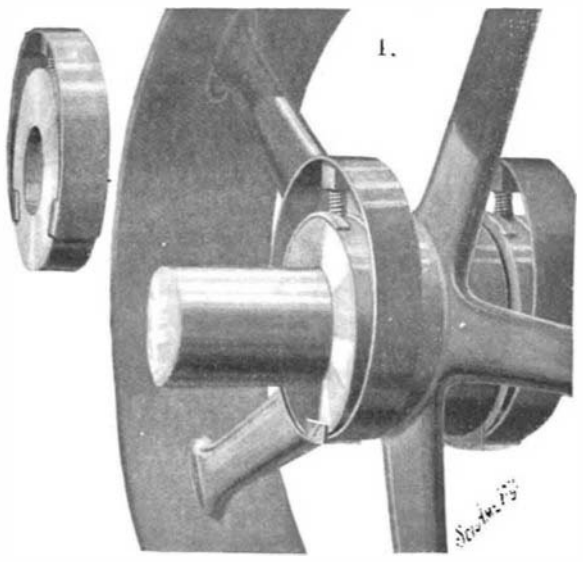
A GUARD FOR THE PROJECTING PARTS OF MACHINERY.

To provide a protector for set-screws and other projecting parts on revolving collars, shafts, pulleys, chucks, and the like, is the purpose of an invention which has been patented by Joseph A. Clercy, 221 W. 123d street, Manhattan, New York city. Fig. 1 shows the guard applied to a collar adjacent to a loose pulley. Fig. 2 represents a simpler, modified form of the device.

The guard comprises essentially a spring-band coiled about and extending over the head of the projecting part, which in the illustration is a set-screw securing a



A GUARD FOR THE PROTECTION OF PROJECTING MACHINE-PARTS.

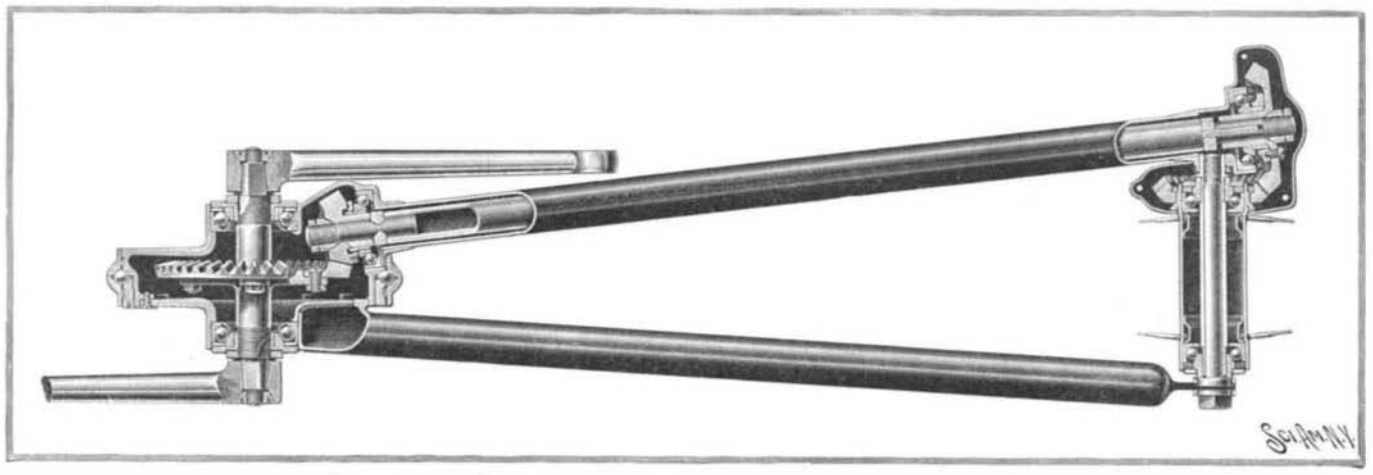
collar adjacent to a pulley on a revolving shaft. The end of the band is formed with a long slot which receives the screw to prevent the displacement of the band. The ends of the band overlap. And the overlapping end of the band is provided with lugs which straddle the side faces of the collar and the sides of the other end of the band.

