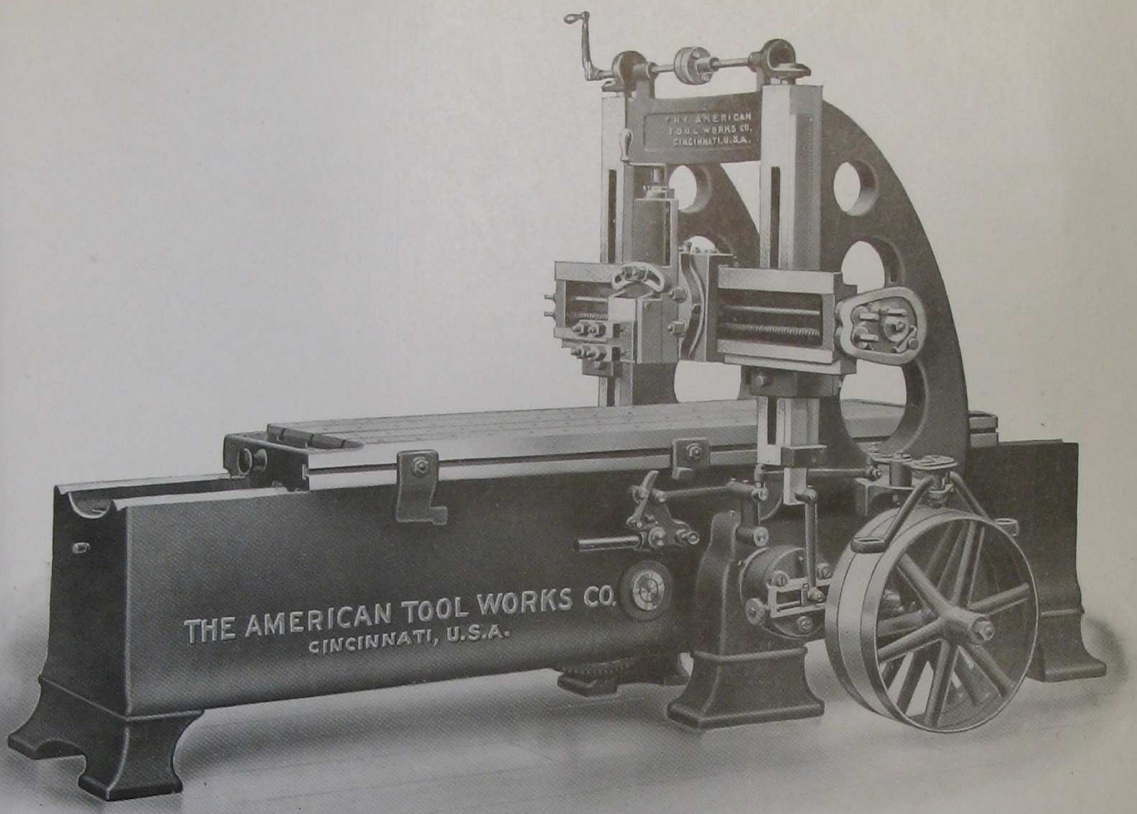


AMERICAN

24-inch Standard Pattern Metal Planer

With one, or two, heads

Planes wide	24½ in.
Planes high	24½ in.
Distance between V centers	13 in.
Standard length of table	6 ft.
Length of bed for standard table length	10 ft. 10 in.
Code Word	PATH

Advances by even lengths of table up to any desired length

In machine construction planed surfaces invariably form the foundation from which all other parts are fitted and aligned. It is therefore of the utmost importance that a high degree of accuracy be maintained in the construction and alignment of a metal planer, for this type of machine tool more nearly reproduces the quality of workmanship inherent in itself than any other metal working machine, consequently if a planer lacks the necessary degree of accuracy the work planed will frequently require considerable scraping, which in itself is the most costly of shop operations. Therefore, undue scraping should be eliminated, not only for reasons of economy, but because a true planed bearing is in every respect superior to a scraped bearing.

THE AMERICAN TOOL WORKS CO.
LATHES, PLANERS, SHAPERS, RADIAL DRILLS
MAIN OFFICES AND WORKS
CINCINNATI, U. S. A.

4M-B-4-20

The workmanship and alignment of "American" planers are of a quality and accuracy that only thoroughly modern equipment and skilled workmen can produce. As a further assurance of their quality, "American" planers are fully and positively guaranteed, if set up and leveled properly, to plane up to their maximum capacity perfectly square, and parallel within a limit of .001 part of an inch.

Although accuracy is the most essential requisite of planer construction, there are also several other important considerations of design which must be observed, in order to produce a machine which will be capable of planing accurate work with the greatest possible economy; therefore, in the following, particular attention is called to these features as developed in "American" Planers.

Proper Facilities for Lubrication are of the utmost importance in machine tool construction. A machine tool will produce satisfactory results only as long as its bearings, both cylindrical and flat, are in good condition, and do not show undue wear; in other words, the average life of a machine tool is equal to that of its bearings.

The Oiling System of "American" Planers is so designed as to secure the most satisfactory results possible. The bearings in the driving mechanism are oiled by means of a **gravity system** which is very effective. Oil pipes which carry a liberal supply of oil are brought to a central point at the outside of the bed, where they are easily accessible. These pipes terminate at reservoirs in the bronze bushings, in which felt strips are inserted. This felt insert serves to filter the oil, as well as to properly distribute it over the entire bearing, and also insures every drop of oil to be used to the best advantage. This arrangement is much superior to that commonly used by which the oil is introduced directly to the bearings through oil holes and grooves, which permits the oil to run out before it has performed its proper function.

No over-run of the table. Over-run of the table, which is caused by the momentum developed by the driving pulleys, has been practically eliminated on "American" Planers by applying **aluminum tight pulleys** in place of the cast iron pulleys formerly used. The aluminum pulleys by virtue of their **lower specific gravity** will develop only **one-third** the **momentum** that a cast iron pulley of the same dimensions and running under similiar conditions will. Another advantage from the use of Aluminum Pulleys is that the belts do not deteriorate nearly so rapidly and can be used 2″ longer than when used with the cast iron pulleys.

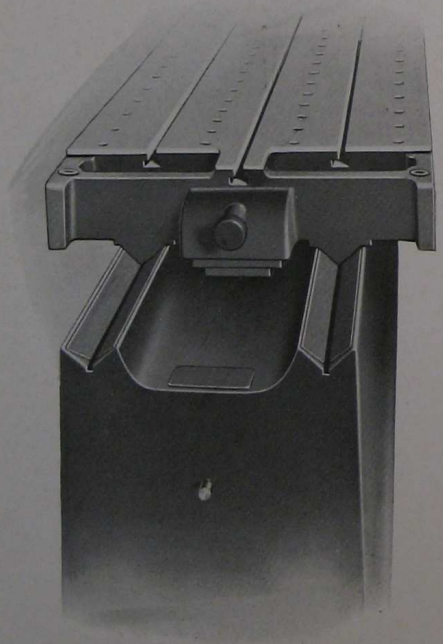


Fig. 1 Showing Closed Bed.

The loose pulleys run on removable bronze bushings in which oil reservoirs are moulded. These bushings are fitted with (a Patented lubricating device which prevents the waste of oil, yet thoroughly lubricates the journals.) A few renewals a week being all that is required. This style of bushing provides effectually against the flying oil (so ruinous to belts) which is characteristic of the usual bronze bushing which is recessed to carry loose oil. The V's have frequent automatic oil rollers and all waste oil is drained into pockets cast integral with the bed where it can be easily drawn off. This construction eliminates the detrimental effects of oil on wood and concrete floors.

Bed is of the square end type with the vees spaced far apart to properly support the table. The cross girths are closely spaced and run the full depth of the bed. The top wall is cast integral with the girths which provides a rigid support for the vees, and prevents the accumulation of chips between the girths, and possible injury to the operator.

At each end of the bed an oil reservoir is cast integral with the end girth, which receives any overflow of oil from the vees, and prevents the detrimental effect of oil on wood or concrete floors or foundations. A convenient pipe permits the oil to be drawn off when necessary.

The vees are wide, giving good wearing surfaces, and are scraped their entire length to a perfect bearing. A system of oil rollers and channels at frequent intervals distributes lubrication to all parts.

Table is of ample thickness, well braced by ribs to obtain great strength without unnecessary weight. T-Slots are planed from the solid, with very liberal allowance of metal around them, to obviate all spring from clamping. Stop holes are provided at extreme ends of table, which allow planing of work much longer than that specified at one setting, a feature not commonly found on other planers. It is equipped with improved dirt-proof feature, which completely protects the V's from chips and dirt, and has quick return, reversing without shock or jar. An improved shifting mechanism removes the belt from one pulley before the return belt engages the other, thus avoiding all disagreeable shrieking of belts. This shifting mechanism is so arranged that table can be run from under the tool for examination of work, and both dogs are so constructed that they pass entirely over the tumbler, thus preventing damage to parts, should belts break or become loose, thereby allowing the table to travel too far after instant of reverse. A safety locking device prevents the table from starting before the operator is ready. Pockets are of rounded form, making easy the removal of chips and dirt.

