The British architect, or, The builders treasury of stair-cases : ... illustrated with upwards of one hundred designs and examples curiously engraved by the best hands on sixty folio copper-plates

Abraham Swan
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THE
BRITISH ARCHITECT:
OR, THE
BUILDERS TREASURY
OF
STAIR-CASES.

CONTAINING

I. An easier, more intelligible, and expeditious Method of drawing the FIVE ORDERS, than has hitherto been published, by a SCALE of Twelve equal Parts, free from those troublesome Divisions called Alligant Parts. Shewing also how to glue up their COLUMNS and CAPITALS.

II. Likewise STAIR-CASES, (those most useful, ornamental, and necessary Parts of a BUILDING, though never before sufficiently described in any Book, ancient or modern;) shewing their most convenient Situation, and the Form of their ascending in the most grand Manner; With a great Variety of curious ORNAMENTS, whereby any Gentleman may fix on what will suit him best, there being EXAMPLES of all Kinds; and necessary DIRECTIONS for such Persons as are unacquainted with that BRANCH.

III. DESIGNS of ARCHES, DOORS, and WINDOWS.

IV. A great Variety of NEW and CURIOUS CHIMNEY-PIECES, in the most elegant and modern TASTE.

V. CORBELS, SHIELDS, and other beautiful DECORATIONS.

VI. Several useful and necessary RULES of CARPENTRY; with the Manner of TRUSSD ROOFS, and the Nature of a splayed circular SOFFIT, both in a straight and circular Wall, never published before. Together with Raking CORNICES, GROINS, and ANGLE BRACKETS described.

The Whole being illustrated with upwards of One Hundred DESIGNS and EXAMPLES, curiously engraved by the best Hands, on Sixty Folio Copper-Plates.

By ABRAM SWAN, ARCHITECT.

LONDON:
Printed for and Sold by ROBERT SAYE, Map and Printseller, No. 53, in FLEET-STREET.
THE

INTRODUCTION.

Those who are well acquainted with this Subject, and have had large Practice in it, must, I think, allow that there needs no Apology for presenting the Public with the ensuing Treatise, which is chiefly designed for the Benefit of such as have had less Practice therein; to whom I hope it will prove no un instructive Piece. Many Books of Architecture have been wrote, and some of them Pieces of great Value; yet after careful Perusal I have never found any of them fit to give a Learner tolerable Satisfaction. And I might venture to say there is no Book yet extant which contains the Rules and Examples of Drawing and Working in so large a Variety, and at the same Time in so plain and concise a Manner, as this single Volume.

Palladio, Scamozzi, and Vignola, are certainly the best and most celebrated Authors who have wrote on Architecture; yet they contain not all that is necessary to be known on this Subject; particularly with regard to Stair-cases, tho' allowed by them all to be one of the most considerable and useful Parts of a Building. The Examples which they have left us of these, are of very little Use either for Drawing or Working. Palladio tells us, that all Care imaginable must be taken in placing the Stair-cases; that it is difficult to find a proper Situation for them, which will no Ways damage the Rest of the Fabric; that the less they are concealed from such as enter the House, the more ornamental they will appear; and that you should have a Sight of the best Part of the House before you arrive at them, by which
which Means the *Fabric* will seem larger than it really is. With such general Directions he contents himself; and pretty much the same might be said of Chimney-pieces. But in both these Subjects I have laid down several Rules, and shewn several Examples, which will be found useful both for Drawing and Working.

There will be very little Difficulty to understand the Proportions of the *Five Orders*; the Retail Measures being exactly adjusted by a familiar Scale of Twelve equal Parts; and all the *Grosi* Measures, such as those of the Base, Shaft, Capital, Architrave, Freeze, and Cornice, are shewn up the Sides of the entire Orders, and explained in View of the Designs. The Doors, Windows, Chimneys, and the Decorations, being fully described in their proper Places, it would be needless to say any Thing more of them here.

Although most of the Terms of Architecture have been already explained by several Authors; yet for the Benefit of those who may not have such Books, I shall here, beyond what I at first proposed, give their Explication.

An *Order* in Architecture, signifies a Composition of the several Parts of an *Entire Column*; such as the Base, Shaft, or Body of the Column, the Capital, Architrave, Freeze, and Cornice: When these are all regulated by their proper Measures, some being plain and grosi, others composed of more delicate Parts, according to the different Orders for which they are intended, and are all united and adapted to their proper Places, they then form that Part of a Building which is called an *Order*; and which adds greatly to the Beauty of the Building if rightly adapted, not to the Situation only, but also to the Rank and Dignity of the Owner.

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Columns may be called Entire without Pedestals; the chief Use of these being for Ballustrades, Obelisks, Statues, and Dados of Wainscoted Rooms, &c. where they are generally a fifth Part of the Height of the Room: The particular Measures of Pedestals are set to the Arches of each Order, where I think they are of little Use, except to shew their Proportions; for in Porticos and Colonades, to which Columns are chiefly used, we seldom find them set upon Pedestals. The Doric Order is so far from having a Pedestal that in its Original it had no Base, as Palladio has shewn in his Colonades; and for this Vitruvius gives an odd Reason, which is, that this Order is like a strong and robust Man, such as Hercules, who was never represented but with his Feet bare:---Whereas the Base of a Column bears more relation in its Use to a Man's Foot, than to his Shoe; and may therefore be esteemed a necessary Part.

Of the several Parts of the Orders more particularly.

The Base imports of the Sutfent or Foot.

In the TUSCAN ORDER it is compofed of three Parts.

The lowermost Part is a flat Member, and is called the Plinth:

The next is the Astragal, which is in Form of a Semi-circle, with its Fillet; this, when used in the Base, is commonly called a Torus, which turns round the Column; the small Hollow or Cavity joining to the Fillet belongs to the Column. The first third Part of the naked Shaft, or Body of the Column, represents a Cylinder; the other two, the Frustum of a Cone, but something swelling: On the uppermost Part of the Shaft is an Astragal, which, employed in this Place, is called a Collar, and turns round the Column.

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The next Part is the Capital, which begins with a Freeze, here called the Neck; at the upper Part of which is a small Hollow, with a small Lift or Fillet, which separates it from the Quarter-Round, or Ovolo. Over the Ovolo is a square Plinth, which is in this Place called an Abacus, and has sometimes a small Hollow and Fillet on the upper Part where it joins.

