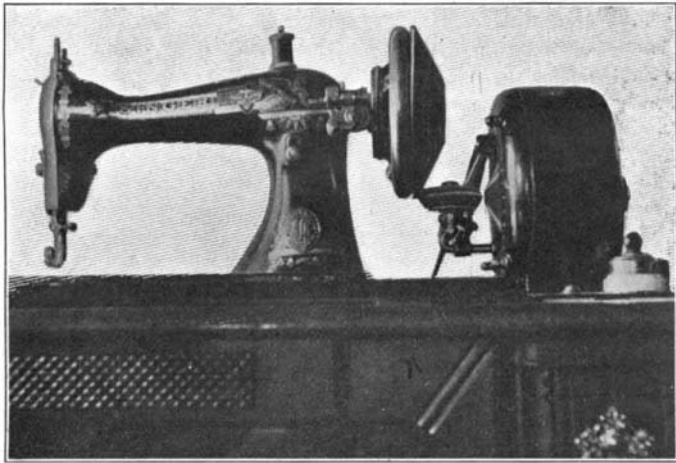


**VARIABLE SPEED GEAR FOR MOTOR-DRIVEN SEWING MACHINES.**

The advantages of using an electric motor to operate a sewing machine are greatly increased by the provision of a positive mechanical means for changing the speed of the machine to suit varying requirements. Our illustration shows a simple gear designed to ac-

