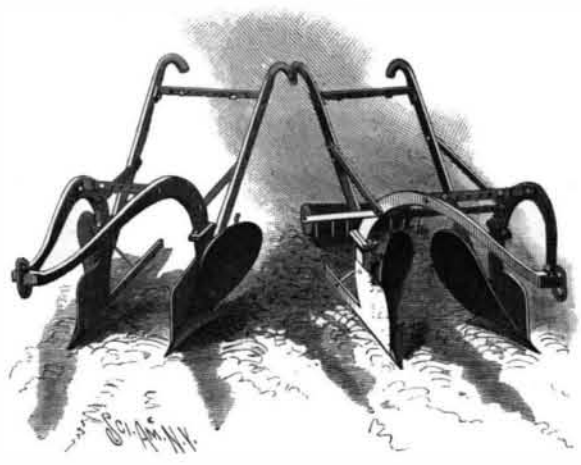
AN IMPROVED PLOW.

The plow which we illustrate herewith is so constructed as to throw earth simultaneously from both sides to a common center or line in covering cane or in the cultivation of plants. The plow may be also adjusted to throw the earth from a common center or line to opposite sides of the plants under cultivation. Our illustrations represent the plow in both adjustments.

The plow is constructed with two beams joined at their front ends and diverging as they extend rear-



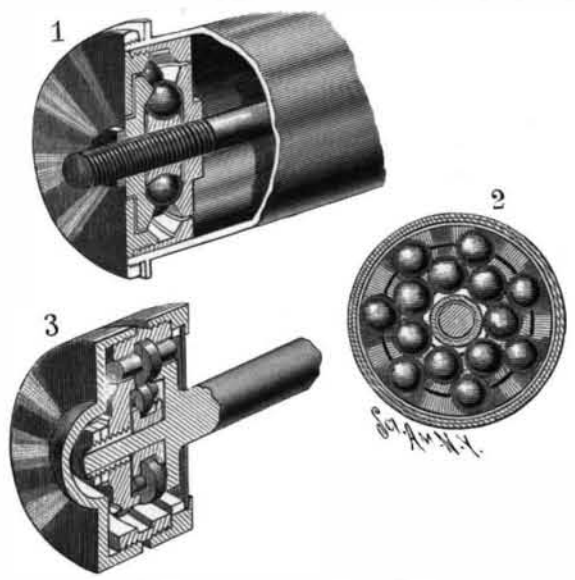
ROSS' IMPROVED PLOW.

wardly. These beams are adjustably connected near their rear ends by sliding bars. The mouldboards are somewhat longer than in ordinary plows, and are designed to throw the earth farther than usual. The landsides are also longer than in the plows now in use, rendering this plow steadier and easier to run. The handles of the plow are capable of being removably connected either with brackets attached to the mouldboards or with arms attached to the shanks. When the plow is adjusted to throw the earth inwardly, a roller and rake are attached to the beams, so that the earth thrown up by the plow may be cultivated by the rake and flattened by the roller. When it is desired to throw the earth outwardly, the plows are interchanged; that is, the plow which was on the right side is now attached to the left side, the other plow being also changed so that its landside shall be turned inwardly. The roller and rake, when the plow is in this position, are removed, since they are not required.

This implement is exceedingly simple, durable and economic, and its plows may be quickly and easily shifted to perform the work for which it is designed. The improvements have been patented by Jesse W. Ross, of New Orleans, La.

A NEW BALL-BEARING.

An invention has recently been patented by James E. Lawrence, of West Shefford, Quebec, Canada, which



LAWRENCE'S BALL-BEARING.

provides a simple adjustable bearing designed to run without oil at a high speed with a minimum of friction. As shown by our illustrations, the bearing may employ either balls or rollers.

Referring to Figs. 1 and 2, it is seen that the bearing comprises a shaft having an inner radial flange. At the outer reduced end of the shaft a disk is secured having a raceway coincident with a raceway on the flange. In the space left between the flange and disk a grooved annulus is situated free from the shaft. In the groove of this annulus balls roll which are engaged by an outer series of balls contained between the raceways of the flange and disk. A ring free from the shaft engages with its raceways the outer series of balls and assists in keeping the parts in position. A cap adjustable relatively to this latter ring is also provided with a raceway to engage the outer balls and in addition keeps out the dust and other foreign matter.

