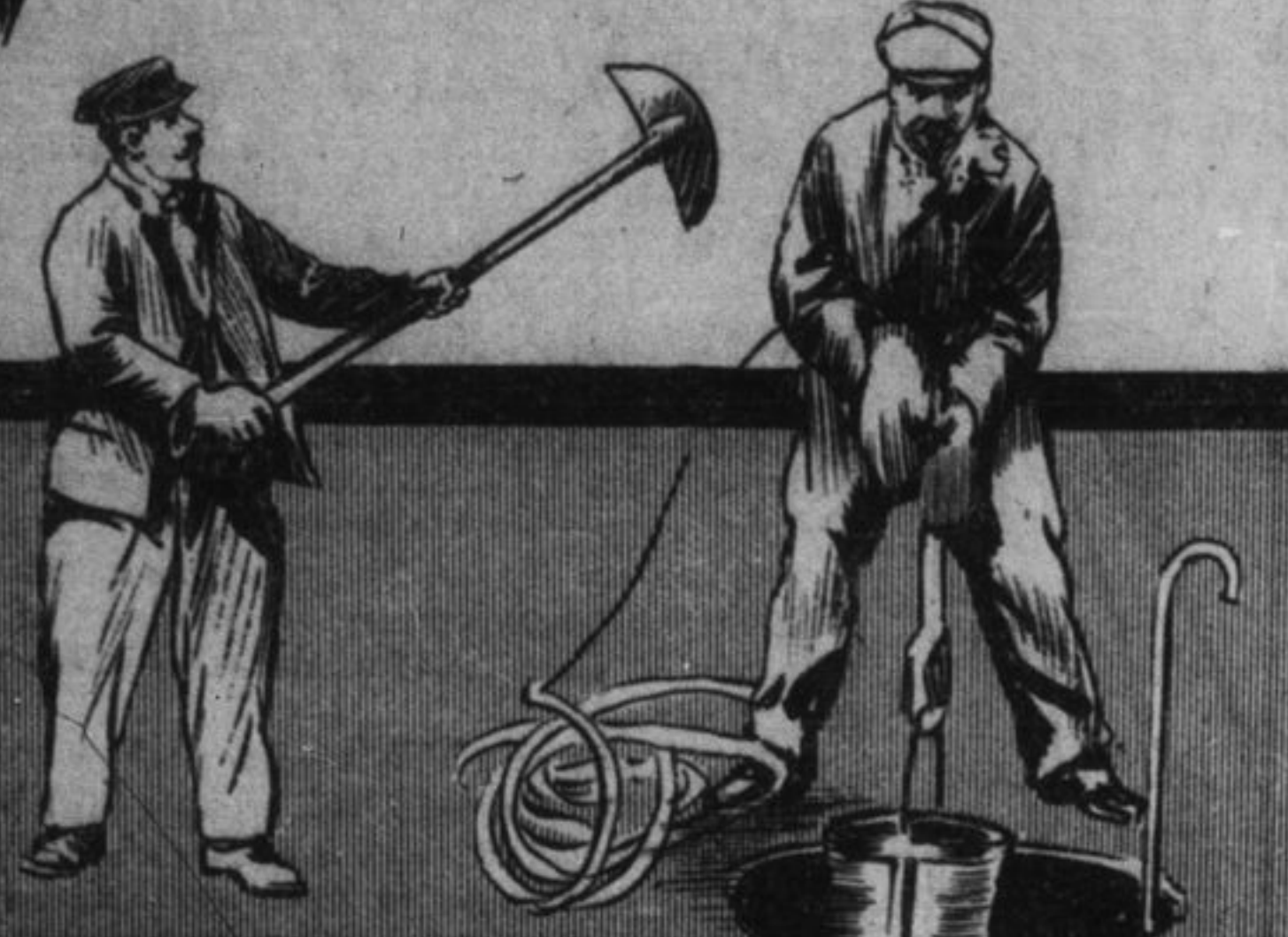


THE HUMAN MOTOR A MERE MACHINE