When the guard is placed in position, the band is opened wide enough to receive the collar and set-screw and is then allowed to spring into place. Such a band can be used on collars of different sizes. If, however, it be desired, the band can be made for special sizes. In order to save material, the construction shown in Fig. 2 has been devised, in which construction the band is formed at both ends with lugs straddling only the collar. The ends of the band do not overlap, but are separated and in contact with the collar at points remote from the set-screw.

The guard is easily applied and serves to prevent the clothing of workmen from being caught by the projecting part.

THE PIERCE CUSHION-FRAME, CHAINLESS BICYCLE.

In order to relieve the rider of the shock due to inequalities in the road, many bicycle manufacturers have provided their wheels with cushioning devices, the most common form of which is a coil spring located within the rear tube and yielding under the weight of the wheelman. But the spring-supported saddle has the defect of changing the distance between the saddle and the crank-hanger, and thereby causes a loss in the application of power. With the object of providing a cushion frame which would yield under the rider, but which would constantly maintain the distance between the pedal and the saddle, the George N. Pierce Company, of Buffalo, N. Y., have devised a novel arrangement which has very successfully withstood tests far more severe than those to which a bicycle is ordinarily subjected.



SECTIONAL VIEW OF PIERCE CUSHION-FRAME CHAINLESS BICYCLE.

In the Pierce chain-driven wheel, the usual spring is supplemented by a hinge-joint at the lower extremities of the rear forks and by a flat plate-spring connecting the crank-bracket with the lower rear tubes. From this construction it follows that, under the rider's weight, the entire frame will yield, and not merely the saddle, with the result that the distance between the saddle and crank hanger will always be constant.

In the chainless bicycle, it is evident that the flat plate-spring between the crank bracket and lower rear tubes cannot be used, and that some arrangement must be employed essentially different in construction but like in function.

With this end in view the driving-shaft bevel-gear is mounted within a crank-bracket composed of two side-pieces firmly fastened together. In a central raceway on the outer periphery of the bracket, balls are placed which are received by a corresponding raceway in a bearing ring rigidly connected with the lower front tube and the seat mast. The two side members of the crank-bracket, being firmly fastened together, rock on this bearing and, acting in conjunction with the cushion and rear hinge joint, serve the same function as the flat plate-spring previously mentioned.

Besides taking up the shock caused by obstructions in an uneven road, the cushion frame with its rocking bearing at the crank hanger possesses the merit of relieving the wheel of much of the strain to which a bicycle is subjected both in climbing hills and in riding over rough surfaces.

Human Hibernation in Russia.

It has been recently brought to light that the Russian peasant, in certain districts, suffers from a chronic state of famine, which occurs annually and is more or less severe, according to circumstances. In the official report given by the Bureau of Statistics of the Department of Pskov, some interesting facts are brought out, which seem to show to what extent man adapts himself to diverse external conditions in the struggle for existence.

In those districts suffering from a lack of crops, which has become almost a chronic state, the inhabitants have elaborated a method for adapting themselves to the want of provisions which is perhaps unknown in other parts of the civilized world. This means is called in Russia "lejka," signifying lying down or state of repose. It is in fact a kind of hibernation, as will be seen from the description which has been given.

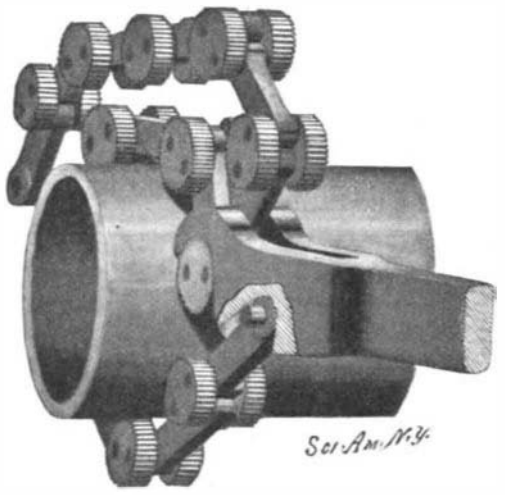
In those cases where the head of the family sees, toward the end of autumn, that by a normal consumption of his supply of wheat it will not last him until the end of the agricultural year, he makes arrangements to diminish the ration as much as possible; but knowing that in this case it will be difficult to preserve the functions at their normal height and to maintain the health and especially the physical force necessary for the work of the spring, he and his family plunge themselves into the "lejka," which means that everybody simply goes to bed, lying down upon the flat stove, according to the proverbial Russian custom, or in the warmest corners, during four or five months. He gets up only to replenish the stove, or to eat a piece of black bread dipped in water. The peasant tries to move as little as possible and sleep as much as he can. Stretched out upon the stove, he preserves the most complete immobility. His only care during the long winter is to expend as little as possible of his animal heat, and for that reason he tries to eat and drink less, move less, and to diminish in fact the vitality of the body. Each superfluous movement is translated into a corresponding diminution of energy, which in turn increases the appetite and obliges him to exceed the minimum of his rations; this minimum being regulated by the quantity of provision that will carry him over until the next harvest. Thus instinct commands him to sleep as much as possible. Obscurity and silence reign in the hut, where in the warmest places, either singly or crowded together, the members of the family pass the state of hibernation.

