No. 753,223. PATENTED MAR. 1, 1904.

H. BEEG.

MATCH BOX FILLING MACHINE.

APPLICATION FILED JUNE 14, 1902.

4 SHEETS—SHEET 1.

NO MODEL.

Fig. 1.

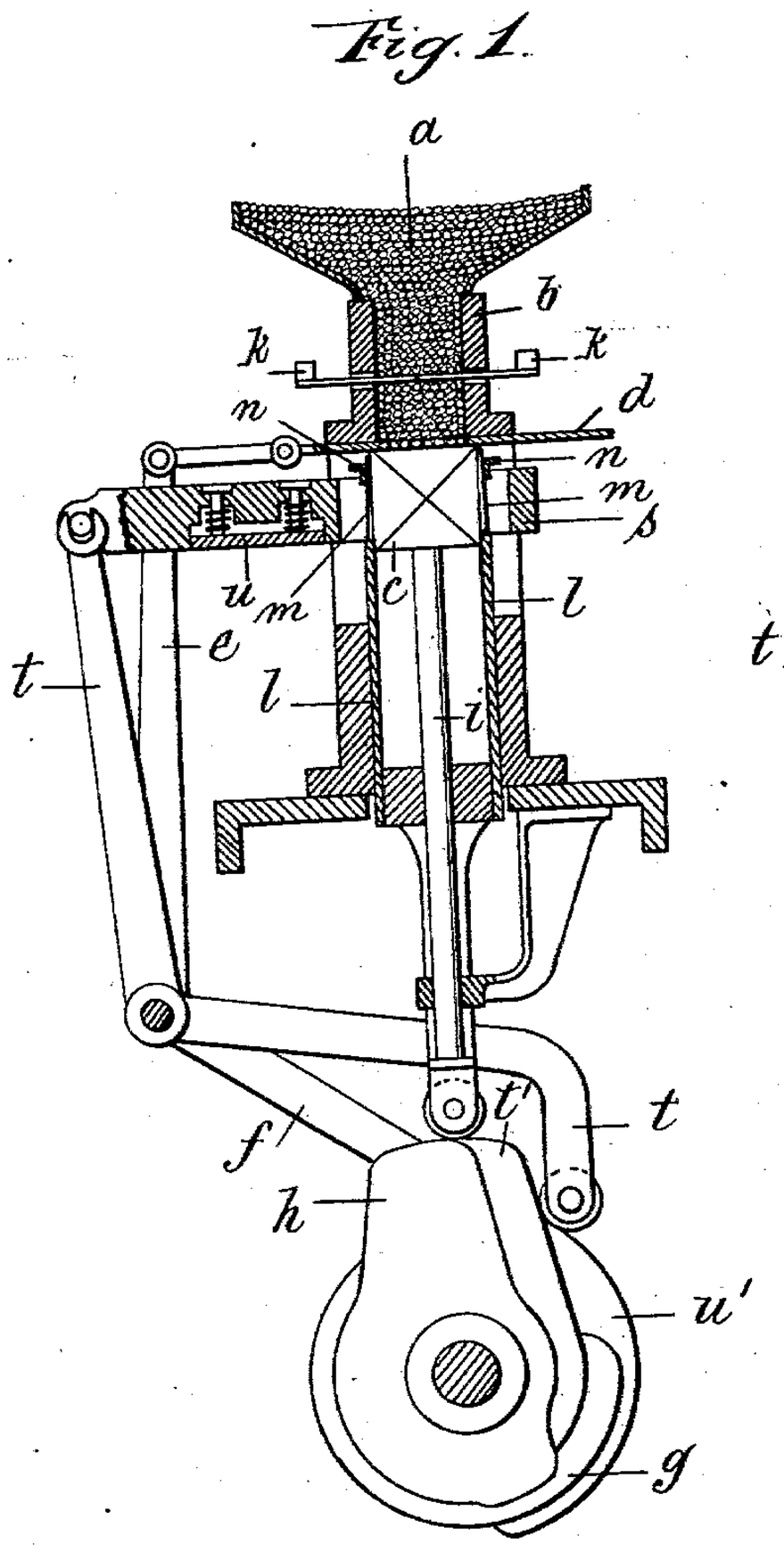
