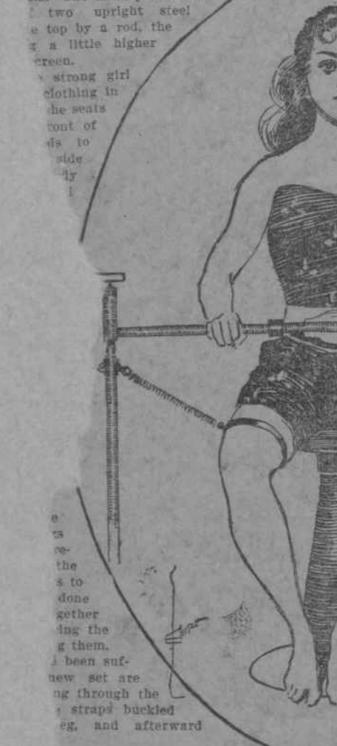


# NEW MUSCLE-MAKER TO MAKE WOMEN STRONG.

will be easy to become strong. An apparatus which turns stiffly in sockets sunk into the upright side bars. This operation serves to strengthen the grip, the muscles of the wrist and forearm. After a short rest, the belts, which are attached to the cross bar by a still stiffer spiral spring, having been properly adjusted, the would-be Amazon is ready for the most violent exercise.

Planting her feet firmly on the floor between the uprights, and bracing herself by grasping the cross bar with her hands, she gradually begins to try how far she can extend the spring. Nearly all the muscles of the body are thus brought into play. The further back the operator leans the more strain is thrown on the practically unused muscles of the abdomen and back. A little of this form of exercise goes a long way in the earlier stages of muscle making, as when taken in a mild way in a most uncomfortable soreness is pretty sure to follow. Still, no one can expect to be able to lift concert grand pianos, or have stones broken on their chests, without some previous preparation, and the Sandow apparatus is designed especially to make this work as simple and as agreeable as possible. A neck band is another appliance that some use, though it is not popular with women, as it serves to make prominent the cords of the throat, and when persistently used lessens the symmetry of the upper bust.



A feature of the Sandow muscle maker which recommends itself especially to women is that by its intelligent and persistent use many physical shortcomings may be corrected. For instance, the calf of the leg may be greatly increased by the use of the calf straps without a corresponding enlargement of the ankles. This result is almost impossible of attainment by ordinary exercise, and even special callisthenics serve to increase the size of the leg relatively to the same extent. A tendency toward round shoulders may also be easily corrected by the use of the stomach belt, and an erect and graceful carriage obtained by thus strengthening the supporting muscles of the back.

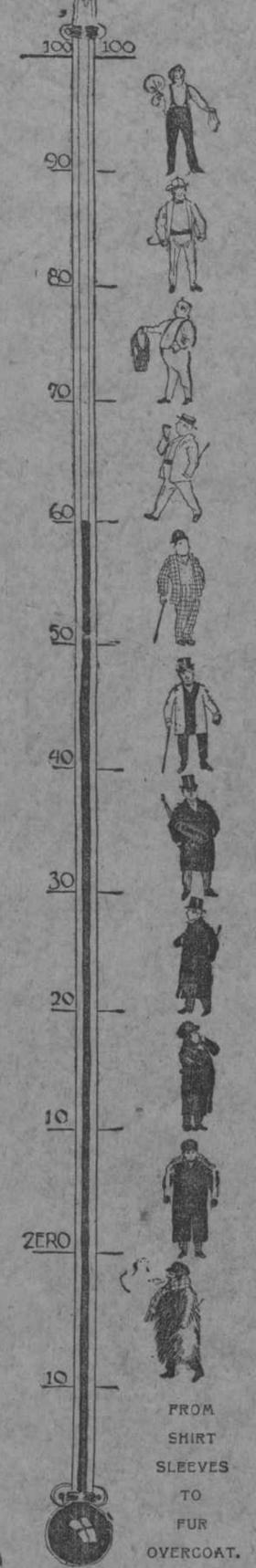
The movements are greatly facilitated by the fact that the legs are sufficiently free to admit of lowering the feet, and swinging them keeping the elastic cable at the high on the legs and lower abdominal muscles raised by this method, the young

woman may rest herself by gripping the steel-connecting rod which turns stiffly in sockets sunk into the upright side bars. This operation serves to strengthen the grip, the muscles of the wrist and forearm. After a short rest, the belts, which are attached to the cross bar by a still stiffer spiral spring, having been properly adjusted, the would-be Amazon is ready for the most violent exercise.