ENERGY'S LAWS CONFORM TO THOSE OF MATTER

Sprinter Duffy, Shows Good Built for Heavy Tasks

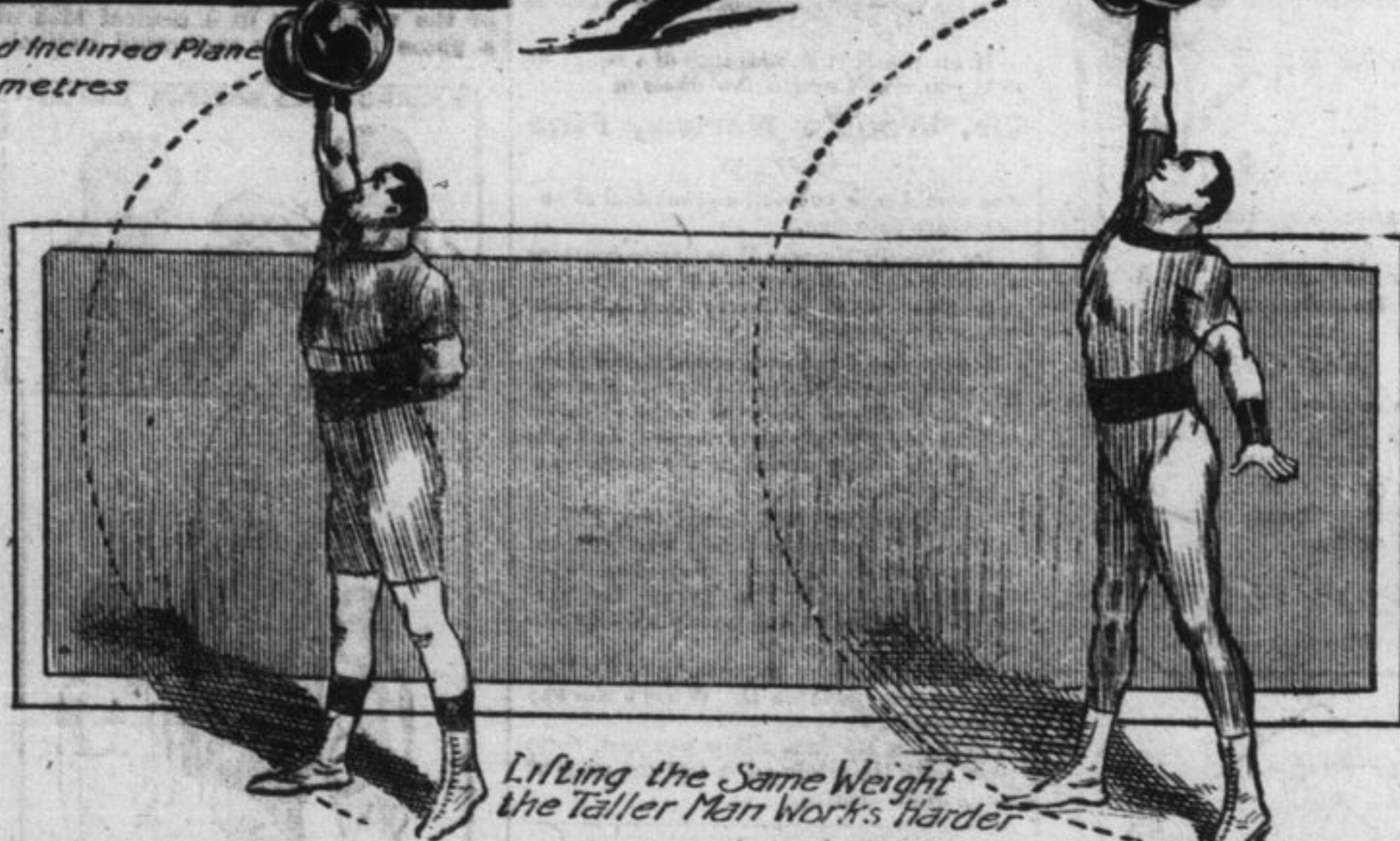
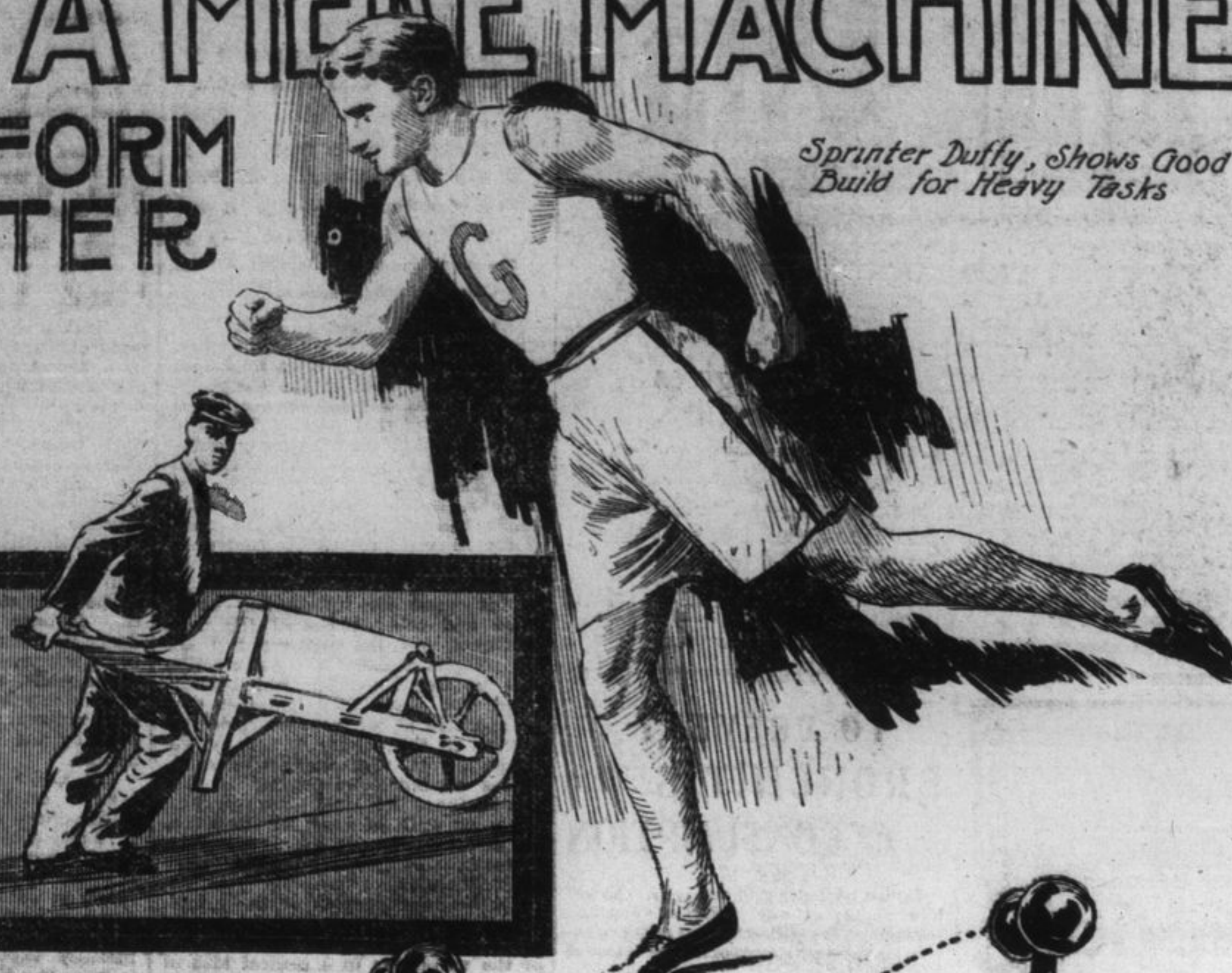