In Fig. 3 we have illustrated a modification which employs rollers. In this case the flange has a peripheral projection. A flanged disk is secured to the outer reduced portion of the shaft and has longitudinal adjustment thereon. In the space between the disk-flange and the peripheral projection first mentioned, a grooved annulus is placed free from the shaft. An inner and outer series of rollers are employed. The inner rollers consist of disks having trunnions on opposite sides bearing upon the annulus. The outer rollers consist of similar disks whose trunnions bear upon the flange and disk. An outer grooved bearing ring surrounds the outer rollers. A cap and confining ring screw upon the bearing ring and keep the parts in place.

These bearings, it is claimed, possess an advantage over other forms in so far as they are designed to run without oil, thus obviating the necessity of removing the mixture of oil and dust which accumulates in most bearings. Another advantage of the invention is the absence of sliding friction between the parts when moving in their respective circuits.

Wheat Production.

The statistician of the Department of Agriculture has issued a detailed statement of the world's wheat production in 1897. The United States heads the list with 530,149,000 bushels, followed by France with 251,298,000, Austria-Hungary with 133,370,000, and Germany with 107,000,000 bushels. All other continental European countries with their enormous population to support produce 600,000,000 bushels, and the United Kingdom only 54,527,000 bushels; Argentine, which is so often quoted as being such a great wheat-producing country, could furnish only 32,000,000 bushels. The totals for the world in the last seven years are as follows:

1897	2,214,030,000
1896	2,428,000,000
1895	2,546,000,000
1894	3,676,003,000
1893	2,563,000,000
1892	2,482,000,000
1891	2,432,000,000

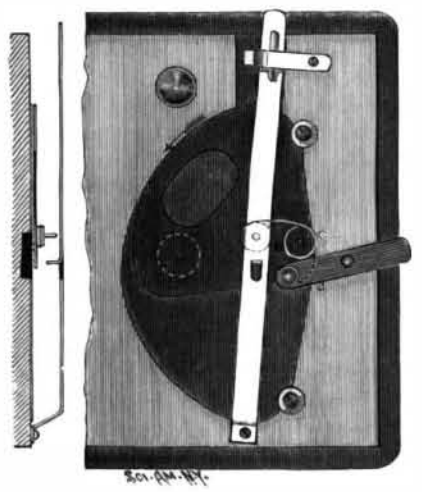
From the totals it will be seen that the United States furnishes nearly one-quarter of the total wheat produced in the entire world, so that it is little wonder that other nations regard with anxiety the war or anything else which tends to prevent the exportation of wheat and flour in accordance with the ordinary laws of supply and demand, and any raising of the price of the breadstuffs of America is sure to be a calamity to some countries where economic laws are quick to respond to any fluctuation in the price of this most important of commodities.

A SIMPLE MAGAZINE HAND CAMERA.

In the hand camera illustrated herewith will be seen one or two features of special interest which make it an extremely useful instrument for those about to begin the practice of photography.

We refer more particularly to the absence of complicated devices and the simplicity of the plate changing arrangement. In the larger engraving the plan of changing the plates or films held in suitable carriers is clearly shown. Under the lid of the camera, attached to a light-tight hinged metal frame, is a thin opaque double-lined rubber bag, having an opening which fits over the wrist, being secured thereto by an elastic band. The hand is slipped through the aperture, then the plates are changed by lifting the exposed plate upward and pushing it down behind to the rear of the bunch. There is the usual rear spring to keep plates pushed forward, so the front shall always occupy the focal plane. After a plate is changed, the flexible cloth is tucked inside and the lid closed, when the camera is ready for an exposure to be made. The plates are held in a metal sliding carrier, operated backward and forward by the focusing pinion in the interior on the shaft extending to the outside, where the varying focus for portraiture or views is readily obtained. On the front end is the usual finder, a shutter setting and releasing lever, as well as a button for regulating the speed of the shutter for time or instantaneous work, and another button for operating the diaphragm plate. The latter, showing the different apertures, may be seen in the small diagram engraving in the upper right hand corner, which also gives a general idea of the ingenious shutter mechanism. This consists mainly of two thin, sickle-shaped metal pivoted blades, connected by a link arranged to open and close when the button-releasing lever is pressed. Pressure downward on the upper lever sets the shutter, and for time exposure the movement is interrupted by a metal finger brought into position by the outside button. The two levers are connected by a spring, which is also the actuating spring. Attached to the right hand end of the connecting link is an ingenious toggle joint, which insures positive motion to the shutter. The latter is shown in an open position. Miniature springs also hold other parts in place.

