

FREE-WHEEL CYCLES.

By N. G. BACON.



OUR girl-lovers of the wheel will be interested to learn that a new device has been invented, by which it is possible for cycles to be fitted with what are termed "free wheels."

England is a very undulating country, and the charms of the pastime lie in the descension and ascension of hills, rather than in cycling over flat surfaces, which generally become monotonous of great length. But sometimes, when the rider wheels her merry way down the sweet rustic lanes, the pace, if pedalling is

still continued, becomes too swift to allow for the enjoyment of the fine landscapes and scenery that are

rapidly passed and left unobserved.

Now often, in a pensive mood, or after a delightful spin, the act of pedalling becomes a wearisome task. How nice it would be, the rider muses, to glide through the air motionless, and to descend the gentle slope like the birds of the heavens, resting as it were on air, preparatory to taking another flight. With the aid of the free wheel, although they never leave the pedals, the feet are continually left stationary by the swifter volition of the wheels; hence the pleasurable sense of locomotion is enjoyed whilst the rider sits at her ease. I have often watched the larger species of birds rest whilst flying, as it were, on some current of air, and it seems to me that this swaying motion resembles the action of the cyclist immediately the speed of the rear wheel exceeds that of the pedals.

The sensation of riding a free-wheel cycle at first is curious, for not only is the non-ability to back-pedal perplexing, but the mode of steering is changed somewhat. Unconsciously though it may be, the cyclist acquires the habit of assisting the steering, especially in turning corners, by means of back-pedalling, but as it is impossible to lessen the speed of a free-wheel cycle in this manner, the rider relies more upon the ability to steer the front wheel than is the usual custom. Thus, if mounted on an ordinary cycle, whilst negotiating corners at a fairly good speed, the cyclist can steer with the feet, at the same time slackening the pace by back-pedalling, but the free-wheel cyclist is powerless to slow up except by application of the brake, and has to relearn how to turn corners, taking into consideration the newly-acquired limitations.

For our girl-cyclists the free-wheel cycle is peculiarly adapted, as it necessitates the least exertion for the greatest amount of pleasure. Excessive cycling, or use of any of the muscles when tired, is known to be injurious to the strong as well as to the delicate, and although the machines of our juvenile riders are geared low, still it cannot be denied that continuous pedalling must be irksome. A five mile spin with the feet motionless directly, and as long as, the undulation of the ground is favourable to the rider, must not only be more enjoyable than the same distance pedalled all the way, but more beneficial.

"Granted that the free-wheel device is good," I hear my readers remark somewhat impatiently, "but what is it?"

Let us imagine that we have before us a cycle. The front wheel is free; that is to say, if you lift it from the ground and turn it round, it will continue its revolutions for so many minutes uninterrupted by any obstacle. But to make the back wheel go round and round, it is necessary to drive it by taking hold of the pedals and turning them round, and so long as the pedals continue their revolution, so long will the wheel revolve. Therefore that wheel is not free, its driving power is attached to the pedals.

To enable the rear wheel to do what the front wheel does, it will be necessary to disconnect it in some manner from the movement of the pedals. The device that enables you to do this is the principle of the free wheel. There are many such devices, all of which are different in some respect, but it will be unnecessary here to state how the back wheel is constructed so as to be at one moment ready for the forward movement of the chain, and at another free of its working. Very few, if any, of us are sufficiently acquainted with mechanical detail to comprehend how this new device comes into force, but sufficient it is for us to know that it does act.

It is very simple to discover whether a cycle is fitted with a free-wheel device, for the pedals of an ordinary cycle will not rotate either forward or backward unless the back wheel is lifted from the ground, whereas it is possible to send the pedals of a free-wheel cycle revolving backward when the machine stands stationary on the ground, and nothing but the pedals and cranks move. Try to turn the cranks and pedals forward and you cannot unless you lift the back wheel from the ground. If the cycle is fitted with a foot brake, it will then only be possible to turn the cranks and pedals backward until the brake is applied at its given point, except when the brake is brought into play at any point, and then the pedals can only be rotated gently, for directly any force is used the brake is applied.

Both our wheels then are free; now we have to consider how we can come to a stoppage if we cannot back-pedal. We must rely entirely upon the brakes, and for this reason it is imperative to fit all free-wheel cycles with two brakes, one for each wheel. Some machines are fitted with what are termed foot brakes for the rear wheel and hand brakes for the front, but experience leads me to prefer the hand brakes, as the foot brake is less restful and not so reliable or easily brought into action as those of the hand.

In the pastime of cycling, at least for juvenile riders, far too much of the work is put upon the muscles of the legs and feet; therefore, to relieve any of the strain by bringing into activity the arm muscles is

advantageous. All foot brakes for this reason are inferior to those applied by the hand. Suppose, for instance, the cyclist is "slipping" a steep hill of indifferent surface, and the wheels come in sharp contact with stones, the severe jolting and vibration of the machine may cause the pedals, unless the rider keeps them securely in place by resting on them in a forward position, to jolt backwards, and the brake comes into force when it is unrequired, and not only so, but by such an unexpected and sudden application of the brake the rider may be so unnerved as to stumble, lose her balance, and come to the ground.