The Driving Mechanism is of very substantial construction, and is rigidly supported. The ratio of speed reduction in the driving train is unusually high. This in connection with the extra wide driving belt insures ample pressure at the table rack. The driving shafts are all accurately ground, and are made from .60 crucible steel. They run in long renewable bronze bushings in main cast iron bushings, which are ground and fitted bodily into holes bored and reamed in the bed. This construction brings the bushings and their supports close up to the driving gears where the greatest strains are concentrated. A feature of this mechanism is that the bull wheel is fixed on its shaft, which runs in two long bushed bearings. The two long journals provide a large bearing surface and the provision made for oiling is very efficient.

All driving gears are cut from the solid with special cutters for the particular number of teeth in each gear and are **tested for accuracy** on a **special gear testing machine.** The high speed gears are the herring-bone type insuring a quiet, smooth running drive with a minimum of wear in the gears.

Housings. We guarantee the housings when leaving our works to be square with bed both front and side, and the faces in perfect alignment with each other, thus insuring a perfect fit of crossrail at any elevation. They are of double-webbed, cored section type, exceptionally heavy, and secured to bed by substantial means. Are tied together at top by an arch of deep box form, giving great rigidity when taking side cuts and when crossrail is in a high position.

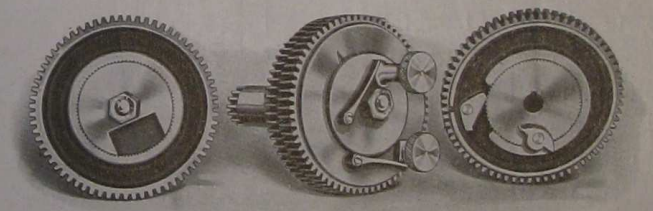


Fig. No. 2. Feed Gear Details.

Bearings for the rail are very wide, scraped to surface plates.

Crossrail is of box section with wide bearings. Is extra long, so that the left hand head can be run to the extreme end, allowing the other head to plane the full regular width of the machine. Is raised and lowered rapidly by our improved power friction elevating device, equipped with an adjustable flange coupling on elevating shaft, through which perfect alignment between rail and table can be quickly and easily maintained. Elevating screws are hung on hardened and ground tool steel collars. All gears are guarded.

Double Rail Heads are made right and left to permit of planing close together. Complete Taper Gib Adjustment is provided. Saddles are graduated for angular planing. Down feed is provided with micrometer adjustment, and down feed screws are supplied with ball bearings, which facilitate accurate adjustment from the squared rod at end of rail. Feed rack is cut from bar steel. Each rail head has automatic variable and independent power feeds in all directions, and also a ready hand adjustment, thus permitting either head to be used as a side head. This result is accomplished by means of an **improved design of the feed gears** on the end of the rail, the construction of which is very substantial, see Figure No. 2. In most planers the feed pawl and ratchet are incorporated in the small gears on the cross feed screws or feed rod, both of which are driven by

the one large feed gear. On "American" multiple rail head planers each of the small feed gears is driven by a separate large gear, in which a pawl and ratchet mechanism is incorporated. As a consequence one of the large gears may be used for driving a pinion on either cross feed screw while the other is used for rotating the pinion on the down feed rod. By incorporating the pawl and ratchet in the large gears **more liberal proportions may be used,** and the ratchet is therefore made much larger in diameter, thus forming a very substantial construction, in which **the possibility of breakage of the feed ratchet mechanism is entirely eliminated.**

Full Length Taper Gibs, having end screw adjustment, are used for taking up wear on the down slides of the rail heads. This forms a much more efficient and convenient construction than is provided on many other planers on which the wear is taken up by means of flat gibs and a series of set screws. With the latter type of gib a full length metal to metal contact is impossible, the pressure and wear all being taken on that portion of the gib directly over the adjusting screws.

The Feed Mechanism is of very convenient and efficient construction. The material used is positively the best obtainable, and all gears, as well as the feed rack, are cut from steel. The feed and elevating screws are made from Special High Carbon Ground Screw Stock.

The Feed Friction is of an improved type, its construction involving the use of two large leather washers held against the friction head by adjustable plates controlled by three adjustable spring studs. This design provides a much larger frictional area than the usual type of band friction and is guaranteed by us to pull all heads at the coarsest feeds provided.

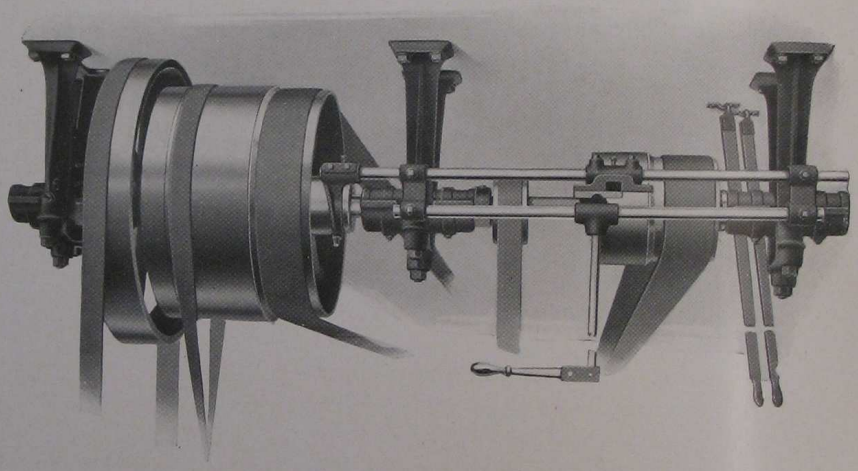


Figure No. 3. Two Speed Countershaft.

Two Speed Countershaft provides two cutting speeds and a constant return speed. The high speed belt supplies the constant return and fast cutting speeds, and the slow speed belt controls the slow cutting speed. The cutting speeds can be varied within certain limits to suit customer's requirements. If not specified by customer, speeds of 40 and 42 feet per minute will be furnished.

Means is provided for quickly engaging the fast or slow speeds through a convenient lever located on the rear housing.

All the running journals, including the hangers, are fitted with improved anti-friction bearings.

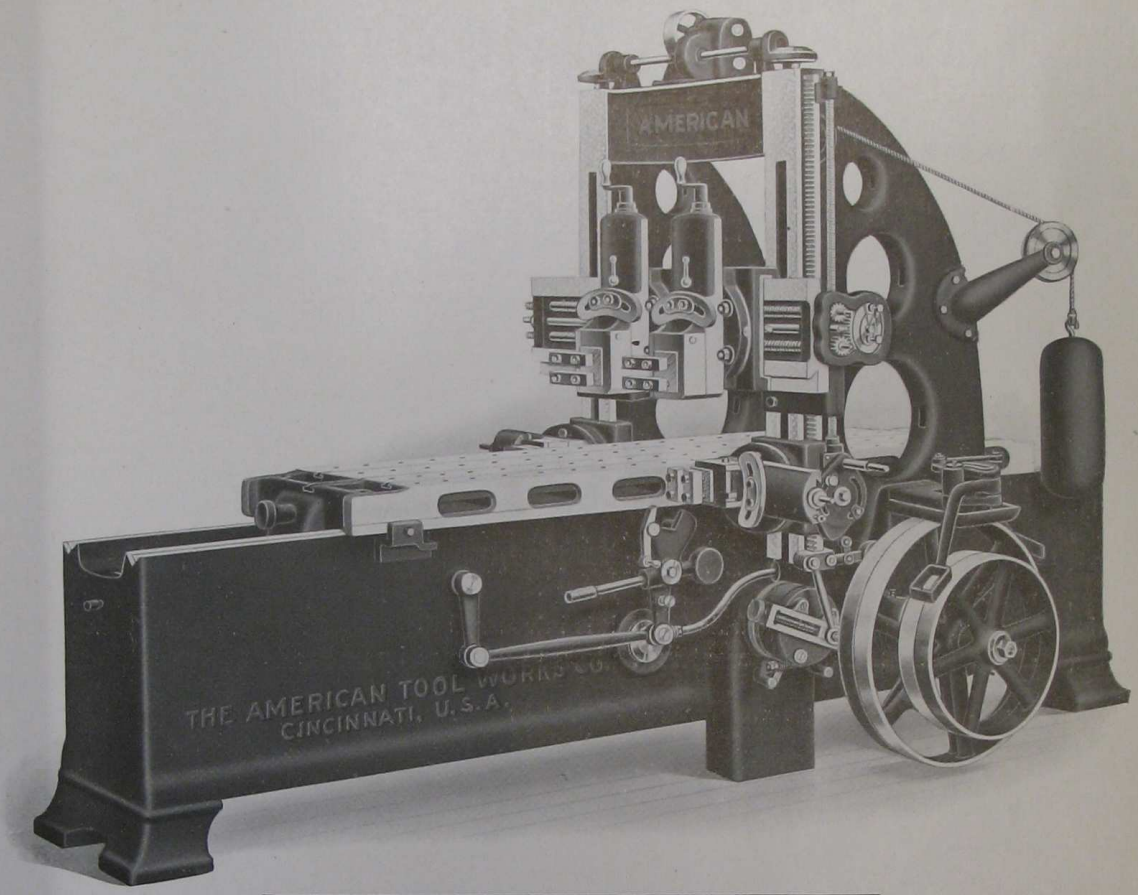
Regular equipment, upon which base price is determined, includes one head on cross rail, an efficient two speed self-oiling countershaft, also all necessary wrenches and **instruction book** for the installation and operation of our machines.