The Entablature; the first Part of which is called the Architrave; this generally consists of two Faccia, above both which is a Fillet with a Hollow underneath it. The next Part is a large plain Faccia, called the Freeze, separating the Architrave from the Cornice.

The first Part of the Cornice is the Bed-Mould, which is composed of a Hollow, a Quarter-Round, and Fillets; over this is the Faccia, or Front of the Soffit, Corona, or Eaves, which is sometimes plain, and sometimes a large Hollow, as in Palladio. At the Top of all is the Cima or Ogee, with its two Fillets.

An Ogee is formed by two Segments of a Circle, the one Convex and the other Concave, being sometimes the sixth Part of a Circle; but sometimes a much quicker Curve, that is to a shorter Radius, especially when used for the horizontal, or level Part of the Cornice, at the returned Part of the Foot of a Pediment; for else the Raking-Ogee will have a bad Effect.

In the DORIC ORDER the Base is called the Attic, and, besides the Plinth, is composed of two Torusse; the uppermost of which has two Fillets; the Hollow betwixt the Torusse is sometimes called the Scotia.

The
The Capital in this Order is something different from the former, having an Astragal, or Bead, at the lower Part of the Quarter-round; Palladio sets to this Part three Annulets, Lifts, or Fillets. The Abacus, or Fascia above the Quarter-round, has an Ogee, and Fillet.

The Architrave is composed of two Fascias; on the upper are six small Drops, or Bells cut like a Dove-tail, set under a Fillet, whose Extent is equal to the Width of the Triglyphs over it. The Triglyphs are projecting Parts in the Freeze, with perpendicular Channels or Gutters; the Depth of each is formed by a right Angle, and is Half the Width. The Metopes are the Space between them, which are perfect Squares; the Triglyphs are capt with a Fillet.

As for the Cornice; the Bed-moulds in this Order are various. That fixed to the Profile is only a Quarter-round with its Fillet, above this are the Modillions capt with an Ogee, set perpendicularly over the Triglyphs, and equal to them in Width; the Paces in the Soffit betwixt the Modillions, which often contain various Sorts of Flowers, are called Coffers, both in this and the following Orders.

In the IONIC ORDER. The Base nearly corresponds with the former, there being only a Bead introduced above the upper Torus; the Capital is different, for here and in the following Orders, the Quarter-round at the upper Part with its Fillet and Hollow is called an Abacus; and in the Centre or Middle of this Capital is a Pomegranate, from which springs the Fillet of the Scroll or Volute. Sometimes in this Place you have a Foliage or Foliage Flower. The lower Quarter-round is carved with Eggs and Darts.
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The Architrave in this Order has generally three Fascias, which some separate by Beads, others by the Projection of a small Fillet only, as in the two lower; the upper has a large Ogee and Fillet, the Carving and Enrichment of which is called Seven-leaved Grabs. The Freeze has nothing particular, except that it sometimes swells. The Cornice has a Dentil Bed-mould; its first Member is an Ogee with its Fillet, over which are the Dentils or Teeth; the next Member is a Quarter-round, or Ovolo, with its Fillet; above this is the Fascia, which contains the Modillions, capt by an Ogee; over this is the Fascia, or Front of the Soffit, and then two Ogees, with their Fillets.

There is no Occasion to enlarge upon the two other Orders, the Corinthian and Composite, since their Mouldings have the same Names as what I have already mentioned. The Corinthian Capital has two Rows of Leaves, one above another; between the Leaves of the upper Tier is shewn the Helices or Stalks, from which spring the Scrolls that support the Abacus.

But since Architecture is much more easily learnt by the Eye, than the Ear, I proceed to explain my Plates, which I shall do as briefly as possible; the Figures themselves being much more expressive than Words.
OF THE
ORDERS
IN GENERAL.

The TUSCAN Order.

PLATE I. Represents the principal Parts of this Order.
PLATE II. Exhibits each particular Part at large.

The Bases, Capitals, Architraves, and Cornices are near Palladio's Proportions; but the Freezze is nine Parts more than his, and so make the whole Entablature equal to two Diameters, and also equal to Two-fifteenths of the Height of the Column. The Height of Scamozzi's Freeze exceeds that which is exhibited in this Profile by one Part and a Quarter.

The DORIC Order.

PLATE III. Represents the principal Parts of this Order.
PLATE IV. Shews each particular Part at large, with two different Sorts of Coronas, or Serifs; one with its Modillions and Flowers; the other is what both Palladio and Scamozzi copied from the Theatre of Marcellus at Rome; and on the Left-hand of this is Palladio's Bed-mould; which is all the considerable Difference in this Order.
Scamozzi gives a Dentil Bed-mould, the Measures of which are placed to the lower Cornice in PLATE III. The Cornice over this has a Free Bed-mould, taken from the Bath of Diancias, at Rome.
PLATE V. Exhibits the Mouldings at large, in Out-lines.
The **Ionic** Order.

**Plate VI.** Represents the principal parts of this order.

**Plate VII.** Represents each particular part at large.

The *modillions* fixed to the *profile*, with the leaves underneath them, have been practiced by Sir Christopher Wren, with the *bed-mould* in the same proportion as here exhibited, but not toothed. The same *Plate* also exhibits *Palladio's cornice*, with the *modillions* finished straight behind; his *bed-mould* is the same here as that which he has given to the *Doric* order: the height which he assigns to the *freeze* in this order is twenty-one parts, and it swells equal to the projection of the *architrave*.

**Plate VIII.** Shews the *gluing* up of the *capital*.

**Plate IX.** Exhibits the *mouldings* at large, in out-lines.

The **Corinthian** Order.

**Plate X.** Represents the principal parts of this order.

**Plate XI.** Exhibits each particular part at large.

The *modillion* placed to this *profile* is shorter than *Palladio's* by two parts and a half, and seems to have a much better *taste*; since his is longer in proportion, than any that we find among the Ancients, who certainly did nothing without the greatest reason. *Palladio's freeze* to this order is twenty-five parts. The height of the column in this order is equal to ten of its diameters; and the *entablature* to two, or to one-fifth part of the column's height.

**Plate XII.** Shews the *gluing* up of the *capital*.

**Plate XIII.** Exhibits the *mouldings* at large, in out-lines.

The **Composite** Order.

**Plate XIV.** Represents the principal parts of this order. Underneath you have *Palladio's cornice*. He gives twenty-four parts to his *freeze* in this order, which is half the diameter of his column.

