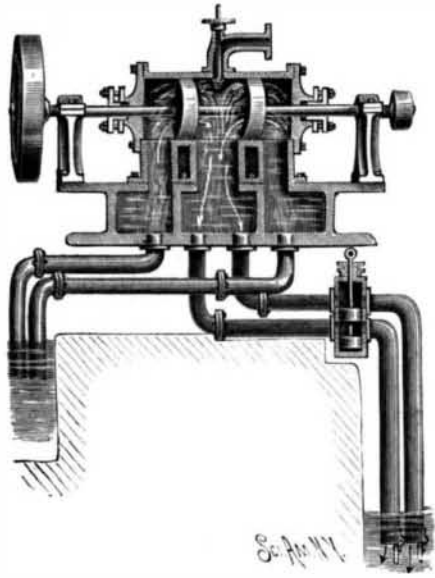


AN IMPROVED HYDRAULIC MOTOR.

The motor shown in the cut, patented by Mr. Hans P. Christiansen, utilizes in its operation the principle of a siphon, the valve and pipe shown at the top affording ready means of always keeping the siphon perfect, water being there admitted to fill all the pipes before the motor commences to work. The level of the water, as shown at the left in the illustration, being higher than at the right, the current flows from the left, as shown by the arrows, through the pipes to both ends of the main cylinder. The driving shaft passes centrally through this cylinder, and on it are mounted two turbine wheels, the wings of which are inclined in opposite directions. The wheels divide the interior of the cylinder into three compartments, both of the end compartments receiving a flow of water from the higher level, which, after passing through the wheels, and exerting its force upon the driving shaft, passes out of the central compartment and thence to the lower level. In the horizontal part of the pipes leading to the lower level is arranged a valve casing with valves by means of which the operator can at any time stop or start the motor, in ordinary operation, by simply closing or opening the valves.

For further information relative to this invention

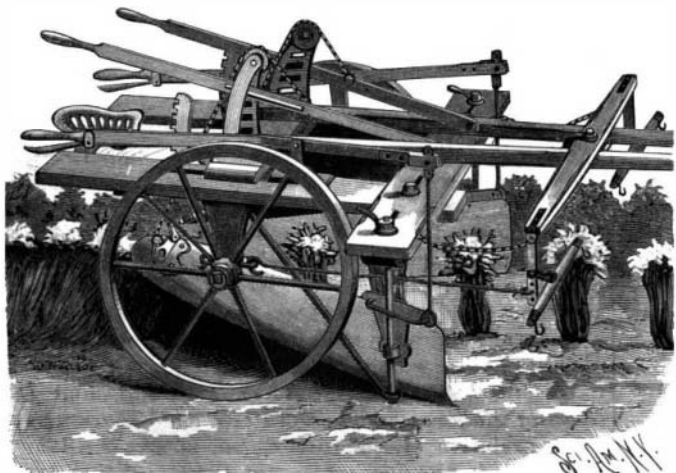


CHRISTIANSSEN'S HYDRAULIC MOTOR.

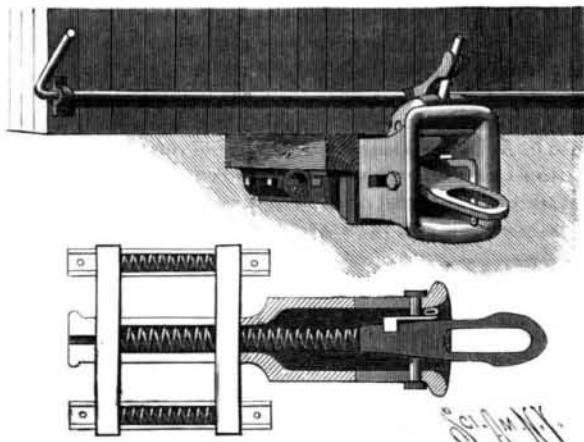
address Messrs. Jens Hansen & Co., No. 463 B Street, Oakland, Cal.

AN IMPROVED MACHINE FOR HILLING CELERY.