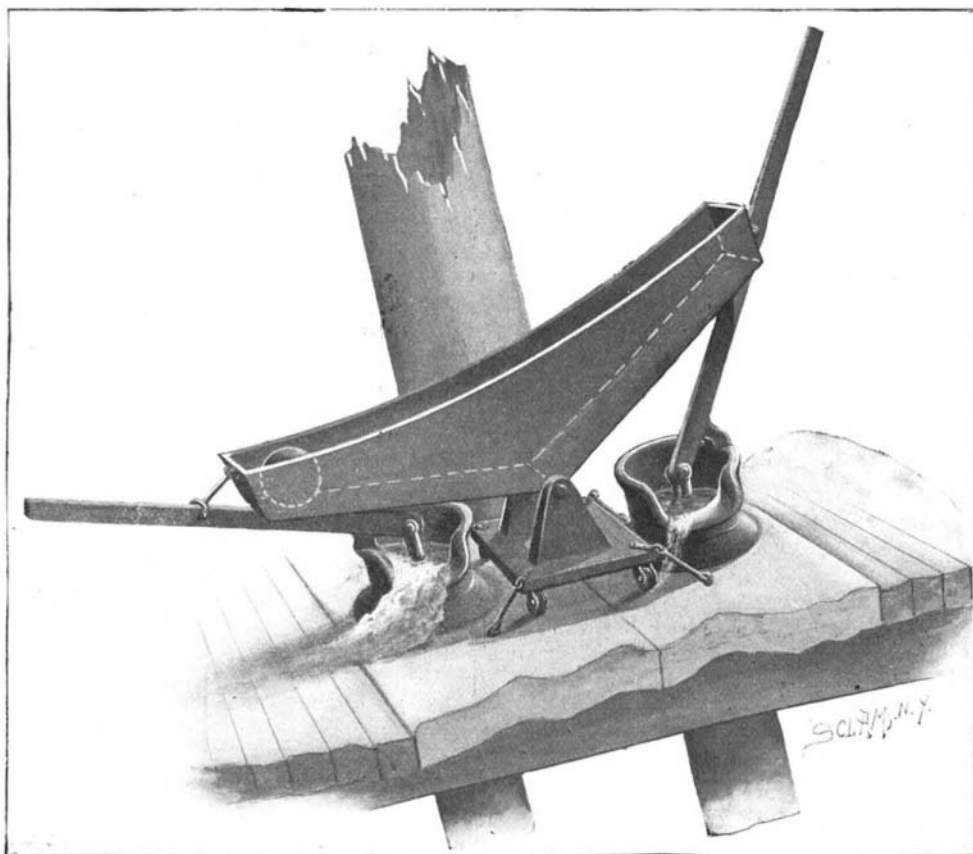


**VARIABLE SPEED GEAR FOR MOTOR-DRIVEN SEWING MACHINES.**

complish this result, which is the invention of Mr. Edward P. Dawson, of 708 South Main Street, Butte, Mont. The gear is very simple and contains no parts which are liable to get out of order. Secured to the driving shaft of the sewing machine is a cone which faces a similar cone secured to the armature shaft of the motor. The cones are spaced apart, the axis of the motor cone lying above the periphery of the other cone, so that their adjacent faces are parallel. A friction wheel is located between the cones in such position that its periphery will engage their faces. The friction wheel is mounted in a slide adapted to travel in guide rods projecting from the motor and lying parallel with the upper face of the motor cone. Normally, the wheel is held in its lowest position by means of a spring acting on a lever connected with the slide, but by means of a cord the outer end of the lever may be drawn down, thus raising the wheel. On operating the motor motion is transmitted from one cone to the other by frictional contact with the intermediate wheel and obviously by raising and lowering the wheel the speed of the machine may be easily varied to any degree desired. The gear shown in our illustration has been in use for six months and we are informed has given perfect satisfaction.

**WAVE MOTOR FOR PUMPING SHIPS.**

"What can't be cured must be endured," says an old proverb, but the Yankee version reads: "What can't be cured must be put to some use," and a capital illustration of this appears in the accompanying en-



**WORKING A VESSEL'S PUMPS BY MEANS OF A WAVE MOTOR.**

graving, which shows a device adapted to use the rolling motion of a ship to work the vessel's pumps. The invention, which is to be credited to Mr. David L. Bradly, editor of the American Ship Builder, New York city, is simplicity itself, comprising merely a trough linged at the center to a standard and secured at its outer ends to the handles of the pumps. The motion of the vessel causes a heavy ball in the trough to roll from one end to the other, rocking the trough up and down, and thus operating the pumps. Since the pumps practically balance each other the weight of the ball when two pumps are used need be but little greater than the weight of water lifted at a single stroke of one of the pistons. Ships at sea, particularly coastwise vessels, ordinarily roll much more than they pitch; but if at any time it be desired to use the pitching movement of a vessel the rocker trough can be disconnected from one of the pumps and the platform on which the rocker is mounted may be easily swung about to the desired angle and secured by hooks. The simplicity and compactness of the motor should appeal to the captains and owners of all schooners or barges, for they will find it very effective, requiring no attention, costing nothing for operating power, having no intricate parts liable to get out of order, and which at the same time occupies a minimum of deck space, which is so valuable for the stowage of freight.

**A School of Invention.**

A manufacturer at Newburg, N. Y., Mr. Thomas Coldwell, himself an inventor of some repute, advocates a new study in the public schools, the cultivation of genius and particularly of inventive genius. In a letter written to the Newburg Journal, from which we make the following extract, Mr. Coldwell outlines his interesting plan.

"Some children show a greater natural taste or inclination for arithmetic or grammar, or any other line of education, than do others, and yet we give them all the same general education, regardless of their natural taste and often through persistent study and encouragement some of the dullest scholars at the start graduate with the highest honors and become our brightest and most successful men.

"If this be true in regard to developing genius in these general and popular lines of education, why not in the line of inventive genius? And why should not every boy be given the privilege of developing himself in this line as well as in any other? I know that inventors generally are looked upon as dreamers and cranks, but the world would be in a sorry plight without them. Next to religion we are indebted to them for our advanced civilization more than any other one thing.

"To give this a practical test I would suggest that our Board of Education offer prizes in the manual training department for the best inventions or improvements in connection with their work, or tools, either in inventing something entirely new, or any improvement in old things, or any suggestions for improvements in connection with the same.

