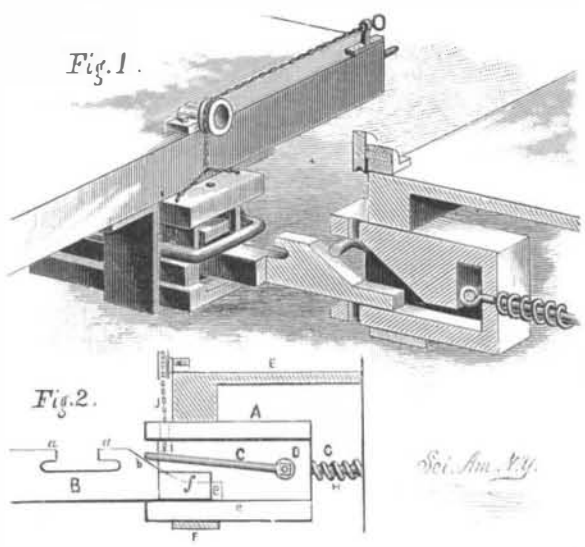
IMPROVED CAR COUPLING.

The drawhead, A, is attached to the platform of the car by irons, F, and drawhead rod, G, which is provided with buffer springs, and passes through the rear end of the drawhead, and is secured centrally to the rod, D. The coupling link, B, is formed with hooks, *a a*, with which the bails, C, engage when the cars are coupled, and it is also formed with inclined portions, *b*, which serve to elevate the outer ends of the bails as the coupling link enters the drawheads, so that the bails will drop over the hooks and effect the coupling. To prevent the coupling link from entering too far when the cars are run together, the drawheads are made with inclined portions (shown in the sectional part of Fig. 1) in the throats, which stop the entrance of the inclined ends of the links.



McARTHUR'S CAR COUPLING.

The extreme ends, *e*, of the link are made flat and reach under the inclined portion of the heads, thus holding the link in a horizontal or nearly horizontal position. The bails are held at a higher level than the floors of the drawheads by the blocks, *f*, formed upon the outside of the heads, so that the ends of the link can pass under them.

Attached directly to the bails are uncoupling chains that pass either to the top and down one side of the car, thereby permitting the bail to be raised either from the top of the car or from the ground, or over a pulley and thence along the platform through an eye, as illustrated in Fig. 1. When it is desired to hold the bail in an elevated position, the ring at the end of the chain is caught over a peg. The operation of the coupling will be easily seen from the foregoing description in connection with the cuts, Fig. 2 being a longitudinal section. The device is automatic in its action, and there is no necessity of going between the cars in coupling or uncoupling. This invention has been patented by Mr. C. McArthur, whose address is P. O. Box 135, Jamestown, Pa.

Straightening Hardened Steel.

It is well known that files are not usually drawn after being hardened, and that the hardening frequently springs them out of line. But notwithstanding that the files are made as hard as they can be by heat and cold water, they are readily straightened after being hardened. This operation is performed at once, as soon as the files have been dipped. The files are taken from a bath of melted lead and chilled while red hot in a tank of running water. This immersion for the instant hardens only the surfaces, while the interior is soft and pliant with heat. At this time the file may be straightened by bending over and under bars. By similar means crooks in steel arbors, reamers, and other long tools may be removed, even after they have been hardened and tempered. A cast steel saw arbor had received an offset or crook in the journal at one end just inside the shoulder. The crook was at the worse end, that next the saw, and although scarcely perceptible to the eye when the arbor was turned on its centers, it was sufficient, when the arbor was in the boxes, to throw the periphery of a two foot saw considerably out. The arbor at the bearing part was very gradually heated, not enough to change color, but to a "black heat." A V-shaped block was placed in a vise bearing against the offset side of the journal, and the vise screwed up. At the third trial the arbor came out perfectly true. A tempered reamer was straightened in the same way, the point at which it was crooked being heated by an alcohol lamp. The heat was sufficient to allow the steel to give, but not enough to start the temper. Steel that has a blue temper only, may be straightened by blows with a pony hammer on a smooth, clean anvil, the face of which should be warmed enough to remove the chill.