Various arguments are brought forward favourable to the foot brake that can be applied to a certain given point and at no other, but so far as my practical experience goes it is against this as all other methods of bringing into action a foot brake.

The brake question, indeed, is the perplexing and even the still unsolved problem in connection with the free wheel, and when experts disagree, it is for the novice to step in and decide the matter for herself. There are several kinds of rim brakes capable of being fitted to back and front wheels, of band brakes and of tyre brakes, all of which are more or less defective and unreliable in crises. The rim brake, it is said, has a tendency not only to disfigure and wear out the rim, but make the wheel itself in time untrue in its running; the tyre brake, by wearing out the tyre and puncturing it, has special liability of being useless in emergencies, while the hub brake may become inoperative through excessive friction, and the band brake, if wet or greasy, is useless and actually impedes the machine when no brake is required.

So much for the brake question. The imperative decision which must be arrived at, is to have the cycle fitted with two brakes, either two hand brakes or one foot and hand, and to see to it that they are in perfect working order before starting on a ride, and especially before "slipping" a hill.

The question naturally arises in the rider's mind, what are we to do with our old cycles? Why, take them to a competent maker, and have them fitted with the free-wheel device and two powerful brakes. This will cost from £1 to £2 10s. or more, and it is incumbent upon the cyclist to decide first as to which free-wheel principle she will patronise, for there are many waiting her choice. There is a danger, of course, of getting an unworkable device, but that applied to any good make of cycle can be relied upon.

It may be interesting to note that the free-wheel device was originated by Mr. Linley some five years ago, when the question of fitting variable gears to machines was suggested. An American firm has introduced rather a novel arrangement by which the cycle is fitted with a two-speed gear as well as a free wheel, the whole of the contrivance being securely packed away in the hub, which in appearance differs but slightly from that of an ordinary cycle. There is a rod, within easy reach of the hand, which has three notches. For a fairly level road, upon which the rider may like to have a gear as high as, say, 70, the rod should be adjusted at the third notch, but for down hill, when a free wheel is desired, the second notch may be utilised, and for hill-climbing, when a low gear, say 60, lessens the labour, the first notch of the rod can be engaged. The mechanism seems to be simple and very ingenious, and the two gears and free-wheel devices are adjusted without any hitch. By this method also, it is possible to have a fixed wheel for riding in crowded

thoroughfares, when a free wheel may be considered to be dangerous, and in this case only one brake is necessary.

It is premature to say exactly where the free-wheel problem will finally solve itself in the manufacture of cycles, for the boom has only just been sprung upon the riding public, and some experts declare that the pastime is on the eve of as great a revolution as that of the advent of the pneumatic tyre. Enthusiastic riders will approach the matter with an open mind, and yet be on the alert to avoid the meddling of faddists. Some of the best firms still hold back, undecided as to which free pedal device they will adopt, but it is undoubtedly a fact

that the free wheel has come to stay, for not only does it enhance the pleasure of all sorts and conditions of riders, from the slowest to the most speedy, but allows the cyclist, after a stiff climb up a formidable ascent, to regain her lost breath by allowing the pedals to be stationary, while the machine either slows itself up, if the road is level, or runs down of its own accord should the descent be so favourable.

Wheelwomen, indeed, are the greatest benefactors, for the free-wheel cycles are easier to ride, to mount and dismount, and prevent the skirt from catching in the pedals. Not only so, but a more easy posture is allowed

in the descension of hills, for no matter how enjoyable the pastime, the old method of "coasting" with the feet on the foot-rests cannot be said to be graceful, whereas now the young, middle-aged or old, all can "slip" the hills without fear of danger, and benefit by the slightest decline of the road surface. There is also less tendency of side-slip on slippery surfaces, a steadier running of the machine at all times, and a more elegant method of propulsion.

Just one word of warning. Follow not the example of those who seek to make puns at the expense of the free wheel, for remember, being costly, it is not given away.

BREAD-WINNING AT HOME.

PART I.

MOST women, whether young or old, would prefer, if it were possible, to earn their living at home. This preference is occasioned by many causes. Tradition, social ideas and strong valid reasons all count for something in the matter. The circumstances which induce women to earn their bread, or, more usually, a portion of their bread, by working at home are as different as are the species of work executed under these conditions. There are girls—a multitude of them—who, possessing for an uncertain number of years a niche in the parental household, and not having, unfortunately, a sound general education, a professional training, or any means whereby to obtain these valuable qualifications, find their choice of employment restricted to the very poor kinds of work which can be done by ignorant people. Want of courage and a foolish timidity as to what relations and neighbours may say have the effect of compelling some girls only to do what can be done in a private house. But the most prevalent cause is undoubtedly want of money. Parents have not or think they have not the £50, or, perhaps, even the £10 which would enable one of their girls to learn a trade, and the girls have not often sufficient resolution to put by money out of their small dress allowances to help themselves forward permanently in life.