We can equip this planer, at extra cost, with extra head on rail, one or two side heads, plain motor drive, or variable speed reversing motor drive and parallel drive, also with Multi-Speed Drive, giving four (4) speeds through cone speed variator with belt or motor drive, providing suitable cutting speeds for all classes of planer work.

21.91

30 in. Standard Pattern Planer, Fig. No. 163.
36 in. Medium Pattern Planer, Fig. No. 171.

Circular No. 170.



AMERICAN

30-inch Standard Pattern and 36-inch Medium Pattern Metal Planers

With one, two, three or four heads.

	30 in.	36 in.
Planes wide	30½ in.	36½ in.
Planes high	30½ in.	36½ in.
Distance between V centers	15½ in.	15½ ft.
Standard length of table	8 ft.	8 ft.
Length of bed for standard table length	12 ft. 6 in.	12 ft. 6 in.

Advances by even lengths of table up to any desired length

In machine construction planed surfaces invariably form the foundation from which all other parts are fitted and aligned. It is therefore of the utmost importance that a high degree of accuracy be maintained in the construction and alignment of a metal planer, for this type of machine tool more nearly reproduces the quality of workmanship inherent in itself than any other metal working machine, consequently if a planer lacks the necessary degree of accuracy the work planed will frequently require considerable scraping, which in itself is the most costly of shop operations. Therefore, undue scraping should be eliminated, not only for reasons of economy, but because a true planed bearing is in every respect superior to a scraped bearing.

THE AMERICAN TOOL WORKS CO.

LATHES, PLANERS, SHAPERS, RADIAL DRILLS

MAIN OFFICES AND WORKS

CINCINNATI, U. S. A.

4M-B-4-20

The workmanship and alignment of "American" planers are of a quality and accuracy that only thoroughly modern equipment and skilled workmen can produce. As a further assurance of their quality, "American" planers are fully and positively guaranteed, if set up and leveled properly, to plane up to their maximum capacity perfectly square, and parallel within a limit of .001 part of an inch.

Although accuracy is the most essential requisite of planer construction, there are also several other important considerations of design which must be observed, in order to produce a machine which will be capable of planing accurate work with the greatest possible economy; therefore, in the following, particular attention is called to these features as developed in "American" Planers.

Proper facilities for lubrication are of the utmost importance in machine tool construction. A machine tool will produce satisfactory results only as long as its bearings, both cylindrical and flat, are in good condition, and do not show undue wear; in other words, the average life of a machine tool is equal to that of its bearings.

The oiling system of "American" Planers is so designed as to secure the most satisfactory results possible. The bearings in the driving mechanism are oiled by means of a **gravity system** which is very effective. Oil pipes which carry a liberal supply of oil are brought to a central point at the outside of the bed, where they are easily accessible. These pipes terminate at reservoirs in the bronze bushings, in which felt strips are inserted. This felt insert serves to filter the oil, as well as to properly distribute it over the entire bearing, and also insures every drop of oil to be used to the best advantage. This arrangement is much superior to that commonly used by which the oil is introduced directly to the bearings through oil holes and grooves, which permits the oil to run out before it has performed its proper function.

No over-run of the table. Over-run of the table, which is caused by the momentum developed by the driving pulleys, has been practically eliminated on "American" Planers by applying **aluminum tight pulleys** in place of the cast iron pulleys formerly used. The aluminum pulleys by virtue of their **lower specific gravity** will develop only **one-third** the **momentum** that a cast iron pulley of the same dimensions and running under similiar conditions will. Another advantage from the use of Aluminum Pulleys is that the belts do not deteriorate nearly so rapidly and can be used 2″ longer than when used with the cast iron pulleys.

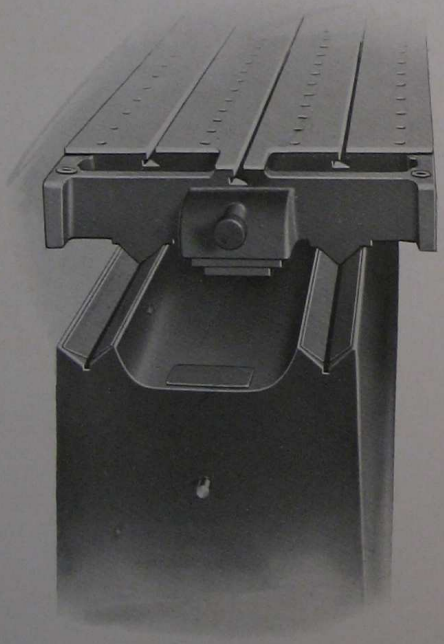


Fig. 1 Showing Closed Bed.

The loose pulleys run on removable bronze bushings in which oil reservoirs are moulded. These bushings are fitted with (a Patented lubricating device which prevents the waste of oil, yet thoroughly lubricates the journals.) A few renewals a week being all that is required. This style of bushing provides effectually against the flying oil (so ruinous to belts) which is characteristic of the usual bronze bushing which is recessed to carry loose oil. The V's have frequent automatic oil rollers and all waste oil is drained into pockets cast integral with the bed where it can be easily drawn off. This construction eliminates the detrimental effects of oil on wood and concrete floors.

Bed is of the square end type with the vees spaced far apart to properly support the table. The cross girths are closely spaced and run the full depth of the bed. The top wall is cast integral with the girths which provides a rigid support for the vees, and prevents the accumulation of chips between the girths, and possible injury to the operator.

At each end of the bed an oil reservoir is cast integral with the end girth, which receives any overflow of oil from the vees, and prevents the detrimental effect of oil on wood or concrete floors or foundations. A convenient pipe permits the oil to be drawn off when necessary.

The vees are wide, giving good wearing surfaces, and are scraped their entire length to a perfect bearing. A system of oil rollers and channels at frequent intervals distributes lubrication to all parts.

Table is of full box construction, well braced by ribs to obtain great strength without unnecessary weight. T-Slots are planed from the solid with very liberal allowance of metal around them, to obviate all spring from clamping. Stop holes are provided at extreme ends of table which allow planing of work much longer than that specified, at one setting, a feature not commonly found on other planers. It is equipped with improved dirt-proof feature, which completely protects the V's and gearing because no chips and dirt can pass through the table, it has quick return, reversing without shock or jar. An improved shifting mechanism removes the belt from one pulley before the return belt engages the other, thus avoiding all disagreeable shrieking of belts. This shifting mechanism is so arranged that table can be run from under the tool for examination of work, and both dogs are so constructed that they pass entirely over the tumbler, thus preventing damage to parts should belts break or become loose, thereby allowing the table to travel too far after instant of reverse. A safety locking device prevents the table from starting before the operator is ready. Pockets are of rounded form, making easy the removal of chips and dirt.

The driving mechanism is of very substantial construction, and is rigidly supported. The ratio of speed reduction in the driving train is unusually high. This in connection with the extra wide driving belt insures ample pressure at the table rack. The driving shafts are all accurately ground, and are made from .60 crucible steel. They run in long renewable bronze bushings in main cast iron bushings, which are ground and fitted bodily into holes bored and reamed in the bed. This construction brings the bushings and their supports close up to the driving gears where the greatest strains are concentrated. A feature of this mechanism is that the bull wheel is fixed on its shaft, which runs in two long bushed bearings. The two long journals provide a large bearing surface and the provision made for oiling is very efficient.

The bull wheel is made from a steel casting and the **pinions** from **steel forgings.** All driving gears are cut from the solid with special cutters for the particular number of teeth in each gear and are **tested for accuracy** on a **special gear testing machine.** The high speed gears are the herringbone type insuring a quiet, smooth running drive with a minimum of wear in the gears.

