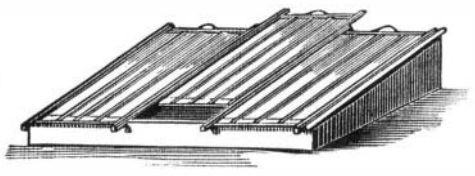


Fig. 3.



GRAPE VINE AND HOTBED FRAMES.

ORNAMENTAL PLANT STAND.

Take the Poles out of the Streets.

Complaints are frequently made against the objectionable practice of the telegraph companies in placing their poles in the streets of cities; and the popular belief is that the wires ought to be put underground. It is true that the main streets of New York are sadly disfigured by the clumsy wooden poles, and probably no improvement can be expected until we have a better city government. But the idea that it would be easily practicable to work the wires underground is a mistake. They could, however, be taken out of the streets and placed above the buildings, as in some cities, and we hope the time is not far distant when this desirable change will be made. As to underground wires, they cannot be easily worked, even when carefully insulated, on account of the interference of static induction. All telegraph wires, without regard to their position, are thus affected, but wires placed underground or in water are affected 50 times as much as those which pass through the air, the amount of the static charge in aerial wires being inversely proportional to the distance of the wires from the earth. The amount of the static charge in all telegraph wires, whether they are stretched through the air or buried under the ground, is proportional, also, to the length of the wire; and consequently an underground wire of half a mile to a mile in length may be worked without any inconvenience from the presence of the static charge, while one of greater length may give rise to the most serious trouble.

In London, all the railroads have stations centrally situated, most of the roads coming into the heart of the city. The South-Eastern Railway, for instance, has a station at Cannon street, which is only one third of a mile from the General Post Office, where the headquarters of the English telegraph lines are situated. Now, these telegraph wires are placed on poles and follow the lines of the railroads into the stations, where they first pass under ground, running as subterranean lines only from the railroad termini to the central telegraph station. Hence, the quantity of underground wire in London is comparatively small. In addition, it may be stated that in all parts of the city there are certain large distributing telegraph offices which are connected by wires with all the sub-stations in the city—of which there are 400 to 500—and every wire from each of these distributing offices to the several hundred sub stations is carried over the house tops; where there are several wires running to the same station, they are insulated on poles which are fastened to the tops of houses. In addition to those that have been mentioned, there are in London 800 private lines, running to all parts of the city. They use what are known as the Wheatstone dial instruments. There is not a single rod of wire working all these instruments that is under ground, the wires all being carried over the house tops. Frequently 40 to 50 insulated wires are made into a single cable, which is suspended on fixtures attached to the roofs of houses.

In 1854 a telegraph company was organized in England which constructed an underground line between London and Liverpool, 210 miles, the cable containing 10 wires. But in less than two years after the line was built, its insulation became so much impaired that the company was obliged to take up and replace a considerable portion of the cable. One wire after another still continued to fail, until there were only five of the ten that would work at all. After this, as others failed, sections of the underground line were abandoned, and wires placed on poles were substituted, until, finally, so much of the underground system had failed that the company decided to place the whole line on poles. The copper and gutta percha which constituted the valuable portion of the underground cable were taken up and sold for enough to replace the whole system with a good overland line. All similar lines that were ever constructed in England have been abandoned, except one of thirty miles, constructed by the government nearly three years ago as an experiment, which is the only line outside of the cities.

In like manner, says Mr. G. B. Prescott, 20,000 miles of underground lines in England, France, and Germany have been abandoned. In the city of New York there are over 5,000 miles of telegraph wires in operation, four fifths of which are used for local communications, stock-reporting instruments, and private lines.

If a law should be passed compelling the companies to place their wires underground, the whole system of communication would have to be changed. But, even were it practicable to work our system upon the underground lines, it would be impossible to place all the wires in the city of New York lone underground in less than four or five years.

The Manora Breakwater.

