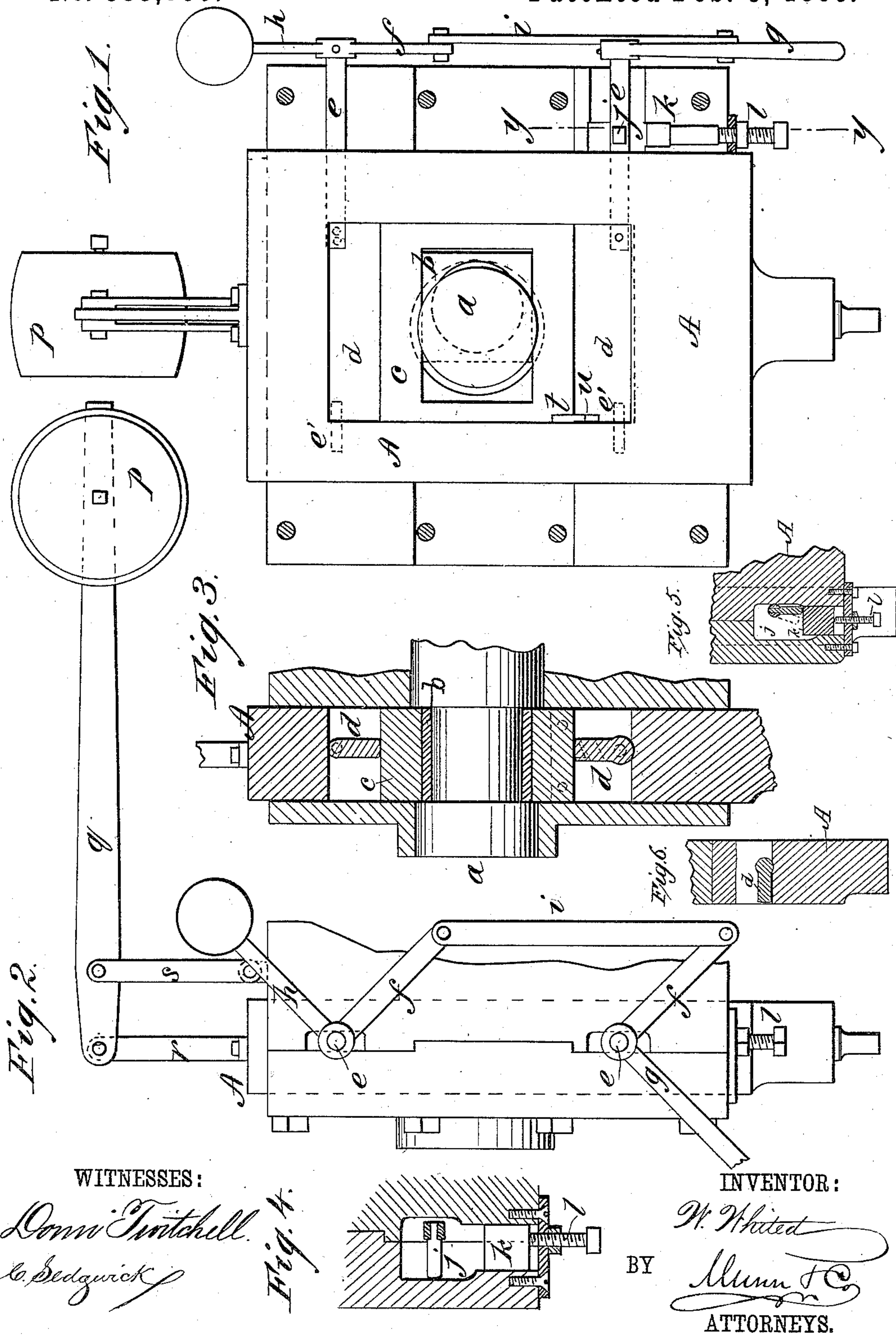


W. WHITED.
PUNCHING MACHINE.

Patented Feb. 9, 1886.



UNITED STATES PATENT OFFICE.

WILLIS WHITED, OF LACHINE, QUEBEC, CANADA.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 335,866, dated February 9, 1886.

Application filed November 10, 1884. Serial No. 147,556. (No model.)

To all whom it may concern:

Be it known that I, WILLIS WHITED, of Lachine, in the Province of Quebec and Dominion of Canada, have invented a new and Improved Punching-Machine, of which the following is a full, clear, and exact description.

The object of my invention is to so construct the head of a punching-machine that the punch may be brought to rest at any desired point, and where most convenient for placing readily and accurately the sheet to be punched. To that end I combine with the sliding head of a punching-machine and its operating mechanism certain devices, hereinafter described, which can be put to use at any point in the movement of the head to effect its stoppage at a certain point, which is variable by adjustment.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a face view of a punching-machine with the face-plate removed. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section of the head. Fig. 4 is a detail section on the line *y y*, Fig. 1. Figs. 5 and 6 are detail views illustrating the operation of certain parts.

A is the sliding head of the machine, fitted for movement by an eccentric or crank, *a*, and a bearing-block, *b*, working in a horizontal slot in a separate block or piece, *c*, which in turn works in a vertical slot in the head between upper and lower devices *d*. These devices may be of any suitable construction, which when placed in one position shall compel the sliding head A to move up and down with the block *c*.