In the machine shown in the illustration the mold-boards are adjustable to suit the height of the plants, and laterally to correspond with the width of the rows, the machine being designed to crowd the earth from the bottom of the furrows under the leaves simultaneously upon both sides of the rows. It has been patented by Mr. Maurice M. Ranney, of Comstock, Mich. The side beams of the frame are adjustable laterally upon the cross beams, and from the under side of each side beam projects a pedestal with an attached spud axle upon which the drive wheels revolve. A post extends downwardly, from a bracket on the under side of each side beam, through a staple and eye formed on a plate attached to the forward end of the mold-board, each post being stayed by a brace bar, and the eyes and staples being large enough to move freely upon the post. For the vertical adjustment of the mold-boards, a link connects the staple on the forward end of each with the forward end of a lever fulcrumed upon an upright of the frame, a rack secured to one of the side beams being provided for each lever, which extends to within easy reach of the driver. A stirrup is bolted upon the outer face of each mold-board at its rear end, a chain from each stirrup passing over a friction pulley journaled on the upper end of a rack secured to the center cross beam, to attachment with a lever pivoted on the forward cross beam, and extending to the driver. The mold-boards are so hung that they



RANNEY'S MACHINE FOR HILLING CELERY.

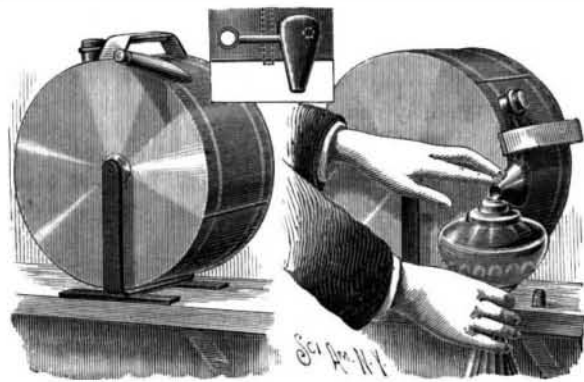


McKERAHAN'S CAR COUPLING.

are quite a distance apart at their forward ends, and nearer together at the rear, where the two boards are connected by a spiral spring, which spring is attached through short adjustable arms, whereby the spring may be lengthened when it is desired to only half hill the rows. The driver, by resting his feet in the stirrups of the mold-boards, can adapt them to any crookedness of the rows or irregularities of the surface, the machine being adjustable to rows from three to five feet apart and from six inches to two and a half feet in height.

AN IMPROVED LIQUID HOLDING VESSEL.

The accompanying illustration represents a vessel to hold oil or other liquids, and permit the contents to be readily and safely decanted into a lamp or other vessel with a small opening, the receptacle being also adapted to hold liquids for transportation or storage. This invention has been patented by Mr. Stewart R. Mace, of Moulton, Iowa. The holder consists of a horizontal cylinder pivotally supported in a suitable stand, the points of pivotal support of the vessel being above its axial center, whereby the weight of contained liquid will always retain the vessel in such position that the filler nozzle and discharge spout will be at the top, except when the vessel is turned in its journaled supports to discharge its contents. The filler nozzle projects from the cylindrical wall of the vessel on one side of the handle, and on the opposite side is the discharge spout, a small orifice from the interior opening into the inner lower portion of the spout, the opening from the interior being considerably less than the outer opening of the spout, so that there will always be an air space above the escaping stream. Intersecting the rear portion of the spout, above the wall of the vessel, is a transverse air passage, produced by the attachment of an arched piece of sheet metal, as shown in the small



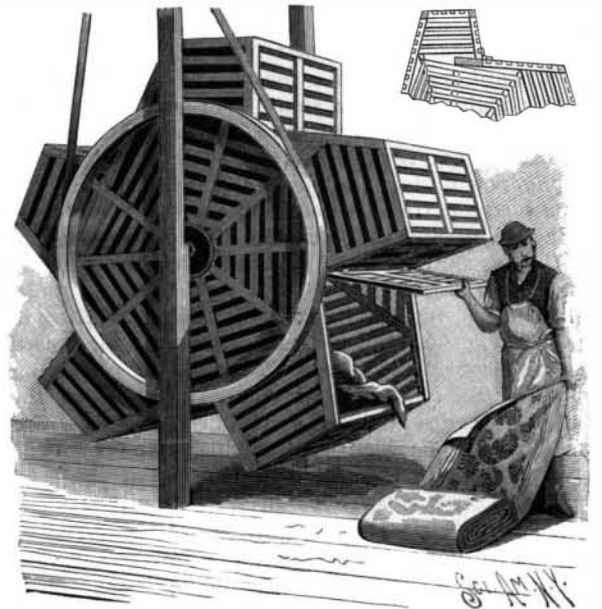
MACE'S LIQUID HOLDING VESSEL.

view, this air passage being in open communication with the vessel near the filler nozzle, so that there is a continuous air duct which will only be closed by the insertion of a stopper or cork in the outer end of the discharge spout. As a consequence the stream of oil or other liquid is caused to flow smoothly, and the spout is designed to be entirely free from drip.