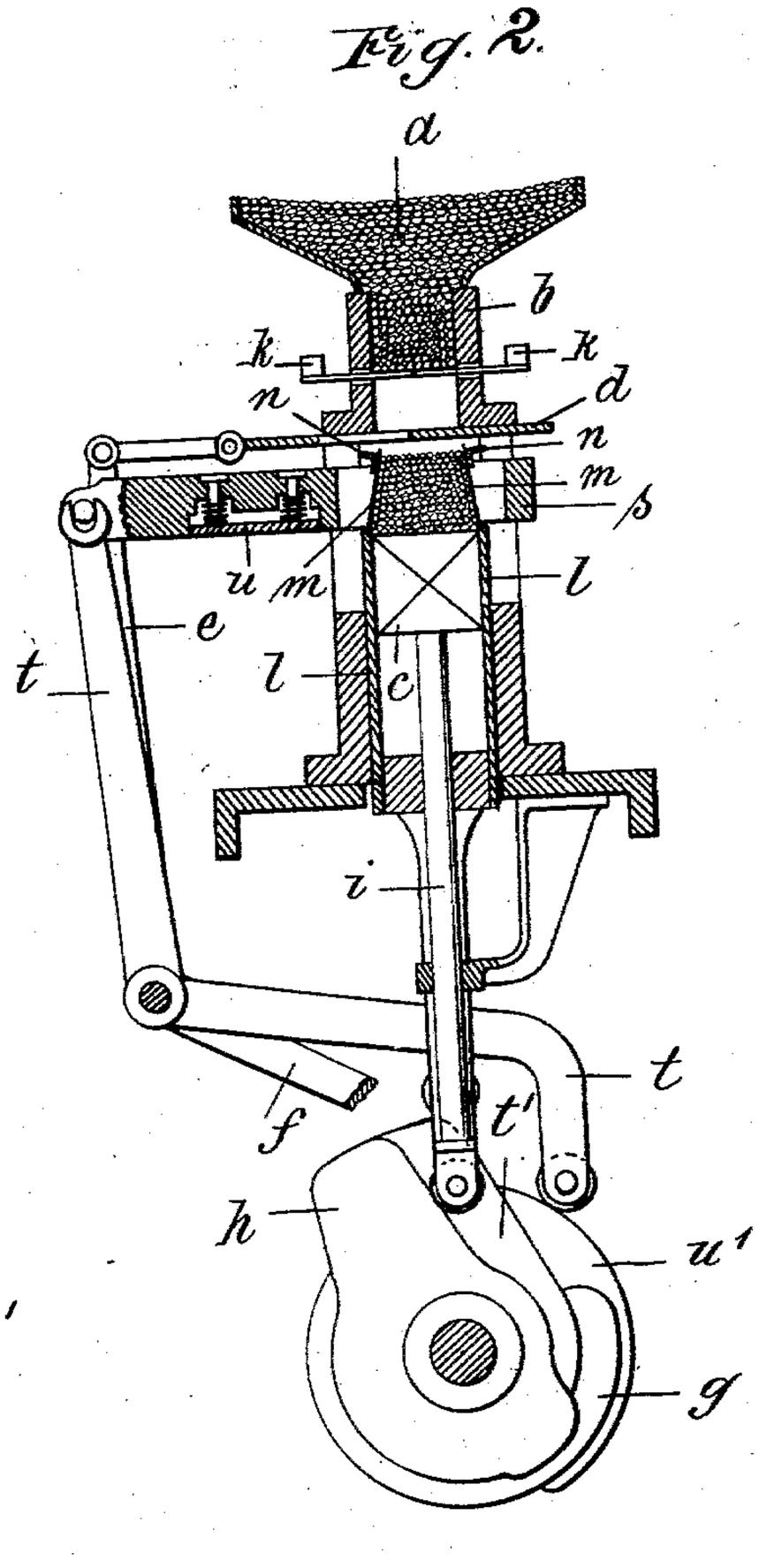


Fig. 2.



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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 3.