A Dead Sea Serpent.

A recent bulletin of the United States Fish Commission gives an interesting correspondence relative to a very peculiar fish—something perhaps between an eel and a shark—that was caught, but not kept, by a Maine fisherman in 1880. It has been frequently referred to as "sea serpent," was 24 feet long and 10 inches in diameter, with tail like an eel and skin like that of a shark, but finer. There were two fins, one on either side, a little back of the head, with a dorsal fin between them. The fish was dead when caught, but had torn the nets badly. Prof. Baird expressed great regret that it was not landed and kept as a remarkable specimen.

STEAM LOG SETTING APPARATUS FOR SAW MILLS.

The engraving shows an apparatus by which the sawyer is enabled to gear the log shifting devices of the carriage, by a shaft operated by steam, located alongside of the carriage, to enable him, by operating a hand lever, to shift the knees of the head blocks forward or backward at will.

The carriage ways or tracks, head blocks, sliding knees, racks, the adjusting shaft, and pinions are of the ordinary or approved construction.

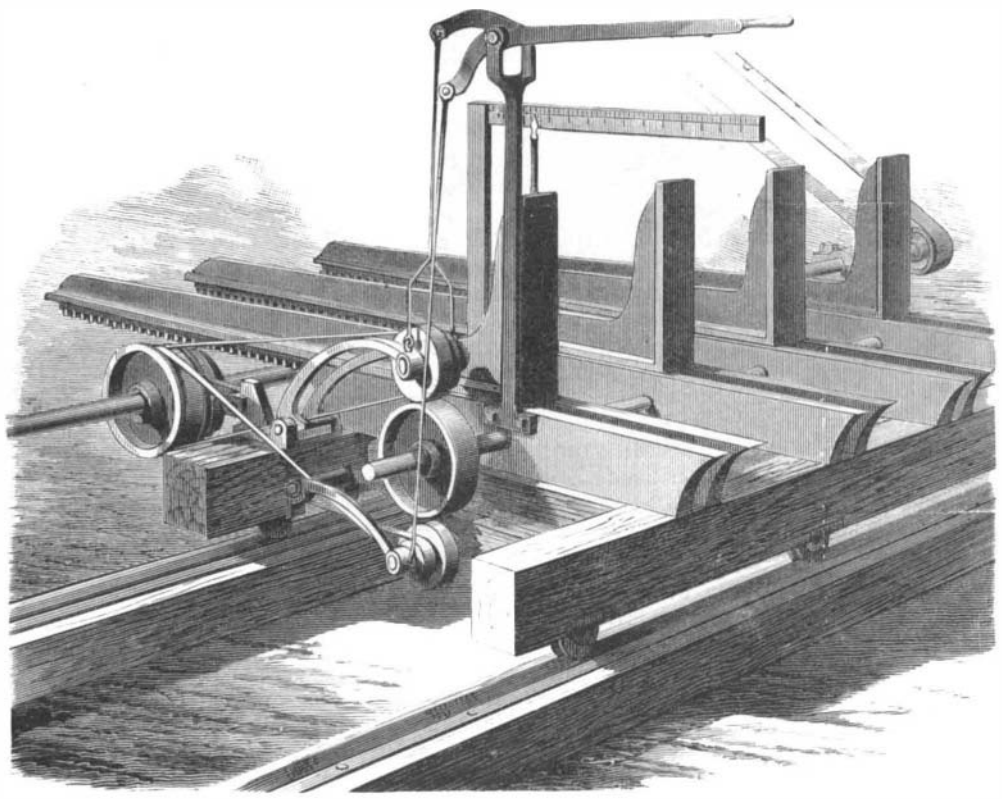
To turn the adjusting shaft and pinions by steam at the will of the sawyer, for setting up to the saw from time to time, and for shifting the knees back when a new log is to be put on, there is arranged a long shaft at the side of the carriage, at the back, supported its length by swing bearings, which are tripped automatically by a trip plate fixed on the carriage to allow the double pulley to slide on shaft, said bearings being weighted, again assume a normal vertical position under the shaft, which prevents the shaft from centrally swagging and wabbling.