**Plate XV.** Exhibits this order, as in its original; with each particular part at large.

**Plate XVI.** Shews the manner of *gluing* up columns.
Of the Arches of all the Orders.

PLATE XVII. Represents two Tuscan Arches; one with Pedestals and the other with a Plinth only the Diameter of the Column; which agrees with Palladio's.

The Piers are never more than Half the Opening, nor less than One-third; but Palladio seems to have more Regard to the Pierage and Opening of the Arch than to the Space betwixt the Medallions. He takes no Notice of the Riling of his Arch above a Semicircle; as Scamozzi has shewn his Tuscan, riling seven Minutes and a Half, which is equal to fix of the Parts, his Doric riling ten Minutes, his Ionic twelve, his Composite fourteen, and his Corinthian sixteen Minutes.

Sir Christopher Wren seems to have exceeded these Proportions, in some of the Arches of St. Paul's; but this probably was the Effect of his very justly considering, that a lofty Arch, at a near View, will have Part of its Beauty hid, by the Projection of the Impost; which made it necessary to give the greater Riling above a Semicircle to his Arches, which are lofty, and to be viewed but at a small Distance from their Feet. If the Arch be low, or is to be viewed at any considerable Distance, it need not rile but little above a Semicircle, the Impost not being then capable of hiding much of it.

The lower Part of the Key-stone, and the Architrave that turns round the Arch, may be both made of the same Width.

It would be needless to say much more of the Arches, since the Measures are set to each particular Part in the Figures.

PLATE XVIII. Represents two Doric Arches; one with a great, and the other with a small Impost; and different Key-stones. The Width of these Arches is regulated by their Number of Triglyphs.

PLATE XIX. Represents two Ionic Arches, with different Imposts and Key-stones.

PLATE XX. Exhibits two Corinthian Arches, with their Measures set to each Part.

PLATE XXI. Shows the Intercolumniations of each Order from Palladio; with two Arches for Door-ways. You are to observe, that these Arches cannot be put in Practice, but where the Impost is above the Eye, which cannot well be less than the Height of six Feet.

Several Designs from Palladio, of Arches over Arches.

PLATE XXII. The Design in the Middle is taken from Palladio's third Book. The Triglyphs over the lower Arch are not to be the Guide in regulating its Width, there being but five in the whole Width betwixt the Columns,
Columns, which are nine Diameters in the Clear. Over this Arch is a Venetian Window of nine Diameters and eight Parts, from Column to Column; the eight Parts are occasioned by the Columns underneath diminishing one-sixth Part.

The other three Designs are taken from Palladio's second Book. The Design on the Right-hand represents two Arches, one over the other; the lower of which is a Doric Arch, five Diameters from Column to Column, and the Ionic above it is five Diameters and eight Parts. The Columns stand on a Plinth equal to Half their Diameter, and the Ballusters are in the Opening of the Arch.

Underneath you have the Ionic Order set upon a Rustic Basement. At the Left-hand are two Designs of Venetian Windows; the Opening of each Arch is six Diameters and a Half; The Spaces on each Side may be the common Intercolumniation, as there represented.

Four different Designs of Doors.

PLATE XXIII. The lower Design to the Right-hand is a Doric Door with Rustic Jamb.

Let the Height of the Column be divided into eleven equal Parts; then one and two-thirds is the Length of the Key-stone. From the Middle of one Column to the Middle of the other is six Diameters and a Quarter; and the Entablature is one-fourth Part of the Height of the Columns. You are to observe, that when the Columns stand on a Step, as in this Design, they are to have only their proper Plinth; but when used as represented by the lower Design on the Left-hand, there is sometimes Half the Diameter, sometimes three Quarters, and often the whole Diameter given to the Plinth. The upper Design on the Left-hand is an Ionic Door; the Entablature is two-ninths of the Column's Height, as is shewn on the Side; and the Modillions, with the Space between each, is Half the Diameter and three Parts.

Several Designs of Doors and Windows.

PLATE XXIV. The Trusses for these Doors and Windows are described in the following, or on Plate XXV, and their Architraves, Friezes, and Cornices, at large, on Plate XXVI.
The Corner of a Door and Window, or Chimney, at large.

PLATE XXV. You have in this Plate the Corner of a Door, Window, or Chimney, with its Traps at large; and the Measures set to each particular Part.

There are three different Rules, or Proportions for Pediments; which are two-ninths, one-fifth, or one-fourth of the whole Extent. It is the first of these that I have followed in Fig. I. two-ninths being the mean Proportion betwixt the other two.

In Fig. II. I have shewn the Manner of the Raking Cornice. To describe this — First from the lower Ogee, which is the Level, or Horizontal Part of the Cornice, from which draw the Lines that represent the Pitch of the Pediment, and divide its Height into four equal Parts, as in the Figure; then draw the Raking Lines 1, 2, 3, to the lower Ogee, and where they cut that Moulding draw dotted Lines, as a b, to the upright Line; then transfer these to the other two Ogees, and a b, a b, and a b, will have each of them an equal Projection from their respective Uprights: And so of the Rest. It will be needless to describe the Manner of a Raking Hollow, or Round, they being both formed in an Ogee.

Fig. III. Represents the upper Part of the Modillion with its Capping. The Raking Mould may be found in the same Manner as in Fig. II.

Two Designs of Cornices for Doors, or Windows.

PLATE XXVI. To proportion the upper Design — Divide the Opening of the Door into six equal Parts, as is usual; one of them is the Width of the Architrave, which may be divided into twenty-four Parts, by dividing one-fourth of it into six Parts; and dispose them as you see them marked in the Design. The Frieze, as shewn upon the Side, is three-fourths of the Architrave; and a swelling Frieze must have its Projection equal to that of the Architrave. I have shewn a Pine-Array to this Bed-mould; but it sometimes returns, with the Face of a Dentil each Way.

In the lower Design, the Architrave is divided into twenty-one Parts, by one-third Part divided into seven, as is shown on the Side; and this regulates the Cornice, as above. The Fillets of the Ogee of the Architrave in both these Desings are drawn in their usual Proportions; but may have full as good an Effect, if made one-fourth, or one-half of a Part more; which may be taken from the Frieze.
Beneath the lower Cornice at the Right-hand is an Ogee, with a Hollow at the Foot; which is sometimes used for a Cornice.