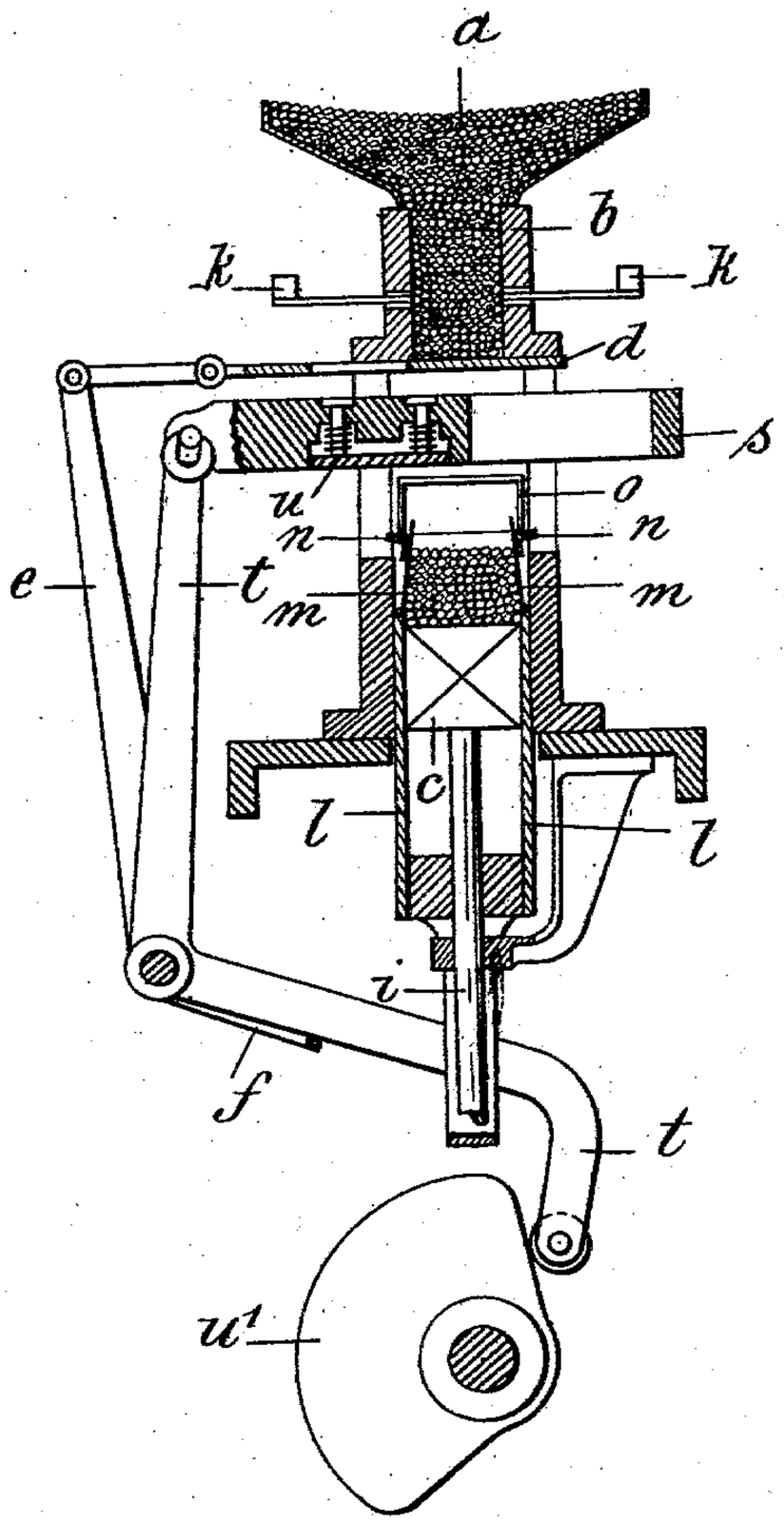