On short mills this shaft is revolved continuously by a belt from any suitable driving pulley, while on long mills there is arranged an automatic belt shifting device, which shifts the belt from a loose to a fixed pulley just before the setting device gets back to sawyer, engaging the set works, which again automatically shifts belt on to loose pulley after the log has been set and the carriage started forward again.

On this shaft there is arranged a double pulley which travels along it with the carriage, the pulley having a feather or key running in the groove of the shaft, so that it may revolve with the shaft so as to drive the friction pulleys journaled in the swinging frames above, and below a friction pulley on the log adjusting shaft. The lower pulley is driven by a straight belt, the upper one by a crossed belt for reversing the motion, or *vice versa*.

The pivoted frames carrying the friction wheels are suspended from the hand lever at the top of the first knee rods, so that by shifting the lever in one direction one of the friction wheels will be made to drive the friction wheel on the adjusting shaft in one direction, and by shifting in the other direction the other wheel will drive it the other way; while in the middle position both wheels will be disconnected and the wheel on the log adjusting shaft will be inoperative and locked. A scale is so located with reference to a pointer on the first knee as to gauge the movements of the knees. The accuracy of the setting is accomplished by using a Reppard or some other suitable press roller, which is set to any size desired by the sawyer; and by pressing on the hand lever the log is brought up to the roller, thus putting the setting in the hands of the sawyer. With an apparatus of this kind the setting of the logs is simplified and at the same time it can be accurately and quickly accomplished, and the services of a setter dispensed with. This invention is covered by two patents by Mr. Walter P. Scofield, of Hawthorn, Fla.

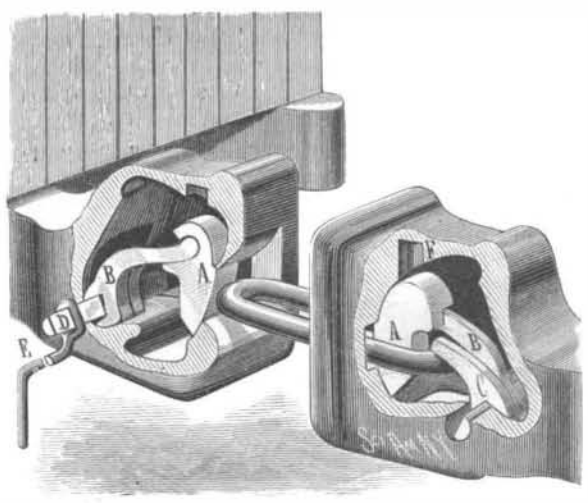
For further particulars, address Messrs. Scofield & Bailey, at the same place.



SCOFIELD'S STEAM LOG SETTING APPARATUS FOR SAW MILLS.

IMPROVED CAR COUPLING.

A large space is formed within the drawhead to receive the pin, A, and allow it to move up and down in coupling and uncoupling the cars. The forward and upper sides of the space are curved in the arc of a circle, and the forward side of the pin is correspondingly curved. Upon the forward side of the pin is formed a shoulder which rests against the draw head at the upper side of its throat, when the pin is down, in order to prevent the pin from rising when in use. An arm, B, is inserted in a socket in the upper rear part of the pin. The rear part of the arm is curved downward, and has a semicircular hole formed through it to receive the shaft, D, which passes through a round hole in the draw head. The hole in the arm, B, is made larger than the shaft so that the latter can have a slight rotary movement within



STAMP'S CAR COUPLING.

the hole. The hole in the drawhead is made larger than the shaft, so that the entire draught strain will come upon the forward part of the drawhead. To the end of the shaft, D, is attached a crank, E, the shaft of which is made of such a length that the arm will be about in line with the side of the car, in order that it may be operated from the side of the track.