## How Methodical Mr. Murray Dresses Himself by a Thermometer.

Henry Murray is a methodical resident of Brooklyn. He is very solicitous about his personal comfort and has designed an ingenious scheme to save brain work and time. This consists of a thermometer so marked that he can tell at a glance just what garment to put on before he goes out of his house in the morning.

It is not necessary for Mr. Murray to scrutinize the scale of his thermometer and



## DEEP HIGH.

Mr. Yerkes will order a fifty-inch lens to be cut to take its place. Already a fifty-inch lens is under way for the Allegheny (Pa.) Observatory. Andrew Carnegie and Henry Phipps, Jr., the Pittsburgh iron kings, will stand the expense.

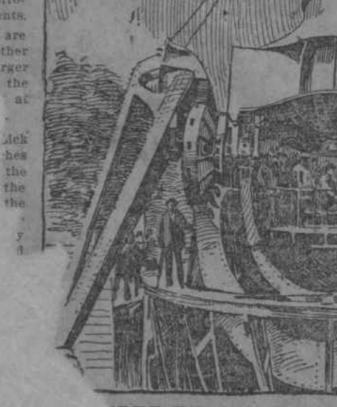
On Mount Lowe, near Pasadena, in Southern California, is the Lowe Observatory, and before long it will be in the front rank of astronomical study with a 37½-inch lens which will be made for it. It will thus out-Lick the famous Lick, and another wonder will be added to the Golden State.

The Paris Exposition of 1900 will have a wonderful spyglass with a tube two hundred feet long. The object glass will be over four feet in diameter. It is said that this will bring the moon within six miles of us.

The Lick telescope was eclipsed in size by the Yerkes telescope, but California expects to regain the distinction of having the largest telescope on earth. Mr. A. H. Isham, of San Domingo, is having made by Louis Gathmann, of Chicago, an object lens ten feet in diameter, to be placed on the summit of Mount San Miguel. This new telescope will be four times as powerful as the Yerkes.

Mr. Isham says a corporation has been formed, and that as soon as the 120-inch

lens is complete, the construction of the observatory will be begun. Mr. Gathmann has invented a system whereby great lenses may be made in sections, and save it is



BERLIN TELESCOPE THAT LOOKS LIKE A BIG STOVE-PIPE.

High gears are only good for speed under most favorable circumstances for exceptionally young riders, who have not the knack of proper pedaling. As a rule, the construction of the gear is easily distinguished from the merely muscular pedal-pounding to the moderate gear the wise choice. Over-gearing is the direct cause of exhaustion and

## GEARING A BICYCLE.

Here Are Facts of Which Plenty of Riders Know Nothing at All.

The following table is a good thing to have handy when your brother cyclist is talking of the mathematics of wheeling:

No. of Teeth in Wheel.	Diameter of Driving Wheel.			About the Distance Traveled on each Revolution of pedals on 28-inch wheel.
	24	26	28	
16	54-6-7	59-5-7	64	17 ft.
17	53-4-8	58-2-9	63	16½ ft.
18	52-2-9	57-0-10	62	16 ft.
19	51-0-10	55-8-11	61	15½ ft.
20	50-0-11	54-6-12	60	15 ft.
21	49-0-12	53-4-13	59	14½ ft.
22	48-0-13	52-2-14	58	14 ft.
23	47-0-14	51-0-15	57	13½ ft.
24	46-0-15	49-8-16	56	13 ft.
25	45-0-16	48-6-17	55	12½ ft.
26	44-0-17	47-4-18	54	12 ft.
27	43-0-18	46-2-19	53	11½ ft.
28	42-0-19	45-0-20	52	11 ft.
29	41-0-20	43-8-21	51	10½ ft.
30	40-0-21	42-6-22	50	10 ft.