In a less expensive camera having a fixed focus is another style of shutter shown in the small engraving. The dotted circle is the lens aperture. The shutter is fan-shaped, pivoted near the apex. Just in front of the pivot is the actuating pin, connected by a coiled spring to the end of the operating lever. The long upright lever has a section near the center cut out and bent down underneath, forming a stop or pin. When the lever is placed as shown and the operating lever on the side of the camera is pressed downward, the pin on the shutter (shown in dotted lines under the lever) strikes the stop on the under side and holds the shutter open for time exposure. By moving the upright lever to the left, the stop is taken out of the path of the pin on the shutter and the latter is free to move to the bottom, making an instantaneous exposure. Rub-



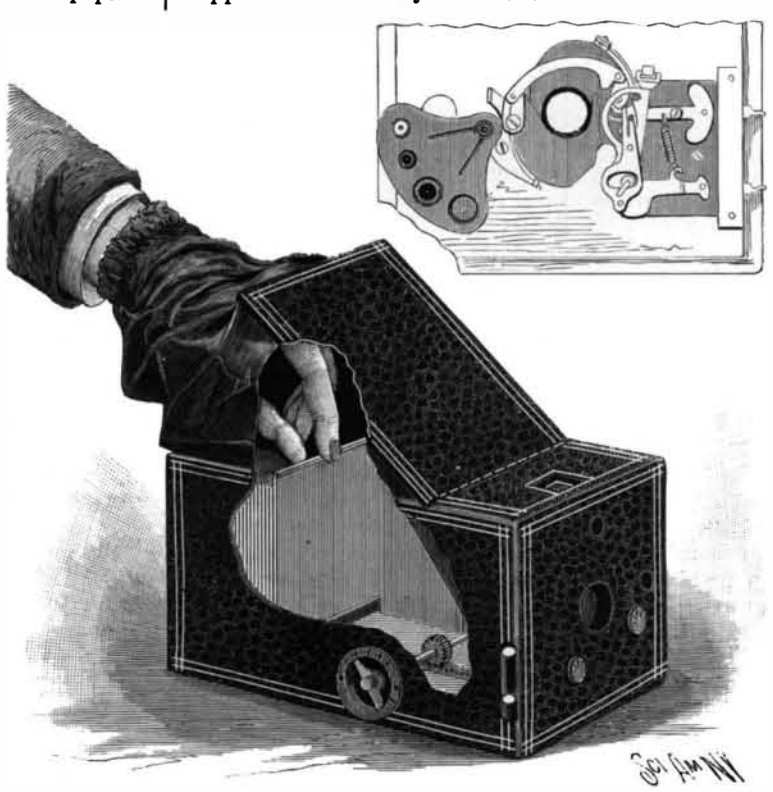
THE SHUTTER.

ber buttons at the top and bottom cushion the shutter at the end of each movement. The diagram at the side is a sectional elevation, showing clearly the position of the pin on the shutter.

The movements, it will be noticed, in the shutters of both cameras are simple and effective.

It is called the "Vive" camera and is made in Chicago, Ill., by the "Vive" Camera Company. The size of the picture is four inches square, and also four by five inches, and plates or films are used interchangeably as may be desired. It is a light, handy instrument, and judging from prints we have seen does excellent work.

THE vegetarians are making a great ado over the alleged triumph of their theory in the long-distance test of walking endurance, 70 miles, in Germany recently. The twenty-two starters included eight vegetarians. The distance had to be covered within 18 hours. The first six to arrive were vegetarians. The first finishing in 14¼ hours, the second in 14½ hours, the third in 15½, the fourth in 16, the fifth in 16½, and the sixth in 17½. The two last vegetarians missed their way and walked five miles more. All reached the goal in splendid condition. Not till one hour after the last vegetarian did the first meat-eater appear, completely exhausted. He was the only one. Others dropped off after thirty-five miles.



THE "VIVE" MAGAZINE CAMERA.