The Manner of proportioning Pedestal Stairs.

PLATE XXVII. Stairs of this Kind are seldom used less than four feet wide; for which Width I have drawn a Rail at large. This may be divided into four equal Parts, and one of them is the Projection of the Mouldings, exclusive of the Space at the Foot of the Hollow.

To the Left-hand of the Rail is shown one of these Parts divided into nine; dispose of these nine Parts to the Height and Projection of each Moulding; as you see in the Plate.

To the Right-hand of the Rail, you have a different Cornice and Base regulated by the same Method.

On the Top of the Plate to the Left-hand is shown the upper Part of a Pedestal.

To proportion the Margin and Mouldings of which——

Let the Width be divided into fix equal Parts; one of them is the Margin, and half that may be the Moulding.

Or, you may proportion this by the Scale of nine Parts below; taking five of them for the Margin, and three for the Moulding.

To the Right-hand of this is the Base proportioned to the Rail at large.

Observe, that for every Foot the Stairs exceed four in Width, you are to increase the Width of the Pedestal by three Quarters of an Inch. If they are less than four Feet, then the Width of the Pedestal must be one-eighth Part the Length of the Step.

Another Sort of Pedestal Stairs.

PLATE XXVIII. These Stairs have a Rail and Ballustre different from the former.

To the Left-hand you have the Architrave, Freize, and Bed-mould for the String-board, in Proportion to the Rail below. The Freize is twenty-seven Parts, or three-fourths of the Width of the Pedestal.

To each Moulding I have set the Measures of its Height and Projection; which Method is also observed in the following Designs.

A different Rail and Ballustre.

PLATE XXIX. These Ballustres are very rich, and would, in my Opinion, produce a very good Effect, if put in Practice.
The Space betwixt each Balluster is equal to Half the Width of the Balluster, which is also equal to the shorter Side of the square Part at Top. The shorter Side of the Plinth is three Fourths of the Width of the Balluster. And the Balluster's whole Width is equal to the Width of the rising Part on the upper Side of the Rail drawn at large.

Another Sort of Pedestal Stairs.

PLATE XXX. These Stairs have a different Rails and Ballusters, full richer than the foregoing. The Measures of the respective Parts are proportioned as before. This Plate also exhibits two different Sorts of Freezes; that over the Design with Oak-leaves and Acorns.

The Section of the Rail.

PLATE XXXI. This Plate represents the Section of the Rail, with its Base, Architrave, Freeze, Bed-mould, and String-board. The Plinth, with the twenty-three Parts set to it, stands along the Landing on the Gallery. The other Part of the String-board which falls below, covers the Joists. To the Right is a Pedestal, with its Base turned round. Either of these Methods may be used, as is thought most proper; but I take the former to be the best Way, when the Base finishes against the Pedestal.

A Flight of Bracket-Stairs.

PLATE XXXII. This Plate exhibits a Flight of four Steps of very rich Branch-Stairs; over which is a Bracket drawn at large. For the Length of the Branch take the perpendicular Height from the Nose of the Step, to the under the Side of the Rail, which ought not to exceed two Feet two Inches. PLATE XXXIII. A Flight of Stairs, with very rich Brackets. PLATE XXXIV. A Flight of Stairs, with two different Brackets, at large.

A Stair-Cafe with two Flights.

PLATE XXXV. Here I must advise the Reader, that I by no Means intended to confine myself to the Rules of Perspective, but to represent the Design in the most useful Form; and therefore continued the Steps all parallel to the first visual Line; for had they all...
rected to the Point of Sight, it would have made the Design useless for what is intended.

Fig. II. Shews the Manner of drawing the Ramp; which is to rise equal to the Height of the first Step of the next Flight, and as much as its Knee is as is shown by the Ramp interflecting the Rail of the second Flight.

Fig. I. Shews you how to make the two Knees agree with each other, which is done by drawing the dotted Lines from the Middle of the Ankle.

Fig. III. Shews the straight Rail interflecting a circular Cap.

Fig. IV. Shews the Manner of Dovetailing the Riser into the Step. And

Fig. V. Exhibits the Plan of the Stairs.

A Stair-Cafe with three Flights.

PLATE XXXVI. This Plate represents a Stair-Cafe of three Flights, with its Landing Rail; and under the third Flight you have two different sorts of Rails.

Fig. I. Shews the solid Part of the Step out of which the Scroll is formed; where o represents the Over-fall of the Step; b the Thickness of the Bracket, with its Mitering to the Riser; and s the String-board.

Fig. II. Shews the Scale for drawing the Scroll of Fig. II. To perform which: — Take the Distance from 1 to the Centre, Fig. II. and set it from 1 to the Centre in Fig. III. Divide that Extent into three Parts, then set four such Parts on the upper Side of the Scale, and draw the Line from 4 to 1; set one Foot of your Compasses at 4, and strike the circular Line; let that be divided into twelve equal Parts, and then draw Lines from 4 through those Divisions, to the upright Line.

[The Scale being thus made, then by it to draw the Scroll.]

Instead of taking from 1 to the Centre, or from 2 to the Centre in the Scale, as was shown by the Ionic Scroll, you are here to take the Mean betwixt them; then set one Foot of your Compasses in 1, and describe a Stroke at 2; take the same Distance and with one Foot in 2, draw the Stroke at 3; then from 3; turn the Part from 1 to 2, and proceed in the same Manner; for if the Distance were taken in the Scale from 1 to the Centre, it would strike the Circle too flat, and if it be taken from 2, it then strikes the Circle too quick.

When this is well understood there will be no great Difficulty in drawing the Scroll over Fig. I, which throws itself out farther in Proportion than that in Fig. II, for this will always be the Case, when the upper Line of the Scale, which consists of four Divisions in Fig. III, is made but with three Divisions or less; whence it appears that the upper Line
Line of the Scale may be drawn at what Length you please, according as you would bring in, or keep out the Scroll.

The Manner of squaring Twist-Rails.

PLATE XXXVII. Fig. II. Exhibits the Pitch-board, to shew what Part of the Step the twisted Part of the Rail contains; the three dotted Lines drawn from the Rail to the Pitch-board represent the Width of the Rail, that from the Middle shews the Ridge, or Middle of the Rail, which is to be kept level. The dotted Lines a, and b, shew how much Half the Width of the Rail turns up from its first Beginning to 2.

