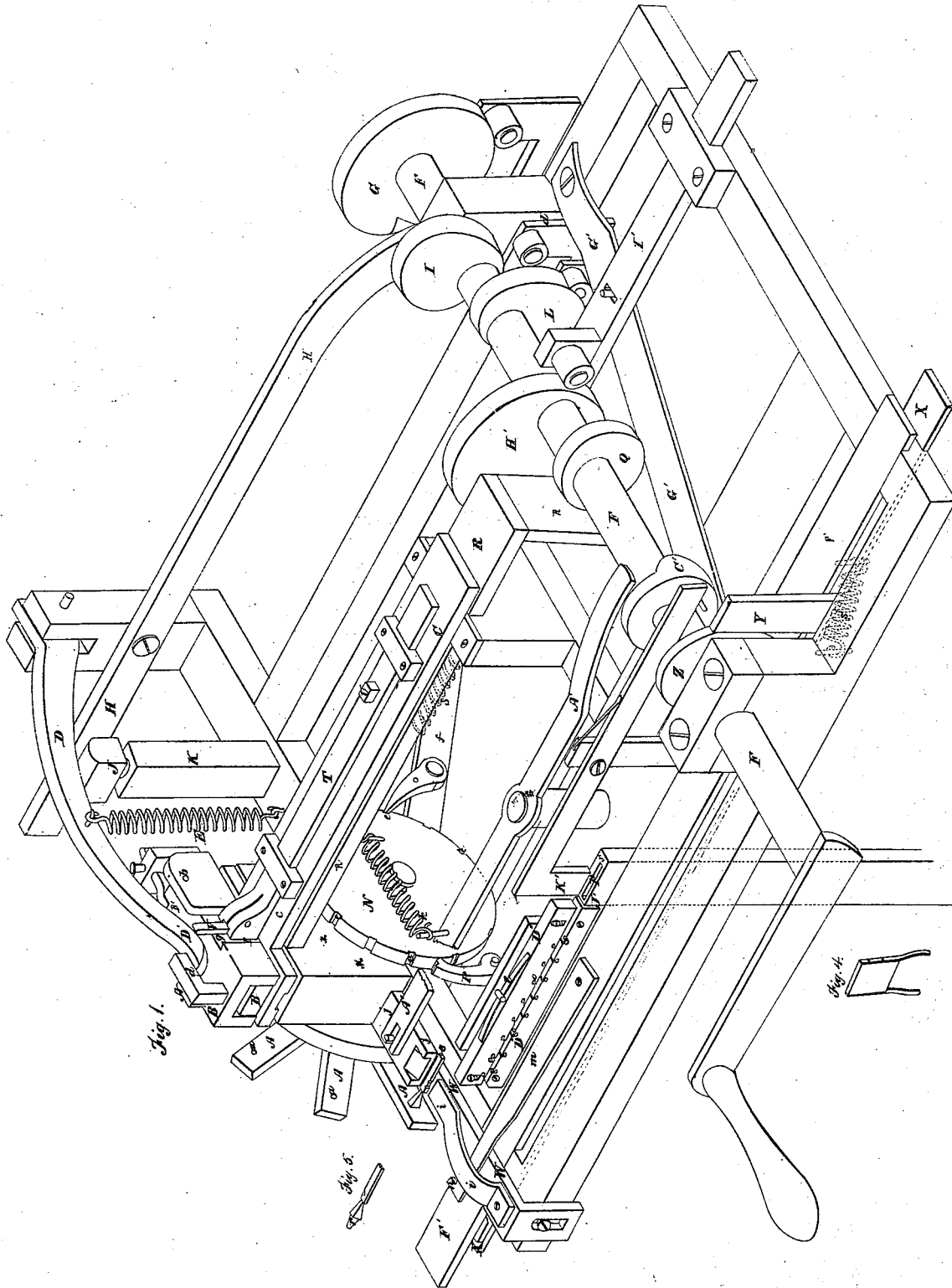


J. Stewart. *Sheet 1. 3. Sheets.*
Type Mach.

N^o 3013.

Patented Mar. 21. 1843.



Sheet 2.3, Sheets

Type Mach.

N^o 30/3.

Patented Mar. 21. 1843.

