THE PROBOSCIS AND LANCETS OF THE STABLE FLY.

BY J. MICHELS.

During one of the annual plagues of the house flies, I was much surprised to notice one of these little creatures escape from my hand, which had just received quite a sharp wound, such as would be delivered by some lancet-bearing dipterous insect.

Being very familiar with the anatomy of the common house fly (*musca domestica*), and knowing it to be incapable of such an act, I determined to secure the next specimen that informed me of its presence in this emphatic manner.

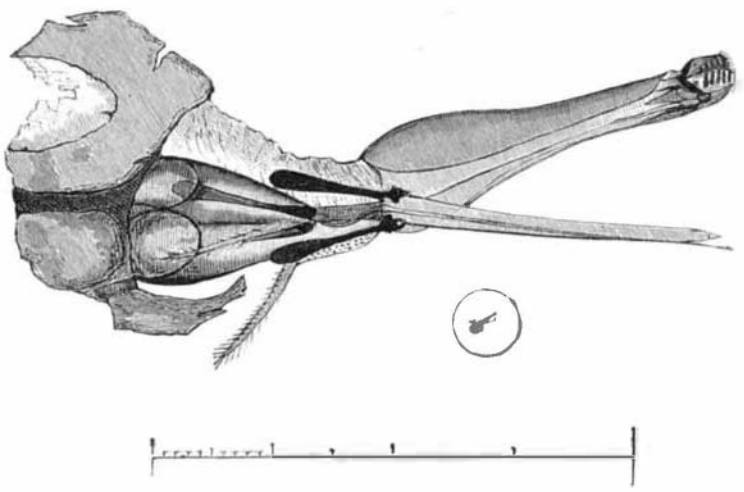
The following day the opportunity came, and when my little visitor had recovered from the alarm caused by the rather sudden withdrawal of my hand, he soon returned when my wrist was courteously placed at his disposal, and he now, without interruption, leisurely regaled himself at my expense.

I now made my observations and found that, although the fly closely resembled and, to the casual observer, would probably be mistaken for one of those with which we are all but too familiar, and whose apparent hostility to the nervous, the irritable, and bald has furnished "Leech" and other caricaturists with a subject for many a sketch, still, on closer observation, the well known proboscis of the house fly, terminating with a lobe, was absent, and in its place a sharp pointed tube-like instrument was seen.

Death by an overdose of chloroform, followed by a dissection of the parts that appeared novel, was soon accomplished, and the same, after proper preparation, permanently mounted in balsam in the usual manner.

A microscopical examination, with a good 1 inch objective, at once revealed the formidable nature of the apparatus at the command of this innocent-looking fly.

As a good drawing saves a long description, I offer one made by "*camera lucida*," which faithfully represents the proboscis and lancets thus prepared, the object in the small circle showing its real size.



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I would direct attention to the strong bayonet-looking lancets, and the powerful muscular levers that propel them at the will of the insect; these lancets, called "*setæ*," vary in number from 8 to 2. After dissecting many specimens of the fly in question, I never observed more than two. The proboscis is doubtless a powerful sucking apparatus, the ferocious-looking jaws with which it terminates being arranged to expand and fasten upon the wound made by the lancets.

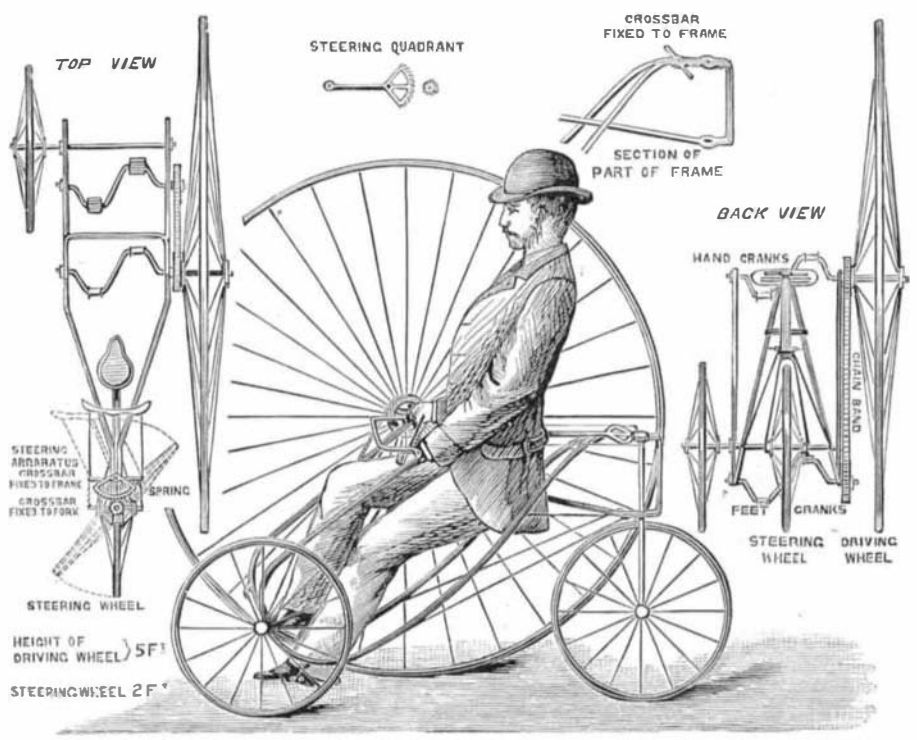
The brush-like appendages, called "*maxillary palpi*," will also be noticed, one of which, in the drawing, is somewhat hid at the base of the proboscis.