In the old days of the high wheel bicycle, or "ordinary," as it is now called, to distinguish it from the modern machine, speed was attained by the circumference of the wheel. A wheel 60 inches in diameter by a single turn of the pedal, was supposed to make a progress of over 15 feet.

In those days the champion cyclists were the men with the longest legs. The longer their limbs, the higher the wheel they could sit. The wheel says that the modern wheelmen accomplish the same result not in a different fashion. What the high wheel achieved in the line of fast travelling is today accomplished rather by means of gearing than by length of limb, and the man with sturdy limbs like piano legs becomes a king of the road, while the long compass of other days is no longer in the running.

A 28-inch wheel geared to 70 inches covers with each revolution of the pedals 18 feet 6 inches of distance, or the equivalent of an old ordinary of 5 feet 10 inches in diameter. The modern rider still rides a high wheel, but in theory. Many of them glibly talk of "gearing," but the test could not be made.

The gear of a wheel is ascertained by multiplying the diameter of the driving wheel in inches by the number of teeth in the large (front) sprocket, and dividing this result by the number of teeth in the small or rear sprocket. This gives the gear in inches.

High gears are only good for speed under most favorable circumstances for exceptionally young riders, who have not the knack of proper pedaling. As a rule, the construction of the gear is easily distinguished from the merely muscular pedal-pounding to the moderate gear the wise choice. Over-gearing is the direct cause of exhaustion and

# DROP A PENNY INTO THE MECHANICAL BICYCLE GIRL.

A MECHANICAL BICYCLE GIRL has just been constructed which works so perfectly and with such lifelike motion as to be regarded as a wonder. It is a most delicate bit of mechanism, fitted with eggs and springs, wires and pulleys, and it seems to do everything but talk.

The first member of this band of automatic bikerettes will soon leave the factory and take its stand on a prominent street corner near the New York end of the Bridge. Those who have seen her say that her costume is thoroughly up to date and includes bloomers of the most daring pattern. As her face is to be of wax, however, no telltale blushes will chase each other over her carefully moulded features should her apparel be adversely criticised, nor will she smile in response to compliments paid either her tailor or herself.

This bicycle girl is out for the money, and she will positively refuse to perform unless her works are plentifully oiled with coin of the realm. Owing to the hard times and the general scarcity of money the wax beauty will go through her paces for the small sum of one penny. As her mechanism is so perfect that she might easily be mistaken for a really, truly young woman, it seems likely that she will jump into popularity at a single bound. When you see her standing on the corner, casting glass sheep's-eyes at the passers-by and moving her head from side to side in her quiet, jerky, little way, just step up boldly in front of her and slip a penny in the hole in the top of the box which hangs before her from a strap around her neck.

You will see her head come to a full stop, her eyes will look at you in a surprised sort of way, and then in little jerks her right hand, which has been lying appealingly on her left breast, will begin to descend slowly but surely toward a stand filled with chewing gum.

All this time you may hear the tinkle of the penny as it pursues its blithesome way by slips and slides down through the bicycle girl's interior economy, until at last it finds a resting place. The moment its journey ends and the bicycle girl, who is older than she looks, is convinced that the money is

safe, she will turn a lever with her left hand, dip her dainty, waxen digits into the tray, and grasping a package of the juicy gum, hand it to you in four slides and two jerks.

Having served her customers, the drawer will close and the right hand resume its resting place over her heart of steel. About the only thing the bicycle girl cannot do is to make change. If by any mischance you should start a 10-cent piece on its downward journey you will get out one piece of gum, as her unvarying rule is that no mistakes are corrected. As her price for gum is expressed by the smallest coin in circulation it will be seen that the bicycle girl is not standing on street corners selling chewing gum for her health. She cannot lose by her customers' errors, and is sure to win.

The mechanism of the figure is really most ingenious, and must have entailed a great deal of study and experiment on the part of the inventors. Its quaint design and the novel purpose to which it is put are of the kind that are certain to make the slot bicycle girl a sure penny catcher, and she will at once take a front rank among the other odd devices to make the public give up their small change in return for the gratification of their idle curiosity. It was only a short time ago that a foreign inventor made the slot restaurant, where you drop in a coin and take out a sandwich, a cup of coffee or a bowl of soup.

