Correspondence.

A Five Legged Frog.

To the Editor of the Scientific American:

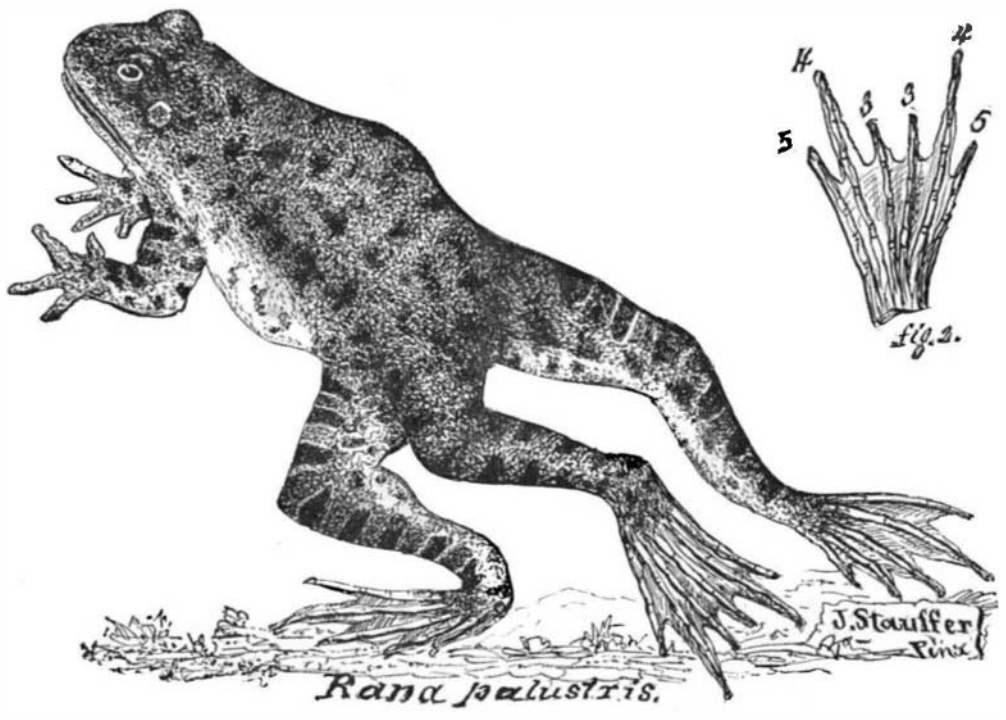
I notice a fine figure of a "three legged woodcock" in the SCIENTIFIC AMERICAN, No. 2, for January 11, 1879, page 23. You remark that "it is rare that monstrosities in nature are ever able to hold their own in the struggle of life." Being handy at drawing, I herewith send you a sketch of a fully matured frog (*Rana palustris*) having five full sized legs, as a counterpart to the woodcock. This was captured in the Conestoga, near the city of Lancaster. I sent a drawing and description to my young friend, John A. Ryder, of the Academy of Natural Sciences, Philadelphia. He wrote the following notice of it, which was published in the *American Naturalist*, vol. xii., p. 751, but not illustrated, which reads.

"A MONSTROUS FROG.—Mr. Jacob Stauffer, the veteran* naturalist of Lancaster, Pa., sends me a drawing of a frog (*Rana palustris*) with a well developed extra hind limb, or what appears from his drawing and description to be, speaking more correctly, a united pair of hind limbs, though occupying an asymmetrical position, and having their true homologies to a certain extent concealed from this cause. A sketch and remark of Mr Stauffer's, however, shows the true nature of this limb to be compound; that is, that it consists of two united halves divided by development from both sides of the body. He remarks: 'The extra leg is of the same color above and below, while the others, or normal legs, are of a dirty yellowish color beneath.' He further says this leg has six instead of five toes, and gives a sketch, which leads me to think that the digital formula of the compound foot must be written in this manner, 5, 4, 3, 3, 4, 5, showing clearly that the limbs are fused together by their inner faces, thus bringing the outer or fourth and fifth toes to the outside, while the prevalence of the superior and outer dark colors, and concealment of the inferior yellow tints, is just what ought to happen in the event of such union."

I quote Mr. Ryder because he presented my ideas in better shape than I had done. I will only add that this frog was alive for five days at Mr. Snyder's saloon, in this city, with a fish hook through the upper jaw. He was made to swim and hop to amuse the crowds of callers. Poor frog, although vigorous and able to use his additional appendage lustily as an oar or leg in his gymnastics, he had just given up his vitality when I laid him out and took an accurate drawing of the creature, which is now preserved in alcohol for inspection. I have heard of a similar frog in one of the Eastern museums.