Fig. III. Shews the same Pitch-board, with the Manner of the Rail's turning up. If the Sides of the twisted Part of the Rail be shaped by the Rail-mould, so that they direct down to its Ground-plan; that is, the upper Side of the Rail being first struck by the Mould, then apply the Mould to the under Side, as much back as the Bevel of the Pitch-board shews, being struck on the Side of the Rail; and then Fig. III. being applied to the Outside of the Rail, from its first twisting Part to 3, will shew how much Wood is to be taken off.

Fig. V. Exhibits the Square of the Rail, with the Raking Line of the Pitch-board, drawn through the Middle on the upper Side; then draw the Depth of the Side of the Rail parallel to this, and the dotted Lines from the Diagonal of the Rail; these Lines shew what Quantity of Wood will be wanting on the upper and lower Sides of the Rail. Set your Compasses at c, and draw the circular Stroke from the Raking Part of the Pitch-board to b, take the Distance a b, and transfer it from a to b, in Fig. VII. the several Distances thus found may be set at any Number of Places, ranging with the straight Part of the Rail; and it then forms the Width of the Mould for the twisting Part of the Rail.

Fig. VII. Shews the Sweep of the Rail. The Rail cannot be fixed less than one Part from Nosing, or Front of the Step.

The remaining Part of the Pitch-board may be divided into any Number of Parts, as here into four; from these Divisions draw Lines across the Pitch-board to the Raking Line, then taking the Distances from the Ground-Line of the Pitch-board to the Plan of the Rail, and set them perpendicular from the Raking Line of the Pitch-board; so shall these Divisions, when the Rail is in its proper Position, lay directly over the Divisions on the Ground-Plan.

In this Figure, m, and n, rise as much above s, as the dotted Line in Fig. V. does above the Width of the Rail, and they sink as much below s as the other dotted Line in Fig. V. falls below the Width of the Rail; the same Thickness must be glued upon s, though the greatest Part will come off in squaring. The Reason of placing the Letters i, m, and
...where you see them, is, that they might not obstruct the small Divisions of the Rail-mould.

Fig. IV. Shews how to find the Rail, when it takes more than one Step. The remaining Part of the Pitch-board is divided into four Parts as before in Fig. VII, and it takes in two such Parts of the next Step. Draw Lines from these Divisions to the Diagonal of the Pitch-board, as in Fig. VII. then take the Distance a b, and set it from c to d, and so proceed with the other Divisions.

Here is also shewn another Way to find the Outside of the Rail-mould. Draw all the Divisions across the Plan of the Rail; then take the Distance from the Ground-Line of the Pitch-board to 4, transfer it from the Diagonal of the Pitch-board to 4 on the Rail; and so proceed with the other Distances. Then, when the Rail is put in its proper Position, e will be perpendicular to b, and all the Divisions, as 1, 2, 3, 4, &c. in the Rail, will be perpendicularly over 1, 2, 3, 4, &c. in the Ground-plan.

Fig. VI. Shews the Plan of a Rail of five Steps.

To find the Plan:—set five Divisions, as from e to h, which is the Height of the five Steps; draw the Diagonal from f to the Plan of the Rail, then take the Distance e f, and transfer it from g to h, and proceed in the same Manner with the other seven Distances.

To find the Width of the Rail-mould—draw the Lines across the Plan of the Rail, at h, set that Distance from the Diagonal to i; and so proceed with the Rest, as was shewn in Fig. IV.

Having formed the Sides of the Rail, perpendicular to its Ground-plan, and having squared the lower End of the Rail, then take a thin Lath and bend it within the Rail, as is represent'd by m, in Fig. I.

This is the readiest Method for squaring a solid Rail; but if the Rail be bent in the Thicknesses, the Nosing of the Steps must be drawn upon a Cylinder, or some other solid Body of a sufficient Width to contain the Width of the Rail, or String-board.

r Represents the Depth of the Rail, touching the Nose of each Step. You are to take a sufficient Number of Thicknesses of this Width, to make the Thickness of your Rail; glue them together upon your Cylinder or Temple, confine them till they are dry, then the Rail taken off is ready squared. Proceed in the same Manner with the Architectural marked a.

A Common Stair-Case.

Plate XXXVIII. The Rail and Balance of the second Flight are removed out of their proper Place, in order to shew the Manner of their finishing to the next Story. At the End of the Winders is a Sky-Light, with what is generally called a Bridge-flight.
To make a Pitch-board, to frame for the Windows — Divide the whole Width into as many Parts, as you have Steps to come against it, which in this Deign are four, allowing the same Height as to the other Steps; this Height will be sufficient for the Whole, though it cannot answer to every Step, since they are of different Lengths.

PLATE XXXIX. Represents twelve different Sorts of Brackets at large.

PLATE XL. Shows eleven different Sorts of Ballasters at large.

PLATE XLI. Exhibits three Plans of Houles; wherein the most convenient Situation of the Stair-cafes is shewed.

The Situation of the Chimmies is indeed different from what is commonly practised in England; but is taken from Palladio, who seldom failed placing his Chimmies betwixt the Windows, that Peofons might at once enjoy the Benefit of the Fire, and the Prospect.

A circular splayed Soffite, for Doors and Windows.

PLATE XLII. Fig. I. Shews the Opening of a Window in a strait Wall: Draw the Lines ranging with the Splay of the Jambsh, where these meet, as at a, is the Length of the Radius, for drawing the Curvature of the Soffite; then take the Distance a b, transfer it from c to d, in Fig. II. then set your Compasses in c, and draw the circular Line e f; then set on the Width of your Soffite, and draw the external Line; this, when bent to a Semi-circle, will range along with each Part of the strait Wall.

Fig. III. Represents the Opening of a Window, of the same Width as the former, in a circular Wall.

Fig. IV. Shews the open Part of the Arch.

The Arch-line may be divided into any Number of Parts, as here into Twelve. Draw Lines perpendicular from the Base-line through all the Divisions to the Line b; then in Fig. V. draw a circular Line, as if for a strait Wall, and divide it in the same Number of Parts, as the Arch-line in Fig. IV. then take off the Distances from the Line b, to the circular Wall, and set them from the outside Line in Fig. V. as at 1, 2, 3, &c. to 12. Then you will have the true Curvature of your Soffite, which, when bent to a Semi-circle, will in every Part agree with a circular Wall.

Fig. VI. Shews a Cone, cut off by the Wall-line.

