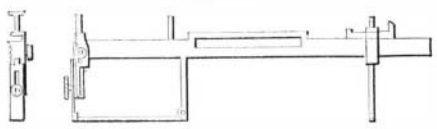
MISCELLANEOUS USEFUL INVENTIONS.

We select this week, from Knight's "Mechanical Dictionary,"* engravings of an interesting series of machines relating to the gaging and setting of axles. We also give illustrations of a variety of baggage checks, from which a good idea of the many ingenious devices, which have been invented for insuring the safety of baggage, may be gathered. Two novel forms of awning, a couple of useful instruments, and some tools complete the list of inventions here presented.

AXLE GAGES

are represented in Figs. 1 and 2. By these implements the spindle is so adjusted in relation to the axletree as to give the required swing and gather. The swing is adjusted to give the downward inclination, and the axle is bent to conform to this guide. The gather is given by the adjustable standard. The swing is the outward inclination of the top of the wheel, and is to meet the requirements of the conical

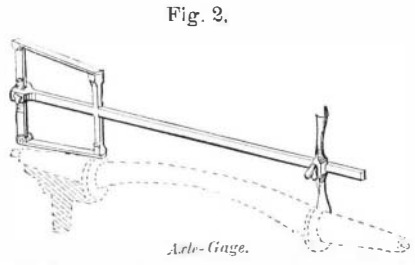
Fig. 1.



Stratton's Axle-Gage.

axle, so that the bottom edge of the spindle shall ride out horizontally. Were the spindle destitute of swing, the wheel would ride outward, bearing heavily against the linch pin or nut. The gather is the forward inclination of the spindle relatively to the general line of direction of the axletree. Fig.

Fig. 2.



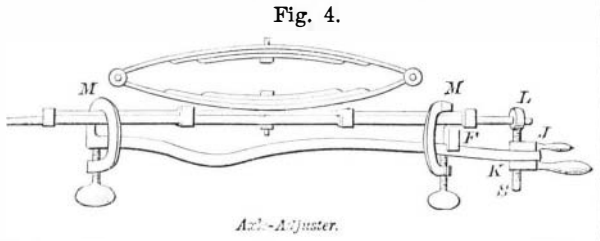
Axle-Gage.

2 shows a gage in which the concave end of the sliding gage is placed on one spindle and the other spindle is set by adjustable bars. The

AXLE SETTING AND ADJUSTING MACHINES

are shown in Figs. 3 and 4. The first is for setting the spindles true on the ends of the axletrees, giving them the required set and gather. The uprights, A C, on the frame, B, are adjustable to any distance. The upright, C, has a jointed

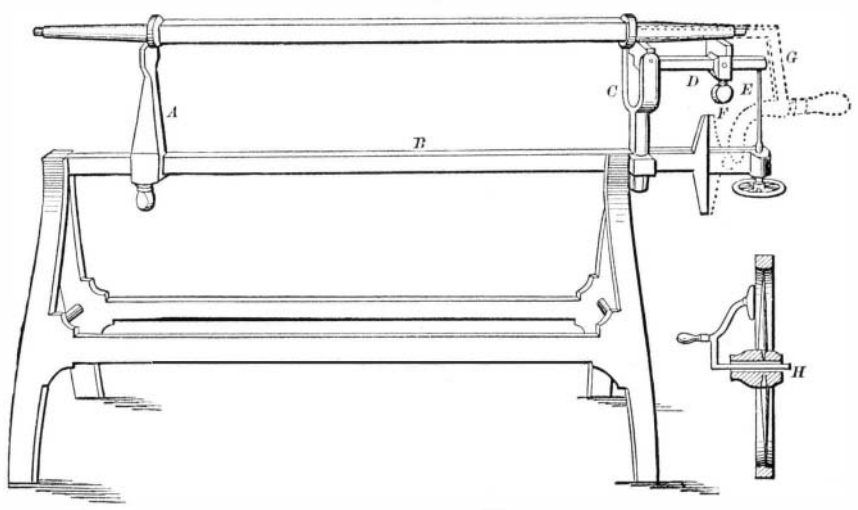
Fig. 4.



