

MODERN BUILDINGS

THEIR PLANNING, CONSTRUCTION AND EQUIPMENT

BY

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Modern buildings, Their Planning, Construction and Equipment

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Hinges

Iron hinges are [generally](#) used for softwood [doors](#), but in good work they should be of wrought and not cast iron, the [extra](#) cost of the former being more than compensated by their greater durability and ease and freedom of working.

For hard-wood doors, brass, bronze, or gun-metal hinges should be selected generally, except in the case of Gothic or other ornamental strap hinges, when the selection of the metal will be governed by taste or price, or by a combination of these two considerations. In specifying hinges, or indeed any ironmongery, it should be borne in mind that these goods are supplied by many different firms and in a great variety of qualities. When it is not desired to stipulate that the ironmongery shall be supplied by any particular firm, great care should be taken to indicate the quality, and the best way to do this is to specify that they be equal to a sample in the architect's [office](#), and to see that the goods supplied comply with this stipulation.

Among hinges, one of the most generally known is the simple Tor cross gamet, illustrated by Fig. 178 (A), its chief use being for ledged and braced doors, the edge of these doors not allowing sufficient fixing for [butt](#) hinges. The heavier qualities are also suitable for framed doors where greater security of fixing is required than can be obtained with a butt. H. and H. L. hinges, as shown in Fig. 35 (B and C), are also very suitable for this purpose, and have this additional advantage, that they can be fixed in any position on the hanging stile, and need not be opposite a top, bottom, or other rail.

For gates, [stable](#) doors, etc., the simplest form of hinge is the hook and strap, Fig. 178 (E and F), made with the hook on a plate, on a driving staple (E), or on a forged two-way strap (F) for building in. This form of hinge, on account of its simplicity, readily lends itself to special design by the architect where this is desired. For heavy gates, stable doors, and similar positions, strap hinges are made with a double strap, either of equal or unequal length (G). One of the best hinges for gates and external heavy doors, to coach-houses, stables, etc., is Collinge's spherical gate hinge, shown at H in Fig. 178, made on the cup-and-ball principle, the cup being on the post or pier and the ball-shaped pin on the gate strap. It will be noticed that the pin has a projecting lip, fitted with a leather washer to exclude water and dirt from the cup, which is filled with oil. These hinges are extremely durable and easy in their working. Fig. 178 (I) illustrates Collinge's double-strap hinge for swing gates. The joint of the top hinge is similar to that last described, and the bottom works on two pins, making the gate self-closing. Messrs. James Hill & Co.'s self-closing hinge for swing gates, illustrated at J, comprises a top hinge with cup joint and a bottom self-closing hinge consisting of two inverted half cups on the gate, working on two balls on the post or pier. One pair works when the gate is swung inwards, and the other pair when it is swung outwards, both coming together only when the gate is closed.

While on the subject of strap hinges it will be well, perhaps, to mention Gothic and other ornamental hinges. These in an age of hand labour were a natural artistic development of a strap hinge, but in modern work they too often consist of a pair of butt hinges and ornamental hinge fronts, as they are termed, which are mere shams, having no connection whatever with the actual hinge.

The most generally used hinge of modern times is undoubtedly the butt hinge, as shown at G in Fig. 179, which is made in a variety of metals and sizes suitable for any framed door. These hinges are screwed to the edge of the door and to the rebate of the frame or lining. When brass butts are used for heavy doors, or where there is much wear, they should be fitted with double steel washers, as shown at D, to form the wearing surfaces in each joint of the knuckle. Projecting butts (Fig. 179, D) are made with wider cheeks, so as to project beyond the face of the door in order to allow it to open clear of architrave or other projection.

Rising butts, as at A, have a spiral joint on the knuckle, which raises the door as it is opened clear of carpets, etc., also giving it a tendency to close by its own weight. Where rising butts are used, the top of door and the top rebate of frame must be splayed.

Ball-bearing butts have two cup-and-ball joints on the knuckle, whereby friction is reduced to a minimum. Fig. 179, C, illustrates an improved ball-bearing hinge manufactured by Messrs. James Hill & Co. The ball races which are adjustable are kept well apart, and the cups made separately, which enables them to be properly hardened.

