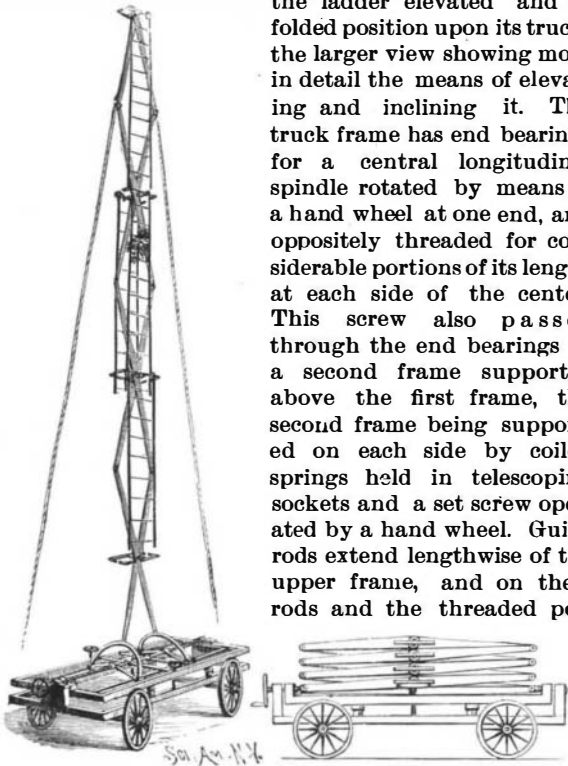


**AN IMPROVED FIRE LADDER.**

A fire ladder which may be conveniently folded upon a truck and readily elevated to a considerable height, while being adjustable to various inclinations as desired, has been patented by Mr. David B. McHenry, of Grenada, Miss. The illustration shows the ladder elevated and in folded position upon its truck, the larger view showing more in detail the means of elevating and inclining it. The truck frame has end bearings for a central longitudinal spindle rotated by means of a hand wheel at one end, and oppositely threaded for considerable portions of its length at each side of the center. This screw also passes through the end bearings of a second frame supported above the first frame, the second frame being supported on each side by coiled springs held in telescoping sockets and a set screw operated by a hand wheel. Guide rods extend lengthwise of the upper frame, and on these rods and the threaded por-

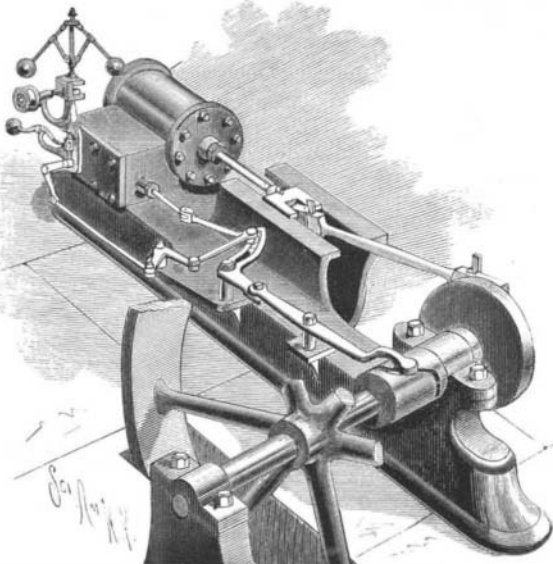


**McHENRY'S FIRE LADDER.**

tions of the central spindle travel two cross bars or bridges having threaded sockets engaging the threads of the spindle. To the outer ends of these cross bars are pivotally connected the arched lower members of a set of lazy tongs, and the pivots of these lazy tongs are formed with T-shaped extensions, between the ends of which ladder sections may be hung by means of hooks. By turning the hand wheel at the end of the frame, the revolution of the central spindle causes the cross bars to which the lazy tongs are pivoted to travel toward each other, and as the lazy tongs are thus gradually extended the ladder sections are hung in place, the apparatus being steadied by guy ropes when it reaches the elevated position. When the lazy tongs are again let down to folded position, the ladder sections are successively removed. To give the ladder an inclination transversely to the truck, the side screws are turned, thus tilting the upper frame. A single or double set of lazy tongs may be employed to support the ladder sections, and the weight is designed to be supported almost entirely by the guide rods, so that there shall be no undue strain on the central threaded spindle. The truck is preferably made with a crane neck. A modified form of this ladder may be used for domestic purposes, and by painters, decorators, etc.