Lifting Dirt With Shovel 38 Kilogrammetres a Day

By Hand Power 73 Kilogrammetres Applied Power

On Shoulder 68 Kilogrammetres Most Effective.

By Wheelbarrow and Inclined Plane 48 Kilogrammetres



Lifting the Same Weight the Taller Man Works Harder

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To return to the soldier. How can the working capacity of this human motor be described in kilogram-meters? Some experiments reported from France explain just how it may be done.

It was desired to know how the human machine could work to best advantage in moving a quantity of dirt from one elevation to another higher one. Why should he take two days to do it if he could do it in one? Or why tire himself so with doing it in one day that he would be unfit next day? Since he was on the payroll of the government, the question was practical.

It was simple enough. Just let him try lifting the load in the various ways, have him examined by a physician each day and compare in each instance the kilogrammetres of work which he was able to do in a day by each method.

Eight methods were tried raising the dirt with a shovel, shoveling it up an inclined plane with a barrow, carrying it up a plane on his back, raising it with a bucket with a rope by hand; using a pulley with a drum and lever; lifting it by a capstan operated horizontally; lifting it by means of an endless chain and buckets operated by a crank, and lastly, lifting it simply by his own weight, that is, by riding down in an empty bucket, while a full one went up at the opposite side of the pulley.

It was found that this last method—using his own weight as the motive power—was far and away the best. While in a day he could produce but 38,880 kilogrammetres of work by tossing the dirt up with a shovel, he could by other means do 280 kilogrammetres—more than seven times as much as with the shovel.

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Determining Working Power.

It is unnecessary to go into an explanation of these methods. One can, for instance, easily see how a bag of

Then the application of the rule means that the larger the muscle the larger the effort it is capable of.

If large and short it should produce a great effort multiplied by a short line in which to exercise itself; if long and thin it works in a longer range but with less expenditure of energy.

The sterno-mastoid and sartorius muscles, for instance, have a long sweep and proportion of heaving; while the pectoral muscle and the gluteus large in volume but short, must work in limited range, but have a large capacity.

When the human motor is used in walking and running it in some degree is an application of the piston idea. And in this connection the scientists have found that the energy expended by the muscles when they contract is compensated for when they relax, although some original effort must be added at every exertion.

Regarding the piston-rod principle in the leg, theoretically the long-legged man should be the swiftest runner for a short distance, while the short-legged man would be the better long distance runner.

It is found, though, that if two sprinters of the same figure, weight, muscular power and having the same length of leg be chosen, the faster will be the one whose thigh is longer but whose leg is shorter in the lower part.

The anatomy of Nasimudin and that of Duffey, the American hurdler and sprinter, was studied in coming to this decision.

By an identical method of reasoning it is declared that the horses called "Byes" such as Eclipse, Gladiator, Holos and Flying Fox are large and powerfully constructed, while the "stayers" are generally small, sometimes even lony, as Arabian and Syrian steeds.

How the lever theory enters into the use of the arms has recently been shown by experiments with dumbbells. Contrary to common belief something more than mere strength must be considered in lifting heavy dumbbells.

Suppose two men of different builds lift the same weight above their heads. They may raise equally as to strength, but the larger man must do more work against greater resistance, because the leverage of his arm is longer.

This accounts for the fact that in athletic contests, where the classification is made according to the total weight lifted, the short, muscular athletes are generally favored.

It is a striking demonstration of man's wonderful adaptation to mechanical principles when using himself as a human motor.

When a man thinks he is a great man it's a sign he hasn't any children to prove to him that he is a fool.

No inventor has yet found a way to make both ends meet.

It is easy to think of one's body as simply a machine. And how much stranger it must seem to consider one's self a combination of mechanical principles, with the various members responding to the same laws as pistons, rods, levers, pulleys and cranks!

Man, in looking upon himself as the lord over matter, generally loses sight of the fact that this dominion is a quality of mind, and that otherwise he is not dissimilar from those things which he operates.

Science, you may have noticed, is never content except when shattering some cherished delusion of man. So some of the leading scientists of France have recently busied themselves with the matter of showing man's relation to machinery.

A human motor—that's all that these scientists have left to us of our anatomy, if we except the more mysterious make-up of the brain. But they haven't stopped with that. Just like the mechanical engine and motor, this human motor must be fed with fuel and in the quality and quantity of fuel depends much of its capacity for work.