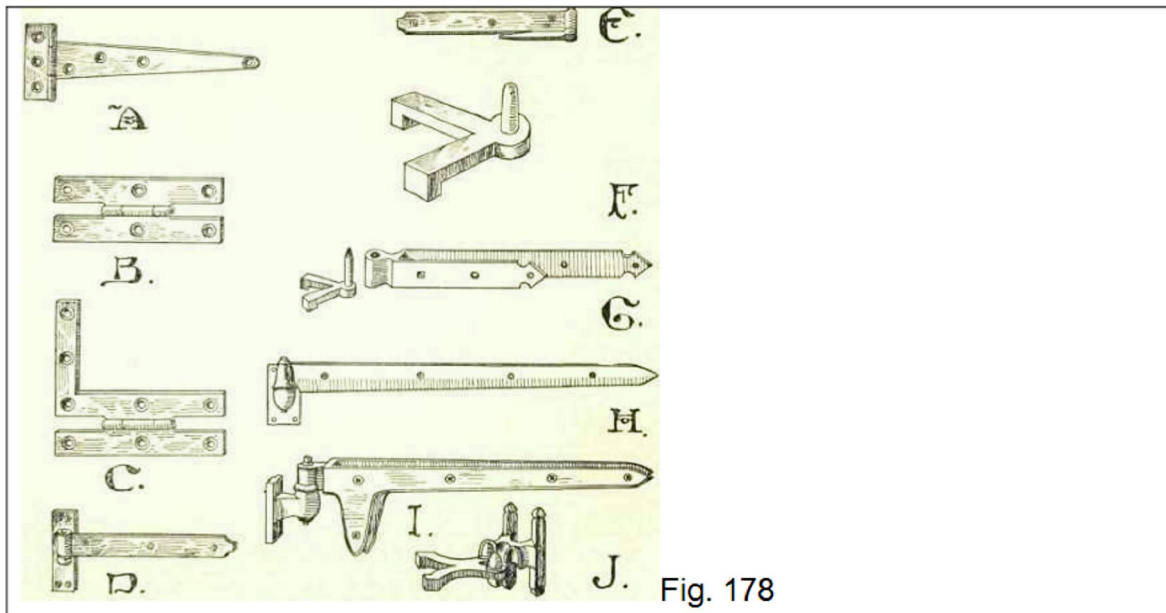


Fig. 178

Cranked butts are only required for special positions, and have to be made to order.

Back-flap hinges (B) are made to allow of the leaves or flaps folding back against each other. Counter hinges (E) are constructed with a double knuckle and two pins working in a loose socket. The hinge is let in flush with the counter top, with the knuckles on the under side, so that, although the flap can be opened right back on to the counter top, there will be no projection above the counter when it is closed. Fig.

179, H, shows an egg joint pew hinge, which is practically a projecting butt with a strong knuckle shaped so as not to tear garments.

Parliament hinges (F) are made to allow of shutters or doors opening clear of a reveal, and lying on the face of the wall, as shown at Fig. 179, I.

Of door springs and spring hinges there are a great many varieties on the market. Spring hinges should always be used in new work in preference to door springs, except for the commoner description of doors or in unimportant situations. Door springs are unsightly, and generally speaking their unsightliness increases with their effectiveness.

All springs and spring hinges should, in good work, have a check action - that is to say, when the door is within a few inches of the closing point the spring should be checked and the door allowed to close gently, to avoid banging backwards and forwards in the case of swing doors, and slamming in the case of doors opening one way only.

The check action is generally obtained by means of a piston coming in contact with a cushion of air in a piston box, from which the air can only escape slowly. Thus the violent swing of the door is checked and slowed when near the closing point.