The construction which I prefer is shown in the drawings. The devices *d d* are of flat form, and hung so as to turn with journals *e e'*, bearing in the sliding head A in such a way that when they are in the vertical position shown the sliding head is compelled to move with the piece *c*, and when they are turned into a horizontal position the sliding head is permitted to remain unacted upon by the block or piece *c*. Attached to extensions of said journals or shafts *e* are lever-arms *f*, that

are connected by a link, *i*, and to one of these shafts *e* is attached a weighted arm or lever, *h*, while to the other shaft a handle, *g*, is attached for operating the whole mechanism. In order to bring the sliding head A to rest, a pin or projection, *j*, is attached to the lower shaft-extension, *e*, and in the supporting-frame of the head is adjusted a stop, *k*, which is actuated by a set and holding screw, *l*, and jam-nut on said screw, which projection *j*, by adjusting the devices *d* to a horizontal position, at the same time removing them from contact with the head-actuating block *c*, is adjusted or turned so as to project downwardly in alignment with the stop *k*.

By adjusting the stop *k* by means of the screw *l*, the head can be stopped at any desired point with the end of the punch slightly above the face of the sheet to be punched.

The operation is as follows: When a sheet is to be punched, the operator pushes the handle *g* from him or in the direction of the arrow *a'*, Fig. 2, thereby throwing the bearers into the horizontal position and out of action. The head can then descend by gravity until arrested at a point in its descent determined by the position of the adjustable stop *k*, with which the projection *j* will now come in contact, in which position of rest of the head the punch will nearly touch a sheet when placed beneath the punch. The sheet to be punched is now to be adjusted beneath the punch as accurately as possible. The operator then pulls the handle toward him, or in the inverse direction of the arrow *a'* a short distance, which by moving the stop *j* into a slightly-oblique position, as shown in dotted lines in Fig. 5, allows the head to descend a little and the punch to come down into contact with the sheet without throwing the head into action.

When the devices *d* are in the vertical position, the head and punch will be reciprocated with the block *c*. When the devices are turned to the horizontal position, the head, with the punch, will be free to take by gravity the lower position, as when the punch has been driven through a sheet of metal. If the screw *l* is adjusted to place the stop *k* in its lowest position, the projection *j* will not prevent this entire downward movement. By

raising the stop *k*, the head can be stopped with the end of the punch above this lower position. After the sheet to be punched has been placed and adjusted by turning the devices slightly from the horizontal position by moving the handle *g* a short distance, as described, the projection *j'* will be brought into the position shown in dotted lines in Fig. 5. The head and punch will thus be permitted to descend by gravity far enough to bring the punch down upon the sheet. If the sheet is not right, it is adjusted, and the handle pulled clear forward; but if the block *c* is moving downward it must be allowed to rise before the handle can be pulled forward, and at the next descent of the block with the head the sheet will be punched.

To prevent the accident that might happen if the block *c* should be too low to allow the devices *d* to be thrown quite into the vertical position, one end of the lower devices *d* is rabbeted at *u*, Fig. 1, and shown by the dotted lines in Fig. 3, and a projection, *t*, Figs. 1 and 3, formed on the block *c* or on the edge of a plate secured to the end of block *c*, so that the lower point of projection *t* will permit the point *u'* of the rabbet *u* to pass when the block *c* is at its highest point; but if the block is not fully up, or has just commenced its downward movement, the point of *t* will strike the point *u'* and hold the devices in such an oblique position that it will be forced into the horizontal position by the block *c*, or down again, assisted by the weighted lever *h*; but if the projection *t* can pass the point *u'*, the weighted lever *h* coming into action, the bearer will be thrown into place.

In large machines where the sliding head is heavy, it is preferable to attach a counterweight to the same, as shown at *p*, which, acting through the lever *q* and links *r s*, balances the head *A*.

Some of the advantages of this construction may be mentioned as follows: The punch may be built with a very short stroke, a little more than sufficient to clear the thickest metal, thus giving more power with less gearing.

The machine can be run at two or three times the speed that is usually obtained and still have the same power. The metal can be placed under the punch more quickly and more accurately than with other punches. The construction is simple and no part is liable to get out of order, and no great accuracy is required in the construction of any part. The same devices may be applied to a horizontal punching-machine.

I am aware that it is not new to employ in connection with the punch-carrying head a sliding block acted upon by the crank-shaft block and adapted to move with the head by means of pivoted bars arranged within the elongated opening of the head which contains said sliding block.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in a punching-machine, of the sliding head *A*, the operating-block *c*, the pivoted devices *d*, and the levers *f* and handle *g* for moving the devices, substantially as described.

2. In a punching-machine, the combination, with an adjustable stop, *k*, of the shaft *e*, having projection *j*, the devices *d*, fitted for movement by operation of the shaft *e*, the operating-block *c*, and the sliding head *A*, substantially as described.

3. The combination, in a punching-machine, with the sliding head *A* and its operating block *c*, of adjustable devices hung so as to be thrown in and out of contact with the block *c*, the lever mechanism connected to the devices *d* for their operation, and an adjustable stop for arresting the downward movement of the head, substantially as described.

4. The combination, with the operating-block *c*, the lower devices *d*, rabbeted at *u*, to form the point *u'*, and the sliding head *A*, of the projection *t* on block *c*, substantially as shown and described.

WILLIS WHITED.

Witnesses:

L. FOREST,
P. W. VALOIS.