They are engaged in trying to discover how to feed our motor in order that we may get the most work out of it, and have even gone into the matter of utilizing waste just as machinists have shown how steam which escapes from the cylinder of a locomotive may be caught and used again.

Not simply a fuel must this work of the French scientists be considered. There is a practical side to it. The discoveries are intended to show how if we apply the principles of mechanics to a man, we may get more work out of him with less fatigue than at present.

Take a soldier for instance. In one country he is loaded down with incumbrances; in another he is permitted to carry nothing on the ground that he can do so more work.

By means of a system of tests, it will be possible to learn exactly which method is better, and to what degree, as expressed in a unit of measurement suited to the purpose.

You may as well get acquainted with this unit at the start, for it must be used occasionally in this article. It is called the kilogrammeter.

The meaning is simple. Suppose you wish to lift an object weighing one

(kilogram (two and two-tenths pounds) a meter from the floor. (A meter is equal to 39.37 inches.)

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No More Alcohol

As now made, Ayer's Sarsaparilla does not contain the least particle of alcohol in any form whatever. You get all the tonic and alterative effects, without stimulation.

Ayer's Sarsaparilla

NON-ALCOHOLIC

When a stimulant is needed, your doctor will know it, and will tell you of it. Consult him freely about our remedies.

The new kind contains no alcohol

We have no secrets to hide! We publish the formulas of all our medicines.

J. C. AYER CO., Manufacturing Chemists, Lowell, Mass.

Do These Symptoms Fit Your Case?

Are you dizzy?
Does your head swim?
Does everything turn dark when you rise after standing?
Are you constantly suffering from headache?
Are you short of breath after going upstairs?
Is your tongue coated and furred?
Do these symptoms give warning that your system needs a thorough cleansing—all poisons must be flushed out. The remedy is Dr. Hamilton's Pills. Marked benefit immediately follows their use.

These famous pills loosen the bowels and stop constipation; they act on the liver and kidneys, make them strong and vigorous.

This ensures health and purity for the blood and consequently the whole system adapts to mechanical principles.

No other medicine tones and braces like Dr. Hamilton's Pills; they at once cure biliousness, headache, dizziness, poor color, coated tongue and all diseases arising through fault of the stomach, kidneys or liver; try them. Result prove the merits of Dr. Hamilton's Pills, 25c. per box, or five boxes for \$1. at all dealers in medicine.

A Muscle As A Piston.

How does this affect the human motor?—Suppose a muscle be considered instead of a piston rod.

La Grippe Mastered.

La Grippe can and should be cured as soon as it starts. The remedy to use is Wade's Cold Cure Tablets (Laxative). It provides just the aid required to prevent the disease getting hold of you. Just as effective for curing colds and for headache and constipation. 10 boxes, 25c. Sold only at Wade's Drug Store. Money back if not satisfactory.

His Offending Camera.

Belgrade, Feb. 16.—A Montenegrin priest who was shipwrecked in a small boat off the Cattaro coast, was refused shelter by the inhabitants because it was reported that he had committed the sacrilege of photographing his daughter and her husband after the wedding ceremony.

Forgotten Aches.

Those who keep Smith's White Liniment at hand and use it when required, are not troubled with aches and pains. It stops rheumatism, lumbago, neuralgia, etc., in the start. Have the remedy at hand and keep these ailments away. Large bottles, 25c., at Wade's Drug Store.

Half the time a man stays out late because he is afraid to go home at an hour that isn't so late but looks like it to his wife.

Every bald head believes it was his active brain that did it.

NEWS OF CHURCHES

VARIOUS EVENTS IN THE RELIGIOUS WORLD.

Rev. Mr. Meikle Becomes Synod Evangelist—Has Fine Gifts For the Work—The Union of the Methodists of Japan.

All but \$200 of the sum promised by the English Congregational Union to clear off debts on the Canadian churches has been raised.

The quarterly board of the Newcastle Methodist church has extended a call to become pastor of this circuit for next conference year.

The congregation of the St. Andrew's church, Westmount, have sent a unanimous call to the Rev. William J. Clarke, pastor of the First Presbyterian church at London, Ont.