**AN AUTOMATICALLY OPERATING VALVE GEAR.**

This gear, which is of simple construction and not



**LANGLAIS' VALVE GEAR.**

liable to get out of order, is designed to automatically increase or decrease the travel of the valve, to admit more or less steam to the cylinder according to the varying load. It is an improvement for which a patent has been recently granted Mr. Pascal J. Langlais, of Rhinelander, Wis. On the drive shaft of the engine is a cam wheel having in its periphery a groove in which travels a friction roller on one end of a lever fulcrumed on the frame of the engine, while the other end of the lever engages a slot in one arm of a bell-crank lever fulcrumed on a bracket. The other arm of the latter lever is segmental, and has a slot in which slides a block pivotally connected by a link with the stem of the slide valve. This block is also pivotally connected by a link with another bell crank lever, and the latter lever is pivotally connected by a link with a third bell crank lever connected by a rod with the stem of the governor. The latter connection is such as to permit the stem to turn without turning the rod, as the latter moves up and down with the governor stem, and the rod has a slot engaged by the inner end of a weighted lever fulcrumed on the governor frame. The arrangement is such that the position in the segmental slot of the block connected with the valve stem is controlled by the governor, the block being moved nearer to or away from the fulcrum point of the lever with increase or decrease of speed, whereby the travel of the valve will be regulated to decrease or increase the amount of steam admitted to the cylinder, the operation being automatically effected as the load on the engine varies.

**Scientific Slaughtering.**

Very few people have any idea what rigid economy is practiced at the great slaughtering plants. Scientific men are constantly cudgeling their brains to devise valuable chemical properties and new compounds in materials heretofore wasted or imperfectly utilized, says the *Drovers' Journal*.

The cross roads butcher who kills a few animals a week, throwing away a large part of the offal, must make a large profit on the meat sold, but modern utilization of by-products makes it so the slaughterer who does business on a large scale could much better afford to sell the meat without profit than to waste what the old-fashioned small butcher could not utilize.

The packing business as at present carried on utilizes a great number of products which were formerly allowed to go to waste. For instance, the stomachs of hogs, instead of being sent to the rendering tanks, are now used for the manufacture of pepsin. Pigs' feet, cattle feet, hide clippings and the pith of horns, as well as some of the bones, are used for the manufacture of glue. The paunches of the cattle are cleaned and made into tripe. The choicer parts of the fat from cattle are utilized for the manufacture of oleo oil, which is a constituent of butterine, and for stearine. Large quantities of the best of the leaf lard are also used for the manufacture of what is known as "neutral," also a constituent of butterine. The intestines are used for sausage casings; the bladders are used to pack putty in; the undigested food in the cattle stomachs is pressed and used for fuel; the long ends of the tails of cattle are sold to mattress makers, the horns and hoofs are carefully preserved and sold to the manufacturers of combs, buttons, etc. Many of the large white hoofs go to China, where they are made into jewelry. All of the blood is carefully preserved, coagulated by cooking with steam, then pressed and dried and sold to fertilizer manufacturers. All of the scrap from rendering operations is carefully preserved and dried and sold for fertilizers. Bones are dried and either ground into bone meal or used for the manufacture of bone charcoal, which is afterward utilized for refining sugar and in some other refining processes.

**The Value of the Scientific American.**

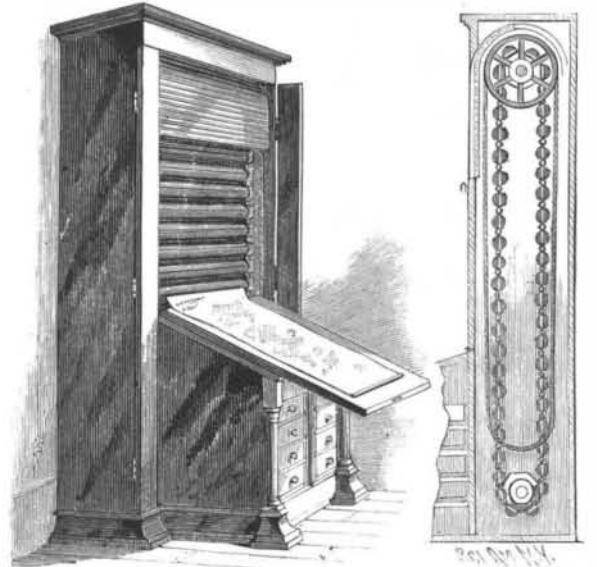
An old subscriber, who is a farmer in Michigan, in renewing his subscriptions to the *SCIENTIFIC AMERICAN* and *SUPPLEMENT* for the present year, writes as follows:

"This makes twenty-eight years' continuous subscription to the *SCIENTIFIC AMERICAN*. How is that for a mossback farmer! It has made electric engineers of both of my sons—one in the employ of O—Company, New York City, and one of the G—E—Company, now at Helena, Mont. Both are graduates of Michigan University. I attribute a large share of their success to their reading the *SCIENTIFIC AMERICAN*."