At a recent meeting of the Institution of Civil Engineers, the paper read was on "The Manora Breakwater, Kurrachee" (the design for which was illustrated on page 99 of volume XXVII. of the SCIENTIFIC AMERICAN), by Mr. William Henry Price.

It was stated that the Manora Breakwater was the most important feature of the Kurrachee Harbor Works, which were commenced in 1860, from the design of the late Mr. James Walker, assisted by Mr. William Parkes. Besides the breakwater the chief works were: In the lower harbor, a stone groyne 8,900 feet long, dredging and removal of rock; and in the upper harbor, an increase of one fourth to the area of the backwater, involving a new tidal channel 2½ miles long, crossed by a screw pile bridge 1,200 feet long, and an embankment 2,780 feet long, to close the old channel, also of a jetty 1,400 feet long, with quays. All these works were now nearly completed, and had already produced great benefit, the entrance having been made direct instead of circuitous, deepened 6 feet and sheltered, the anchorage space enlarged, and the internal accommodation improved. The trade of the port was $17,500,000 per annum, and railway communication with the Punjaub would further develope it. About $2,250,000 had been expended on the whole of the harbor improvements.

The Breakwater projected from Manora Point for a length of 1,503 feet, into a depth of 5 fathoms of water, in order to shelter the entrance from the southwest monsoon seas, and to prevent their tearing up sand from the bottom and depositing it as a bar. The characteristics of the sea, wind, and tides, as bearing on the design, were alluded to, and it was stated that the bottom was irregular near the shore. The structure consisted of a base of rubble stone, leveled off generally to 15 feet under low water; and on this concrete blocks, each weighing 27 tuns, were set on edge, leaning back at a slope of 3 inches to 1 foot, and without bond, two blocks forming the width and three the hight, and together making a square of 24 feet in cross sections, the top being about the level of high water. The rubble base was deposited from native boats, and was leveled for the superstructure by helmet divers. Two European mason divers were employed, and six native divers trained on the work, the latter chiefly for shifting the rubble. No accident occurred, and the party generally did not suffer in health. After mentioning circumstances which determined the use of concrete blocks and of Portland cement, particulars were given of the composition of a 37-tun block, the materials being cement, river sand, shingle, and quarry lumps, with salt water. The ratio of the bulk of the cement to that of the finished block was nearly $\frac{1}{11}$. About 3,500 tuns of cement were used. The mixing station, block ground, and molding of the nineteen hundred and seventy-two blocks, including three hundred and twenty-five of special smaller sizes, were then described; and it was remarked that the Messent mixers had been found very efficient. The blocks were sometimes used one month after being made, and once, as an experiment, a 27-tun block was safely lifted in seven days. When the work was fairly established, the blocks cost for current expenses $3.75 per cubic yard, though the average total rate was raised beyond this by extra expenses in the earlier stages.

The blocks were lifted on to the trucks by a steam hydraulic traveling crane of 50 feet span; each truck carried one block, and was taken separately by a tank locomotive to the breakwater. The blocks were set by a steam traveling crane, called the Titan, which ran on rails laid on the finished work, and overhung the end, so as to carry the blocks of three tiers in advance to their places, thus dispensing with staging. The framing of this crane supported a traveler and crab, worked by an 8-horse power engine on the top, which also drove the traveling gear of the entire machine. The cost of the Titan, delivered and erected at Kurrachee, was $14,395. The rate of setting was limited by the progress of the foundation and by the supply of blocks, but during the last season ten 27-tun blocks were set daily on an average, while on one occasion six blocks were laid in one hour and forty minutes without special pressure.