Bishop William C. Doane, Episcopal bishop of Albany, N.Y., is known as the "bullet bishop," because in writing or speaking he never uses a sentence over ten words in length.

St. James Methodist church, Montreal, has invited the Rev. William Sparling, B.D., formerly assistant pastor, to return to them in June, 1909, as pastor. Mr. Sparling is at present in Winnipeg.

The Sunday school of St. Luke's church, Winnipeg, of which Rev. T. W. Savary, formerly of Kingston, is rector, is supporting a real live missionary entirely. She is Miss Hettie Rowman, B.A., and she has lately sailed for the Orient.

Bishop John W. Hamilton, who was expected to sail for Jamaica about the first of January, was prevented from starting, and in consequence is still in the United States, thus escaping the disaster by which he might otherwise have been overtaken.

Bishop Earl Cranston, who will be one of the representatives of the board

of bishops of the Methodist Episcopal church at the approaching general conference of the new Japanese Methodist church, will also represent the board of foreign missions of his church at the conferences at Shanghai, in commemoration of the centenary of missions in China.

An important conference will convene in Tokio, Japan, on the 3rd to the 7th of April next. This will be the seventh conference of the world's student Christian Federation, and will be the first international conference of any kind to be held in the far east. Nineteen hundred separate societies of Christian students in eighteen different countries are affiliated in the federation, the combined membership being 113,000 students and instructors.

Rev. William Meikle has been requested by the evangelistic committee of the Presbyterian synod of Toronto and Kingston to become synod evangelist. Mr. Meikle has devoted much of his ministerial life to evangelistic work, for which his experience and his natural talents both fit him well, and in which he has had remarkable success. He is a graduate of Queen's University in arts, and of Princeton in theology. Recently he has been pastor of a congregation in Glass Bay, C.B., and before that was in charge of First church, Vancouver.

Kidneys Must Have Aid.

Unlike most other diseases, kidney troubles seldom show any tendency to cure themselves; their tendency is to grow steadily worse. Disorders of the kidneys lead to lumbago, gout, rheumatism, heart troubles, Peck's Kidney and Liver Pills and be cured. In boxes, 25c. For sale only at Wade's Drug Store. Money back if not satisfactory.

A tortoise brought by Bishop Land to Lambeth when he became archbishop, outlived eight archbishops, and died at 130 years old.

White Flour

It is unequalled for cakes, biscuits, in a general way can also be bread. Put up 24 lb. sacks.

Kingston Co., Ltd.

HIS TITLE CH...

"Cold Storage" signification Ottawa, Feb. 15.—J. official title of dairy been changed by a council to dairy commissioner, in view importance which the vision of his work is Roadick has given attention to questions for some years past.

YEAR 74.

From Trapper
M&K FUR

McKa Fur Coat

IN
Raccoon, Beaver and Fur-Lined

Beat the World Value, Comfort Quality.
LOOK THEM OVER

John McKa FUR HOUSE
149-153 BROADWAY

15 Horses For This Week

All classes consisting of polo, Delivery, Drivers, and mares. Horses sold on six months giving approved note, with horses sold with a warrantable any time before 12 o'clock the day following date of representation. For further apply at

112 CLARENCE ST. OR 42 PRINCESS ST.

Tenders for Sale

SEALED TENDERS required for the House of March 1st, 1907, to March 1st, 1907, to March 1st, 1907, to March 1st, 1907. Further information given by

BUY PITTSBURGH PER SHARES

If you buy now you will receive five months of monthly payments, 50¢ off for each share. You own 350 acres in the Mining district in the City.

JOSEPH F.

Kingston & Cap

Heated Cats leave for Kingston on Monday. Cats leave to catch all

Telephone

And they will CALL AT Clarence Street, Back 294

Try a Pound of Myers' HOME-MADE

For Sunday's Breakfast

To Contract

TENDERS ARE INVITED for various works required and additions to the site of the new Kingston & Cap. Plans and specifications for inspection. Tenders to be submitted to the undersigned on FRIDAY, Feb. 22nd, at 10 o'clock, and to be accompanied by a check for \$100.00. Further information given by

TAKE NOTICE

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