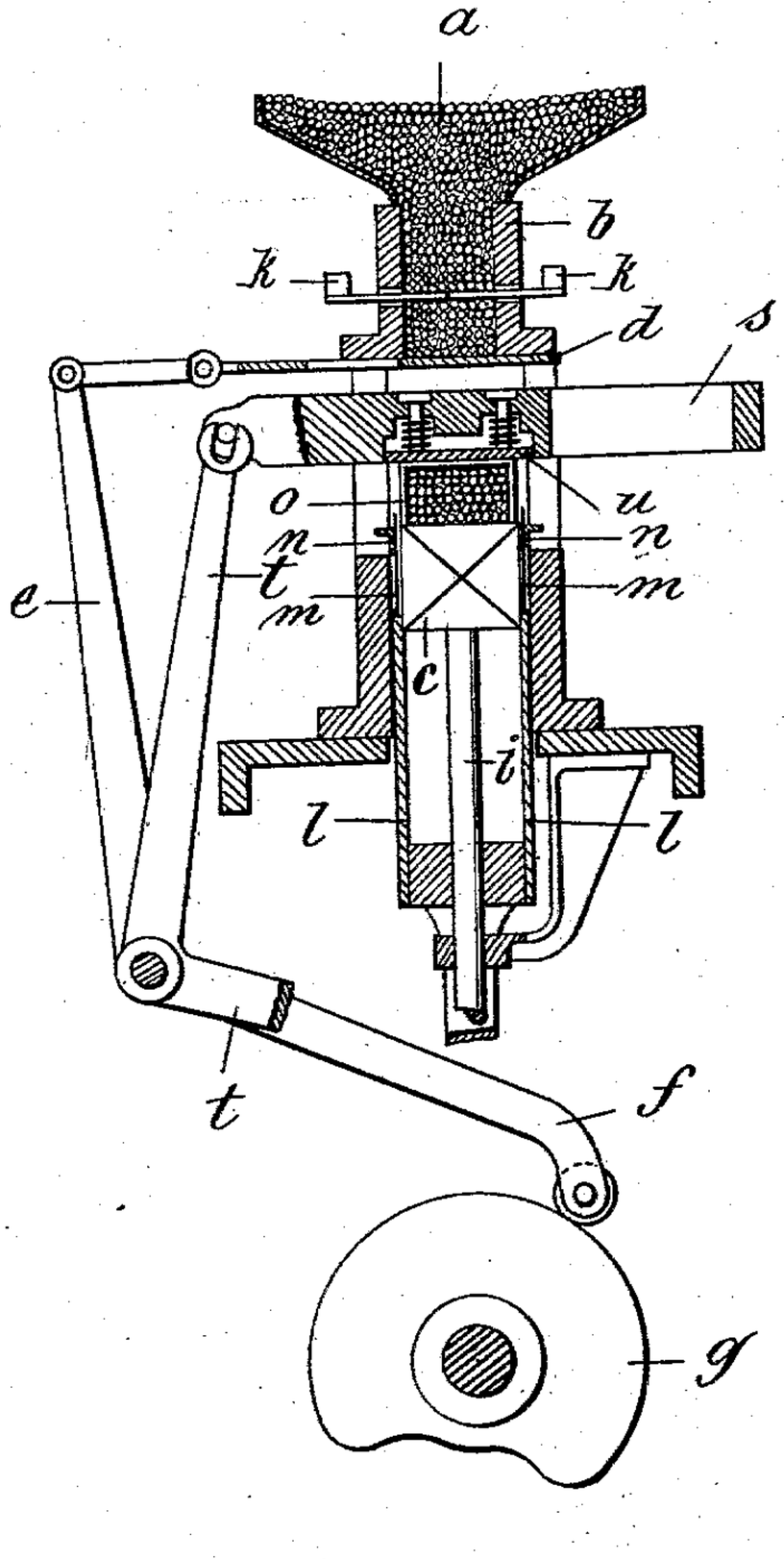