Beside the arm, B, is placed the arm, C, which has a semicircular hole in its rear end to receive the shaft, D. This arm is curved forward, and is made of such a length that its forward end will rest upon the inner end of the link. With this construction, by a slight movement of the crank the outer end of the link can be raised more or less, the enlarged hole in the arm, B, allowing this to be done without moving the pin, A. When the cars are run together the entering link strikes the pin and pushes it back far enough to free the shoulder from the drawhead, and then forces the pin upward and passes its lower end, when the pin drops through the link. In the lower side of the drawhead is an opening large enough to permit the passage of the pin and its arm, thus facilitating repairs. In the upper part of the drawhead is a cylindrical recess, F, extending nearly to the top. In case the parts should break, and no duplicates be on hand, the metal above the recess can be broken away and coupling made with an ordinary pin.

This invention has been patented by Mr. William Stamp, of Susquehanna Depot, Pa.

Alcohol in a Bushel of Grain.

Grains of the different kinds produce alcohol in about the following proportions: Corn affords 40 pounds of spirits of the specific gravity of 0·9427, containing 45 per cent of absolute alcohol for each 100 pounds of grain; wheat, 40 to 45 pounds of spirits; barley, 40; oats, 36; rye, 36 to 42; buckwheat, 40. Now, 40 pounds of such spirits equal 3½ (3·5) gallons of government-proof spirits. Taking corn at 56 pounds per bush., rye at 56 pounds, wheat at 60, barley at 48, oats at 32, and buckwheat at 52, these grains should afford the following quantities of proof spirits per bushel: Corn and rye, each, 1·96 gallons, or almost 2 gallons; wheat, 2·1 gallons; barley, 1·68 gallons; oats, 1·12 gallons; and buckwheat, 1·82.

Crystalline Oxygen and Liquid Nitrogen.

From a very brief report of a communication made by M. Debray to the Academie des Sciences we gather that some new facts relating to the liquefaction of nitrogen have been brought forward. Oxygen had been liquefied by being submitted to great pressure, and when this pressure was suddenly withdrawn the lowering of temperature was so great that crystals of oxygen appeared in the liquid mass, and the nitrogen in contact with the oxygen assumed the liquid state.

The Red Sky Explained.

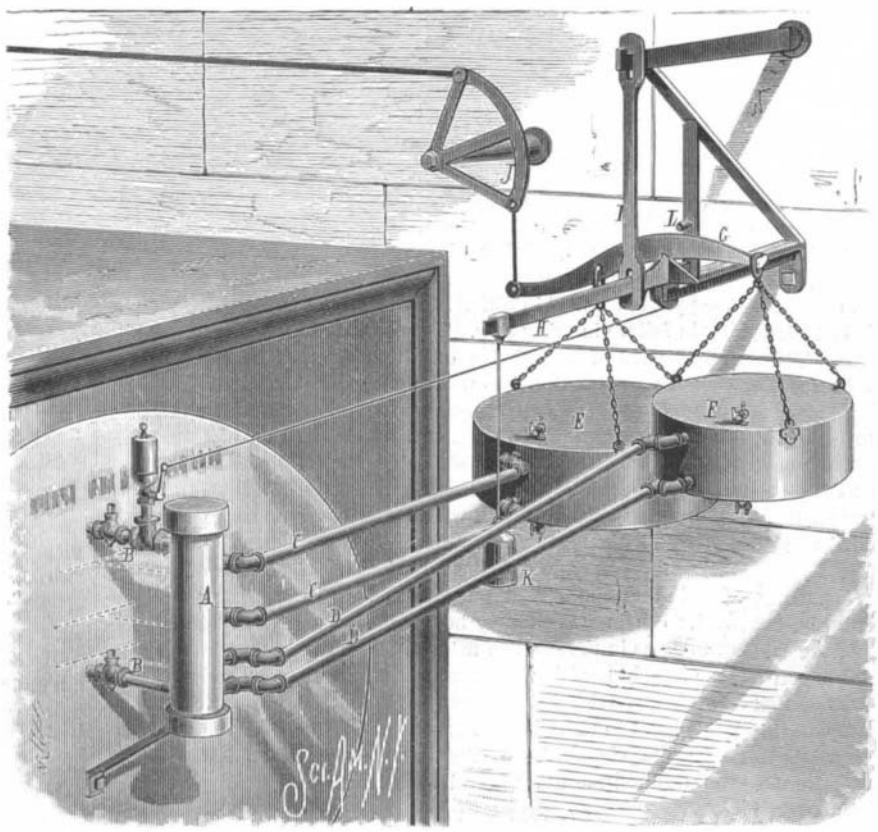
The red afterglow that has caused so much discussion among philosophers is now explained by a correspondent of the SCIENTIFIC AMERICAN, who asserts that the phenomenon is due to the red spot from the planet Jupiter. This great rosy cloud disappeared several months ago from the atmosphere of Jupiter, has had just time, according to this correspondent, to travel to our earth, and is now hovering over us, causing the ruby coloring of our skies night and morning. Nobody ever has or will be able to prove that this is not the fact; therefore, it must be true, says the correspondent. The question is settled; it is useless to talk further about cosmic dust, Java ashes, or aqueous vapor.