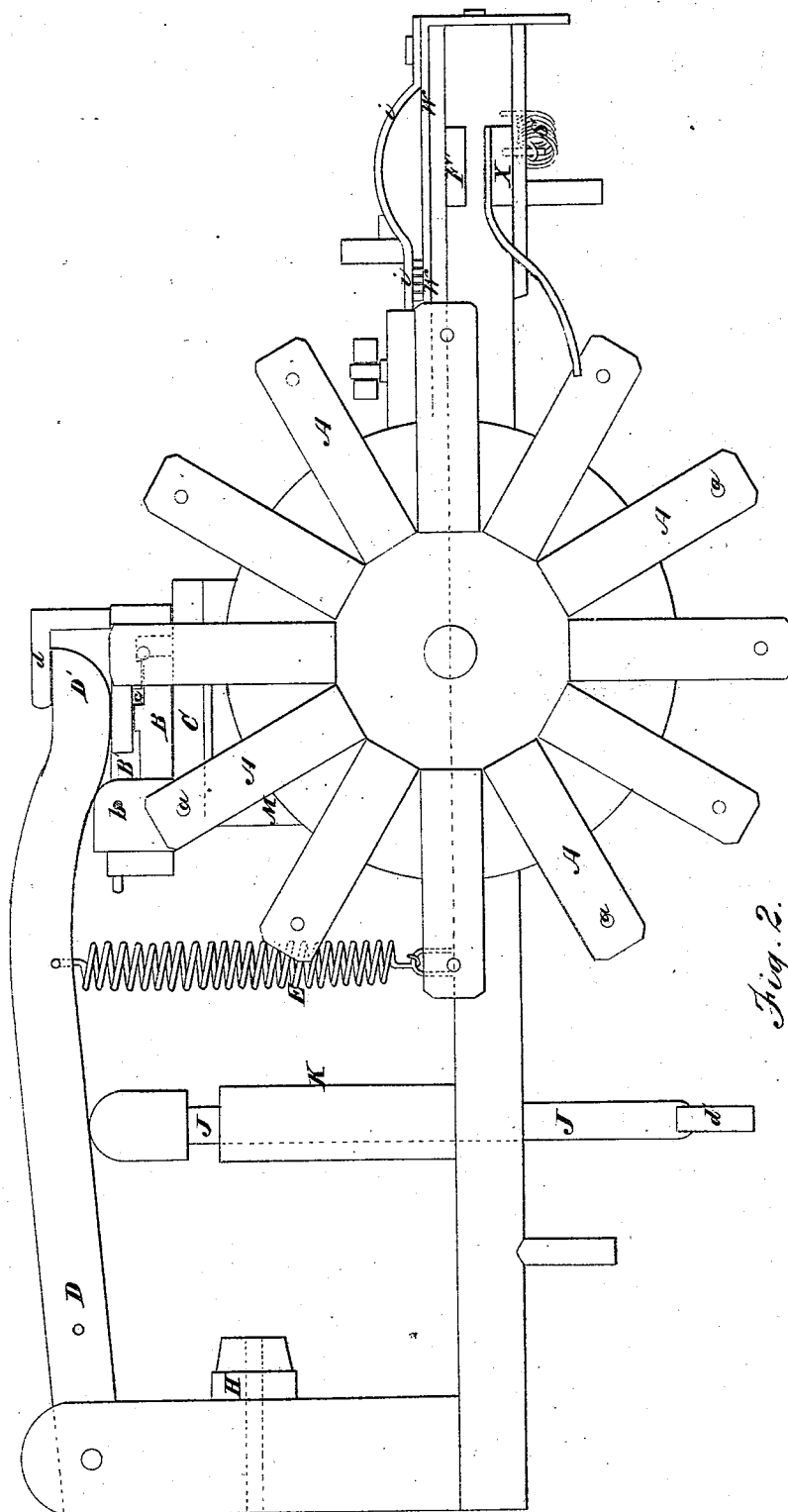


Fig. 2.

J. Stewart.

Sheet 3. 3. Sheets.

Type Mach.

N^o 3013

Patented Mar. 21 1843.