Housings. We guarantee the housings when leaving our works to be square with bed both front and side, and the faces in perfect alignment with each other, thus insuring a perfect fit of crossrail at any elevation. They are of double-webbed, cored section type, exceptionally heavy, and secured to bed by substantial means. Are tied together at top by an arch of deep box form, giving great rigidity when taking side cuts and when crossrail is in a high position. Bearings for the rail are very wide, scraped to surface plates.

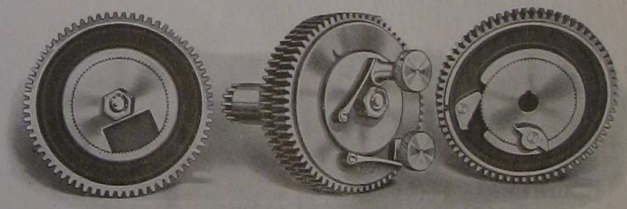


Fig. No. 2. Feed Gear Details.

Crossrail is of box section with wide bearings. Is extra long, so that the left hand head can be run to the extreme end, allowing the other head to plane the full regular width of the machine. Is raised and lowered rapidly by our improved power friction elevating device, equipped with an adjustable flange coupling on elevating shaft, through which perfect alignment between rail and table can be quickly and easily maintained. Elevating screws are hung on hardened and ground tool steel collars. All gears are guarded.

Railheads are made right and left to permit of planing close together. Complete Taper Gib Adjustment is provided. Saddles are graduated for angular planing. Down feed is provided with micrometer adjustment, and down feed screws are supplied with ball bearings, which facilitate accurate adjustment from the squared rod at end of rail. Feed rack is cut from bar steel. Each rail head has automatic variable and independent power feeds in all directions, and also a ready hand adjustment, thus permitting either head to be used as a side head. This result is accomplished by means of an **improved design of the feed gears** on the end of the rail, the construction of which is very substantial, see Figure No. 2. In most planers the feed pawl and ratchet are incorporated in the small gears on the cross feed screws or feed rod, both of which are driven by

the one large feed gear. On "American" multiple rail head planers each of the small feed gears is driven by a separate large gear, in which a pawl and ratchet mechanism is incorporated. As a consequence one of the large gears may be used for driving a pinion on either cross feed screw while the other is used for rotating the pinion on the down feed rod. By incorporating the pawl and ratchet in the large gears **more liberal proportions may be used,** and the ratchet is therefore made much larger in diameter, thus forming a very substantial construction, in which **the possibility of breakage of the feed ratchet mechanism is entirely eliminated.**

Power elevating mechanism. The power elevating device is completely enclosed in a housing which is mounted on the arch. A single pulley on the drive shaft receives power from the countershaft. The gears and shafts are of high grade materials, and the journals are bronze lined. The frictions are operated by a drop lever at the left housing for elevating or lowering the rail.

The rail alignment coupling on the elevating shaft provides means for quickly and accurately setting the rail in alignment with the table without disturbing the nuts on the elevating screws.

Full length taper gibs, having end-screw adjustment, are used for taking up wear on the down slides of the rail heads. This forms a much more efficient and convenient construction than is provided on many other planers on which the wear is taken up by means of flat gibs and a series of set screws. With the latter type of gib a full length metal to metal contact is impossible, the pressure and wear all being taken on that portion of the gib directly over the adjusting screws.

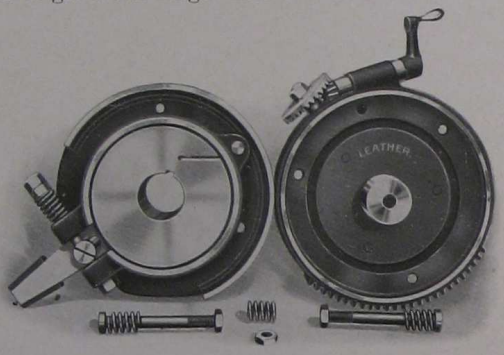


Fig. No. 3. Interior of feed friction.

The feed mechanism is of very convenient and efficient construction. The material used is positively the best obtainable and all gears, as well as the feed rack, are cut from steel. The feed and elevating screws are made from Special High Carbon Ground Screw Stock.

The feed friction is of an improved type, its construction involving the use of an adjustable combination band and disk friction (see Figure No. 3.) The disk friction consists of two large leather washers held against the friction head by adjustable plates held in tension by three adjustable spring studs. This design provides a much larger frictional area than the usual type of large band friction and is guaranteed by us to pull both heads at the coarsest feeds provided. The disk friction has a further effect of relieving the band friction of any wear during the reverse or cutting stroke, as the latter is held open by the action of the disk friction, and is only in actual working contact at the instant of reverse.

Two speed countershaft provides two cutting speeds and a constant return speed. The high speed belt supplies the constant return and fast cutting speeds, and the slow speed belt controls the slow cutting speed. The cutting speeds can be varied within certain limits to suit customer's requirements. If not specified by customer, speeds of 26 and 45 feet per minute will be furnished.

Means are provided for quickly engaging the fast or slow speeds through a convenient lever located on the rear housing.

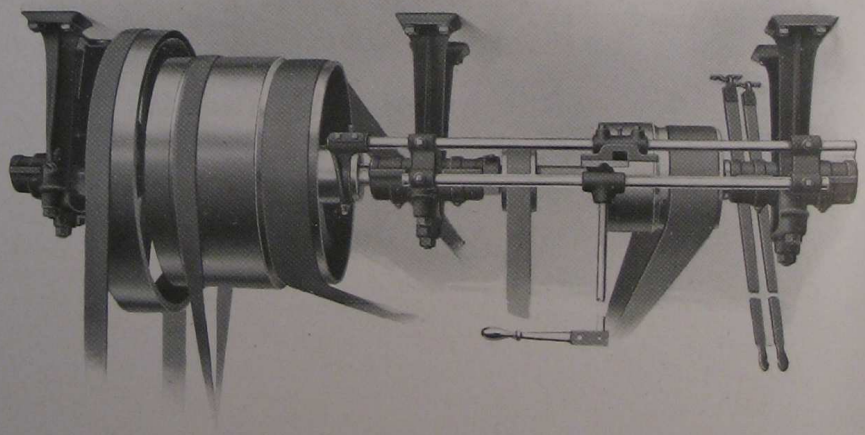


Figure No. 4. Two Speed Countershaft.

All the running journals, including the hangers, are fitted with improved anti-friction bearings.

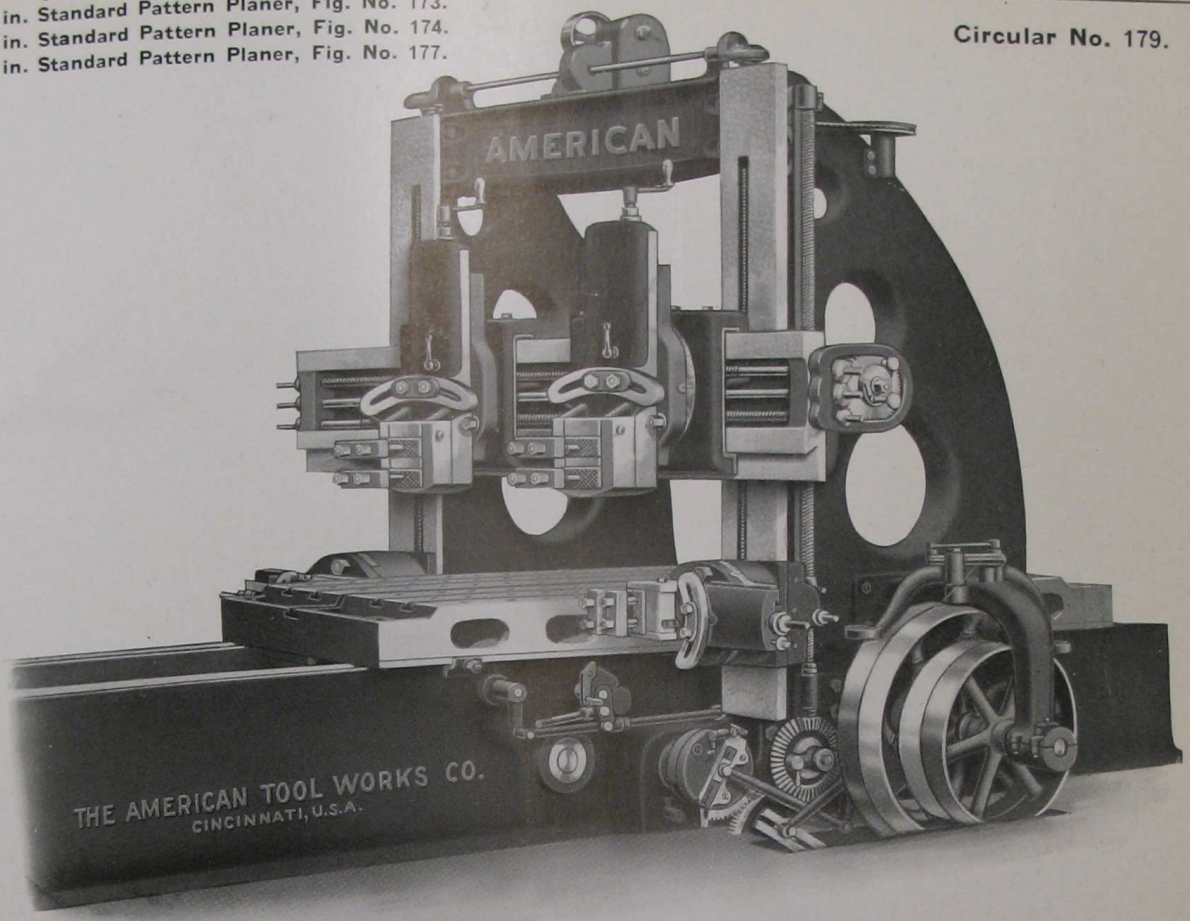
Regular equipment, upon which base price is determined, includes one head on cross rail, an efficient two speed self-oiling countershaft, also all necessary wrenches and **instruction book** for the installation and operation of our machines.