I apprehend this fly is the stinging stable fly (*stomoxys*) which sometimes goads horses almost to madness by their severe and incessant punctures. They are clearly not particular in their diet; and wandering into private dwellings and horse cars, attack the first they approach.

IMPROVED TRICYCLE.

We select from the *English Mechanic* the accompanying sketch, with its details, of the Bradford tricycle. It is operated by both hands and feet. The feet rest upon cranks that drive a shaft placed in the lower portion of the framework, and as this shaft is rotated, it communicates motion by means of a chain band to the large 60 inch driving wheel. The shaft of this driving wheel has two cranks, which, being engaged by the hands of the rider, materially assist locomotion. A steering wheel 24 inches in diameter is placed in the rear, being attached to a vertical rod; its upper end being provided with a small gear wheel meshing into the geared arc of a lever, the opposite end of which, formed like a fork, partially encircles the body of the rider. By inclining the body to the right or left, this lever, turning on its pivot, produces a corresponding turning of the steering wheel.

By the arrangement of the tricycle, it may be propelled by either hands or feet, at the option of the rider, or the simultaneous action of both hands and feet may be employed.



THE BRADFORD TRICYCLE.

Separation of Nickel and Cobalt.

The separation of nickel and cobalt has hitherto been a somewhat difficult operation, but by the new method, which I made known a short time ago, this is effected easily and rapidly. The following method of detecting and isolating minute quantities of nickel in commercial chloride of cobalt, supposed to be pure, will give an idea of its practical nature: A few grains of that salt are dissolved in water, and the whole of the cobalt precipitated, with the nickel, by xanthate of potash employed in slight excess, and previously dissolved in a little distilled water. A few drops of ammonia are then added, just sufficient to render the liquid slightly alkaline, and the dark green xanthate of cobalt is collected on a filter. The whole of the nickel is in the filtrate, and the whole of the cobalt in the filter. The nickel in the filtrate is precipitated by a few drops of sulphide of ammonium.

Character of xanthates.—Besides the yellow precipitate which the soluble xanthates give with salts of copper, all the insoluble xanthates, on dissolving in nitric acid, give rise to nitrous ether, which is readily recognized by its odor. —*Dr. T. L. Phipson, in Chemical News.*

Repairing Gas Bags.

When small leaks occur in bags used for gas to supply a magic lantern, they can be closed with thick boiled glue mixed with glycerin, in the proportion of 1 part of glycerin to 4 of glue, applied warm to the bag while filled with air. If too much glycerin is added the cement will be sticky, which can be overcome by strewing powdered soapstone over it; if too little glycerin is added, it is too hard. If the holes or rents are large, the glue is made quite stiff and applied to strips of soft leather and this applied as a patch. Glue is better for this purpose than caoutchouc or gum.

New Mechanical and Engineering Inventions.

An improved form of Tubular Bridge has been devised by Mr. George E. King, of Des Moines, Iowa. The posts, counter braces, and lateral braces, are connected to a tubular arch by pins passed through angle irons rigidly secured to the arch, and also to eyes formed on the posts and braces. The advantage of this arrangement is that the tube is not weakened, nor so perforated that moisture can enter between the joints of the plates.

In the Manufacture of Twist Drills, it is required to clear them or reduce them in diameter from the cutting edge of the spiral. The drill is held in a spindle. A finger engages the spiral slot in the drill as the latter is moved downward, so that it is always kept in proper relation with the cutter, the inclination of which may be varied as desired.

Messrs. George and Samuel Isaacs, of New York city, propose a new Rail Cleaner for cars, which consists of improved bushes, which are held down by levers, upon the track in front of the wheels. Arrangements are provided to prevent the brush head turning out of true, and the tufts are so fastened in the heads that the bristles are prevented from becoming cut or broken. This device is well suited for use on street cars.