Fig. 4.



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NO MODEL. 4 SHEETS—SHEET 3.

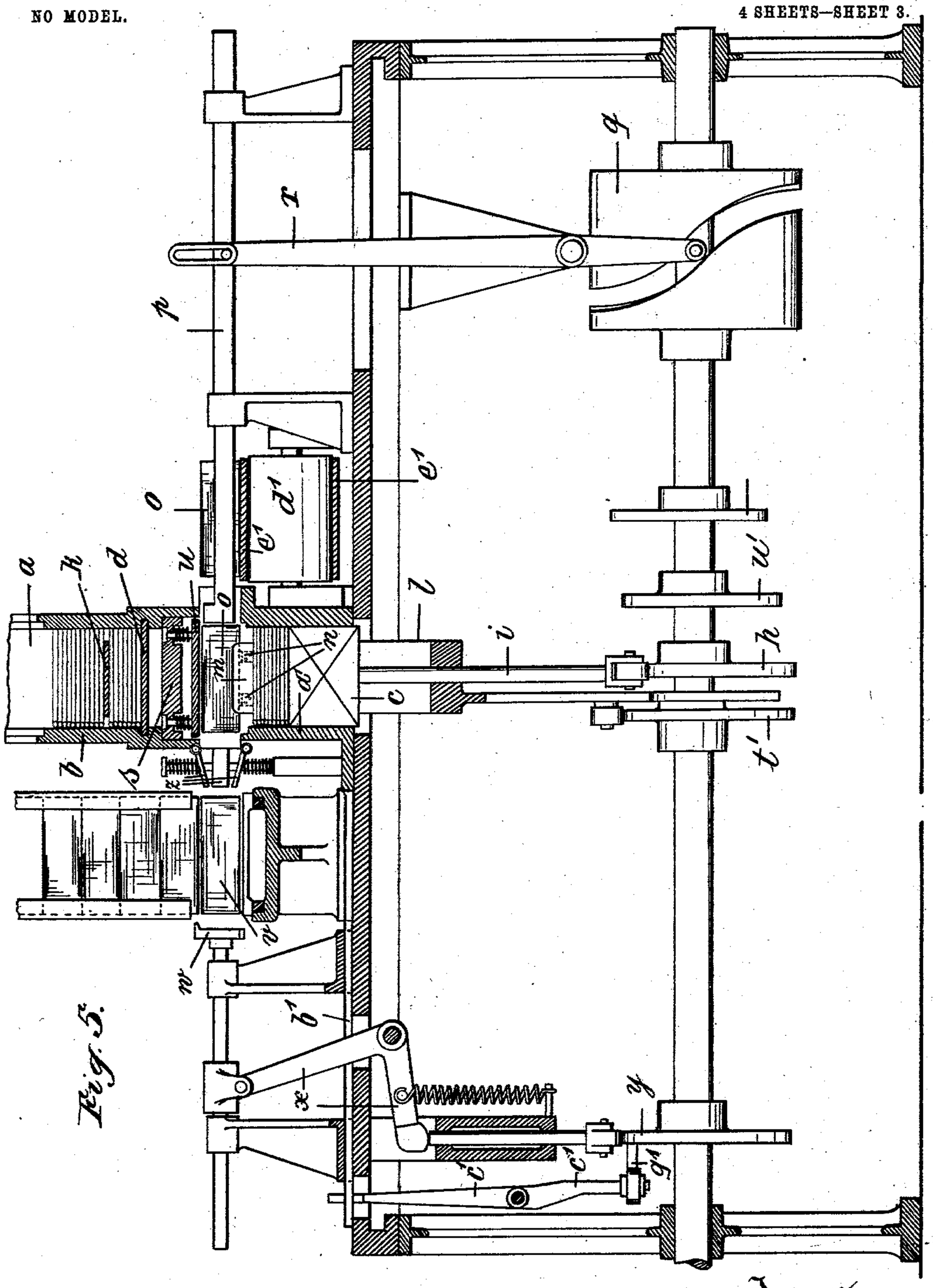

Fig. 5.

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NO MODEL. 4 SHEETS—SHEET 4.