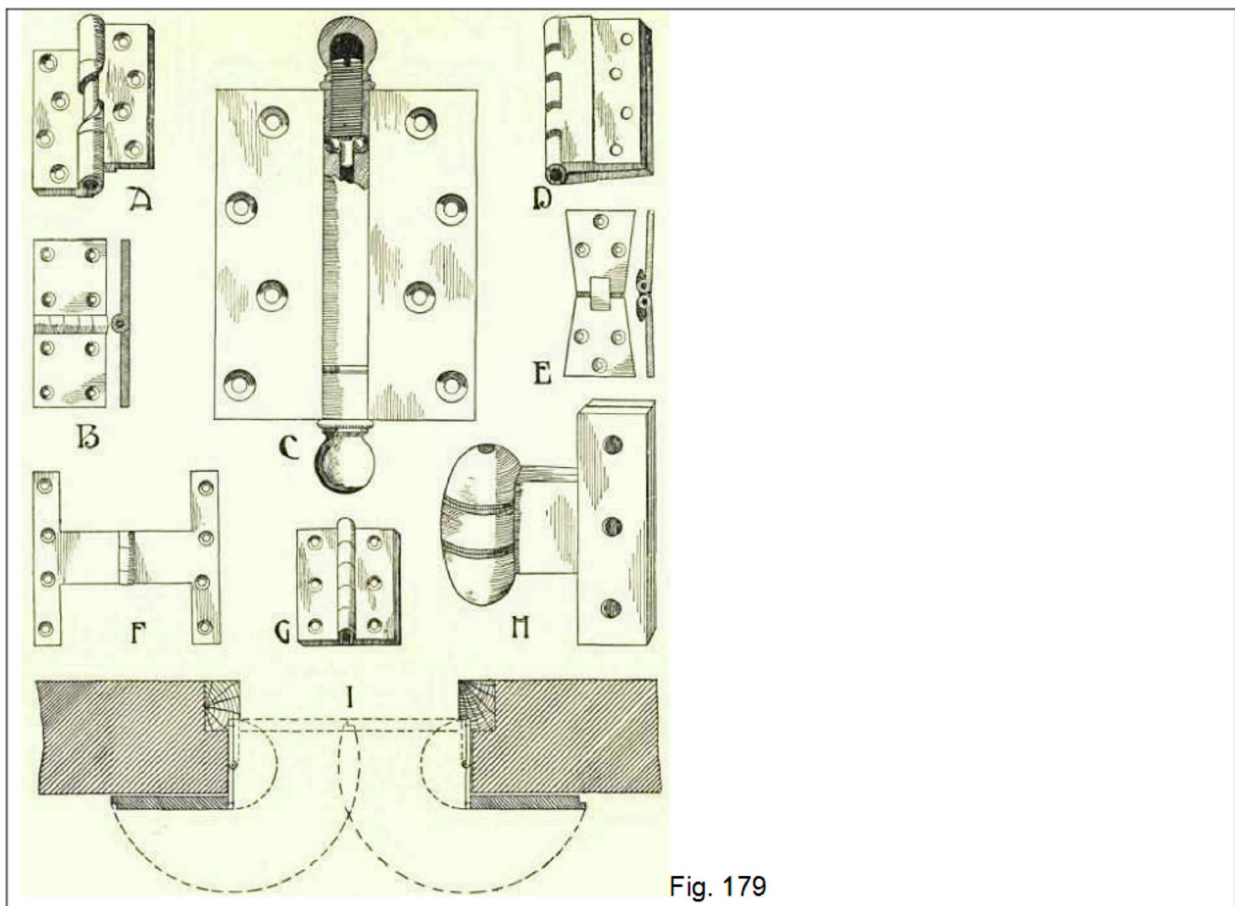


Fig. 179

One of the simplest and most effective springs for unimportant positions is the ordinary adjustable coil spring, fixed at one end to the frame and at the other to the hanging stile. The spring is often wrongly fixed with the ends parallel to the edge of door, causing the spring to follow the form of a letter S. It should be very slightly extended, and fixed as shown at Fig. 180, A, and care should be taken that it is fixed so that opening the door winds the spring up.

A helical spring is shown at B. The spring is enclosed in the barrel attached to the jamb, and can be readily adjusted as to strength. There is a small [wheel](#) in the end of the arm, which runs on a plate screwed to one of the rails of the door.

Weston's steel-rod door spring is illustrated at C. The spring is obtained by means of a twist in the rod itself, and its strength can be regulated by means of the capstan head.

Figs. 181 and 182 illustrate respectively the "Improved Norton" and the "Blount" door springs and pneumatic checks, while Fig. 183 illustrates the "Bardsley" of which Messrs. Nettlefold & Sons are the sole agents. This spring has an oil check, which it is claimed is superior to the pneumatic check, and it has a releasing device by means of which the checking power is removed when the door is nearly closed, thus allowing the spring to exert its full power in order to latch the door. There are several other makes of check springs differing in [details](#).