J. STAUFFER.

Lancaster, Pa.



A FIVE LEGGED FROG.

Crabs of Cape Verde Island.

A rock crab (*Grapsus strigosus cf.*) was very abundant, running about all over the rocks, and making off into clefts on one's approach. I was astonished at the keen and long sight of this crab. I noticed some make off at full pace to their hiding places at the instant that my head showed above a rock 50 yards distant. The crab often makes for the under side of a ledge of rock when escaping from danger, and may then be caught resting in fancied security by the hand brought suddenly over it from above.

The dry rocks were covered with the dung of the crab, which is in the form of small, brittle, white sticks about an inch in length, very puzzling objects at first sight. The cast shells of the crab, which are bright red and very conspicuous, were lying all over the rocks. At Still Bay, on the sandy beach on which, although it is on the leeward side of the island and the sea surface was smooth, a heavy rolling surf was breaking, I encountered a sand crab (*Ocypoda ippeus*) which was walking about, and got between it and its hole in the dry sand above the beach. The crab was a large one, at least 3 inches in breadth of its carapace. In this species of crab the eyestalks are very long. The eyes are on the side of the stalks, which are longer than eyes, and projecting above them are terminated by a tuft of hairs. When the animal is on the alert these long eyestalks are erected, and stand up vertically side by side far above the level of the animal's back.

With its curious, long, column-like eye serect the crab bolted down toward the surf as the only escape, and as it saw a wave rushing up the shelving shore dug itself tight into the sand and held on to prevent the undertow from carrying it down into the sea. As soon as the wave had retreated it made off full speed along the shore. I gave chase, and whenever a wave approached the crab repeated the maneuver. I once touched it with my hand whilst it was buried and blinded by the sandy water, but the surf compelled me to retreat, and I could not snatch hold of it for fear of its powerful claws. At last I chased it, hard pressed, into the surf in a hurry, and being unable to get proper hold in time it was washed down into the sea. The crab evidently dreaded going into the sea.

These sand crabs breathe air through an aperture placed between the bases of the third and fourth pairs of walking legs, and leading to the gill chamber. They soon die when kept for a short time beneath the water, as shown by Fritz Muller's experiments.—*H. N. Moseley's Notes.*

* He means because I am over 70 years of age I am a veteran—as a naturalist.—J. S.

Winding Up a Horse.

The Rev. Dr. Chamberlain, in a letter to the *American Missionary*, from Mudnapilly, India, gives the following singular experience he had with a balky horse:

Nineteen years ago, says the venerable divine, I bought in Madras a peculiar kind of horse. He had to be wound up to make him go. It was not a machine, but a veritable live horse.

When breaking him to go in the carriage he had been injured. An accident occurred in starting him the first time, and he was thrown and hurt and frightened. It made him timid; afraid to start. After he had once started he would never balk, until taken out of the carriage. He would start and stop and go on as many times as you pleased, but it was very difficult to get him started at first each time he was harnessed to the carriage.

He was all right under the saddle, an excellent riding horse, and would carry me long distances in my district work, so that I did not wish to dispose of him; but I could not afford to keep two; whatever I had must go in carriage as well as ride, and I determined that I would conquer.

How I have worked over that horse! At first it sometimes took me an hour to get him started from my door. At last, after trying everything I had ever heard of, I hit upon an expedient that worked.

I took a strong bamboo stick two feet long and over an inch thick. A stout cord loop was passed through a hole two inches from its end. This loop we would slip over his left ear down to the roots, and turn the stick round and round and twist it up.

It is said that a horse can retain but one idea at a time in its small brain. Soon the twisting would begin to hurt. His attention would be abstracted to the pain in his ear. He would forget all about a carriage being hitched to him, bend down his head, and walk off as quiet as a lamb. When he had gone a rod the horse boy would begin to untwist, soon off would come the cord, and the horse would be all right for the day. The remedy never failed.

After having it on two or three times he objected to the operation, and would spring about and rear and twitch and back, anything but start ahead, to keep it from being applied. We would have, two of us, to begin to pat and rub about his neck and head. He would not know which had the key. All at once it would be on his ear and winding up. The moment that it began to tighten he would be quiet, stand and bear it as long as he could, and then off he would go. It never took thirty seconds to get him off with the key. It would take an hour without. After a little he ceased objecting to have it put on. He seemed to say to himself, "I have got to give in, and may as well do it at once," but he would not start without the key. In a few months he got so that, as soon as we got into the carriage, *he would bend down his head to have the key put on*, and one or two turns of the key would be enough.