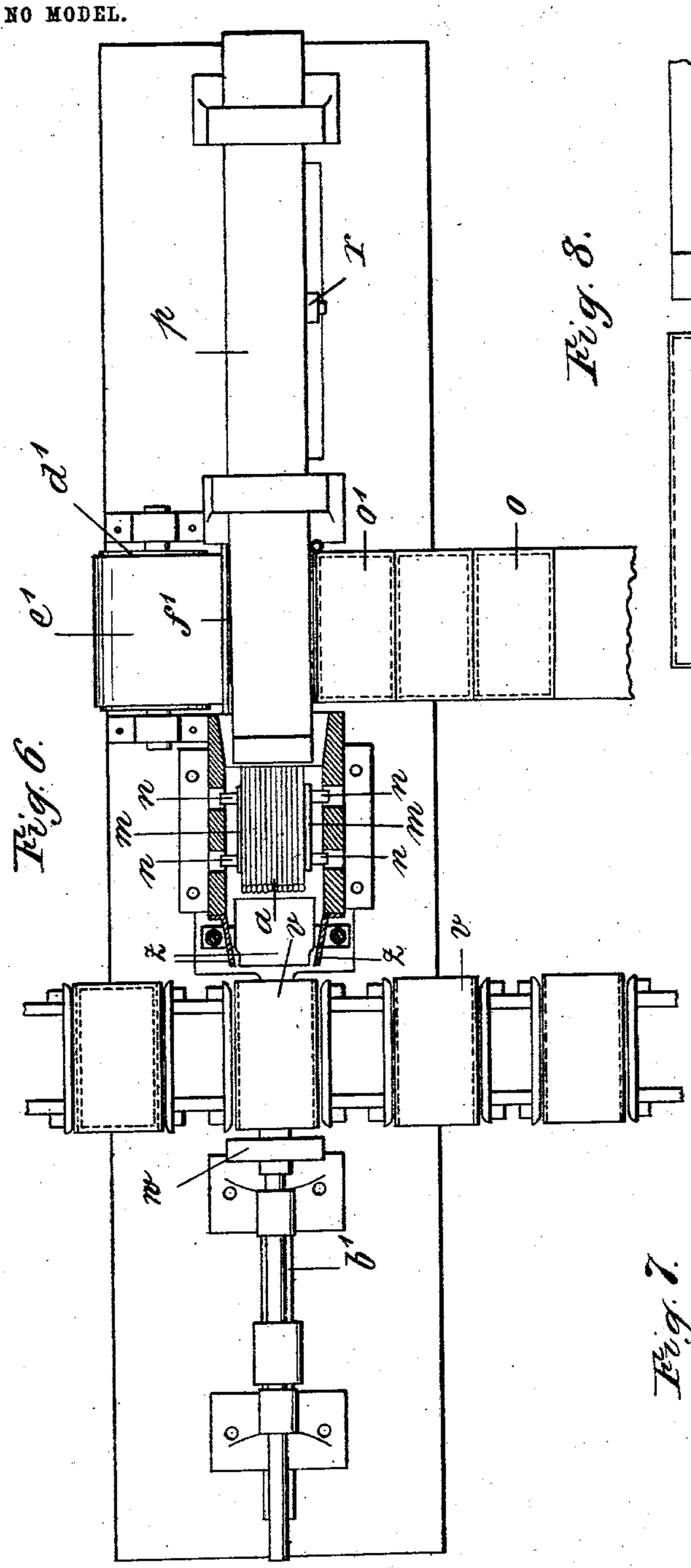

Fig. 6.

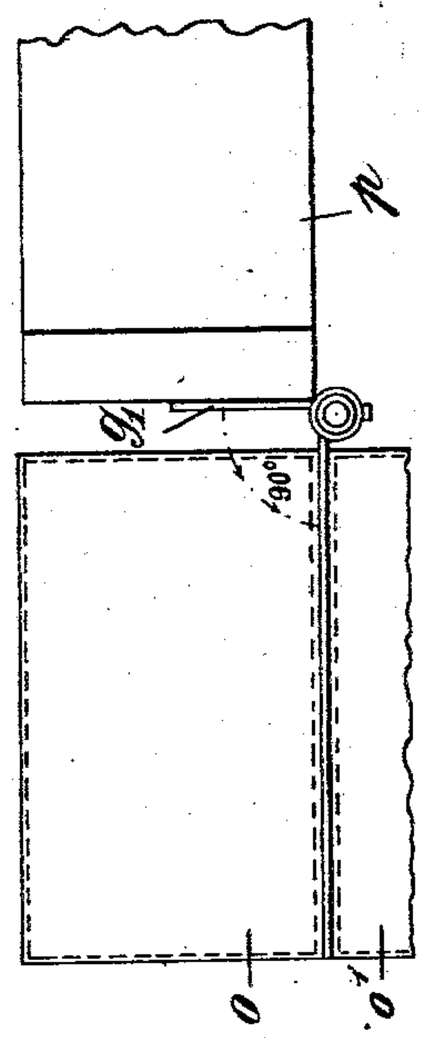

Fig. 8.