We can equip this planer, at extra cost, with extra head on rail, one or two side heads, plain motor drive, or variable speed reversing motor drive and parallel drive, also with Multi-Speed Drive, giving four (4) speeds through cone speed variator with belt or motor drive, providing suitable cutting speeds for all classes of planer work.

621.91

42 in. Standard Pattern Planer, Fig. No. 173.
48 in. Standard Pattern Planer, Fig. No. 174.
60 in. Standard Pattern Planer, Fig. No. 177.

Circular No. 179.



AMERICAN

42-inch, 48-inch and 60-inch Metal Planers

With one, two, three or four heads.

	42 in.	48 in.	60 in.
Planes wide	42½ in.	48½ in.	61 in.
Planes high	43 in.	49 in.	61 in.
Distance between V centers	23 in.	23 in.	30 in.
Standard length of table	10 in.	10 in.	12 in.
Length of bed for standard table length	16 ft. 6 in.	16 ft. 6 in.	20 ft. 7¼ in.

Advances by even lengths of table up to any desired length.

In machine construction planed surfaces invariably form the foundation from which all other parts are fitted and aligned. It is therefore of the utmost importance that a high degree of accuracy be maintained in the construction and alignment of a metal planer, for this type of machine tool more nearly reproduces the quality of workmanship inherent in itself than any other metal working machine, consequently if a planer lacks the necessary degree of accuracy the work planed will frequently require considerable scraping, which in itself is the most costly of shop operations. Therefore, undue scraping should be eliminated not only for reasons of economy, but because a true planed bearing is in every respect superior to a scraped bearing.

THE AMERICAN TOOL WORKS CO.

LATHES, PLANERS, SHAPERS, RADIAL DRILLS

MAIN OFFICES AND WORKS

CINCINNATI, U. S. A.

4M-B-4-20

The workmanship and alignment of "American" planers are of a quality and accuracy that only thoroughly modern equipment and skilled workmen can produce. As a further assurance of their quality "American" planers are fully and positively guaranteed, if set up and leveled properly, to plane up to their maximum capacity perfectly square and parallel within a limit of .001 part of an inch.

Although accuracy is the most essential requisite of planer construction, there are also several other important considerations of design which must be observed in order to produce a machine which will be capable of planing accurate work with the greatest possible economy, therefore in the following, particular attention is called to these features as developed in "American" Planers.

Proper facilities for lubrication are of the utmost importance in machine tool construction. A machine tool will produce satisfactory results only as long as its bearings, both cylindrical and flat, are in good condition and do not show undue wear; in other words, the average life of a machine tool is equal to that of its bearings.

The oiling system of "American" Planers is so designed as to secure the most satisfactory results possible. The main driving or pulley shaft runs in three (3) long **phosphor bronze bearings,** which are **ring oiled.** Large pockets serve to retain the lubricant, which after its passage of the bearings, is carried back to the pockets by return ducts, thus producing a circulating oil system which keeps the bearings constantly flooded with oil. The other bearings in the driving mechanism are oiled by means of a **gravity system** which is very effective. Oil pipes which carry a liberal supply of oil are brought to a central point at the outside of the bed, where they are easily accessible. These pipes terminate at a slot cut lengthwise in the bushings, in which a felt strip is inserted. This felt insert serves to filter the oil, as well as to properly distribute it over the entire bearing, and also insures every drop of oil being used to the best advantage. This arrangement is much superior to that commonly used by which the oil is introduced directly to the bearings through oil holes and grooves, which permits the oil to run out before it has performed its proper function.

No over-run of the table. Over-run of the table, which is caused by the momentum developed by the driving pulleys, has been practically eliminated on "American" Planers by applying **aluminum tight pulleys** in place of the cast iron pulleys formerly used. The aluminum pulleys by virtue of their **lower specific gravity** will develop only **one-third** the **momentum** that a cast iron pulley of the same dimensions and running under similiar conditions will. Another advantage from the use of Aluminum Pulleys is that the belts do not deteriorate nearly so rapidly and can be used 2″ longer than when used with the cast iron pulleys.

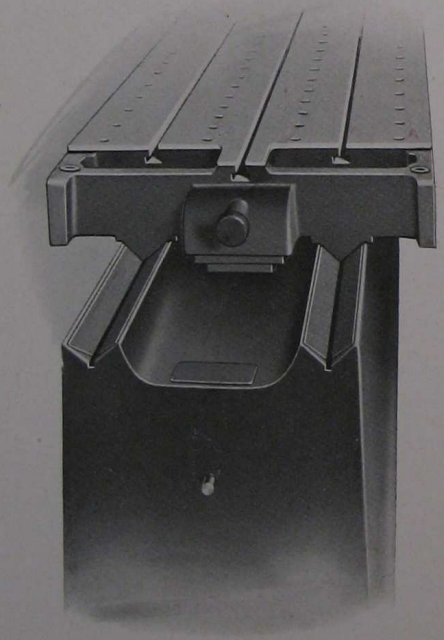


Fig. 1 Showing Closed Bed.

The loose pulleys run on removable bronze bushings in which oil reservoirs are moulded. These bushings are fitted with (a Patented lubricating device which prevents the waste of oil, yet thoroughly lubricates the journals.) A few renewals a week being all that is required. This style of bushing provides effectually against the flying oil (so ruinous to belts) which is characteristic of the usual bronze bushing which is recessed to carry loose oil. The V's have frequent automatic oil rollers and all waste oil is drained into pockets cast integral with the bed where it can be easily drawn off. This construction eliminates the detrimental effects of oil on wood and concrete floors.

Bed is of the square end type with the vees spaced far apart to properly support the table. The cross girths are closely spaced and run the full depth of the bed. The top wall is cast integral with the girths which provides a rigid support for the vees, and prevents the accumulation of chips between the girths, and possible injury to the operator.

At each end of the bed an oil reservoir is cast integral with the end girth, which receives any overflow of oil from the vees, and prevents the detrimental effect of oil on wood or concrete floors or foundations. A convenient pipe permits the oil to be drawn off when necessary.

The vees are wide, giving good wearing surfaces, and are scraped their entire length to a perfect bearing. A system of oil rollers and channels at frequent intervals distributes lubrication to all parts.

Table is of full box construction, well braced by ribs to obtain great strength without unnecessary weight. T-Slots are planed from the solid with very liberal allowance of metal around them, to obviate all spring from clamping. Stop holes are provided at extreme ends of table which allow planing of work much longer than that specified, at one setting, a feature not commonly found on other planers. It is equipped with improved dirt-proof feature, which completely protects the V's and gearing because no chips and dirt can pass through the table, it has quick return, reversing without shock or jar. An improved shifting mechanism removes the belt from one pulley before the return belt engages the other, thus avoiding all disagreeable shrieking of belts. This shifting mechanism is so arranged that table can be run from under the tool for examination of work and both dogs are so constructed that they pass entirely over the tumbler, thus preventing damage to parts should belts break or become loose, thereby allowing the table to travel too far after instant of reverse. A safety locking device prevents the table from starting before the operator is ready. Pockets are of rounded form, making easy the removal of chips and dirt.

The driving mechanism is of very substantial construction and is rigidly supported. The ratio of speed reduction in the driving train is unusually high. This in connection with the extra wide driving belt insures ample pressure at the table rack. The driving shafts are all accurately ground and are made from .60 crucible steel. They run in long renewable bronze bushings in main cast iron bushings, which are ground and fitted bodily into holes bored and reamed in the bed. This construction brings the bushings and their supports close up to the driving gears where the greatest strains are concentrated. A feature of this mechanism is that the bull wheel is fixed on its shaft which runs in two long bronze bushed bearings. The two long journals provide a large bearing surface and the provision made for oiling is very efficient.