Then the key became unnecessary. He would bend down his head, tipping his left ear to the horse boy, who would take it in his hand and twist it, and off he would go.

My native neighbors said, "That horse must be wound up or he cannot run." And it did seem to be so.

When he got so that the "winding up" was nothing but a form, I tried to break him of that, but could not succeed. I would pat him and talk to him and give him a little salt or sugar or bread, and then step quietly into the carriage and tell him to go. "No." Coax him. "No." Whip him. "No." Legs braced, every muscle tense for resistance. A genuine balk. Stop and keep quiet for an instant, and he would hold down his head, bend over his ear, and look around for the horse boy appealingly, saying very earnestly by his actions, "Do please wind me up. I *can't* go without, but I'll go gladly if you will." The moment his ear was touched, and one twist given, off he would go as happy and contented as ever horse could be.

Many hearty laughs have we and our friends had over the winding up of that horse. If I were out on a tour for a month or two and he were not hitched to the carriage, or if he stood in the stable with no work for a week or two during the monsoon, a real winding up had to take place the first time he was put in. We kept him six years. The last week I owned him I had to wind him up. I sold the patent to the man that bought the horse, and learned from him that he had to use it as long as the horse lived.

Should City Horses be Turned Out to Pasture?

Grass is the natural food of the horse. In spring and summer the fresh green herbage of the field and mountain springing up among the rocks, along water courses, or in the valleys, seasoned with the twigs of shrubs and trees, and the great variety of other plants which are both pleasant to the eye and good for food, constitute a rather bulky but nutritious and acceptable aliment. This food distends the paunch and gives an outline to the animal, which, as concerns city horses, is, to say the least, unfashionable. Very heavy horses, high bred horses, and even those accustomed from colthood to concentrated food, especially to receiving oats regularly, and whose skins are thin from having had regular grooming, protection from the weather and from the attacks of flies, do not do well as a rule when turned to pasture. It is hard to make city people understand this. This is true—and being true, ought city horses ever to be turned to grass? Certainly not in all cases. If they have a good, deep, dark shed to go under at will, to get away from insects, and to protect them during cold storms; copse and young woody growth in which they may at will take shelter from the flies; running water in the pasture; plenty of good sweet grass, not too close cropped nor yet too rank; and about one third to half their usual feed of grain daily—say four quarts of oats and an equal measure of bran—and access to salt at all times, they would do well—not gain in flesh, probably, but they would come through the summer looking fly bitten, perhaps; but, nevertheless, in such shape that they would soon get into first-rate working order, with a new lease of life from the change. It is quite as important for farmers to understand this as for the city owners of horses—and much hard feeling saved, and perhaps the annoyance of lawsuits may be avoided, by the knowledge. There should always be a proper understanding of exactly what is to be done by the party taking the horses.—*American Agriculturist.*

[After considerable unfortunate experience in turning horses out to recuperate in pastures during the summer, we have come to the conclusion that horses accustomed to city work and care, whose condition is tolerably good, are seldom benefited, but are often injured, and never come back to their work in as good trim as when sent away.—EDS.]

Our Ferry Traps.

The frequent narrow escapes from fearful catastrophes make it necessary that we should again call the attention of steamboat inspectors to their duty in this regard. It is not too much to state that New York has the best as well as the worst managed ferries on the continent. And yet the best are far from being what they may and should be, where the interests involved are of such vast magnitude. It is not uncommon to find 1,000 persons crowded on board one of the boats of the Fulton ferry at certain hours of the day, and more at night. It is hardly within the power of language to describe the horrors which would ensue were a boat thus loaded to sink, from whatever cause, whether from collision caused by fog or by ice. These excessive freights of humanity may be witnessed several times on every working day of the year.

The boats of all our ferries, and especially the one named, should have their vacant space below deck filled with copper bound oil casks, since it has been proven that water tight compartments are a myth. Their upper decks should be covered with life rafts. The life preservers in the cabins of the Fulton ferry boats are beyond the reach of passengers. The outside bulwarks between fenders and rail should be fitted with sectional life rafts, which could be dropped overboard in an instant.—*American Ship.*

Remarkable Electrical Experiments.