A Cornice for a Chimney.

PLATE XLIII. To proportion this Cornice — Let the Architrave be divided into three equal Parts; divide one of them into ten, and dispose them to the Height and Projection of each Moulding, as is shewn in the Plate.
I have made these Divisions by a Diagonal Scale, because I take that to be the readiest Way, once setting the Compasses being sufficient. The Architrave is one-sixth Part of the Opening, as usual.

A different Cornice and Architrave.

PLATE XLIV. The Architrave here is divided as in the former; the Measurers are to be disposed as in the Plate.

A different Cornice and Architrave.

PLATE XLV. The Architrave here is divided into four Parts, and one of them into eight; dispose of them as in the Plate, to each particular Part.

A Cornice in the same Form, but larger in Proportion than the foregoing.

PLATE XLVI. The Architrave is here divided into three Parts, and one of them into ten; dispose the Measurers as in the Design.

Several different Mouldings for Frames.

PLATE XLVII. There are three different Rules for proportioning these Mouldings; — One is to divide the whole Width of the Frame into seven equal Parts, and take one for the Moulding; the next is to divide it into fifteen, and take two for the Moulding; and the last is to divide it into eight equal Parts, one of which is given to the Moulding. Having thus found the Width, you may divide it into three equal Parts, and one of them into nine; then dispose these Parts to the Height and Projection of each Moulding, as is shewn in the Plate.

A Chimney-piece, with a Frame over it, for a Picture or Pannel.

PLATE XLVIII. The Opening of this Chimney is a perfect Square, which is certainly a very good Proportion, except when they run to a great Extent; then the Width of the Chimney may be divided into thirteen Parts, twelve of which may be the Height; or into seven Parts, and take six for the Height; or into fifteen, and assign thirteen for the Height.

Whichsoever
Whichsoever Proportion you follow, it makes no Alteration in the Ornaments. The Architrave is one-sixth, as usual; the Width of the Architrave, and one-third Part more, gives the Height of the Freeze.

Over this Chimney-piece is a very rich Frame, for a Picture or Pannel. To proportion which—divide the Width within into eight Parts, seven of these Parts will be the Height within, and one of them is the Width of the Moulding; as was shewn at large in the foregoing Plate. The Knots at the Corners are to be made of different Lengths, according to the Ornaments which are intended to be put in.

Another Chimney-piece, with a very rich Frame over it.

PLATE XLIX. The Architrave of this Chimney-piece is one-sixth Part of the Opening; and the Trusses is two-thirds of the Architrave.

Over this Chimney-piece is a very rich Frame; the Ornament on the Top is represented something in the Form of a Pediment.

The Moulding of the Frame may be proportioned as the foregoing.

Another Chimney-piece, with a very rich Frame over it, adorned with a Pediment.

PLATE LI. The Architrave from Outside to Outside is divided into seven equal Parts; one of which is the Width of the Trusses; and the Height of the Architrave as one fifth Part, together with its large Ovolo, adorned with Shells and Flowers.

The Frame may be proportioned as the former.

The Knots at the Corners are here twice the Width of the Moulding.

A Design for a Chimney-piece in a lower Story.

PLATE LII. In this Design, the Height of the Freeze is two-sevenths of the Width of the Opening of the Chimney; and the Trusses up the Side of the Chimney are one-fifth: The Width of the Trusses, that support the Cornice, may be one-sixth of the Opening.

The Architrave is between one-fifth and one-sixth Part.

To proportion the Frame and its Trusses over this Chimney. Divide the Extent from the Outsides of the Trusses in the Freeze, into ten equal Parts; one of them shall be the Width of the Trusses, above; another Part must be given
given to the Ovolo with its Margin and Ogee; and six Parts must be assigned for the Width within.

The Plinth, on which this Frame stands, is Half one of those Parts.

Another Chimney-piece, with a Frame and Pediment over it.

PLATE LII. The Architrave is here One-sixth Part of the Opening, the Freeze is Three-fourths of the Architrave, and the Trusses up the Side are One-fifth of the Opening.

The Width of the Trusses to the Frame is One-ninth of the whole Extent that is perpendicularly over the Architrave.

You may observe, that this, and all the foregoing Chimneys, with their Mantlings (which are their Architraves, Freezes, and Cornices) are proper Designs for Chimneys, without the Frames over them.

Different Sorts of Chimney-pieces, with different Trusses.

PLATE LIII. To the lower Chimney is shown a Pannel, with a Pediment over it. The Measures are expressed on the Plate.

Two very grand Designs of Chimneys.

PLATE LIV. In the upper Design, the Architrave and Freeze are each of them One-sixth Part of the Opening; the Truss is the same Width as the Architrave.

In the lower Design, the Height of the Freeze is twice the Width of the Architrave.

The Rest of the Measures are to be seen in the Plate.

The Nature of Angle-Brackets, Groins, and Frets.

PLATE LV. Fig. 1. Shews the Quarter of a Circle.

To find its Hip, or Angle-bracket; — Divide its Projection into any Number of equal Parts, as here into six; then draw the dotted Lines from these Divisions to the Diagonal-line, or Projection of the Angle-bracket; this will divide the Projection of the Angle into the same Number of equal Parts; then take the Heights 1, 2, 3, 4, 5, 6, from the Ground-line of the Quarter-circle, and let them up from the Diagonal.
gonal, and then will your Hip, or Angle-Bracket, answer that of the
freight Part.

Fig. II. Shews the Manner of finding the Hip-Mould of an Ogee —
Divide your Ogee into any Number of Parts here into six, as before; then
take the Projection from the Upright Line, and set it up from the Diagonal,
as in the former Figure.

Fig. V. Shews the Manner of finding the Hip-Mould of the same Ogee,
when turned the reverse Way.

Fig. III. Shews you how to trace out a Bracket, which rises more than
it projects — Divide its Projection into any Number of equal Parts, as
here into seven, and draw the Lines from 1 to 1, from 2 to 2, &c.

Fig. IV. Shews a Bracket of the same Height and Projection. To find its
Angle-Bracket, or Hip — Divide its Projection into any Number of
equal Parts, then take the Distances 1, 2, 3, &c. to 7, upon the traced
Bracket, and set them from the Diagonal 1, 2, 3, &c. to 7. This is
sufficient to shew, that if the traced Bracket had been drawn in any other
irregular Form, the same Method would do to find its Hip.