The base was commenced on the 17th of March, 1869; and later in that year the shore end stump, 45 feet long, to make a starting place for the Titan, with other preparatory works, was completed, after some unavoidable delays, and the first block was set on the 1st of November, 1870. The delays of the foundation were merely felt in the first season's work, but a length of 225 feet was built in four months, taking the breakwater out to 270 feet from the shore. During the second season, 1871-72, after a few days spent in repair of monsoon damages, a length of 523 feet was built in about four months, making a total of 793 feet. During the third season, after the repair of monsoon damages, a length of 710 feet was built, completing the breakwater on the 22nd of February, 1873, to its full length of 1,503 feet, which had thus been barely twelve months in actual building.

The action and effect of the monsoon sea, and the repair of damages, were then detailed. In 1871 the center joint opened here and there, and one block was over from the top course on the harbor side. Slight damage also occurred to the shore end in the sea angle. The nature of the settlement was described, also a curious rocking action, and the closing up of the cross joints under the action of the sea. The repairs of the damage, in the first season, cost $925. During the second monsoon, 1872, twenty-five blocks were washed out from the top course on the harbor side, eighteen of these block being, in one length, 86 feet. The damage was again traceable to inequality of settlement. The sea side did not suffer, nor did the shore end, though both showed evidence of the force of the sea. The damage was repaired in a few days at a cost of $2,560. The monsoon of 1873, the first after the completion of the breakwater, did trifling damage, and was confined to the shore half length, still pointing clearly to weakness of foundation. The repairs cost $995. In the monsoon of 1874, the outer end and scar, which had not then been in any way specially secured, lost five blocks during unusual weather, though no other part of the outer half length suffered, but the shoreward half opened here and there. The repairs of this season cost $2,090, and included the re-erection of an iron beacon on the outer end. The nature and extent of the subsidence (which in some parts amounted to 3 feet, but without dislocation), were then noticed, also the action of a mollusk, the pholas, on the concrete blocks, and the effect of the sea on the rubble base, which did not, however, affect the stability of the superstructure.

The cost of the breakwater had been $467,825, or $311.25 per lineal foot, but this amount included preliminary charges, the current expenses during the last season being only $170 per foot. This sum included the repair of damages during the progress of the work, and during the two monsoons since its completion, but not the expense of engineering and office establishment. The work had been carried on in the Bombay Public Works Department by the author and his assistants, advised by Mr. William Parkes, as consulting engineer, and without employment of any general contractor. The completion of the work was favorably noticed by all the government authorities concerned.

Recent American and Foreign Patents.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED HORSE-HITCHING DEVICE.

John Schoonmaker, New York city.—This consists in attaching to the reins rings which are caught upon hooks on the forward part of the wagon body, so that, should the horse attempt to run away, the whole weight of the wagon will come upon his mouth and hold him back.

IMPROVED STILL.

Henry Deymann and Edward Melchers, Toledo, Ohio.—This inventor proposes an improved column for refining stills, in place of the so-called French column, so that a finer spirit, with less steam pressure, is produced by means of simpler construction, which prevents leakage, decreases the trouble and expense connected with the repairs of the French column, and which may be put in the space of one story, with a considerable saving in copper plate. The essential features consist in arranging the chambers of the columns, on opposite sides thereof, with alternating horizontal and vertical partition plates and connecting overflow pipes and draining stop cocks. The intercommunicating arrangement of the chambers virtually produces two columns in one, so as to require about half the hight and material only, and offers the advantage of having all the overflow pipes at the outside.

IMPROVED INKSTAND.

Herman Schirmer, Wheeling, W. Va.—This is an ink vessel with an inverted conical tube extending nearly to the bottom of the vessel, and having an orifice at the lower end in connection with an air regulating device by which the hight of the ink in the tube is regulated.

IMPROVED PHOTOGRAPHIC PLATE HOLDER.

Frank A. Howson and William S. Howson, Brooklyn, N. Y.—This is an improved combination holder for the ground glass and plate for photographic cameras, by which, in every case, the exact image that was focused on the ground glass is obtained with perfect certainty on the sensitized plate. By its use the ground glass door of the camera may be dispensed with. The device is provided with lower grooved glass holders, glass buttons or studs at the top, and a side support, on which the ground glass and plate are insulated, and securely fastened by a spring top plate.