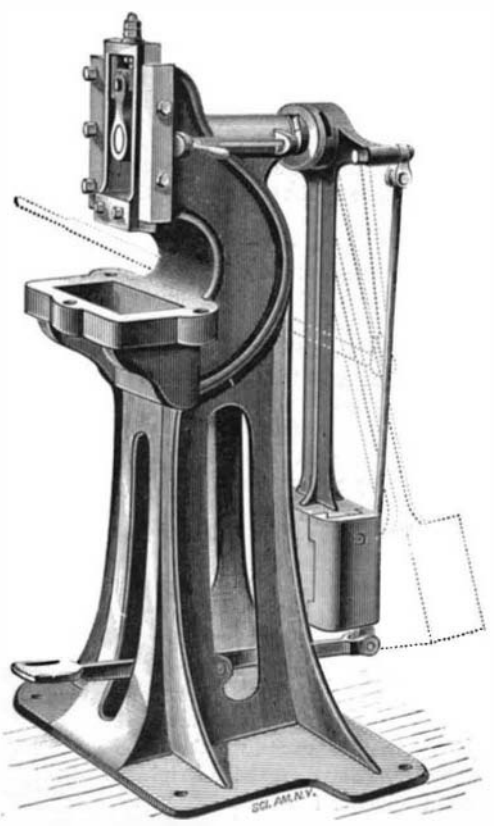
Some twenty years ago, says a writer in *Inter-Ocean*, Mr. Andrew Crosse, of Bloomfield, England, stood foremost in the grandeur of his experiments and investigations in electrical science, and his achievements ranked among the most splendid of his day, while his skill entitled him to high rank among the devoted investigators of scientific truth. Mr. Crosse collected the electricity from the atmosphere by means of a wire with points, supported on poles, fixed to the tallest of the magnificent trees which adorned his grounds. This conducting wire was carried into a room, where it terminated in a large brass ball. Near this was another similar ball, which was connected with a neighboring pond, down in the water, by means of a metal rod, and by means of an adjusting screw and large glass handle the electric discharge was easily directed into the earth by bringing the two balls together when not experimenting, or the charge was not too strong. Mr. Crosse had a Leyden battery, consisting of fifty-one gallon jars, containing seventy-three square feet of coated surface on each side, and with about 1,600 feet of his lightning rod wire, he has frequently collected sufficient lightning to charge and discharge this battery twenty times a minute, with reports as loud as a musket. The battery, when fully charged, would perfectly fuse into red hot drops thirty feet of iron wire in one length, the wire being 1-270 of an inch in diameter. When the battery was connected with 3,000 feet of rod during a thunderstorm, a constant stream of discharges took place between these balls. And if the center of a cloud was vertical over the points, the bursts of thunder and the crash of the accumulated fluid conspired to produce an appalling effect.

A NEW PRESS.

The press shown in the annexed engraving is quite novel in principle, and although a recent invention it is rapidly coming into notice. It is adapted to a great number of uses, such as the punching and shearing of metals and other materials, stamping, embossing, etc., by foot or hand. It accomplishes work that has heretofore been done only by power presses. It performs some astonishing feats; for example, a press like that shown in the engraving will easily shear one-half by two-inch wrought iron, and punch a ¾ inch hole through 5-16 inch iron by foot power alone, and it can do more when operated by hand.

This astonishing result is obtained by the employment of a weighted pendulum, swinging back and forth or describing a complete circle if necessary. The pendulum is used in connection with an automatic clutch, a shaft, and a slide. The pendulum is easily set in motion by the pressure of the foot upon the treadle; this revolves the shaft with the same results and performs the work with the same speed as in ordinary power presses.

The weight of the pendulum may be varied to suit the work in hand, a supplemental weight being fitted to each side of the pendulum, to be attached or removed as occasion may require. The press is provided with a foot pedal, which yields to upward pressure, preventing accidents to the feet of the workman, and also avoiding breakage in case an unyielding body should accidentally get under the pedal. When required the press is furnished with a hand lever, as indicated in dotted lines. It is thus capable of rapidly