Fig. VII. Exhibits an Elliptic Arch, not rising so high as a Semicircle.

Fig. VI. Exhibits an Arch boarded over; wherein the several Figures
1, 2, 3, &c. represent so many Ribs or Jack-Rafters set upon the circular
Body of the Arch, in order for another Arch to intersect it, where these
boarded over the Groins are formed.

Underneath are three different Sorts of Frets; and two common Chimney-
Pieces, each containing two different Designs.

Plate LVI. Exhibits four different Sorts of Carbols or Consoles, for
setting Statues or Buffs upon.

Plate LVII. Shews six different Designs of Shields.

Plate LVIII. Exhibits four other Sorts of Shields.

Trusses of different Sorts.

Plate LIX. Fig. I. Shews the form of a trussed Roof, with three
King-Poits, that may carry seventy Feet, or upwards.

Fig. II. Exhibits an M. Roof, capable of carrying as great an Extent as
the former; indeed both these Designs are capable of carrying almost any
Extent.

Fig. III. Represents two different Sorts of Trusses.

Fig. IV. Shews the Manner of piecing Timber.

Sometimes the Joint may be extended as far as ε, with another Bolt
through it.

To the Left is shewn a different Sort of Joint.

Fig. V. Shews the Manner of Trussing a Girder.

If you leave your Trusses full long, then with the Pieces b and c you may
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Fig. VI. Represents the Manner of Trussing Partitions.
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and
The Manner of laying a Frame in Leagment.

PLATE LX. Fig. I. Shews the Manner of Backing a Hip. — Divide the Thickness of the Hip into two equal Parts; then having found the Pitch of your Hip, as is shewn in Fig. II, set one of these Parts upon the Base-Line, from b to a; and it shews what Wood is to be taken off.

If the Side of the Building comes in with a Bevel, as the dotted Line b, in Fig. I. then transfer Half the Thickness of the Hip, from d to e, in Fig. III. and take the Distance f e, in Fig. I. and set it from c to g, in Fig. III. this will shew how much is to be taken off the Hip, when the Building bevels.

Fig. IV. Shews the Principal with its two Hips for the Bevel-End.

Fig. V. Shews the long Hip, laid out ranging with the Side of the Building.

In Fig. VI. The dotted Lines represent the Beam laid parallel to the Bevel-End.

In Fig. VII. The dotted Lines shew the Principal, as it will appear when the Beams are laid bevel.

Fig. VIII. IX. and X. Represent the Frame for the Square-End.

Fig. XI. Represents a circular Body.

To find the Curve, for any Lath or Margin, to be bent round this Body, parallel to its Base. — Let the Points b and c represent the Margin which you intend to bend round; then draw a right Line through those Points, to meet the Perpendicular or Diameter produced as in a, and it gives the Length a b the shorter, and a c the longer Radius for striking the Curve required. And if a Margin was to be bent round any other Part of this circular Body, as d e, draw a right Line through those two Points as before, to intersect the Perpendicular, as in f, and it gives the Lengths f d and f e, to strike the Curve. This may be sufficiently demonstrated by a right Cone applied all round; or, which is the same Thing, if the Radius was turned upon a Spindle at a, it would touch the circular Body every-where at an equal Distance from the Base.

Fig. XII. Shews the Method of bending a Cornice round any circular Body. When you have found the Spring of your Cornice, which is shewn at the Right-Hand, let the dotted Lines be drawn parallel to the Spring; and where they intersect the Centre, or Middle of this Body, as in e, you will have the Radius to strike the Curve of your Cornice. This may be proved in the same Manner as the foregoing.

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TO PROPORTION the

TUSCAN Order.

ANY Height being given for this Order,

Let it be divided into nine equal Parts, as is shewn up the Side of the Column.

Then, one of these Parts is the Diameter of the Column at its Base; Seven Parts are given to the Shaft, or Body of the Column, including the Base and Capital; and two to its Entablature, which includes the Architrave, Freeze, and Cornice.

Having found the Diameter of the Column at its Base,

Let it be divided into four equal Parts, as in Plate II. Then divide one of these into twelve, which is done thus:

Take the Extent of one of these four Parts, and set it from A to B; then set your Compasses at Pleasure, and run twelve Divisions, as on the Line B C; from the Extent of these Divisions draw a Line to A; when these Divisions are squared up from the Base Line, that is, drawing the Perpendicular, 1, 2, 3, &c. your Scale is made, and the Line A B is divided into twelve equal Parts; as would easily appear by drawing Parallels from each of these Perpendiculars to A B.

Then dispose of these Measures to the Height and Projection of each particular Part, as you see them set in the Plate, which is all you have to do.

In making the Scale, it is plain, that your Compasses may be set at any Distance; for set up C D equal to A B, from D run twelve Divisions with your Compasses at a smaller Distance than before; from their Extent draw a Line to C, and square up from the Base as before; then these Divisions, if rightly drawn, will exactly answer to the former.

When a Column happens to be just a Foot Diameter, each of these Parts will be a Quarter of an Inch, since there are forty-eight Quarters in a Foot. When the Diameter is two Feet, each Part will be Half an Inch; if four Feet an Inch; and whether more or less, it will be shewn by the Scale. Under the Column is shewn a Cornice from Palladio.
To Proportion the

Doric Order.

This Plate exhibits at one View all the particular Parts of this Order, together with several different Cornices, to be used as Occasion may require.

It would be needless to say any Thing more of the Scale, since it is the same for all the Orders.

Any Height being given for the Doric Order,

Let it be divided into ten equal Parts, as is shewn up the Side of the Column.

One of these Parts is the Diameter of the Column at its Base; Eight Parts are given to the Shaft, or Body of the Column, including the Base and Capital; and two to the Entablature (which always means the Architrave, Frieze, and Cornice).

To diminish the Column — Let it be divided near the Base into six equal Parts, as is shewn in Plate IV, five of which are to be given to the Top.

If the Column is to be fluted, it may be divided into twenty-four Flutes, of which there are two different Sorts used in this Order. Those shewn on the upper Part are most common; they are worked to an Arris, and are sunk down two different Depths, one of which is describ'd by the fourth Part of the Circle, the other by a sixth, as is shewn on the Plate to the Right-hand of the Base; The Square, or Fillet of the other Sort, is equal to one-third Part of the Flute, as in the following Orders.