AN IMPROVED CAR COUPLING.

The coupling shown in the illustration is designed to be automatic in its operation, and to permit the disconnection of the coupling from either side of the car, while it also possesses a longitudinally yielding link bar whereby injurious shock is avoided. It has been patented by Mr. Charles McKerahan, of No. 78 Middle Street, Alleghany City, Pa. The drawhead has a rearwardly extending portion of reduced diameter, and the front part of its top wall has a hollow projection or pocket that is longitudinally slotted to permit the vibration of an upright lever. The link bar is pivoted on pins in opposite longitudinal slots in the throat of the drawhead, thus adapting it to be inclined from a horizontal plane and have a sliding movement, and at its rear end is a stout spiral spring extend-

ing within the reduced rear portion of the drawhead body, as shown in the sectional plan view. At the side of this spring are two longitudinally slotted spring cases, each containing a spiral spring, the flat transverse guide bars of which extend through the intermediate slotted rear end portion of the drawhead body, the spring cases being secured upon stringers of the car frame. A heavy depending latch block, adapted to engage the opening in the link bar, is pivoted to swing in the pocket in the top wall of the flaring portion of the drawhead, and at its side is a spring dog adapted to maintain the latch block in normal position for coupling when the parts have been arranged therefor. The lower end of the upright lever in the slot in the top of the drawhead is secured to the latch block, its upper end being engaged by a rock arm upon a transverse shaft journaled in boxes attached to the end wall of the car body, this transverse shaft being rotated by crank arms at the sides of the car. A flat loop, its ends made fast to the car frame, engages the sides and bottom of the drawhead to hold it from displacement and allow it to slide longitudinally. When two cars having this coupling are to be connected, the latch blocks are raised, when, upon engagement of the link



BOWMAN'S CARPET CLEANING MACHINE.

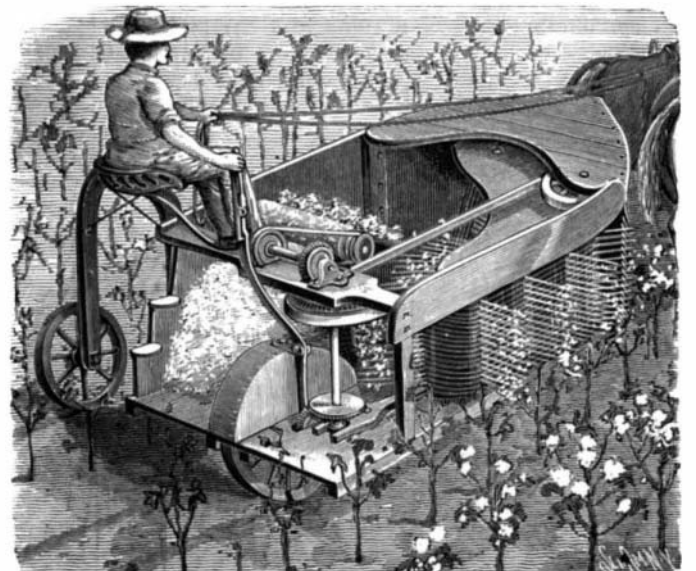
bars by the coming together of the cars, one bar slides above the other, and the top bar, by its contact with the spring dog, lets the latch block fall into locked engagement with the link bar that is on top, thus effecting a secure coupling, and one which permits of free lateral motion.

AN IMPROVED CARPET CLEANING MACHINE.

The cut shows a rotary machine designed to prevent the bunching of the carpets being cleaned in it, which forms the subject of a patent issued to Mr. William Bowman, of Battle Creek, Mich. The hub of the machine has two classes of radially extending spokes, one class of spokes extending outward to tangentially arranged strips which constitute retainers, while the others lead to tangential strips connected to the retainers. Upon the retainers and the strips are built up frameworks serving as supports for slats, whereby there are formed outer carpet-receiving chambers, while to the spokes are connected strips which act as barriers at the ends of the machine. One or more traps or lids are provided, for putting in and taking out the carpets, which, as the cleaner is revolved, fall from the upper chambers into the lower chambers, and thus are thoroughly beaten.