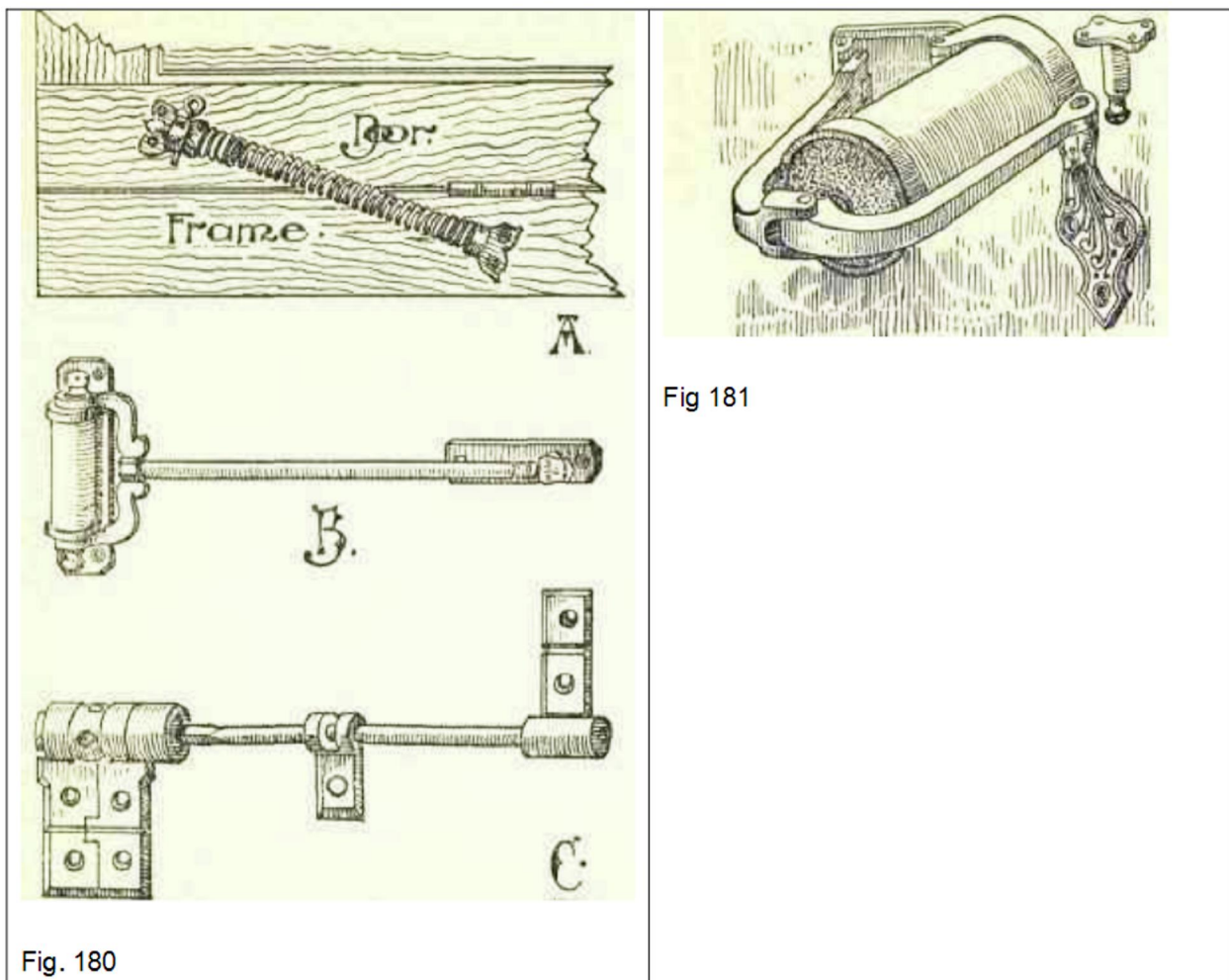


Fig 181

Among the several varieties of spring hinges the neatest and most effectual are those contained in boxes let in flush with the [floor](#) or paving, and having top centres secured to top of frame. They can be had either with or without check action. There are several makes of these hinges, all very similar in outward appearance, but differing in [construction](#). They are made with either single or double action, the former for doors opening one way only, the latter for swing doors. Fig. 184 is a plan, with top plate

removed, showing the construction of "[Smith's](#)" double action hinge, by which it will be seen that on opening the door in either direction a set of spring rings are forced open. In the "Climax," illustrated by Fig. 185, the power is obtained by means of two spiral springs. Both "Smiths" and the "Climax" are made in varying strengths to suit doors of different weight. "Hill's Improved Swing Door Centres," illustrated by Fig. 186, are actuated by a single spiral spring, the strength of which can be adjusted to suit varying weights of doors by means of the capstan head B; while the capstan headed [screw](#) marked A enables the door to be set perfectly true, and so saves much time in fixing. The "Slave" single-action and the "Slave" double-action floor springs with pneumatic checks are respectively illustrated at A and B in Fig. 187.