Plate V. Shews the Base, Architrave, and Cornice at large.

The Scale there exhibited is two Inches and a Quarter, which gives the Proportion of a Column of nine Inches Diameter.
To Proportion the

IONIC Order.

ANY Height being given for this Order,
Let it be divided into eleven equal Parts,
as is shewn up the Side of the Column: One them
is the Diameter at the Base.

Nine Parts are given to the Shaft, including the
Base and Capital, and two to the Entablature.

You have here four different Sorts of Cornices for
this Order, and two different Sorts of Modillions;
the one turned up behind, like the Corinthian,
sometimes with a Scroll and Leaf behind, and a
Leaf on the under Side, set within a small Leaf,
or Filler; and the other is from Palladio.

PLATE VIII. Shows all the Parts of the Capital.

Fig. I. Shows a Capital, with an Ope-Abacus.

Fig. II. A different Capital, with its Scrolls
touching the Ovals.

Fig. III. The Plan of a Capital, with its Scroll
on one Corner; the dotted Lines on the other
Corner shows the Thickness of the Pieces to be
 glued on.

Fig. IV. Shows the Body of the Capital.

Fig. V. Shows the Scroll. — To draw which,
take the Distance from 2, to the Centre in your
Scale. Fig. VIII set the Compasses at 1; in Fig. V.
and describe a Stroke at C, with the same Di-
fance from 2, cross the former Stroke in C, and
this will be the Centre to turn that Part from 1
to 2; and so proceed with the Rest, taking the
several Distances from the Scale, in which the
Distances from 1 to the Centre, or from 2 to the
Centre, are respectively equal to those from 1
to the Centre, or from 2 to the Centre in the Scroll,
and so on.

To make the Scale in Fig. VIII. — The Base
Line contains nine Parts, and the Upright twelve;
divide the Circular Line, from Fig. VIII. to the
Eye of the Volute, into twenty-four equal Parts,
through which draw Lines from where they meet
to the Upright Line.

The Eye of the Volute contains two Parts and a
Half.

Fig. VI. Shews Half the Plan of a Square Ca-
pital; wherein the Figures 1, 2, 3, 4, 5, 6, rep-
resent the Thickness of the Pieces to be glued on
to the Corners.

Fig. VII. Shews the Body of the Capital,
with the Mouldings worked before the Pieces are
glued on.

PLAT IXE. Shews the Base, Architrave, and
Cornice at large, with the Manner of forming their
Modillions.
**To Proportion the CORINTHIAN Order.**

ANY Height being given for this Order,

Let it be divided into twelve equal Parts, as is shewn up the Side of the Column.

One of them is the Diameter of the Column at the Base; Ten Parts are given to the Shaft, including the Base and Capital; and two to the Entablature.

The Capital in this Order is one Diameter and a sixth Part.

This Plate also exhibits another Cornice larger than that fixed to the Profile, but yet is not so large as that which Vignola has given to his Corinthian.

It is not necessary to lay any more of the Proportions, the Measures being left to the respective Parts.

PLATE XII. Shews the different Parts of the Capital.

**Fig. I.** Shews the Pieces glued upon the Diagonal.

**Fig. II.** Shews the Capital viewed Angle-ways, with Part of the naked Bell of the Cap.

**Fig. III.** Represents the Body of the Capital, with some of the Blocks glued on. **Fig. II.** at the upper Corner, to the Left, shews how much the Capital should taper at each Side, since seven and an half on the other Side is scarce sufficient for the Plan of the Abacus.

**Fig. IV.** Shews the Capital, with all the Measures of the Height, Width, and Projection fixed to every Part.

**Fig. V.** Shews the Plan of the Capital, with the Manner of Revolving the Cants, for gluing on the lower Tier of Leaves.

**Fig. VI.** Shews Half the Front of a Square Capital.

**Fig. VII.** Shews the Plan of a Capital; one Part circular, and the other square; with the Manner of setting out the Flutes and Leaves of each.

PLATE XIII. Shews the Base, Architrave, and Cornice at large, drawn by the same Scale as the Doric and Ionic.
To Proportion the

COMPOSITE Order.

ANY Height being given for this Order,

Let it be divided into twelve Parts, as the

Corinthian, there being no Difference in the Ori-

ginal betwixt these two, except in the Capital, the

Composite having a proper Ionic Capital above the

Leaves: These Leaves commonly differ from the

Corinthian, being carved with what is called

Parley.

There are two different Cornices; one of them

has an Architrave-Modillion, which Palladio and

Scamozzi copied from a Corinthian Work at Rome,

called the Frontispiece of Nero, from which they

both took their Ionic Base.

PLATE XVI. Shows the Manner of Gluing

and Fluting Columns, which may be useful to those

who have had but little Practice in this Way.

Fig. I. Shows a Column in the Red: The Pieces

at each End on which the Column hangs, have their

upper Ends left level with the upper Side of the

Column, that when a freight Rule is laid on those

two Pieces, and Fig. VI. placed to the Bottom of

the Column, and Fig. VII. to the Top, with the

Flutes and Fillets drawn on each of them, then

Lines, drawn by the Rule from the Bottom to the

Top, will swell and diminish your Flutes.

Fig. II. Shows a Pilaster, with two Gauges;

one to gauge from a freight Side, and the other to

gauge one that diminishes: It will be sufficient to

put in Slat for three Flutes, and gauge from each

side; for when there are more, it is difficult to run

the Gauge true.

Fig. III. Shows two Ribs glued together.

Fig. IV. Shows a Column glued up.

Fig. V. Shows the Rule for diminishing the

Ribs, before they are glued together. Sometimes

when the Stuff is thin, each Rib is fixed to a Tem-

ple, and bent near to the swelling of the Column,

and so glued two and two together. To diminish

the Column, divide the Height into seven Parts;

at two of these Parts strike a Semi-circle; then

draw the dotted Lines from the Neck of the Col-

umn to the Semi-circle; divide the remaining

Part of the Semi-circle into four equal Parts;

where these cut the Semi-circle, they will give the

diminishing Parts, as is shown up the Side of the

Column, by the Figures 1, 2, 3, 4.

Fig. VI. Shows the Splaying Mould of the Ribs

and the Backing Mould.

Fig. VII. Shows two Flutes in a Rib. You are

always to observe, that the Flutes happen not in the

Joints.
This Plate Shews how any of the fire going Chimneys
May be Shortened if Required.

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