FEED WATER REGULATOR AND ALARM.

The device shown in the accompanying engraving is a combined feed water regulator and low water alarm for steam boilers; the supply of water to the boiler is automatically regulated, and, in the event of the water falling dangerously low, a whistle sounds the alarm. The dotted lines, B B, indicate the different water levels in the boiler, the upper line representing the highest water level, and the lower line a dangerous level. Two closed vessels, E F, are suspended from a beam, G, upon opposite sides of its fulcrum. When arranged at like distances from the fulcrum they should be made of different sizes; thus the vessel, E, should have twice the capacity of the other, so that when it is half full of water it will balance the other when full. The beam, G, is fulcrumed near the end of another beam, H, which works on a fixed fulcrum. The other end of the beam, H, has attached to it a weight, K. A closed upright pipe, A, is connected above and below, by branches, with the steam and water spaces of the boiler. This pipe is connected at different elevations, by flexibly jointed pipes, C C, D D, with the upper and lower portions of the vessels, E F. The arrangement of these pipes and their position in regard to the water levels in the boiler are clearly shown in the engraving. The flexibly jointed connections of the pipes provide for a rising and falling motion of the vessels, E F. The vessel, E, will be about half full of water when the level of the water in the boiler is at its medium height. The alarm vessel, F, connecting both above and below with the pipe, A, at or about the danger water level in the boiler, will then and at all times, excepting when sounding an alarm, be kept full of water by the pressure of steam in the boiler, and will balance the vessel, E, when only half full.

As the water in the boiler falls below the medium level sufficiently to empty the feed regulating vessel, E, of water, the alarm cylinder, F, will fall while the other rises, and the beam, G, by means of crank rod and lever connections or by other suitable mechanism, will operate the injector or cock connected with the water supply pipe so as to feed water to the boiler. When the water in the boiler has reached its highest level the upper pipe, C, will be immersed at its connection with the pipe, A, and the pressure of steam will cause the vessel, E, to become full of water. It will then be heavier than the cylinder, F, and will fall, and in its operation of the beam, G, will cause the mechanism connected therewith to shut off any further supply of water to the boiler. In case the supply of water fails from any cause, so as to fall to the lowest safe water level, then the cylinder, E, will be emptied of water; and as the water descends so as to bring the connection of the pipe, A, with the pipes which lead to the cylinder, F, a little below the level of the water in the boiler the cylinder, F, will also be emptied. This will remove so much weight from the end of the beam, H, on which the beam, G, rests, as to cause the weight, K, to tip the beam, H, when the lever of the whistle is opened, and attention called to the dangerous level of the water in the boiler. A rest on the beam, H, prevents either vessel from falling too low in the operation of the apparatus. The vessels are fitted on their tops with cocks to provide for the escape of air and also with cocks in their bottoms for blowing off any mud that may collect in them. The inventors state that this apparatus has been in practical operation for some time and has given perfect satisfaction.