AN IMPROVED COTTON PICKER.

The illustration represents a machine designed to pick only the ripe cotton, without disturbing the bolls



STEPHENSON'S COTTON PICKER.

of unripe cotton or the leaves or limbs of the plant. It has been patented by Mr. Charles R. Stephenson, of Lyon, Miss. In the forward part of the car which carries the mechanism, at one side, is journaled a vertical shaft, upon which is loosely mounted a frame, the top and bottom faces of which are nearly triangular in general outline, these faces being connected by vertical strips. On the vertical shaft, within the frame, is a drum, and in the rearwardly extending portion of the frame is another shaft carrying a drum, an endless apron extending around the two drums. Upon this apron are vertical boxes in which are journaled outwardly projecting spindles that are tapered and have longitudinal grooves. Upon the inner ends of these spindles, within the boxes, are grooved pulleys, the upper pulley having a flange adapted to roll in contact with a track attached to the under surface of the upper part of the frame, and thus communicate a rotary or twisting motion to all the pulleys and their spindles, by means of a belt or cord running over the top and bottom pulleys and alternately behind and outside of the others in the series. A vertical shaft, journaled in the floor and a rear cross bar of the frame, receives its motion through bevel gears from the drive wheel, a clutch mechanism, connected with a lever in easy reach of the driver, allowing the gear to be thrown into and out of engagement, and a belt from this shaft operates the forward drum-carrying shaft. Upon the lower end of this main operating shaft is formed an eccentric adapted to be engaged by the short arm of a forked lever pivoted on the floor in front of it, the long arm of such lever entering a notch in the lower part of the drum-carrying frame, whereby the latter is vibrated, or moved in and out, with the rotation of the shaft. In the forward part of the frame, to the left of the drum shaft, is also journaled a vertical drum shaft, belts or cords running horizontally around all three of the shafts journaled in the frame, one such belt or cord passing between each series of outwardly projecting spindles. Behind the latter shaft, and adjoining the wall of the car, is arranged an inclined endless carrier, the lower end of which is placed near the floor while its upper end is near the top of the car at the rear, the drum operating the carrier receiving its motion through a belt from a short shaft connected with the main operating shaft. The upper part of the main drive wheel is incased, and the auxiliary side wheel turns on a stud projecting from an inverted U-shaped bar attached to the side of the car. As the machine is drawn through the cotton field, the drum shafts are revolved to move the spindles rearwardly, while the cotton is wound loosely upon the rotating spindles, as the vibrating frame is alternately projected among and withdrawn from the cotton plants. As the spindles pass into the car at the rear, the cotton is removed from them by the horizontal belts or cords passing around the drum at the foot of the inclined carrier, which takes the cotton up for delivery in bags or to a wagon attending the pickers.

Rich without Money.

Many a man is rich without money. Thousands of men with nothing in their pockets, and thousands without even a pocket, are rich. A man born with a good, sound constitution, a good stomach, a good heart, and good limbs and a pretty good headpiece, is rich. Good bones are better than gold; tough muscles than silver; and nerves that flash fire and carry energy to every function are better than houses and land. It is better than a landed estate to have the right kind of a father and mother. Good breeds and bad breeds exist among men as really as among herds and horses. Education may do much to check evil tendencies or to develop good ones; but it is a great thing to inherit the right proportion of faculties to start with. The man is rich who has a good disposition, who is naturally kind, patient, cheerful, hopeful, and who has a flavor of wit and fun in his composition.

The hardest thing to get on with in this life is a man's own self. A cross, selfish fellow, a desponding and complaining fellow, a timid and care-burdened man—these are all born deformed on the inside. They do not limp, but their thoughts sometimes do.—*Clay Manufacturers' Engineer.*

The Swedish Cure for Drunkenness.

The habitual drunkard in Norway or Sweden renders himself liable to imprisonment for his love of strong drink, and during his incarceration he is required to submit to a plan of treatment for the cure of his failing which is said to produce marvelous results. The plan consists in making the delinquent subsist entirely on bread and wine. The bread is steeped in a bowl of wine for an hour or more before the meal is served. The first day the habitual toper takes his food in this shape without repugnance; the second day he finds it less agreeable to his palate; finally he positively loathes the sight of it. Experience shows that a period of from eight to ten days of this regimen is generally more than sufficient to make a man evince the greatest aversion to anything in the shape of wine. Many men after their incarceration become total abstainers.