IMPROVED MONUMENT.

John N. Wallis, Fleming, and Theodore Wallis, Scipio, assignors to themselves and James A. Moore, Auburn, N. Y.—This inventor proposes gravestones of a more tasteful form than those commonly used. He suggests making the monuments of stone and glass, having inclosed chambers for the preservation of flowers and other objects.

NEW HOUSEHOLD ARTICLES.

IMPROVED CURTAIN FIXTURE.

William H. Maine, Abington, Mass.—This is a spring curtain roller provided with a device for preventing the unwinding of the spring when the roller is removed from the brackets. A spiral roller spring acts on a spindle, revolves the same, and throws a pin instantly out of its seat against a cam of a sleeve, so as to retain the spindle and prevent the unwinding of the spring. The roller thus remains in locked position as long as it is out of the brackets, and is instantly available for use when replaced in the brackets.

IMPROVED COMPOSITION FOR SOAP.

William F. Darnoby, Nashville, Tenn., assignor to himself and Edward B. Stahlman, of same place.—This compound, the inventor states, is an excellent article both for laundry and toilet, and is very cheap. It is made of Kirk's double extract, Colgate's soda soap, sal soda, water, spirits of ammonia, ether, and oil of sassafras.

NEW AGRICULTURAL INVENTIONS.

IMPROVED CHECK-ROW ATTACHMENT FOR CORN PLANTERS.

George C. Flagg, Columbus, Ill.—This includes several new and ingenious devices, so constructed that wheels mark the rows in one direction and marker arms mark it in the other direction. The machine is so guided that the ends of the inner markers may meet, or nearly meet, the ends of the marks made by the outer markers upon the previous crossing, so that the ground is marked in accurate check row by the machine crossing the field in one direction.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED CAR COUPLING.

Oscar E. Ford, Meridian, Miss., assignor to himself and Min or B. Clinton, Dallas, Tex.—This coupling consists of drawheads with forward-projecting parts, which are recessed at their inner sides, and provided with laterally sliding spring-acting jaws that interlock by the entering of the projecting parts of the drawheads into the space formed by the shorter part. The drawheads are thus firmly connected without chance of getting detached, while the jaws have play in vertical direction by the widening of the recesses at the rear part, which allows the coupling of cars of different hights.

IMPROVED CRANK STOP.

William H. Phillips, Bridgeton, N. J.—The cranks of windlass and other shafts have been heretofore disconnected by the backward rotation of said shafts, but the shafts required to rotate several times in order to effect such result. This inventor effects the disconnection at the first backward rotation of the shaft, and to this end provides a pivoted catch, which engages a sliding piece that locks the crank to the shaft.

IMPROVED SPARK CONVEYER.

Charles K. Cullers, Bunceton, Mo.—This device is principally a kind of ball-and-socket joint for connecting the sections of pipe for conducting the smoke for the locomotive back along the top of the train to the rear end, the said joint being free to oscillate to any required extent, and allowing the necessary contraction and extension of the pipe, and at the same time keeping tight.

IMPROVED SADIRON SHOE.

Victor C. Thebaud, Buffalo, N. Y.—A large number of inventions are in existence for getting rid of the unnecessary weight of metal in flat irons, most of which accomplish their object by abolishing the fixed handle and substituting an adjustable one which will serve for several bodies. The present inventor suggests a very different plan, and proposes a shoe for the iron, which is easily attached and replaced at will, so that an effective ironing surface is always obtainable. The device is made with external flange, having curved side extensions at the front and a fastening screw at the rear part to be readily applied to the iron.

IMPROVED TREADLE FOR MACHINERY.