Large drive gears are made from steel castings and the **pinions** from **steel forgings** heat treated. All driving gears are cut from the solid with special cutters, and are **tested for accuracy** on a **special gear testing machine.** The high speed and intermediate gears are the herringbone type insuring a quiet, smooth running drive with a minimum of wear in the gears.

Housings. We guarantee the housings, when leaving our works, to be square with bed both front and side, and the faces in perfect alignment with each other, thus insuring a perfect fit of crossrail at any elevation. They are of double-webbed, cored section type, exceptionally heavy, and secured to bed by substantial means. Are tied together at top by an arch of deep box form, giving great rigidity when taking side cuts and when crossrail is in a high position. Bearings for the rail are very wide, scraped to surface plates.

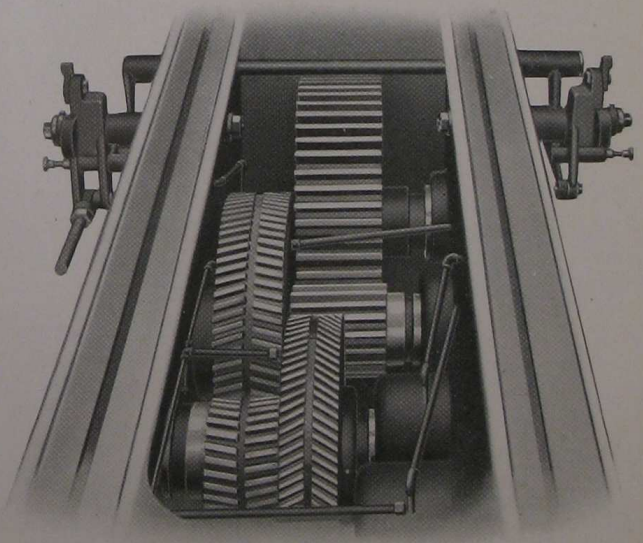


Fig. No. 2.

Crossrail is of box section with wide bearings. Is extra long, so that either head can be run to the extreme end, allowing the other head to plane the full regular width of the machine. Is raised and lowered rapidly by our improved power friction elevating device, equipped with an adjustable flange coupling on elevating shaft, through which perfect alignment between rail and table can be quickly and easily maintained. Elevating screws are hung on hardened and ground tool steel collars. All gears are guarded.

Railheads are made right and left to permit of planing close together. Complete Taper Gib Adjustment is provided. Saddles are graduated for angular planing. Down feed is provided with micrometer adjustment and down feed screws are supplied with ball bearings which facilitate accurate adjustment from the squared rod at end of rail. Feed rack is cut from bar steel. Each rail head has automatic variable and independent power feeds in all directions, and also a ready hand adjustment, thus permitting either head to be used as a side head. This result is accomplished by means of an **improved design of the feed gears** on the

end of the rail, the construction of which is very substantial, see Figure No. 3. In most planers the feed pawl and rachet is incorporated in the small gears on the cross feed screws and feed rod, both of which are driven by the one large feed gear. On **"American"** multiple rail head planers each of the small feed gears is driven by a separate large gear, in each of which a pawl and rachet mechanism is incorporated. As a consequence, one of the large gears may be used for driving a pinion on either cross feed screw while the other is used for rotating the pinion on the down feed rod. By incorporating the pawl and rachet in the large gears **more liberal proportions may be used,** and the rachet is therefore made much larger in diameter, thus forming a very substantial construction in which **the possibility of breakage of the feed rachet mechanism is entirely eliminated.**

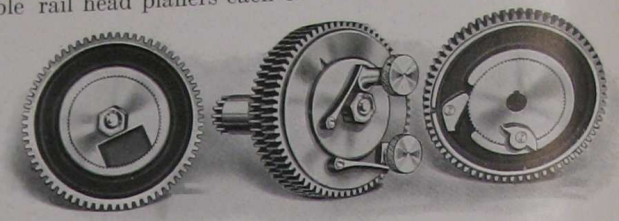


Fig. No. 3. Feed Gear Details.

Power elevating mechanism. The power elevating device is completely enclosed in a housing which is mounted on the arch. A single pulley on the drive shaft receives power from the countershaft. The gears and shafts are of high grade materials, and the journals are bronze lined. The frictions are operated by a drop lever at the left housing for elevating or lowering the rail.

The rail alignment coupling on the elevating shaft is incorporated in the large gear on the shaft, and a removable guard provides access to it when necessary.

Full length taper gibs, having end-screw adjustment, are used for taking up wear on the down slides of the rail heads. This forms a much more efficient and convenient construction than is provided on many other planers on which the wear is taken up by means of flat gibs and a series of set screws. With the latter type of gib a full length metal to metal contact is impossible, the pressure and wear all being taken on that portion of the gib directly over the adjusting screws.

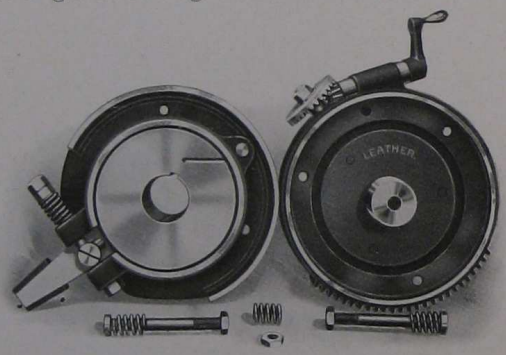


Fig. No. 4. Interior of feed friction.

The feed mechanism is of very convenient and efficient construction. The material used is positively the best obtainable and all gears, as well as the feed rack, are cut from steel. The feed and elevating screws are made from Special High Carbon Ground Screw Stock.

The feed friction is of an improved type, its construction involving the use of an adjustable combination band and disk friction (see Figure No. 4.) The disk friction consists of two large leather washers held against the friction head by adjustable plates held in tension by three adjustable spring studs This design provides a much larger frictional area than the usual type of large band friction and is guaranteed by us to pull both heads at the coarsest feeds provided. The disk friction has a further effect of relieving the band friction of any wear during the reverse or cutting stroke, as the latter is held open by the action of the disk friction, and is only in actual working contact at the instant of reverse.

Two speed countershaft provides two cutting speeds and a constant return speed. The high speed belt supplies the constant return and fast cutting speeds, and the slow speed belt controls the slow cutting speed. The cutting speeds can be varied within certain limits to suit customer's requirements. If not specified by customer, speeds of 24 and 42 feet per minute will be furnished.

Means is provided for quickly engaging the fast or slow speeds through a convenient lever located on the rear housing.

All the running journals, including the hangers, are fitted with improved anti-friction bearings.

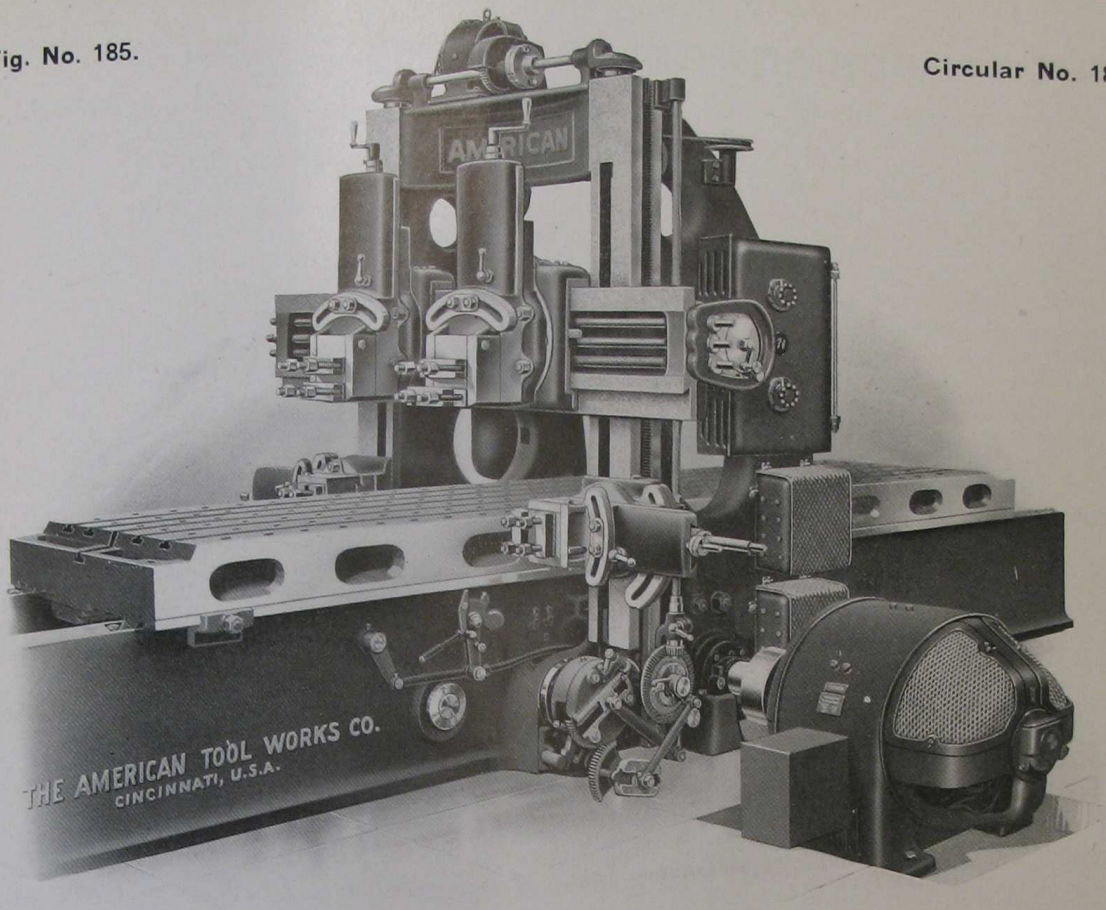
Regular equipment, upon which base price is determined, includes one head on cross rail, an efficient two speed self-oiling countershaft, also all necessary wrenches and **instruction book** for the installation and operation of our machines.