Among girls of another class, such as the daughters of small farmers and artisans, no absurd pretence of idleness is kept up. It is assumed that girls as well as boys must earn their living or must help their men-folk in some definite form either of bread-winning or of money-saving. The small farmer is probably more willing than the clerk (who reckons himself the social superior) to pay a comparatively large premium to have his daughter taught a business. Yet such far-sightedness is only comparative, and there remain in this class, too, a large number of people who would rather fritter away any amount of money upon small transient pleasures than reserve the lump sum that is needed for the attainment of any permanent benefit.

Strongest of all the forces that bind women to their home is the domestic tie. The daughter cannot go out all day and leave the blind aged mother by herself; the wife must be at home to cook the dinner and to keep the dwelling in good order; the mother cannot leave her young children. And yet the woman's traditional old-time work of money-saving, and of preserving, indeed, not only money but health and all the good gifts of life, is not found adequate; money must be earned so that life itself may continue.

I have said that different as are the circumstances which lead to home bread-

winning, so is the work different. There are differences of degree which will become apparent to those readers who follow me through the series of employments which I am about to describe; but there is also one important difference in kind, which should be noted carefully before we proceed further. Employments which can be pursued at home are severed into two classes, according to their dependence upon or independence of the originating power of the worker. The products of art and literature, the principles of philosophy, the results of invention, are all dependent upon certain individual beings, without whom they would never have been created, or, at least, never have assumed their present form. With this class of "Bread-winning at Home" I do not intend to concern myself in these articles. My attention will be restricted to the second and much more numerous class of home bread-winners—to those persons whose work owes something, perhaps, to their ingenuity and much to their industry and dexterity, but is in design and idea not of their creating at all.

It is, in short, of those forms of home bread-winning which either are drawn into the complex meshes of the manufacturing system, or struggle with varying degrees of non-success not to be drawn in, that I propose in this and in future articles to speak.

BALLS AND BOXING-GLOVES.

Most girls buy lawn tennis balls, play with them and lose them. They may look now and again with vague curiosity at those two curiously-shaped sinuous pieces of cloth which curl round the ball so neatly, and join each other almost imperceptibly; but could they explain how the ball is covered? Do they picture to themselves people engaged in making and covering those balls? I doubt it; for most people have very little notion how anything is made, except certain ordinary forms of food and clothing, which are daily manufactured under their very eyes. And girls are only slightly more ignorant than other people, inasmuch as they have peculiarly few opportunities of observing how the business of practical life is carried on.

If we would see tennis balls covered, we must go to Woolwich, for the industry—why one hardly knows—is almost exclusively carried on there.

Alighting at the Arsenal, I found myself in a wholly different world from the London I had left. Here were no fashionable people, and few shops that did not address their appeal to the thrifty; but neither was there the mean cheerlessness of London poverty. The streets were filled with sea-faring men and with workmen from the Arsenal; and behind the very block of artisans' dwellings which presently I entered, the river and the ships of many nations were passing down

together. Surrounded by the forces of man and nature, by warfare and commerce in its nobler forms, the interests even of small lives could not be entirely petty.

As I entered the block of dwellings, however, I did not see the river at the back, but only a rather narrow and dark staircase much encumbered with children, whose noise throughout my subsequent conversation with the tennis-ball coverer made the receipt of information difficult. The woman whom I visited owned several of the children on the stairs, and inhabited a set of three small rooms for which the rent was 6s. a week. My friend, the ball-coverer, was a pleasant woman with an air of capacity which her statements concerning her work bore out. Taking down a box from a shelf, she showed me that it was filled with balls waiting to be stitched. The balls looked at first sight as though they were ready for use. Each india-rubber ball was already covered with cloth, and the covering adhered to the ball by means of the solution of india-rubber and naphtha which is used for the purpose. But the edges of the two hour-glass shaped pieces of cloth would come apart after a little of the sort of usage to which tennis-balls submit. Consequently the balls were sent to my friend to be stitched, after having been finished up to this point in the manufactory of one of the wholesale dealers in games. Taking up a needle and some flax thread, the woman proceeded obligingly to show me how she went to work. Slipping her needle along underneath the cloth edges, she explained that the ideal was a ball which, after it had been pressed (returning again to the factory for this purpose), should reveal no stitches. It was also very important not to split the cloth but to join the edges, as surgeons say of a wound, "at the first intention." Turning to the question of £ s. d.—though pounds do not complicate accounts in bread-winning at home—I found that the work was paid at the rate of 6d. per dozen balls stitched. But out of this payment it devolved on her not only to provide needles and thread, but to pay the carriage of the consignments of balls. This last obligation makes, of course, rather a hole in the payment. She told me, further, that she could easily stitch four dozen a day, and she looked to earn about 12s. a week. For two months in the winter she would be out of work, and occasionally there were other slack times, as the work is dependent naturally upon the season when lawn-tennis is played. All these statements showed this particular woman to be a better worker than most of her neighbours in Woolwich who are thus employed.

My next visit was to a woman who gave out work, and was consequently in a position to obtain a general view of the trade. She told me that she paid the workers 4d. per dozen, she defraying the carriage, and naturally