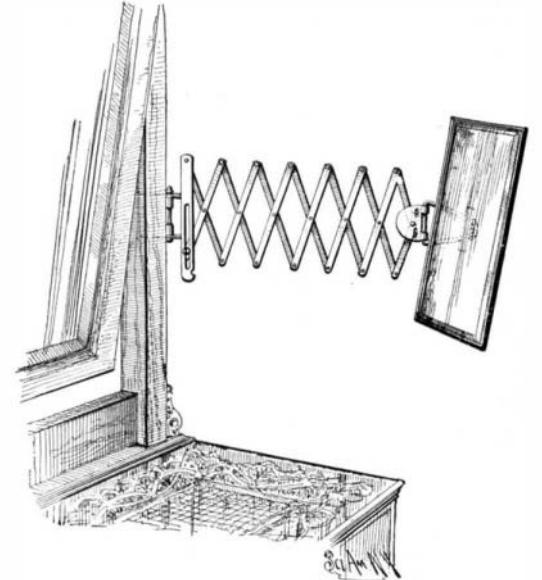
"If the Board of Education have not the power to offer these prizes, they might allow private individuals to do it. I have tried this plan in our factory, and have been surprised at the development of inventive genius among the men. During the first six months we had only eleven suggestions for improvements; during the fourth six months we had over seventy. And this rapid development was from men who had shown no marked genius in this line previously."

If the prominence of his witnesses is any criterion, Lloyd Collis, of New York city, must certainly possess a valuable patent. The patent covers an improved car coup-

ling. As witnesses to the inventor's signature we note on the drawing the names of Collis P. Huntington and W. L. Strong and on the specifications the names of Chauncey M. Depew and George J. Gould.

**ODDITIES IN INVENTION.**

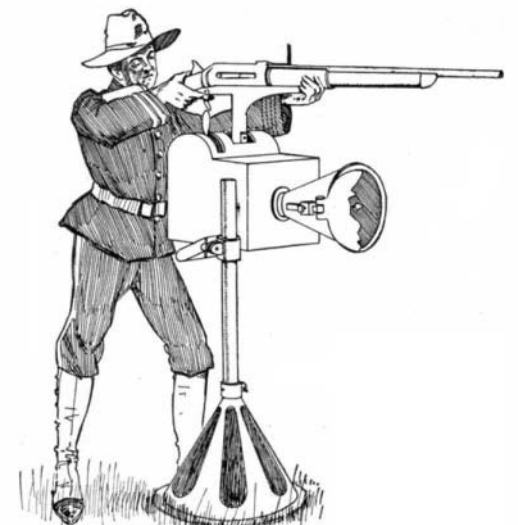
**MIRROR SUPPORT.**—The advantage of having a small mirror attached to a bureau mirror by an extensible bracket is readily apparent, permitting, as it does, the use of both hands when viewing one's reflection at different angles. Nevertheless such an attachment is liable to prove a great annoyance unless it can be compactly folded up when not in use. A bracket which can thus be folded is provided by a recent invention, and is illustrated herewith. It consists of a lazy tongs extending from a bar which is hinged to the bureau. One of the links of the lazy tongs is



**MIRROR SUPPORT.**

pivotaly connected with the upper end of this bar, while the other adjacent link is provided with a pivot-stud which passes through a slot in the bar and may be secured thereto by a thumb-nut. Obviously on raising or lowering this stud in the slot the bracket can be extended or retracted to any desired extent. The small mirror is mounted on the end of the bracket in such manner that it can be turned to any angle. The entire bracket also can be swung in a horizontal plane to any required position.

**TARGET PRACTICE WITHOUT AMMUNITION.**—The raw recruit may now be perfected in target practice without wasting any ammunition or exposing himself and others to the dangers resulting from carelessness and poor marksmanship. This can be accomplished by using a new apparatus recently patented by a Swedish inventor. The apparatus comprises a dummy gun mounted upon a universally jointed support which permits the gun to be pointed to any desired direction. A pointer co-operates with this support to indicate even the slightest movements of the gun. The parts are normally so adjusted that when the gun is aimed di-



**TARGET PRACTICE WITHOUT AMMUNITION.**

rectly at the target the pointer registers with a bull's-eye mark at the center of a glass disk on the front of the apparatus. A clamping device is actuated, when the trigger is pulled, to lock all the parts against further movement. Deviations from the proper aim may be then determined by noting the position of the pointer. In practice it may be found desirable to secure a mirror in front of the registering disk so as to reflect the position of the pointer to the marksman. The unskillful operator being provided with a registering target close at hand can thus more readily observe his defective aim and more quickly learn to perfect himself in target practice.