THE DEVELOPMENT OF THE CALIPER.

One of the first tools to suggest itself to the mind of the early worker in metals for the measurement of diameters or thicknesses probably was a gauge something like that shown in Fig. 1, which is simply a notched plate of iron, the width of the notch being the measurement of the diameter or thickness required, and by repeated applications of this gauge to the work, as it neared completion, accurate results were secured; but

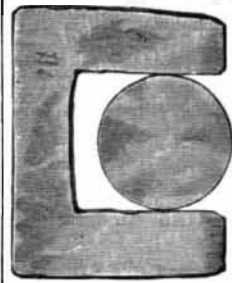


Fig. 1.

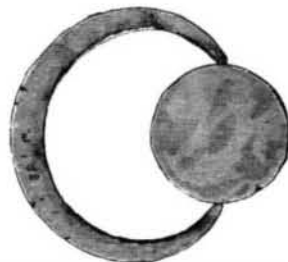


Fig. 2.

this tool was what would now be called a special tool or gauge designed for measuring fixed diameters. It lacked the adjustable feature which was necessary to adapt it to work of different sizes. Of course the tool could have been heated and altered, but this would have occasioned considerable labor, as well as the loss of the original gauge. It is, therefore, probable that, for an adjustable gauge or caliper, something like that shown in Fig. 2 was employed.

This tool consisted of a curved bar of metal, with the ends approaching each other, and the adjustments were effected by bending the bar. An obvious and early improvement upon this caliper is shown in Fig. 3. The difficulty of bending a bar whenever an adjustment was required suggested the use of a frictional joint at the center of the bar, which would permit of swinging the arm of the caliper to adapt it to the measurement of different diameters. From this crude mechanical device have been developed all the modern improved forms of caliper, one of

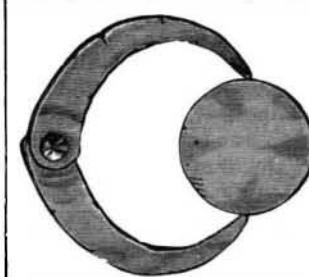


Fig. 3.

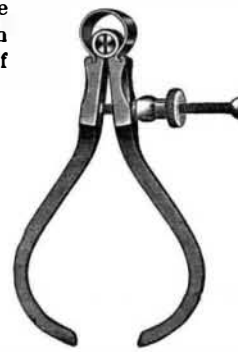
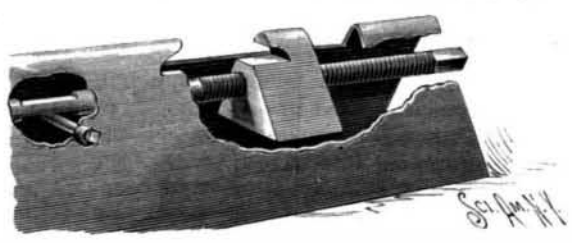
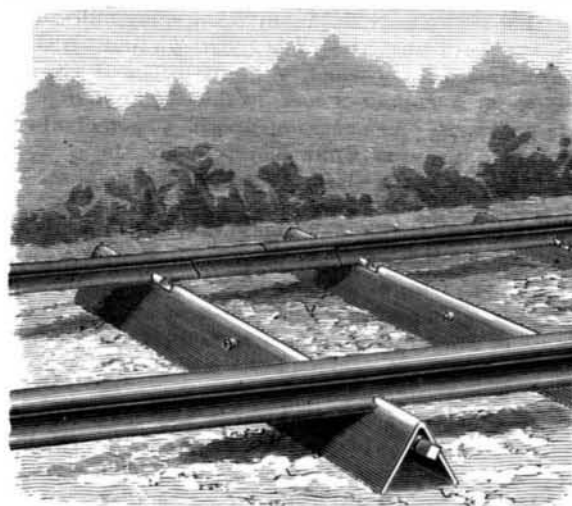


Fig. 4.

the latest improvements in this line being what is known as the Stevens caliper, represented in Fig. 4, manufactured by the J. Stevens Arms and Tool Co., Chicopee Falls, Mass. In this caliper the jaws are connected together by a fine joint, and a C-shaped spring is applied which tends to separate the free ends of the jaws. The adjustment is instantly effected by a simple and durable slip nut, which, together with the joint and spring, forms an ideal arrangement appreciated by every mechanic.