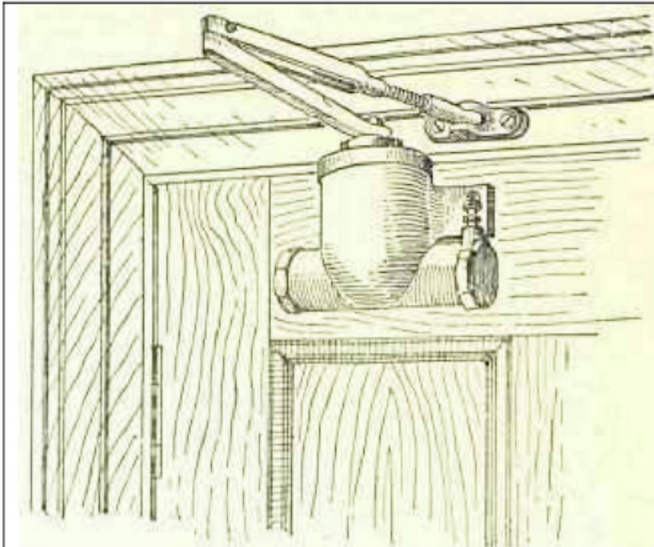


Fig. 182

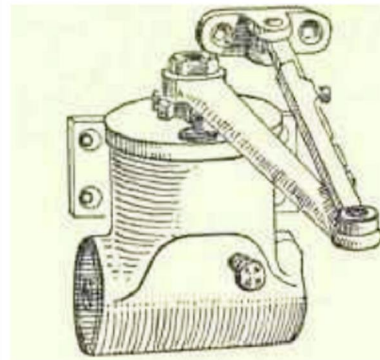


Fig. 183

The floor springs patented and manufactured by Robert Adams comprise several patterns suitable for various positions. They are made either with or without checks, and the checks are either pneumatic or hydraulic. The latter pattern is generally to be preferred, as the liquid being oil, the internal parts are always kept lubricated. Fig. 188, A and B, illustrate respectively the "Crown Victor" (double action) and the "London Victor" (single action). Both can be had either with or without oil checks, and it will be noticed that these hinges take up much less space than most other patterns. The special features of the hinge comprise a wide angle of opening, (in the case of the "Crown" the door can be opened to an angle of 135° and in the case of the "London" to an angle of 180°); a large size internal spring A, which ensures great elasticity and durability; a capstan screw C, by means of which the closing power can be regulated; an automatic compensating action, which prevents any slackness from wear; a safety valve to prevent injury by unduly violent use; and a screw S, by means of which the speed of closing may be regulated.

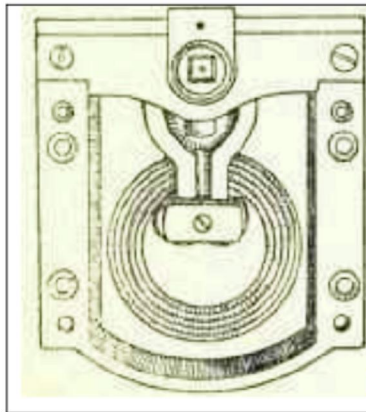


Fig. 184

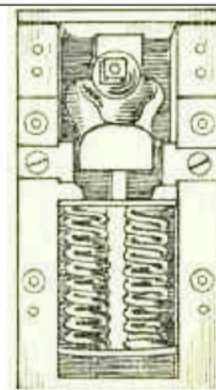


Fig. 185

Fig. 188, D, illustrates the "King Victor" double-action floor spring for exposed situations. This hinge is designed specially to resist strong currents of wind blowing in one direction, but to open easily the reverse way. This is effected by means of separate and independent closing springs, only one of which comes into action at a time, according as the door is opened in or out, and each of which can be regulated for strength independently. The spring is provided with a silent oil check, and possesses most of the advantages claimed for the "Crown." It will not, however, open to quite such a wide angle, and a stop should be provided to prevent breakage by undue violence. The "Hurricane Victor," specially designed to stand exceptional wear and to open 135°, is shown at C, but a stop should be provided to prevent its opening beyond this. Each spring can be independently adjusted, so that the door may be set to resist a hurricane on one side and be easily opened in the opposite direction. This hinge is without the check action. Special patterns are catalogued for situations where the ordinary floor springs cannot be employed, as, for example, immediately over a girder. The several shoes and top centres for use with the "Victor" hinges include adjustable patterns, by means of which the door can be adjusted both laterally and vertically after the hinge is fixed.