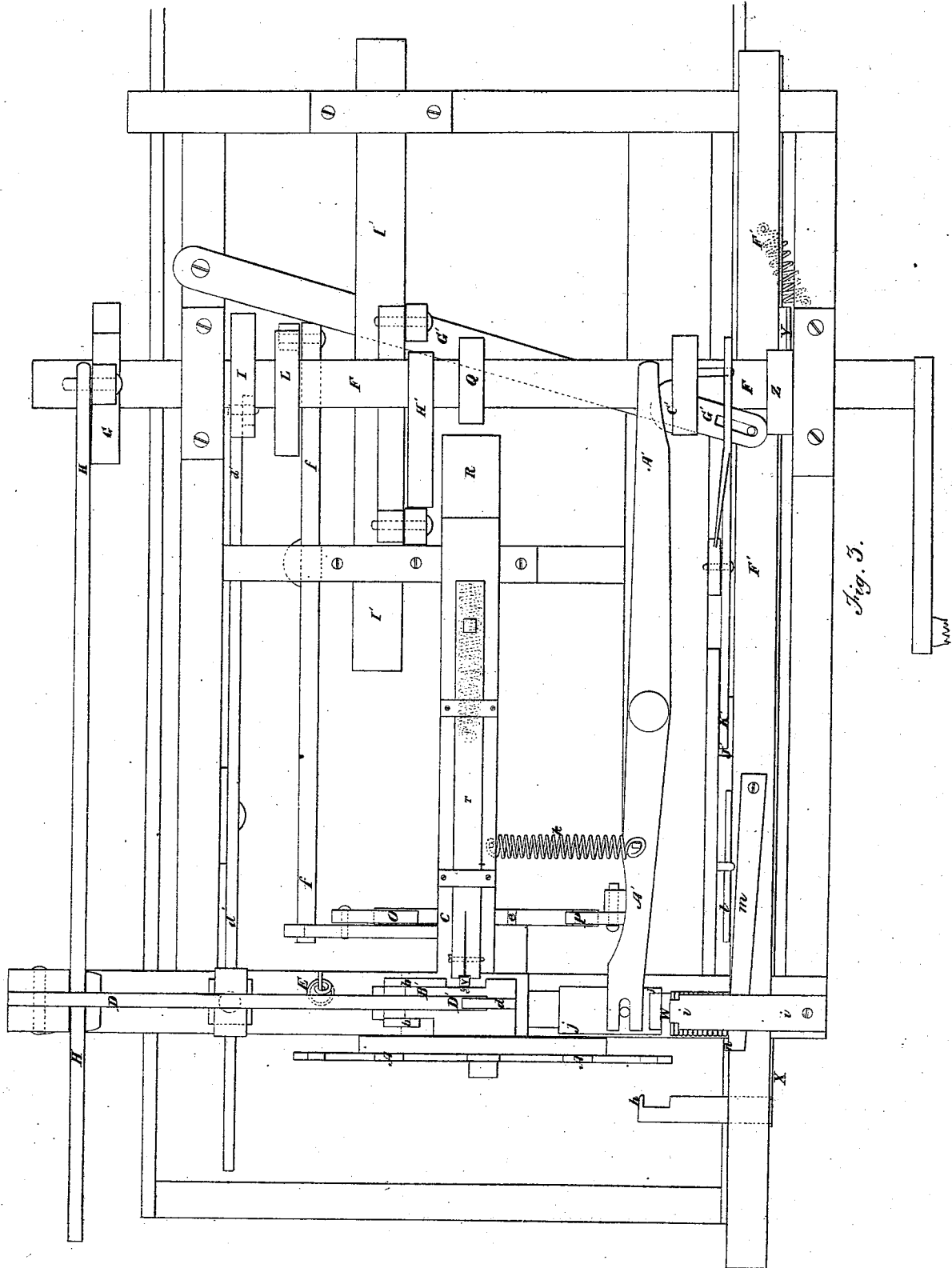


Fig. 3.

UNITED STATES PATENT OFFICE.

JAMES STEWART, OF NEW YORK, N. Y.

IMPROVEMENT IN TYPE-CASTING.

Specification forming part of Letters Patent No. 3,013, dated March 21, 1843.

To all whom it may concern:

Be it known that I, JAMES STEWART, of the city of New York, in the State of New York, have invented certain new and useful Improvements in the Machine or Apparatus for the Casting, Smoothing, and Setting Up of Type for Examination; and I do hereby declare that the following is a full and exact description thereof.