There is also a mechanical doctor which hands out prescriptions for various ailments when a penny is put into the part of the body, supposed to be affected. If your stomach is out of order you drop a coin into the front of this figure and receive a powder guaranteed to aid digestion, restore the appetite and drive away pain. These mechanical doctors are taken about the streets of London and do a thriving business in picking up the pennies of the poor. An enormous number of penny-in-the-slot machines is being daily used in New York. The industry has become such an important one that these machines have caused serious trouble to the banks. They collect all the pennies and a large number of the nickels and dimes.



## A LIVE MAN IN A BOX.

Surprising System of Robbing Freight Cars Pursued by a Gang of Railroad Thieves.

A mystery that has long puzzled the railroads radiating from Chicago was cleared up the other day, when a gang of thieves was unearthed that had pursued a daring and ingenious scheme for stealing valuable freight in transit. A systematic plan of robbery was being carried out by this gang, the most startling feature of which was the shipment of one of the members nailed up inside a stout box.

Here the live man who was being shipped as freight and as likely to be stood on his head as on his feet, was provided with bread and meat to be eaten inside the box. He had, moreover, a kit of tools with which to cut his way out when the proper time came.

The gang consisted of three men—Peter Nelson, George W. Parker and James C. Miller. Miller was the man who went in the box, and according to the confession, secured from one of the members of the gang by the Chicago police, he has had some uncomfortable experiences.

The box in which Miller was shipped as "household goods" was fitted with straps and braces so as to make it as comfortable as possible. It is now in possession of the police. The box was always carefully arranged before being shipped on one of its mysterious trips.

A soft carpet was laid on the bottom and around the sides, for there was no knowing how it would be stored or tossed about by freight handlers, and Miller said he did not like having more bones broken than were absolutely necessary. There were holes cut in the top and sides of the box to let in air to the waiting freight stealer.

The provisions and tools he took with him were carefully stowed in such a way that he could easily get at them. Miller would then take his place inside the box and one of his confederates would close down the lid.

Iron straps would then be nailed around the box. These straps would be put on in such a way as to conceal the air holes and at the same time to leave the ends free so that Miller could make his escape. The two ends of the box were on hinges and there was also a plank on a hinge in one of the sides.

## SPORTS OF CRIMINALS.

All Remarkable for an Element of Cruelty. Criminal Athletes.

Mario Carara, a disciple of Cesare Lombroso, the Italian expert in criminal anthropology, has made a special study of the sports that criminals engage in. The innocent games of childhood, in the case of criminals, are tinged with cruelty and sometimes accompanied by homicide.

Criminals skip the rope, but part of the game is to trip up the jumper and let him fall heavily upon the stone pavement. Criminals play leap-frog, but the object of the game is that he who makes the "back" shall rise suddenly and violently just as the frog mounts and throw him to the ground.

The criminals play blindman's buff, but the man with the bandaged eyes carries a handkerchief bearing in one corner a jagged stone, a piece of hard, sharpened wood, or a bit of iron. With this weapon he strikes those whom he pursues.

Another remarkable form of this game is for the blinded one to be struck by one or another of his companions if he fails to name the one that touches him. The penalty is not the innocent one of the children's game, but a blow so severe that a physician has often to be called in after the game is over, and occasionally the sufferer is disabled for some time.

It has been found in those Italian reformatories, where prisoners are not kept in solitary confinement, that prisoners' games are often accompanied with bloodshed, and that it is almost impossible to prevent cruelties. This is especially true where prisoners work together, for they secrete tools and use them as weapons in brutal sports.

In one of these games the player has in each hand a stick having fixed in the end a keen metallic point. He interweaves his arms, revolving the sticks with rapidity, and the game is for another prisoner to thrust his head between the arms and endeavor to follow the revolutions of the sticks without being wounded. It usually happens that he receives fifteen or sixteen wounds and comes out with a bleeding head, while now and then mortal wounds are received.

There are contests in which the fingers and hands are deeply wounded, and the scars are an honorable distinction. The characteristic feature of all these games, which are the recreation exclusively of criminals in prison, is the love of combat. If, as is held by experts, sports are the means of working out the superfluous activity of life, it is evident that the case is



LOCKED UP IN A FREIGHT BOX IN ORDER