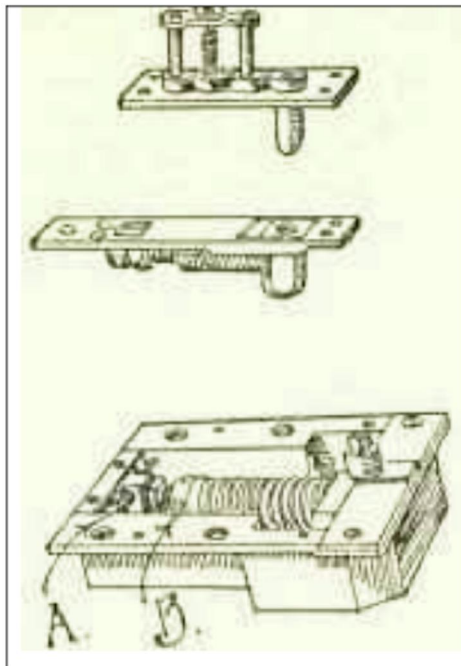


Fig. 186

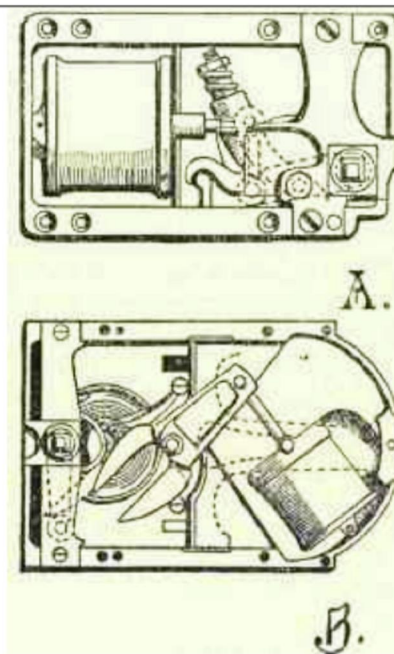
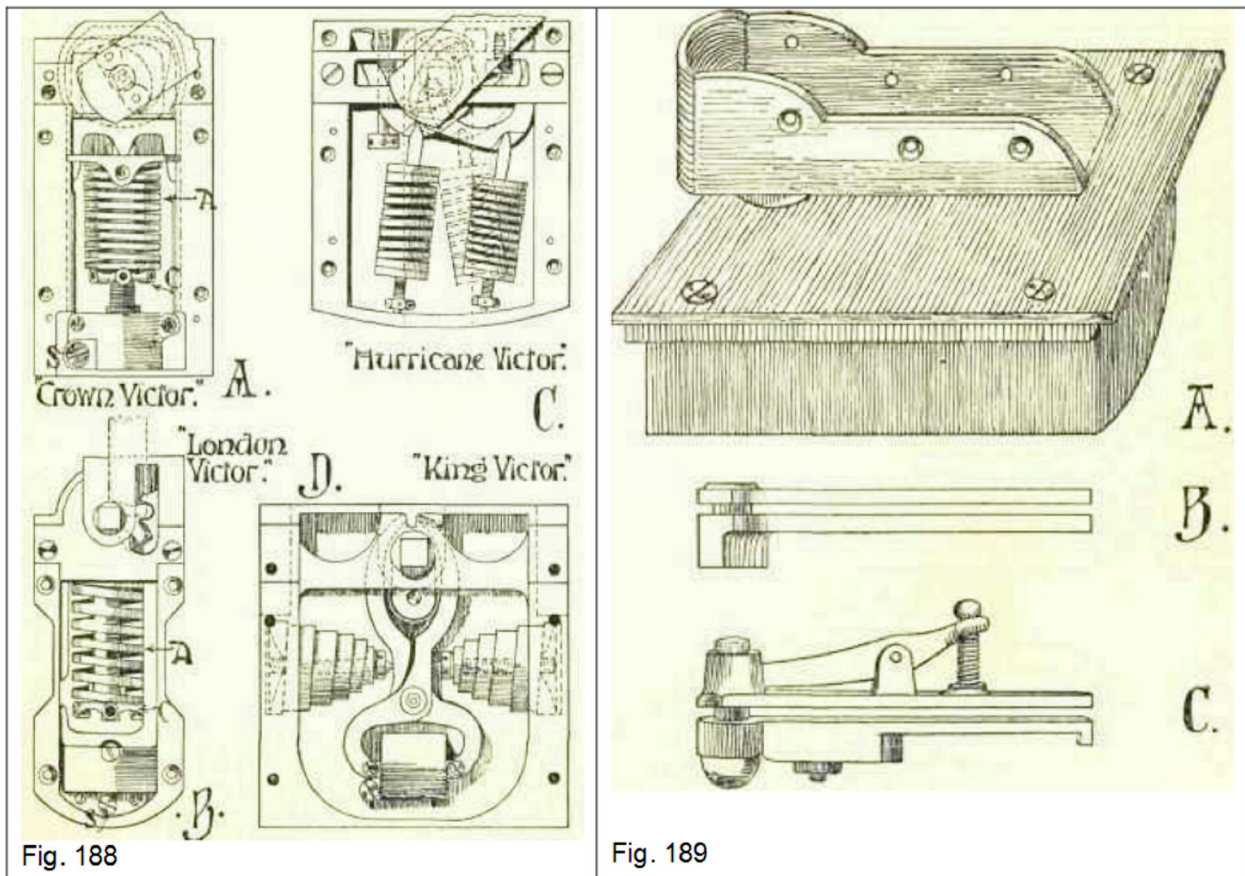


Fig. 187

Water-tight floor springs have a groove running round the flange of box, which is filled with rubber or other suitable substance to form a water-tight packing when the cover-plate is screwed on.

It should be noted that some of these [hinges](#) have special outer boxes for fixing in floors other than wood. Fig. 189, A, is a sketch of [Smith's](#) floor spring, showing the shoe for [door](#), and is typical of this type of hinge. Fig. 189, B, shows a plain and C an adjustable top centre.