Axle-Adjuster.

bar, D, projecting from it, which rests on a screw rod, E. This bar is a straight edge, to show the taper of the axle; for when the same is placed on the uprights, and the stop, F, brought up to it by the screw, the taper will be given by the gage, G, shown in dotted lines. If the axle does not touch the stop, F, it is too high on the end, and must be brought down by the blacksmith. If it touches at the end and not at the shoulder, it is too low and must be treated accordingly. The axle is then turned end for end, and the operation is repeated. The T end on the frame is to set the T foot of the gage against, as shown. The angle of the gage is obtained by setting the gage foot against the spoke, and putting the straight edge, H, in the axle box, as in the smaller figure. A more portable form of the same general character is shown in the axle adjuster, Fig. 4. It consists of a bar hooked to the axle tree in two places. The bar is fastened by the clamp, M, and fulcrum block, F. The eyebolt is hooked over the end of the spindle, and the adjustment of the latter is accomplished by the screw, S, and set nuts, J K.

Fig. 3.

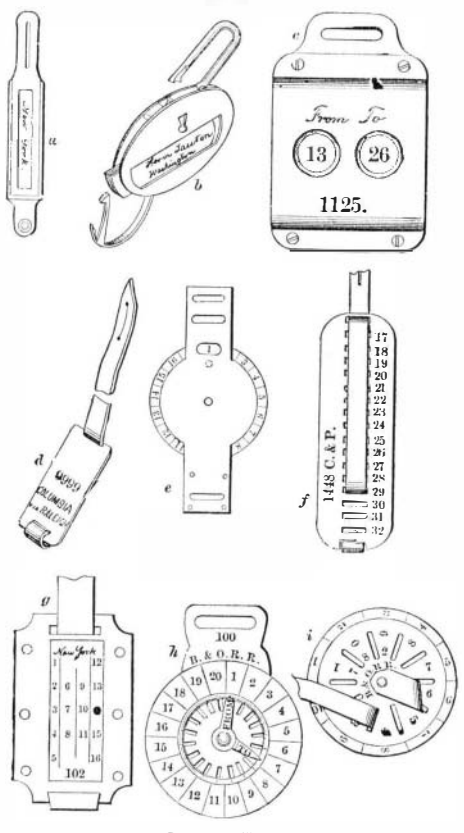


Gorton's Axle-setting Machine.

BAGGAGE CHECKS.

In Fig. 5, *a* shows a label holder of two metallic portions, which serve as a frame for a card, on which is inscribed the destination. *b* is a lock-up case for several of such cards, any one of which can be exposed as desired. *c* has two series of numbers on wheels, and the places of departure and destination are indicated by numbers agreeing with the schedule of stations. *d* has the places of departure and destination on the sides. Either reading may be hidden by the strap. On the return trip the other side of the check is shown by the inverse reeving of the strap. *e* has a disk with a circumferentially numbered margin. A number agreeing with the schedule number of the station for which the baggage is bound is exposed at the opening on the plate. By an arrangement of the strap, the latter is made to hold the disk so as to secure the required presentation of the figure. *f* has a series of station numbers in a row; the strap is so rove through the slots as to indicate the station (29) at which the baggage is to be put off. *g* is a metallic case inclosing a card with the numbers of the stations printed thereon. A punch mark indicates the station of destination (14 in the engraving). The strap holds the parts of the case together. *h* has a dial plate and pointers, which indicate the stations of

Fig. 5.

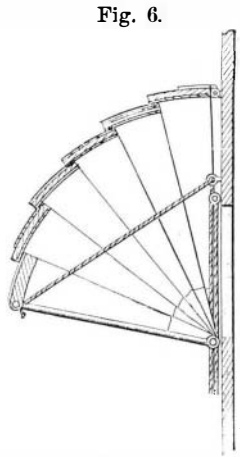


Baggage-Checks.

departure and destination. *i* is a metallic disk with radial slots and corresponding numbers. The strap is so rove through the slots as to give the required indication. The

AWNINGS,

Fig. 6.



Arched Awning.

shown in Figs. 6 and 7, are made in two forms. In Fig. 6 the lower edge is attached to the boards which are secured to the side extensors, which are made in toggle sections, operating as lazy tongs. The upper edge is coiled on a roller held by a pawl. A spiral spring keeps the arm extended. In Fig. 7, front and tapered side slats slide one beneath the other, and are connected by plates with headed studs which work in slotted plates affixed on the adjacent slats. The end slats collect like the folding parts of a fan; the roof slats take position in vertical parallel series when closed. The

ALLOY BALANCE,

represented in Fig. 8, is intended for weighing those metals whose proportions are stated decimally, being constructed on the principle that weights *in equilibrio* are inversely as their distances from their points of support. The point of suspension, *a*, of the balance is adjusted until the arms are respectively as the two stated proportions, say 17 tin to 83 copper. The half of the beam is divided into 50 equal parts, numbered from one end; and the point of suspension being adjusted proportionally, the weight, *w*, is brought to a position where it enables the beam of the empty balance to stand in equilibrium. A quantity of copper being then placed in the scale suspended from the short arm will be balanced by the proportionate quantity of tin in the other scale.