This invention has been patented in this country, and a patent has been applied for in England, by Messrs. Johnston & Brown, of 127 Pastorius Street, Germantown, Philadelphia, Pa.



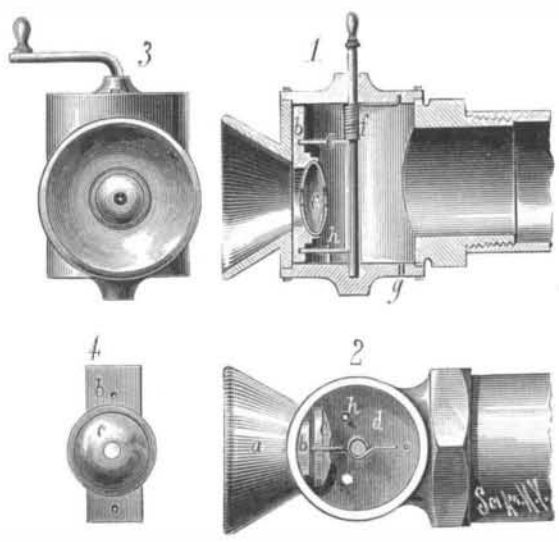
JOHNSTON & BROWN'S FEED WATER REGULATOR AND ALARM.

The New Atlantic Telegraph Cables.

Mr. John W. Mackay has written to the London *Times* saying that the first of the two new cables being made is expected to be laid and ready for business in June, and the other during the year. He says they do not contemplate making a war of rates on the existing system, but will establish slightly lower charges and a more prompt service. The secretary of Messrs. Latimer Clark, Muirhead & Co. says the right has been purchased to use the Muirhead patents for the duplex working of the cables, whereby the effective power of transmission will be practically doubled.

SPEAKING TUBE MOUTH PIECE.

The accompanying engravings represent a mouth piece for speaking tubes that is so constructed that the least current of air in the tube will blow the whistle. Fig. 1 is a longitudinal sectional elevation, Fig. 2 is a plan view of the same, Fig. 3 is a front, and Fig. 4 a rear view. The mouth piece is screwed to the end of the speaking tube. The casing is provided with removable top and bottom pieces in which a vertical spindle is journaled, whose upper end has a crank handle. A spring, *f*, having one end secured to the spindle, is wound around the spindle, and has its upper end fastened on the under side of the top plate. From the spindle project two arms, *h e*, on whose outer ends is an upright piece, *b*, which is provided with a central aperture,



THOMAS' SPEAKING TUBE MOUTH PIECE.

and has its outer surface rounded transversely to fit closely against the inner surface of the cylindrical casing. A whistle, *c*, of the usual construction is held over the aperture. The movements of the arms are limited by studs on the bottom piece of the casing. The piece, *b*, is held loosely on the ends of the arms, thereby preventing its curved surface from working with too much friction against the inner surface of the casing; and if there is any lost motion between the piece and the casing, the pressure of the current of air in the tube will press the piece against the casing, thus preventing an escape of air and causing the whistle to be sounded by the least current. The spring holds the whistle across the inner opening of the bell mouth; and when the tube is to be used for speaking, the piece carrying the whistle is swung to one side by means of the crank handle. The water that accumulates in the casing flows off through the hole, *g*.

This invention has been patented by Mr. William Thomas, who may be addressed for further information, P. O. Box 529, Pittston, Pa.

Car Brake Contest.

Mr. William Loughridge, of Baltimore, the patentee of a number of car brake improvements, has commenced a suit in equity in the United States Circuit Court, Pittsburg, against the Westinghouse Car Brake Company for infringement of Mr. Loughridge's system of operating car brakes patented in 1864 and 1873. A large interest is involved, and the suit is likely to be long and costly.