In my machine for casting type a due portion of the fused metal is to be injected into the mold by means of a force-pump connected with a furnace and melting-pot in a manner similar to that which has been practiced in other type-casting machines. I have not, therefore, represented this part of the apparatus in the accompanying drawings; but my improvement commences in that part of the machine which is immediately connected with the pump, and which constitutes the jet through which the metal passes on its way to the mold. There are in my machine a number of such jets or inlets for the metal, which are situated, severally, near the ends of revolving arms that radiate from a center, and which are successively brought into contact with the type-mold. In a machine which I have constructed there are twelve such arms, and I shall so describe it; but this number may be varied at pleasure. They are made to revolve in a manner to be presently described. When a type is to be cast, one of these arms is brought up against the mold in such manner as that the jet or opening through it shall coincide with that part of the jet which is formed in the type-mold itself. The parts are then pressed together and the metal injected by the pump. The pressure is then removed, the mold is opened, and the type liberated. The next arm is then brought up opposite to the mold, while that through which the last type was cast carries said type off on its way to a part of the apparatus which may be denominated a "breaker" or "separator," by which the jet is broken off and left in the revolving arm and the type deposited upon the metallic plate or separator preparatory to the smoothing of its sides by the smoothing-dies, which constitutes another of my improvements. These smoothing-dies perform the operation in a manner much better than the rubbing usually effected by hand. As the type is carried round by the

revolving arms it is exposed to the cooling influence of the atmosphere and of the arm in which it is held until it is brought into contact with the separator. The space which it thus travels, being equal to one-fourth of a circle, will cool it sufficiently; but the cooling may, if desired, be promoted by a current of air artificially induced. As the arm leaves the separator the jet is pushed out of it by means of a punch actuated by a slide.

The type, as they are deposited upon the metallic plate called the "separator," are carried one by one, by means of a sliding catch, between the smoothing-dies. These consist of two bars or strips of steel faced perfectly true upon a lap and converted into cutters by making saw-kerfs across them, into which a bur-nisher may be passed, so as to raise a series of delicate cutting-edges. By this process they are prepared for being set up, examined, and dressed by means of an apparatus which is novel in its character and operation. The manner in which I construct and operate my setting-up apparatus constitutes another of my improvements.

For setting up the type I prepare a box or receiving-trough, which I prefer to make not more than three feet long, and which has an interior cavity the width of which is equal to the length of the type and its measurement from side to side equal to the width of the type. This box or trough I place vertically at the end of the smoothing-dies, and the sliding catch above named carries the types sufficiently far beyond these dies to deposit it immediately over the opening in the setting-up trough or box. Within the opening in this box there is a spring-slide which, by its friction, will sustain the row of types, but which will readily yield to pressure; and every time that a type is deposited by the sliding catch a depressor is brought down by a cam and forces the type into the box, leaving it on a level with the upper end of said box. When this box has in this manner been filled with type, it is removed and another substituted for it. The respective motions required in the operations are performed by the aid of cams placed on a revolving shaft. The whole machine I place upon a frame on which it slides, so that it may be readily removed from the furnace.

In the accompanying drawings, Figure 1 is

a perspective view of the machine. Fig. 2 is an elevation of that end thereof which is toward the furnace and pump. Fig. 3 is a plan or top view.

A A are the radiating revolving arms, which have the jets *a a* near their ends. These jets are made conical, the largest end of the cone being on the side toward the mold to admit of the jet-piece being readily pushed out after the type has been broken off, as shown in Fig. 5, where *r* represents the conical part of the jet.

B is the mold, the lower part of which is in contact and connection with the flat bar C C, which, from its mass, serves to conduct off the heat and to keep the mold at a due temperature, notwithstanding the rapidity with which the types are cast. The top B' of the mold is hinged at *b*, and it is to be raised for the delivery of the type. *c* is the jet or opening in the mold with which the jets *a* on the revolving arms are to coincide when a type is being cast.

D is a lifting-lever, the end D' of which engages with the hook-piece *d* on the cover of the mold, and raises it when required. It serves, also, to hold the top of the mold down by the action of the spiral spring E.

F F is the main shaft, to which motion is to be communicated by hand or otherwise, and which carries the cams by which the respective levers and slides are operated.

G is the cam which works the lever H, connected with the pump for the supply of the metal, as in some other machines.

I is the cam which opens and closes the mold through the intervention of the lever D, which it effects by depressing a lever, *d' d'*, the opposite end of which raises the slide J, which passes through the socket K.

L is a cam that carries the revolving jet-arms A A round in the following manner: The axis of these revolving arms passes through the head-block M, and has on it a gage or dividing-wheel, N, furnished with twelve notches, *e e*, on its periphery. The cam L depresses a lever, *f f*, which raises a feed-hand, O, that carries the wheel N round to the proper distance, when the pawl P falls into one of the notches *e* and holds one of the arms A in its proper place during the time of casting a type. While this is being done the mold B must be pressed against that one of the arms A which is to receive the metal, and the matrix, also, must be carried up against the opposite side of the mold and again withdrawn before the type is removed therefrom. Q is the cam by which these motions are effected.