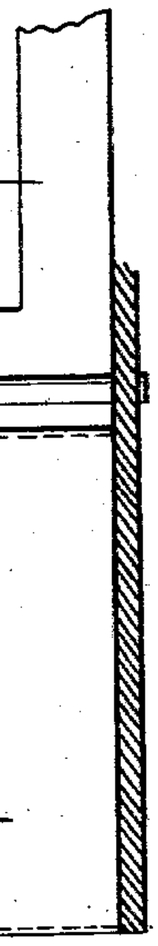

Fig. 7.

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UNITED STATES PATENT OFFICE.

HANS BEEG, OF DURLACH, GERMANY, ASSIGNOR TO THE FIRM OF BADISCHE MASCHINENFABRIK & EISENGIESSEREI, VORMALS G. SEBOLD AND SEBOLD & NEFF, OF DURLACH, GERMANY.

MATCH-BOX-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,223, dated March 1, 1904.

Application filed June 14, 1902. Serial No. 111,616. (No model.)

To all whom it may concern:

Be it known that I, HANS BEEG, manager, residing at Hauptstrasse 90, Durlach, in the Grand Duchy of Baden, German Empire, have invented new and useful Improvements in Match-Box-Filling Machines, of which the following is a specification.

The present invention has for its object an apparatus for filling safety-match boxes directly from a feed-hopper containing the matches, the operation being different from the methods employed hitherto. In machines of this kind as many matches as are required to fill a box are divided off in the hopper, and they are allowed to drop by the removal of a slide. The matches may be allowed to drop immediately into a match-box tray situated beneath the hopper. In some cases the matches instead of dropping into a match-box tray placed mouth upward have been first moved laterally away from the outlet of the hopper and then introduced from below into an inverted match-box tray having its mouth downward. Now the present invention, for the purpose of greater simplicity in construction and operation, enables the matches to be filled into a match-box tray situated mouth downward directly under the hopper-outlet, this operation being embodied in a machine of very simple and efficient construction. The machine is also particularly distinguished by the fact that the empty trays are fed in a row at one side of the hopper, each being pushed by a piston under the outlet of the hopper, while the outside cases are fed in a row at the other side of the hopper, the same piston serving both to remove the filled tray and to push it into the case.

In the accompanying drawings, Figures 1 to 4 are vertical sections of a filling apparatus proper in four different positions. Fig. 5 is a side elevation of the essential parts of the whole machine. Fig. 6 is a plan of Fig. 5. Figs. 7 and 8 show a detail on a larger scale.

a is the feed-hopper containing the matches and leading at its lower part into one or more rectangular spouts *b*, open at the lower end, but capable of being closed by means of a slide *d* and intermediately by two knife-like cut-off slides *k*, adapted to enter between the matches. Fig. 1 shows the cut-off slides in the completely-closed position. The matches located below the cut-off slides rest when the slide *d* is opened on a piston *c*, vertically movable by means of a cam *h* acting through a rod *i* and friction-roller. In its highest position (shown in Fig. 1) the piston extends close up to and closes the aperture in the slide *d*, which corresponds exactly to the lower end of the spout *b*. The cross-section of this piston corresponds in size and shape to the aperture of the slide, and the quantity of matches situated between the cut-off slides *k* and the piston *c* is exactly equal to the capacity of the sliding tray of a match-box. The piston *c* is guided in a sleeve *l*, which is movable up and down in guides by a cam *t'* on the main shaft and is shown in its highest position in Figs. 1 and 2. On the descent of the piston *c* the matches resting on it descend with it and are received between two spring-flaps *m*, pivoted to the upper part of the two longer sides of the sleeve *l*, the narrow sides or ends of which are open. The spring-flaps *m* are kept outward by the piston *c* when the latter is in its upper position, but are moved slightly inward when the piston *c* descends within the sleeve, the latter remaining in its highest position and the cut-off slides remaining closed, as shown in Fig 2. The flaps *m* have near their upper edges small external fillets *n n*, which serve as supports for the inverted trays *o*, that are fed in from the narrow sides or ends The slide *d*, actuated by means of a bent lever *e f* and a cam *g*, then closes the lower end of the spout *b*, and the sleeve *l* descends, together with the piston *c*. Fig. 3 shows the piston *c* and sleeve *l* in the lowest position. A slide *s* is pushed in by a cam *u'* and a bent lever *t*. When the slide *d* has entirely closed the lower end of the spout *b*, the cut-off slides *k* are moved outward and allow a suitable quantity of matches to fall upon the slide *d*, whereupon the slides immediately close again and cut off the matches which have dropped onto slide *d* from the re-