AN IMPROVED METAL CROSS TIE.

The cross tie shown in the cut is designed to securely hold the rails in position and be sufficiently elastic to prevent injurious shocks to the rolling stock. It has been patented by Mr. James P. Taylor, of No. 315



TAYLOR'S METAL CROSS TIE FOR RAILROADS.

Pecan Street, Fort Worth, Texas. The body of the tie is preferably of wrought iron plate, and bent to nearly triangular shape in cross-section. At the proper distances apart to allow for the width of the track are longitudinal slots, in which are integral lips or flanges adapted to hook over the adjacent edge of the base flange of the rail when placed on the tie. Within the tie body is located a rod, oppositely threaded at each end, and on these threads are mounted blocks or nuts, as shown in the small figure, each block having a lug adapted to fit upon the inner base flange of the track rail. The outer ends of the rod are squared to receive a wrench, and near its center is a square portion, where the rod rests upon a transverse bolt. The squared portion of the rod is designed to retain it from rotation when in place sufficiently to prevent it from relaxing the lugs, the rod yielding when turned by a wrench to adjust the parts and draw these lugs against the flanges on the track rails.

Thinking and Doing.

The successful man, as a rule, is that one who knows the trick of doing the right thing at the right time, and the trick is not one which comes from inspiration, but from trained habits and thought. All the untrained genius in the world combined could not have composed in their present perfect literary form the thirty-nine articles, it was genius schooled and trained which accomplished them.

Attention enough is now given to physical training, but there is still a somewhat common lack of faith in some parts of the United States with regard to the advantages of mental training. A little "schooling," it is considered, is essential, but boys and girls, it is thought, especially in the country, should not be permitted to waste too much time over their books. The theory was, and, to a lesser degree, is, that good men are best made by beginning their working careers early—the earlier the better. But a change is occurring in this matter, as in others, and in these days of great enterprises, in which trained thought, science, and skill play so large a part, the man of educated mind is likely to be preferred to the man of uneducated mind. The man who has been taught to think according to system and principle is the man who, in the most attractive business pursuits, is sought by employers.

The value of such training as enables the man to rise promptly to the requirements of the emergency was very happily illustrated by Mr. Chauncey M. Depew the other day in an address he delivered to the boys of St. Paul's school, at Concord. Mr. Depew said:

"In a boat race between a Yale and an outside crew the other day, the oar of the stroke oarsman broke just at the critical moment. In such cases the great thing is to know just what to do, to be able to call on all your powers of knowledge and skill. The ordinary man knows how to drive, to go to church and sit in his pew, to come in when it rains, but only the well trained man knows what and how to do in an emergency. An ordinary man would have said: 'Abandon the race.' This fellow made up his mind in a moment, and judging just the right moment and just the right place, he leaped from that thin shell of a boat without disturbing the other rowers. Thus the boat was relieved of his weight, and Yale won."

The difference between the ordinary and the extraordinary man, when it does not arise from extraordinary natural gifts, to quote from the *Philadelphia Ledger*, lies generally in the superior mental training of the latter. The former may have intellect as quick and bright, but unless it has been trained to act, he is like a man with all the craftsman's tools, but without the craftsman's trained skill. The hand does the better work always, the better-schooled the thought behind it is, and this applies not less to the ordinary workman of the anvil, saw, or loom than to the man of affairs. The carpenter or mason whose mind has been trained as well as his hand is likely to put aside the plane and the trowel and to become the master builder or architect. It is the mental training that tells oftenest in this world's race, and the man who seizes the right moment in it when to stay in or when to leap from the boat is pretty certain to be found at the end upon the winning side.

The Tortoise Market of Philadelphia.

The taste for "stewed terrapin" and "snappersoup" has become so general in Philadelphia, that the United States are now ransacked for the means of supplying it. Within a few years the species sold were the "terrapin," *Malacoclemmys palustris*; the "red belly," *Chelopus insculptus*; the "slider," *Chrysemys rugosa*; and the "snapper," *Chelydra serpentina*. Now large invoices of turtles are sent from Mobile, New Orleans, and St. Louis, which include the following species: *Chrysemys bellii*, *C. elegans*, *C. concinna*, and *C. troostii*; *Malacoclemmys geographica*, and *M. leseurii*; total, exclusive of sea turtles, ten species. All are abundant in the market except the *C. bellii*.—*E. D. Cope.*