Of spring hinges other than floor springs, one of the best known is Gerish's. The single-action hinge is shown at Fig. 190, A, and the double action at B. The spring is contained in a cylinder, and is let into a circular mortice in the door frame. A chain is attached to the spring and passes through a hole in the hinge-plate attached to the frame, and in the case of double-action hinges through the middle plate also, and is attached to the plate screwed to edge of door. The double-action hinge consists of two knuckles, one of which comes into play when the door is opened in one direction, and the other when it is opened in the other direction. A pair of double-action spring hinges is usually considered to consist of one spring hinge and one blank. Single and double-action helical spring [butts](#) are illustrated at C and D, and the double blank hinge at E. The helical spring or springs are contained in the cylinders. These hinges can be had with capstan heads for regulating the strength as illustrated, or non-regulating. The action of the single-acting hinge will be obvious from the illustration; the double-action hinge consists of two cylinders, and three plates corresponding to the two knuckles and three plates of Gerish's hinge, the only difference being that in the one case the spring is contained in the hinge joint and in the other it is separate. F and G illustrate an improved double-action spring hinge and blank manufactured by Messrs. Nettlefold & Sons, the advantages claimed for it being rapidity of fixing, neater appearance than the three leaf varieties, and that, unlike them, it prevents sagging of the door. The blanks are on similar principles to the hinge.



The "Victor" butt spring for single-acting doors, as shown in Fig. 190, H, manufactured by Robert Adams, is made with a silent check action, and the door can be thrown fully back. This hinge is fixed near the bottom of door, and an ordinary butt is used at the top.

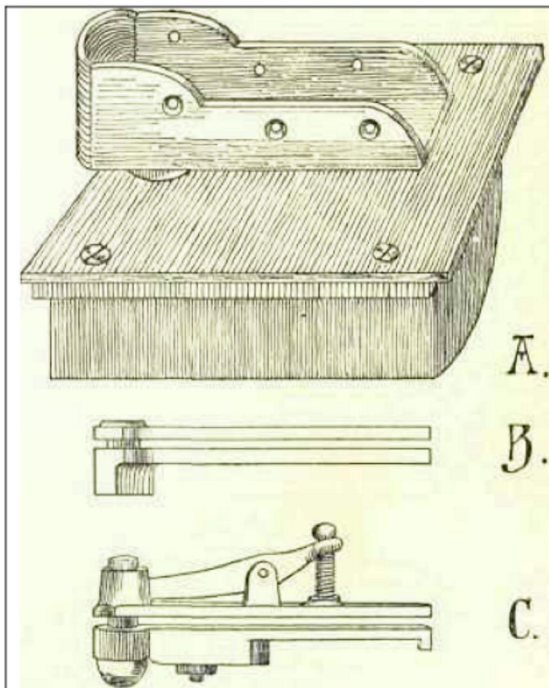


Fig. 189

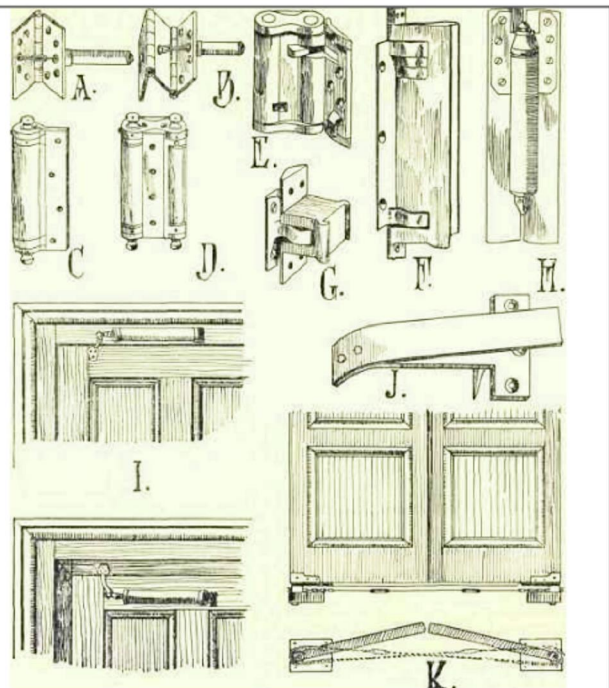


Fig. 190

Most of these hinges are without check action, but an independent door check such as the "Magic" (I), can be used in the case of single-action doors, or one of the many door slams on the market, such as that shown at J, may be used.

Fig. 190, K, represents the special "sympathetic" door gear for opening and closing double-hung doors simultaneously. It can be adapted to open both leaves at the same time either in the same or opposite directions.

The many varieties of hinges which are specially made for fittings and cabinet purposes are scarcely within the scope of this paper. They can be selected from the catalogue of any first class firm dealing with this class of goods.

In dealing with furniture and fastenings, money will be well spent in selecting the best. Where economy is a point to be considered it may be obtained by simplicity of construction, but the workmanship and material should be of the best. Where the very cheap locks fail most is in the inferior workmanship and materials, and the extreme lightness of the working parts.

Locks must be chosen according to their position and use. In many situations the mechanism of a very elaborate lock would be quite thrown away.