We can equip this planer, at extra cost, with extra head on rail, plain motor drive, or variable speed reversing motor drive and parallel drive; also with Multi-Speed Drive, giving four (4) speeds through cone speed variator with belt or motor drive, providing suitable cutting speeds for all classes of planer work.

621.91

Fig. No. 185.

Circular No. 182.



Reversing Motor Drive.

AMERICAN

MULTI-SPEED PLANERS

24 inch to 60 inch inclusive.

Belt and Motor Driven.

The advisability of planing various metals at different speeds has created a decided demand for planers providing more than one cutting speed. In those shops where the work is uniform, or where each planer or group of planers, is devoted to certain classes of work only, the single speed type is perfectly satisfactory. It is quite necessary, however, where planers are called upon to plane various metals, that they provide a greater number of cutting speeds.

We are prepared to furnish "American" Planers with several distinct types of Multi-Speed Drives, which are described in the following, in their order of importance.

THE AMERICAN TOOL WORKS CO.

LATHES, PLANERS, SHAPERS, RADIAL DRILLS

MAIN OFFICES AND WORKS

CINCINNATI, U. S. A.

4M-B-4-20

THE "AMERICAN" REVERSING MOTOR PLANER

The Reversing Motor Drive for planer service is without doubt one of the greatest improvements of recent years in the electrical unit drive for machine tools. Its development has been largely due to the demand for a planer drive that would overcome the limitations of the belt driven type which are especially objectionable on the larger sizes of planers when subjected to severe service. On the other hand, it must also be admitted that for the ordinary run of planer work where the duty required is not severe, the belt driven machine, when properly designed, has proven to be entirely satisfactory, both from the standpoint of economy in first cost and maintenance, as well as in working efficiency. The belt driven machine, therefore, will continue to be extensively used on the many classes of work to which it is well adapted, especially where speed variation is not essential.

Although the Reversing Motor Planer Drive is comparatively new, a number of years have been devoted to its development and perfection, consequently the experimental stage had been safely passed before this drive was placed on the market. We thoroughly investigated and carefully tested out this drive in our own works, under unusually severe conditions, and as it has proven satisfactory even beyond our own expectations, we are now prepared to furnish it on all sizes of "American" Planers.

The Equipment illustrated and described herein is fully guaranteed by the makers to give entirely satisfactory results under ordinary working conditions, the electrical apparatus being such as will not require other than the usual attention necessary to keep a motor in good running order. "The motors have been so designed that sparkless commutation for the complete cycle results, in fact, the commutator attains that blue-black polish which indicates the entire absence of sparking and perfect commutation."

There can be no doubt but that where the service is severe, the direct connected motor drive affords the great advantage of enabling the planer to take much heavier cuts than would be possible with the belt driven type.

The Reversing Motor Drive also provides an ideal arrangement for speed variation as either the cutting or reverse speed may be quickly varied at any time by merely operating an ordinary controller lever. The variation between the cutting and return speed is entirely independent, that is, the slowest cutting speed may be used in connection with the fastest return speed, or vice versa, and the speed changes can be made just as readily under a cut as otherwise. In all, about thirty speeds are provided, both forward and reverse, the number depending on the size of the motor. This easy access to the various speeds will undoubtedly add greatly to the productive possibilities of the planer, as the operator will naturally feel encouraged to always select the proper speeds for every job.

The following table indicates the size of motor and range of speeds recommended for the various sizes of "American" Planers. The speeds given may be varied within reasonable limits.

HORSE POWER OF PLANER MOTORS FOR REVERSING TYPE MOTOR DRIVE

Size of Planer	24″	30″	36″ M. P.	42″	48″	60″
LIGHT DUTY	4 H. P.	6 H. P.	6 H. P.	12½ H. P.	12½ H. P.	12½ H. P.
MEDIUM DUTY	5 H. P.	7½ H. P.	7½ H. P.	15 H. P.	15 H. P.	15 H. P.
HEAVY DUTY	6 H. P.	10 H. P.	10 H. P.	20 H. P.	25 H. P.	30 H. P.
EXTRA HEAVY DUTY	7½ H. P.	12½ H. P.	12½ H. P.	25 H. P.	30 H. P.	35 H. P.
RANGE OF CUTTING and RETURN SPEEDS FEET PER MINUTE.	31′ to 124′	26′ to 104′	26′ to 104′	22′ to 88′	22′ to 88′	22′ to 88′

CUTTING AND RETURN SPEED RANGES ARE ALIKE, EACH HAVING INDEPENDENT REGULATION.

CUTTING SPEEDS ARE BASED UPON MOTOR SPEEDS OF 250 TO 1000 REV. PER MIN.

Widened Planers should have same motors as recommended for Extra Heavy Service on the basic size machines.

A further advantage of the reversing motor drive lies in the fact that the table may be slowed down when passing over hard spots, and also it may be speeded up between cuts on work having gaps between the cuts.

The starting and stopping for both forward and reverse strokes is regularly controlled by the tumbler lever on the bed, or if desired a pendant switch can be used which is suspended over the work to assist the operator in positioning the table. This auxiliary switch is included in the regular equipment, and is additional to the regular tumbler mechanism.

The operation of the entire electrical equipment is so sensitive and reliable that edging cuts of half-inch lengths can be easily obtained, and the stroke lengths will not vary more than one eighth of an inch on cuts of any length or velocity;—this feature is most valuable when planing to shoulders or inside of pockets.

The Direct Connected Motor Drive by virtue of its location effectually eliminates all vibration which is characteristic of the various forms of mechanical speed variators which, by reason of the belt drive were necessarily mounted upon the top of the housings. The reversing motor drive has the further advantage of being practically noiseless at all times. This feature is in marked contrast to the noise and vibration characteristic of the geared type of speed variator.

At first thought it may appear that the construction and operation of the reversing motor drive is necessarily complicated and will therefore require skill in handling, above that which is possessed by the average planer operator. On the contrary, however, the actual operation of this mechanism is **extremely simple** and will be readily understood. The only adjustments necessary are confined to those required to change the speeds, which are easily accomplished by moving the rheostat pointer on the controller panel to the position indicated for the desired speeds, a separate and distinct rheostat being provided for both the forward and reverse speeds. The movement of the table itself is controlled by means of the tumbler handle at the side of the table in exactly the same manner as on the belt driven planer. To start the table it is only necessary to slightly move the tumbler lever, the direction in which the table will run being indicated by the direction in which the tumbler is moved. The table dogs are used to limit the stroke length which can be varied from approximately six inches up to the maximum capacity of the machine.

The reversal of the machine is entirely automatic and is accomplished very quickly, there being no perceptible pause at either end of the stroke. As before explained, the cutting and return speed can be varied independently, the total range of speeds being at the ratio of four to one, thus providing a very wide range suitable for all classes and conditions of work. The table can be stopped at any point within its working cycle by means of the tumbler handle in exactly the same manner as on the belted type. At this point it is again emphasized that only average skill is required to operate this drive and any ordinary workman accustomed to planer operation can readily familiarize himself with the mechanism in a few moments.