During the course of the famine of this year, the press has several times noted cases of this kind, but up to the present time it has been generally unknown that the lejka was not a temporary or accidental affair, but a regular system elaborated by a series of generations of peasants, who are accustomed to consider the half-ration as the rule, a sufficiency as an unattainable ideal, and hunger as an inconvenience to which he can "adapt" himself by the winter's sleep. It would be interesting to obtain further details as to this state of hibernation, as, aside from the moral question involved, it is of interest from a physiological and psychological point of view.

AN IMPROVED CHAIN PIPE-WRENCH.

A new chain-wrench for use upon pipe shafts and coupling-rods has been invented by Philip H. Bohner, of Peckville, Penn., and Charles A. Bohner, of Paducah, Tex., which wrench insures a firm, positive grip at all times, and an instant release when desired. Fig. 1 is a perspective view of the chain-wrench.

With each side of the links of the chain toothed gripping-disks are connected. To the end link a lever is pivoted, having a forked hook, the members of which freely receive the links, and also engage a pair of disks to close the wrench. When the chain is passed around a pipe and the hook engages the corresponding pair of disks, then upon swinging the lever upwardly, that part of the chain is tightened encircling the pipe.



A CHAIN-WRENCH FOR PIPES AND SHAFTS.

The toothed disks are firmly forced into engagement with the outer pipe-surface, so that the pipe is turned. The pivots for two adjacent links on a pair of disks are arranged diametrically opposite each other, so that the pull of the links is exerted in the proper direction when the chain embraces the pipe. Upon swinging the lever down, the forked hook immediately moves out of engagement with the corresponding pair of disks. Hence the chain is instantly released.

It will be observed that the forked hook extends forward beyond the point of connection of the lever with the end link. Consequently the hook does not completely disengage the pair of disks upon returning the lever for a new grip.

When the teeth on the disks are worn away, the chain can be reversed, so as to make use of the teeth on the other side of the disks.

Atomic Weight of Radium.

Demarcay's work on the spectrum of radium brought out the fact that as the proportion of the radio-active constituent in the barium chloride becomes greater, certain spectrum lines increase in brightness. The other conditions being equal, this gives a definite and valuable indication that the radio-active substance has a distinct existence apart from all known elements. Following up this hint, Sklodowska Curie has endeavored to determine the atomic weight of radium, or at least to get some information as to its order of magnitude. For that purpose she subjected to fractional distillation a mass of purified radiant barium chloride, obtained from half a ton of uranium residues supplied by the Austrian government. She further treated the chloride by fractional precipitation in alcohol. The highly active substance obtained was used for determining the atomic weight by means of the silver nitrate reaction. The values thus obtained varied from 140 to 145·8, as against the atomic weight of inactive barium 137·7 found at the same time. This of course leaves the atomic weight of "radium" indeterminate, but it is clear that radium is not allotropic barium, since no allotropic forms of an element have different atomic weights. And further, whatever be the atomic weight of radium, it must be greater than that of barium.—S. Curie, in Comptes Rendus.

THE department of water supply of New York city is now preparing specifications for filtering plants which the department intends to install at the Springfield pond in the Ridgewood watershed. This pond was cut off from the Brooklyn mains early in the summer on account of its pollution by several small towns.