Lathe Spindles.

The old time method and the present usual way of making a lathe spindle is to first drill for the center, ream it to the taper, turn and fit the steel center, and use this steel center for one of the points of suspension in the turning and finishing until the arbor is in place in the stock. It has been found, however, that after all was done the center of the head arbor (the revolving spindle) could be seen to be out of true in its projecting length. This error was—and is—usually remedied by taking a light finishing chip from the center while it revolved with the spindle in the lathe head boxes; but the source of the error remains—a lack of coincidence between the center hole and the spindle bearings.

A better way is this: The lathe spindles now are generally hollow—all engine lathe spindles. They are of steel, and as they come from the forger are centered and end-squared. They are then chucked, drilled from end to end with a twist drill, and reamed to size by a half round drill. Nothing is done for the reception of the center, but the spindle is swung, and turned, and absolutely finished by the hole that goes through from end to end. When the spindle is finished and fitted and put into its bearings the center seat is reamed out with the taper reamer, and the steel center is fitted. It is always absolutely true by this method.

Beef Juice vs. Beef Tea.

Prof. Roberts Bartholow, of the Jefferson Medical College, says: "Nothing has been more conclusively shown than that beef tea is not a food. It is nothing more than a stimulant. The chemical composition of beef tea closely resembles that of urine, and it is more an excrementitious substance than a food.

"In preparing beef juice, the lean part of the beef should be selected. This should be cut into thick pieces about the size of a lemon squeezer. The pieces should be next placed upon a hot coal fire for a moment, to scorch the exterior; the meat is then transferred to the lemon-squeezer, which has been warmed by dipping in hot water, and the juice pressed out and allowed to flow into the glass, which has also been heated. The juice is seasoned with a little salt and Cayenne pepper, if the patient desires it, and taken immediately. In this way the nutritious elements of the meat are obtained, and the slight scorching develops constituents which give the peculiar flavor to cooked meat." This is for a diet, the principle of which is the administration of those elements which are disposed of in the stomach, and do not require the aid of the intestines in their digestion.

Hard-Riding Cars.

A Western car builder not long since put a new passenger car into service in the suburban traffic of his road, and not long after was taken to task by the general manager because the car was a hard-riding one. Although it was to all appearances like a number of other cars of the same class that had been built by the road, yet there was no question as to the unsatisfactory nature of its riding qualities.

Complaints from the patrons of the road became so frequent that the car was taken out of service and sent to the shops to see if the cause of the trouble could not be discovered and remedied. The running gear was examined and overhauled and a new set of springs put in. The car was again put on the road, but without any perceptible improvement in its performance. The complaints were renewed, and the car was again taken to the shops and a second set of springs put in, including both elliptics and equalizers, but with no better success.

The superintendent and master car builder made repeated trips in the car, but without obtaining even a clew to indicate the real cause of the difficulty. As a last resort, the car was provided with a pair of trucks that had been running under an easy-riding car, and then there were no more complaints about the hard riding.

The fault was evidently somewhere in the trucks, and in order to settle this point beyond dispute, the trucks that had been taken out were put under a car that had always ridden well, and on the first trip it was found to ride as hard as the first named car. A new wheel-grinding lathe had just been put into the shops, and the wheels of the defective trucks were trued up. The cause of the trouble was soon revealed. All, or nearly all, of the eight wheels were found to be out of round, the eccentricity in some of them amounting to an eighth of an inch.

This incident shows the importance of thoroughly testing the accuracy of wheels before putting them in service, and also illustrates the peculiar and unsuspected difficulties car builders have to contend with in their efforts to serve their employers and the public.—*Nat. Car-Builder.*

A WRITER in *Hygiene Pratique* states that boots and shoes may be rendered waterproof by soaking them for some hours in thick soap water. The compound forms a fatty acid within the leather and makes it impervious to water.