The illustration on the first page shows the motor placed on the right hand side of the planer and coupled directly to the driving shaft. However, the motor may be placed on either side of the machine and can be connected directly to the shaft or thru spur or bevel gears, its location depending upon where the motor may be most conveniently located to utilize the available floor space. For elevating the rail a small motor is mounted on the arch, being connected thru gears to the regular elevating mechanism.

The foregoing description has been intentionally restricted to a consideration of only the mechanical features of the reversing motor drive. This has been done for the reason that information relating to the electrical principles of its construction and operation will necessarily be more authentic if compiled by the makers of the electrical apparatus; this information is therefore furnished in a separate bulletin.

4 Step Cone Speed Variator, Belt or Motor Driven

With this type of Drive Four Cutting Speeds are obtained through a pair of opposed four step cone pulleys operated by an endless belt between them, the whole being mounted upon a substantial platform on top of the housings. The belt is shifted from step to step and provides a range of speeds calculated to cover a wide working range. This, coupled with the constant high speed return of the platen, insures the greatest working economy.

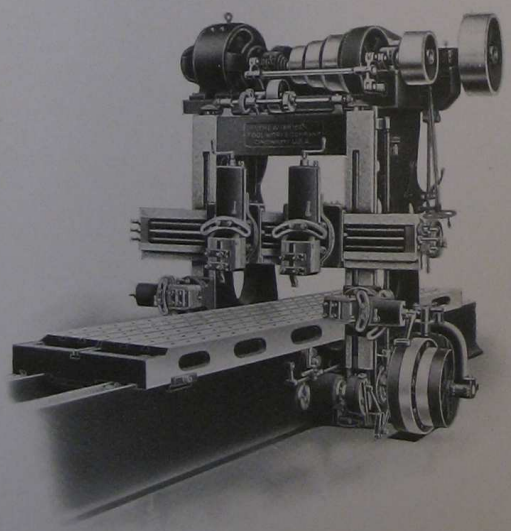


Fig. No. 1. "American" Planer with Cone Speed Variator.

Simplicity of the Variator. This drive has primarily two distinct and necessary advantages over the old geared drive, viz.: Simplicity of Design and Freedom from Destructive Vibration. There are no change gears to break, stick to or cut shafts, no troublesome frictions to wear and be adjusted, no jaw clutches to be bruised or broken and no large reservoir of oil to be splashing and leaking over the machine. It is free from the distracting noise and vibration of the gear driven type, which condition becomes worse as the parts are subjected to wear, on account of the excessive speed of the gears. Such vibration invariably imparts inaccuracy to the work being planed and hence unfits the geared drive for accurate planer work. This new Speed Variator is absolutely free from all the above defects and insures the smoothest possible work. Its simplicity, efficiency and durability will appeal to those interested in this type of drive.

The Shifting of the Belt is novel and very effective. A pair of belt forks are moved alternately along guide rods by means of a pair of cylindrical cams, which revolve alternately through the medium of a set of intermittent gears operated by the hand wheel shown at rear. One revolution of this wheel shifts the belt from one step to another and a shot pin indicates the complete revolution. The cam rolls have spiral slots milled in their peripheries, each belt fork being moved along the guide rods through the medium of a roller operating in the spiral slots. The relation between the cams and forks is such as to shift the belt off of the high step of one cone before placing it on the high step of the opposing cone.

The Tension of the Belt is controlled by the vertical lever, shown at the rear, operating in a radial slot. This lever is of convenient height and operates a pair of bell cranks through a link connection. The bell cranks serve as levers to slide the "driven" cone towards the "driver," thus slacking the belt. This feature, together with the mechanical belt shifting device and the fact that the steps of the pulleys are beveled on the edge, so as to offer no resistance to the passage of the belt, permits of easily making rapid changes of speed, even though the belt is very wide. After the belt is located for the desired speed, it is brought up tight by moving the hand lever to the point where tension is sufficient for the work, after which the lever is securely clamped by the binder handle shown.

The Driven Cone Being Moved Towards the Driver which former carries the planer cutting belt, is a distinct feature, inasmuch as the tension of the vertical belts is not disturbed when making speed changes, and the danger of their flying off, from becoming loose, is overcome.

All Shafts in this Variator are of large diameter, accurately ground and run in massive phosphor bronze journals perfectly lubricated by the "ring" or "dynamo" system of oiling. Journals are supplied with liberal oil wells and return ducts, thereby preventing the oil from escaping and coming in contact with the belts. The bearings are of the "ball and socket" type insuring perfect alignment at all times.

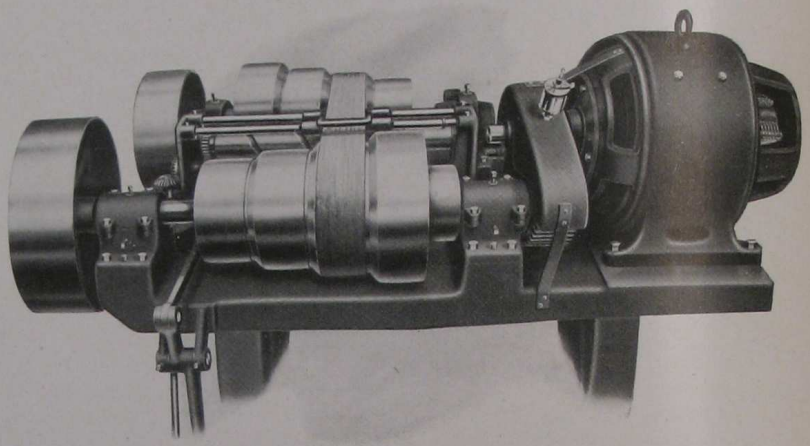


Fig. No. 2. Top view Cone Variator.

Speeds Changed Without Stopping. This is a valuable feature of this drive, as with the old geared type it was necessary to wait until the mechanism slowed down to almost a standstill before the clutches or gears could be engaged. With this drive it is far easier to make the changes while in motion than otherwise. Driving pulleys have fly-wheel rims, the momentum of which reduces to a minimum all shocks to the driving mechanism due to intermittent cutting and at reversing, also insuring a steady, even pull at the cutting tool. They are perfectly balanced, running without the least vibration even on the highest speeds. This, coupled with the smoothness of the drive, the scientific design and accuracy of the planer itself, insures a finished job which is free from imperfections, requiring the least, if any, attention from the vise hands in fitting.

Cutting Speeds can be arranged suitable to individual requirements, but are regularly furnished to provide 20 ft., 30 ft., 40 ft., and 50 ft., with a constant return speed of about 80 ft

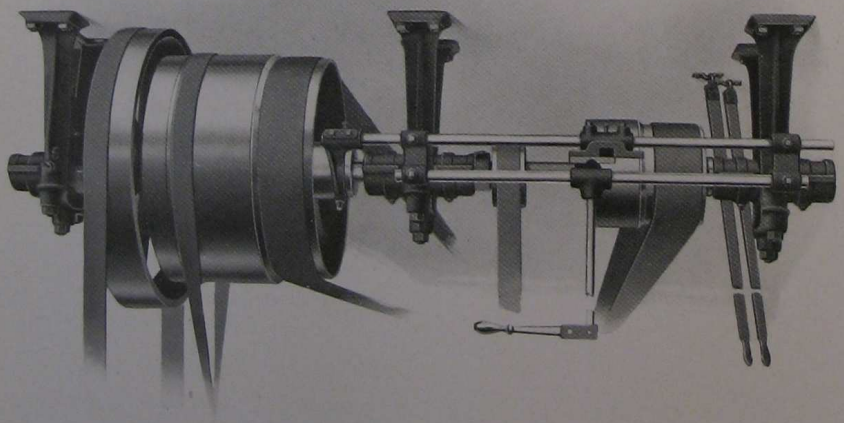


Fig. No. 3. Two Speed Countershaft.

Belt Drive is regularly furnished with this Variator, the tight and loose pulleys being applied to the rear cone shaft. The drive can be obtained direct from a line shaft, provided it has sufficient speed, but, slow shafts of about 150 R. P. M,, require an intermediate or "jack" shaft. With our construction it is a simple matter to convert the belt drive into a motor drive at any time after the machine is installed.

Motor Drive illustrated above, may be furnished. A constant speed motor is required, either of the Direct or Alternating Current type. The motor is connected to the Variator either by a coupling or through spur gearing. A starting box is all the controlling mechanism necessary. Should the motor at any time become disabled, the driving gear on end of Variator shaft, may be replaced by a pulley, and the planer driven by belt from a countershaft or another motor conveniently placed. The flexibility of this construction insures the constant use of this machine at all times.

Two Speed Countershaft. This type of drive is by far the simplest of the three. Two cutting speeds are obtained thru a simple and efficient Two Speed Countershaft (Fig. No. 3) which is free from gears and is attached to the ceiling in the usual manner. The self-oiling feature of this countershaft minimizes attention to it and insures the longest life.