R is a slide upon which the flat bar C C rests and against which the cam Q acts. This slide is retracted by the spring S, and it is connected to a second slide, T, resting on the top of the bar C. These two slides R and T are connected together by a bolt or pin, U, which fits closely into mortises in each of them. There is also a mortise through the flat bar C

of such length as to allow the bolt U to play back and forth within it to a short distance.

V is the matrix which is held by the slide T, and which must be carried up against the type-mold at *g* when the type is being cast, and this is effected by the action of the cam Q against the slide R. The matrix V being thus forced against the mold, this also is pushed laterally to a sufficient distance to cause it to bear firmly against one of the arms A, while this also is pressed into close contact with the tube from the pump. At the moment of completing the casting of the type the matrix is retracted, the top B' of the mold raised, and the type liberated. The wheel N is then carried round one-twelfth of a circle, removing the type with it on its way to the separator. The action of the parts connected with the mold is then renewed and another type cast.

W is the separator, which consists of a flat plate of metal which is made adjustable, and onto the surface of which the type is brought as the arms A are carried round, and the jet is thereby broken off from it and the type left upon the plate. The jet is subsequently pushed out from the arm by the wire or punch *h*, which is attached to a slide, X. The stud Y is attached to this slide, and against this the cam Z operates. The slide X is drawn back by a spiral spring. (Shown in dotted lines at S S.) As the type are successively deposited on the separator they are pushed forward under a spring piece, *i i*, by means of a slide-piece, *j j*, which is moved back and forth by the lever A' under the action of the lateral projection on the cam C' and of the spiral spring *k*.

The type deposited upon the separator W are next to be carried between the smoothing-dies D' D'', the uppermost of which is acted on by a spring, *l*. This is effected by means of the metallic piece or sliding catch *m*, which is attached to the slide F'. The lip *n* on the piece *m* passes between the dies D' D'', and after catching hold of a type on the separator W, which is pushed against it by the slide *j j*, while the piece *m* is between the separator and the spring-piece *i i*, the notches or kerfs *o o* on the smoothing-dies are, as before noticed, to be burnished up, so as to form fine cutting-edges, and by these the smoothing of the type is perfectly effected.

F' is a slide which is moved back and forth by the arm G' under the action of the cam H' and the slide I'.

J' J' is the upper end of the box or trough in which the type are to be set up. This is on a level with the lower smoothing-die, and the lip *n* carries the type so far as to stand precisely over the cavity *p p*, where it leaves it, and the depressor K' is then brought down upon it by the action of a pin on the cam *c'*, thus leaving it on a level with the top of the box J'.

The spring-slide which sustains the type in the box is shown in Fig. 4.

I have thus fully described the manner in

which I construct my machine for casting and dressing type, and have also set forth the special arrangement of the cams, levers, and slides by means of which the respective movements required are or may be effected; but it will be manifest to every competent machinist that the manner of producing these motions may be varied in numerous ways, while the same ends will be attained by equivalent means. I do not intend, therefore, to make any claim or to limit myself to the particular arrangement of the cams, levers, or slides as represented, but have given them as a good practical method, such as I have actually essayed, of carrying my improvements into operation; but

What I do claim as constituting my invention, and desire to secure by Letters Patent, is—

1. The manner of arranging and using the radiating arms constituting the revolving jets through which the metal is to pass from the melting-pot and force-pump into the type-mold, the said revolving arms being made also to remove the type from the mold and to deposit it on the separator, in the manner set forth.

2. The manner of carrying up and retracting the matrix and of causing the mold to be thereby pressed against the movable arms and the latter against the tube connected with the force-pump, by an arrangement of slides combined and operating substantially in the manner set forth.

3. The mode of constructing and using the smoothing-dies, as set forth, and, in combination therewith, the manner of arranging the separator, and the apparatus by which the type is pushed forward, seized, and carried between the smoothing-dies and then deposited on the setting-up box or trough.

4. The manner of setting up the type preparatory to its being examined and dressed, by the use of a setting-up box or trough over which the type is deposited and into which it is passed, substantially as herein set forth.

JAMES STEWART.

Witnesses:

THOS. TURNER,
JASPER SIMONS.