An improved Hand Loom has been devised by Messrs. W. P. Clements and Jas. H. Cagle, of Davidson River, N. C. The new features include a shuttle box and throwing apparatus, and a new heddle construction. When the batten strikes the cloth, the weight of the shuttle and clamp piece relieves all pressure from the shuttle, so as to facilitate the throwing of the same, and the arrangements are such that when the operator has to stop, to tie a thread or for any other cause, he can instantly go on with the work without being required to find the treadle in which he left off work.

An improved Pipe and Bar Cutter, which cuts off the pipe or bar very quickly and smoothly, has been patented by Mr. Jesse Astall, of Galveston, Tex. By simply turning a hand nut the cutter is fed forward. There is a device for holding the pipe very securely as the piece is cut off.

A new Zinc Smelting Furnace has been devised by Mr. Octavius Lumaghi, of Collinsville, Ill. The new feature consists in constructing the back wall of the furnace with holes through it. Removable plates are provided in combination with retorts through their butt ends, for allowing a circulation in them when desired. In smelting, all that can be got in the form of spelter is thus obtained, and then all the zinc that remains in the retorts in the form of oxide is extracted.

Mr. James Craik, of La Cross, Wisconsin, proposes a new Bail and Driver for Millstones, which carries the stone with a positive motion, and at the same time permits the stone to poise itself with the utmost freedom on the top of the spindle. The construction is both simple and ingenious.

A new Car Brake, devised by Mr. Jacob J. Anthony, of Sharon Springs, N. Y., comprises a cylinder containing pistons, which are forced apart by steam, water, or air, under pressure. By this means levers are moved so as to force the brake shoes against all the wheels simultaneously, and with an equal pressure on both sides of each wheel.

A new Leather Rounding Machine has been devised by Mr. Thomas S. Reed, of Calais, Vermont. The upper roll has one of its journals supported in a pivoted and the other in a sliding box. This facilitates the purpose of the machine, which is gradually to compress the leather by passing it through different grooves until it has attained the required diameter.

For moving cars about in car shops, yards, etc., over short distances, Mr. Andrew Lebus, of Flora, Ill., has contrived a simple and powerful Jack. A clamp is secured to the car sill, and a plate having a V-shaped notch is applied to the rail. A lever is then moved, throwing a rod forward, which propels the car. The lever is then moved backward, the plate takes a new hold, and the operation is repeated. This invention will doubtless prove of much utility.

A new Ballast Distributing Car, for ballasting a railroad track with broken rock, gravel, sand, etc., has been devised by Mr. Adam B. Dockstader, of Sherman, Tex. In the bottom of the car are a number of spouts, which are closed by a series of pivoted boards, which may be moved simultaneously by a lever from the platform. With this construction the ballast can be discharged as desired while the train is in motion. This will doubtless materially facilitate labor.

A novel Mail Bag Catch, for taking mail bags and delivering them from a car while the latter is in motion, has been patented by Mr. George F. Shaver, of Westfield, N. Y. A rod on the car seizes a bag suspended from the roadside crane, while another rod on the latter, at the same time, takes a bag suspended from a frame attached to the car. The bag entering the car slides inward and strikes a curtain, so that it is subjected to no injurious shock.

Those of our readers who may desire further information concerning any of the above described inventions, can obtain the same by communicating with the inventors at the addresses named.

New Building Inventions.

A novel Eaves Trough Machine, devised by Mr. William J. Barber, of Covington, Ind., forms the trough of metal by causing the sheet to pass through suitably shaped rollers, which give it the necessary turns and beadings. This is a very simple and ingeniously constructed machine.

A new Vault Cover and Railing has been invented by Mr. Clarence H. Straight, of Bryan, Ohio. It consists of racks, which may be turned downwards to rest upon the pavement or floor, and so to close the opening, or to turn upwards to serve as a railing for the same.

For Holding Window Sashes in any desired position, Mr. Zelotes Curtis arranges toothed eccentric cams, that are pivoted to the casing of the fastener and operated by bell crank levers, which turn on a common pin, and are acted upon by a spiral spring. This device retains the sash securely and is very easily operated.

Mr. Daniel T. Keeffe, of Glens Falls, N. Y., also has devised an improved Sash Holder, which sustains the window at any height without the use of cords or weights. A roller is provided with a flanged bearing frame that is acted upon by a helical spring. This is combined with a screw-threaded plug, which enters the casing. The roller, by friction, holds the sash as desired.