**AN IMPROVED EXHIBITING APPARATUS.**

This apparatus may be made in a style which will include an elaborate combination of desk and case, or in a less expensive portable or wall style, in either instance making convenient the compact arrangement and ready display of maps, charts, drawings, fabrics, wall paper, carpets, shades, etc. It is designed for use in schools, railroad and express offices, retail stores, etc., or in a wide variety of ways, including use in the chart rooms of ships. The improvement has been

patented by Mr. Daniel W. Tower, of Grand Rapids, Mich. The rolls of maps, fabrics, or other material are supported in holders on an endless carrier made up of links, as shown in the sectional view, each link having at one end a hook and at the opposite end an eye, and the chains thus formed running on sprocket wheels on top and bottom shafts in the case. At each end of the upper shaft is a hoisting pulley, over which passes a hand rope, by means of which the carrier may be moved to bring any desired roll in position for one end to be drawn out for inspection, such drawn out portion then lying on a downwardly swinging lid, with which the front of the case is provided. The case also has side doors and an upwardly swinging wooden curtain,

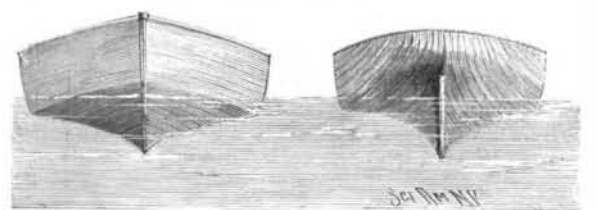
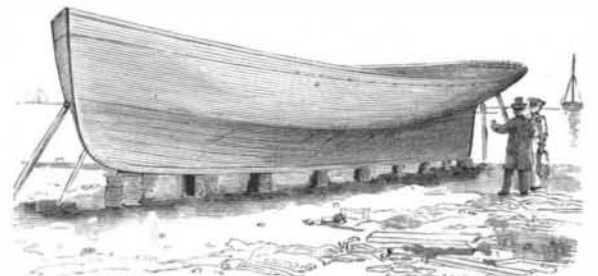


**TOWER'S EXHIBITING APPARATUS.**

such as is used in the ordinary roll top desk. The roll holders and rollers to receive the maps, fabrics, etc., extend completely around the endless carrier, being arranged between every pair of links. Each link has at one side a plate with a nearly cylindrical socket adapted to receive one end of the roll holder, the socket having at its front edge a slot, in which is inserted a squared stud on the end of the roller. A pivoted keeper on the front of the plate is provided for locking the stud in place, and the roller is actuated in the same manner as the ordinary shade roller, a spring brake, controlled by pressure of the finger, preventing the too easy or accidental rolling up of the map or fabric. The invention also provides for a modified form of carrier, designed to make the apparatus of still greater capacity.

**IMPROVEMENT IN VESSELS' HULLS.**

The illustration represents an improvement in the hulls of vessels designed to afford the maximum of speed and safety, while the construction is such that drift to leeward will be in a great measure avoided. The invention has been patented in Canada and Great Britain, as well as in this country, by the Rev. Patrick O'Brien, of St. Patrick's Deanery, St. John's, Newfoundland. The bottom of the vessel is curved in convex form from the stem to the stern, and has a concave face from the keel to the sharp-edged bilge, while from the bilge to the top of the hull the sides are curved, presenting an outer convex surface at the stern. The small figures represent bow and stern views. In every case where a cross section is taken through the bilge the sides and the bottom of the hull meet at an obtuse angle, and the outward inclination of the sides preferably increases from the ends of the hull. The steering qualities of vessels built after this plan are designed to be greatly improved, especially in high winds, which throw the hull over upon its side, as the bilge sections then serve as a side keel to hold the vessel to its course. This improved vessel has received the indorsement of many practical captains and seamen.



**O'BRIEN'S VESSEL'S HULL.**