Andrew N. Hagerty, West Alexander, Pa.—This is an auxiliary treadle and connecting rod, in combination with the main treadle and connecting rod, to work a pawl for starting the machine by a ratchet wheel. The object is to insure the turning of the machine in the right direction, and to avoid the necessity of starting the balance wheel by hand, thus leaving both hands free for managing the work.

IMPROVED RAIL JOINT.

George A. Mead, Salem Center, N. Y.—In this device, the tongue or tenon of one rail enters a slot in the other. The slotted part is bolted together by a couple of bolts, arranged the same as in fishplate joints. The object is to make an endless joint, and to dispense with the fishplates commonly used.

IMPROVED WATER REGULATOR AND INDICATOR FOR STEAM BOILERS.

Dexter Cook, Elmira, Ohio.—This is a cylindrical tank traveling in vertical guides and supported by a spring. It is connected at top and bottom with the steam and water spaces of the boiler. When the water in the boiler falls below a certain level, the tank, becoming lighter, is raised by the spring, and the fact is indicated by a graduated scale and pointer and by a whistle allowed to sound by mechanism connected with the tank. The latter is also connected with a feed valve, so as to open the same, and thus allow water to enter the boiler when a deficiency is indicated, and closes the valve when the level is reached.

IMPROVED FEATHERING PADDLE WHEEL.

Peter Gregerson, Wauzeka, Wis., assignor to himself and Phillip Miller, same place.—The paddles are hung by pivots above their centers, and are held to their work by stops. The latter are controlled by sliding rods which, acted upon by a cam on the wheel shaft, push said stops beyond the outer edge of the paddles, and then retract them by springs. There are other devices which allow the cam to shift right or left, as the wheel is turned in either direction, and an ingenious mechanism is provided for purposes of adjustment.

IMPROVED GATE.

Robert Samuel Rinker, Mount Jackson, Va.—The object of this invention is to provide an improved automatic or self-opening gate; and it consists in an arrangement of elbow levers and catch hooks, controlled by a cord or wire, with a weighted lever, upon one end of which lever the wheels of the vehicle pass to raise the weight and set the gate, so that it can be readily opened from either side by the person in the vehicle by pulling a tripping cord, arranged upon both sides of the gate, within convenient reach, upon a post, each vehicle serving to raise the weight and set the gate for the next succeeding one.

IMPROVED BRICK KILN.

Holland B. Evans and Earnest G. Kemper, St. Charles, Mo.—The invention relates to a new construction and arrangement of the several compartments of the kiln and their flues, which cannot be made plain without the aid of drawings. In general the flues are so made that their heat can easily be controlled, and by using the invention it appears that as many more bricks as are contained in the compartments can be burned with the same or less amount of fuel than with a kiln of the same dimensions constructed in the old way

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED RECORDING AND SIGNAL FARE BOX.

Edward Henry Schnell, South Norwalk, Conn.—Another machine for enforcing honesty in car conductors is a recording and alarm fare box, in which the record is made by punctures or slits formed in a piece of paper at the same time that the signal is sounded. There is also a separate compartment in the case of the instrument for depositing tickets as they are collected by the conductor, with a door which only opens when the signal and recording devices are actuated. So that in order that the tickets shall agree with the record the conductor is obliged to collect and deposit all the tickets.

IMPROVED BARREL.

Leslie E. Sunderland, Williamsburg, Va.—The object of this invention is to provide a barrel for the shipment of produce, which shall be capable of transformation after the said produce is delivered, so as to occupy a comparatively small space, and be returned to the sender at the rates of solid freight and at a comparatively trifling cost. It consists in a series of staves, connected by hoops which have peculiar fastenings, which adapt the staves to be disposed flat for return transportation, or rolled up and fastened to form a barrel. The sides of the barrel are straight, and the heads are held in place by lugs alternating, when the barrel is set up upon opposite sides of the head. The heads are thus of less diameter than the inside of the barrel, so that the barrel, when returned, may be packed full of heads, and the rest of the barrel sides packed flatly together.