Ordinary door locks are divided into two kinds as regards the method of fixing them in the door, namely, "Rim locks," which are fixed on the face of the door; and "Mortice locks," which are let into a mortice on the edge of the door. Each of these two kinds is again divided into "Dead - shot locks," or "Dead locks," as they are often called, "Latching locks," and "Two-bolts locks." A "Dead-shot lock" consists of one bolt actuated only by a key. A latching lock consists of a spring bolt actuated by a handle, but such that it can be locked by means of a key, rendering the handle inoperative. A two-bolt lock consists of a spring bolt actuated by a handle and a dead-shot bolt. A third variety is the ordinary night latch for street doors, which consists of a spring bolt actuated by a handle on the inside and a key without, - generally speaking, however, the key in no sense locks this bolt, the locking being done by means of a small catch or pin on the inside, which renders both handle and key inoperative.

A stock lock is a rim lock in a hard wood instead of a metal case. It is used for stable, coach-house, and similar doors. The angles are sometimes iron bound for strength and protection. This lock is also largely used on church doors, the iron or metal corners generally being ornamental.

A draw-back lock for street doors consists of a spring bolt actuated by a draw-back knob on the inside, with a hook or catch to hold the knob back when it is not required, and a key to lock the spring. Such are made as rim, mortice, or stock locks.

Fig. 191 illustrates, at A, B, C, D, and E respectively, a single-bolt iron-bound stock lock (A), a rim dead lock (B), a two-bolt rim lock (C), a two-bolt mortice lock (D), and a rim night latch (E). Mortice locks can also be had of an upright form, suitable for doors with narrow stiles, and centre bit mortice locks are made to fit into the cavity drilled by a centre bit.

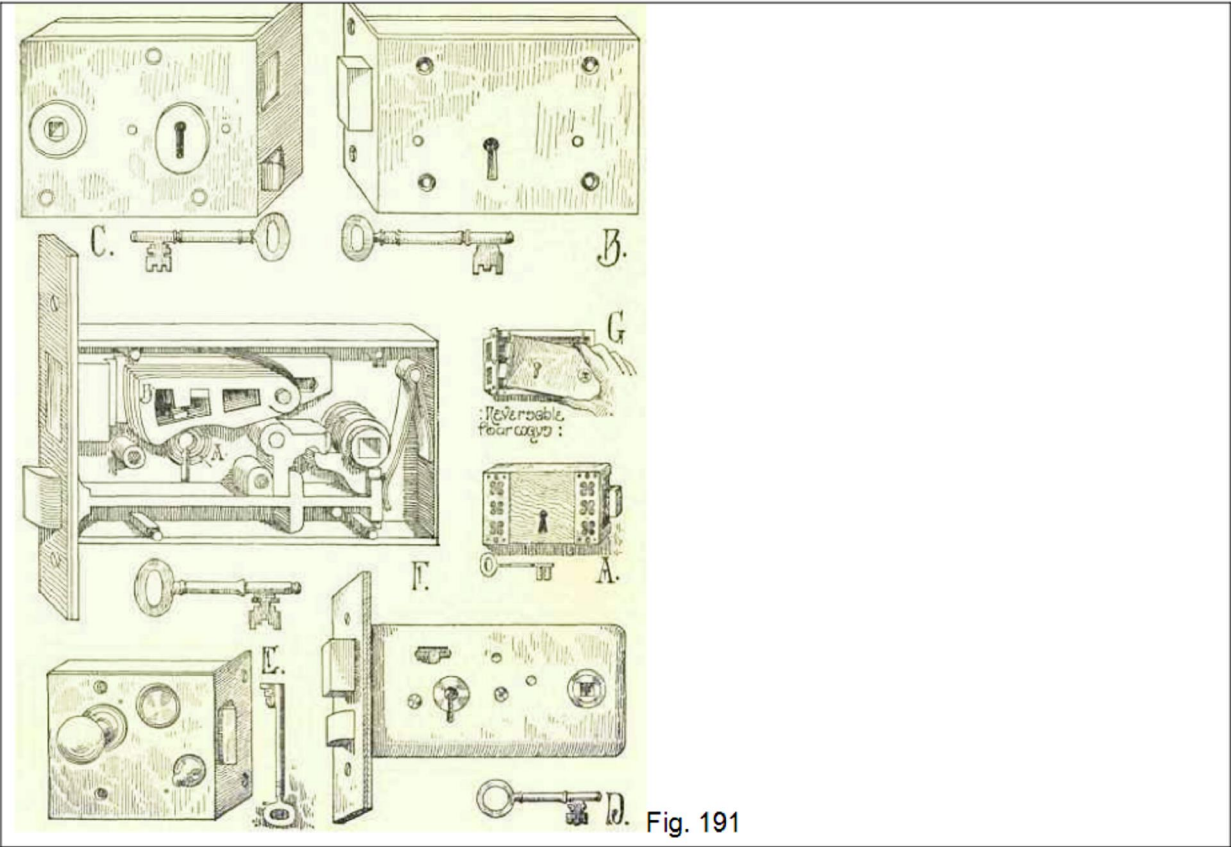


Fig. 191