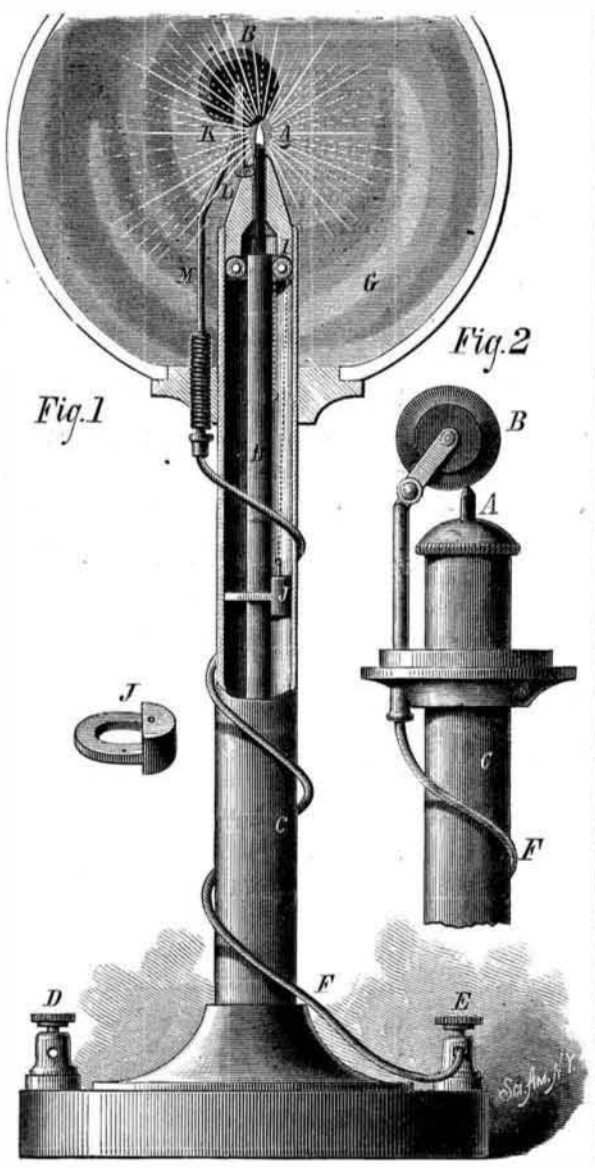
PEERLESS PUNCH AND SHEAR PRESS.

punching 1 inch holes through 5-16 iron. An ingenious stop is shown at the side of the press by which the punch may be brought into action at every oscillation of the pendulum or whenever required.

This press, and other styles on the same plan which we may hereafter describe, are made by the Peerless Punch and Shear Company, of 52 Dey street, New York city.

NEW FORM OF ELECTRIC LAMP.

The accompanying engraving represents an electric lamp (Reynier's system) designed by G. Cromé for domestic use. It is said that this lamp gives very good results when operated by six Bunsen elements. When a series of lamps is used the current should be supplied by a dynamo-electric machine. The carbons are inclosed either by a simple globe



IMPROVED ELECTRIC LAMP.

or by a bell filled with nitrogen or rarefied air, and the lamp may be used with safety in powder mills, in mines, and under water.

The carbon pencil, A, is a little less than $\frac{3}{16}$ inch in diameter. It is guided by the tube, H, and is pressed upward against the edge of the disk, B, by the weight, J, attached to a cord passing over the pulley, I. The carbon is in electrical communication with the binding post, D, and the carbon disk, B, is connected with the other binding post, E, by means of the wire, F.

The globe, G, rests upon the collar attached to the main standard of the lamp, and is entire throughout, except at the bottom. This globe may be replaced by a glass bell filled with nitrogen, which will retard the combustion of the carbons.

The disk, B, is supported by a lever, K, that is pivoted in the insulated standard, M. The lower end of this lever is bent at right angles, and is made to exert a slight lateral pressure on the carbon when the point of the carbon presses against the disk, B. The upward movement of the carbon causes the disk, B, to turn slightly, thus presenting a new surface to the action of the current.

The device shown in Fig. 2 is similar to that already described, the difference being that the regulating lever is omitted.

A Steam Rammer for Paving Streets.

The Philadelphia papers contain descriptions of a new and successful invention in use in that city for laying street pavements. According to the statements of our contemporaries it pounds granite blocks and cobble stones into place, making the surface, one paper says, as smooth as a billiard table, and promises to do away with the old style of paving the streets. The rammer, which looks like a locomotive at a distance, is operated on the same principle as a trip hammer, and can be so regulated as to make a stroke of one pound weight or 1,500 lb. This enables the operator to produce a level surface on every portion of the street it passes over, while the most expert man power cannot strike over two hundred pounds. Durability and solidity are the important features of paved streets, and while hand power can only force the stone into the earth three inches, the steam rammer sends them six inches with ease; thus making the stones compact and solid. It is claimed that the streets paved with this new invention will last until the stone is worn out. The machine weighs six and a half tons, and even that makes no rut or impression on the street which it has rammed. In repaving streets paved with cobble stones under the old system it is necessary to relay them, while, with the steam rammer, they can be driven to a level with perfect ease. It requires the services only of an engineer and a man to guide the rammer to work the machine. It consumes one fourth of a ton of coal per day. A number of streets in West Philadelphia bear splendid specimens of its work.