THE BAROMETROGRAPH.

Fig. 9 is a self-adjusting barometer. The pressure of the atmosphere affects four metallic boxes having undulated faces. In each of these a vacuum exists, and they are attached together, so that, for an equivalent variation of pressure, the movement is four times greater than for one box only. A strong steel spring, R, acts upon the boxes against the atmospheric pressure, and controls the lever, L, at B

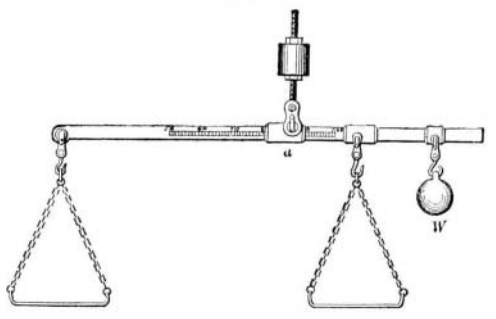
The indications of the lever are registered as follows: A cylinder, C, is revolved by clockwork, and makes one revolution per week. It carries blackened paper, against which the

Fig. 7.

Lazy-Tongs-Extension Awning.

point of a spring attached to the lever rests, tracing a white line on a black ground. At the end of each week the paper is changed for a fresh one, the record on the old one being

Fig. 8



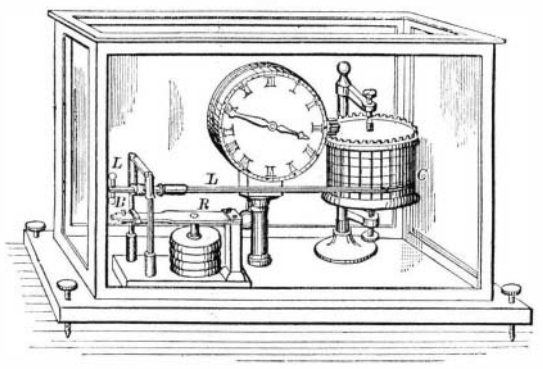
Robert's Alloy Balance.

protected by a coat of varnish.

AWL HANDLES

are represented in Fig. 10. The first is a locking pliers,

Fig. 9.



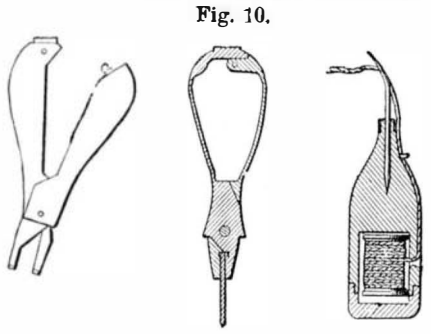
French Barometrograph.

whose jaws are adapted to hold either of the tools; those not in use are inclosed in the hollow handle when the latter is closed. A boss on the end of the handle forms a hammer. The figure shows an elevation open, and a section closed. The eye-pointed awl, also represented, introduces the thread. Fig. 11 is an

AXE TESTER.

The axe to be tested is slipped upon the bar,

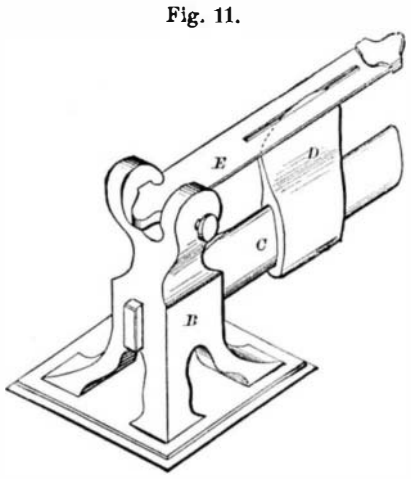
Fig. 10.



Awl-Handle. *Lasting-Awl.*

C, toward the standard, B, until it fits tightly. The gage plate, E, is then allowed to descend upon the edge of the axis, D, when, by placing the eye over the slot, the slightest variation in shape may be detected.

Fig. 11.



Axe-Tester.

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