The Melodiograph.

Several contrivances have been invented to record the notes of melodies played on a piano, organ, or other key instrument, but were all more or less useless on account of their complexity, imperfectness, or expense.

Zigliani's melodiograph is very simple, usable, and cheap. A double flat spring placed under each key is connected with a battery and with a recording apparatus, which consists of a comb provided with insulated teeth gently resting on a copper cylinder. A strip of ruled and chemically prepared paper is drawn over this roller by a clock work, and receives the impressions or marks of the teeth of the comb. This clockwork can be regulated so as to cause the paper to move in conformity with the time kept by a person playing the instrument. Every time a key is depressed the circuit is closed, and the electricity, passing through one of the teeth of the comb, makes a mark corresponding to the key that has been depressed.

The Phosphorescence of the Sea.

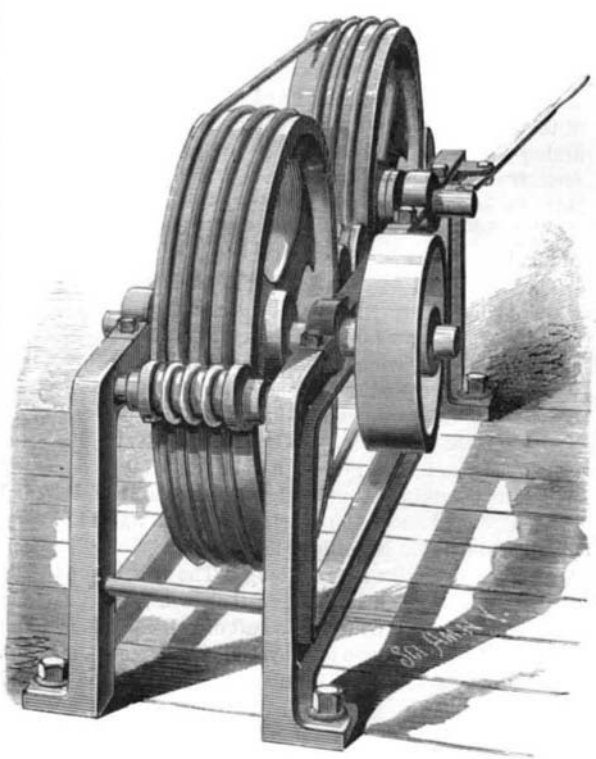
The illumination or phosphorescence of sea water at night, observable in this latitude in the summer, and at all times in tropical regions, is largely due to *Noctiluca miliaris*. It is a gelatinous little speck of a fellow, in shape like a peach, but only $\frac{1}{50}$ of an inch in diameter. The light, which is of a greenish hue, arises from scores of minute points. A glass of water taken where these creatures are present may contain myriads of them. Nets and ropes drawn through the sea pick up millions of Noctiluca; and the ropes and meshes are made luminous by them until they become dry.

NOVEL DEVICE FOR TRANSMITTING MOTION.

We give herewith an engraving of a new device for transmitting motion, invented by Messrs. Dennis, Samper & Valenzuela, of Bogota, United States of Colombia, South America. This device is intended for the transmission of power from one shaft to another, and it may be employed in transmitting continuous rotary motion or a reciprocating rotary motion.

It consists, as will be seen, by reference to the engraving, of two pulleys placed, one upon the driving shaft, the other upon the driven shaft, and connected by a belt, rope, or chain which passes several times around each pulley. When a continuous rotary motion is to be communicated from one shaft to the other the belt is endless, but when the motion is alternating the belt need not be endless; it may be wound several times upon the pulleys and have its ends attached to the pulley rims.

The belt is prevented from moving along laterally on the pulleys by the small grooved rollers journaled on diametrically opposite sides of the pulleys, and embracing the several convolutions of the belt. It is stated that the slight side pressure required to keep the coils of the belt in position on the pulleys amounts to nothing compared with the saving of power by avoiding the slipping of the belt.



DEVICE FOR TRANSMITTING MOTION.

The applications of this device are numerous. It may be used in transmitting power in place of the ordinary belt, and in most cases in place of cog gearing. It may be applied to hoisting machinery and to the transmission of power by wire ropes.

Further particulars may be obtained from Mr. Silvestre Samper, 262 President St., Brooklyn, N. Y.