mainder. During the same time the piston *p*, Fig. 5, has been moved forward by the cylindrical cam *g* and the lever *r* and has pushed an inverted tray *o* onto the fillets *n* of the flaps *m*. These trays with their open side or mouth downward are supplied successively by any known means (after each backward movement of the piston *p*) to one side of the outlet of the spout *b*, whereupon the piston *p* pushes the tray under the outlet, and it falls down until it rests by its edges upon the fillets *n*. The piston *c* now rises, together with the sleeve *l* and the flaps *m*, until the tray *o* bears against the spring-plate *u*, mounted in the slide *s*, whereupon the piston *c* forces the matches resting upon it into the tray *o*, the two flaps *m m* being forced apart by the piston *c* rising between them in order that the upper edges of the flaps shall bear close up against the walls of the tray *o* and permit all the matches to rise smoothly into the tray *o*. During this operation the sleeve *l* descends with the flaps *m m* sufficiently to disengage the upper edges of the flaps from the tray, which is then released. When the matches have been all packed firmly in the tray, the latter is held only between the spring-plate *u* and the piston *c*, as shown in Fig. 4. The piston *p*, which has meanwhile remained in the position to which it had been advanced, now moves farther forward and pushes the filled tray *o* out from between the piston *c* and the plate *u*. At the other side of the spout *b* the outer cases *v* of the match-boxes are fed up by means of a chain or belt, (shown in Figs. 5 and 6,) one of them being exactly in line with the tray *o* in front of the piston *p*. By means of a piston *w*, which is actuated by a bent lever *x* and cam *y*, this case is pushed over four spring-tongues *z*, that serve to guide the tray *o* when pushed forward by piston *p* smoothly into the outer case *v*. The tray may be pushed either partly or wholly into the outer case *v*, the piston *w* making during the pushing-in a longer stroke to the rear in the one than in the other event. The entire match-box is now filled and ready for removal. Should the tray not have been fully pushed in or shut for the purpose of enabling the condition of the box to be examined, the complete pushing-in or closing of the box may be effected by hand or by means of mechanism situated elsewhere.

The sleeve *l* has only the two sides visible in Figs. 1 to 4, the other two guides for the piston *c* being stationary and at a distance apart somewhat greater than the length of the matches, so as to afford the clearance necessary to prevent the matches being retained by friction against these stationary walls.

Just before the matches are charged into the tray *o*—say in the position Fig. 3—one wall *a'*, Fig. 5, of the piston-guide is pushed inward slightly by means of a slide *b'*, lever *c'*, and nose *q'* on the cam *y* for the purpose of pressing the matches level with their heads and tails in the same vertical plane in order that they may enter the tray *o* truly and without liability of any match catching.

The trays *o* are fed by means of a simple belt *e'*, on which they are placed and which travels over two rollers *d'* at a speed greater than that necessary for replacing the tray that has been removed before the next feed of a fresh tray is required, so that there will always be a tray *o* bearing against the side of the piston *p* as it moves, which tray as soon as the front end of the piston on its return movement has passed clear of the tray will be carried along by the belt *e'* until it meets a stop *f'*. The belt *e'* then slips underneath the tray, and in order that on the forward movement of the piston *p* the next tray shall not be caught by it also this second tray is kept back slightly from the first one. For this purpose a small readily-working spring-flap *g'*, Figs. 7 and 8, is pivoted in such position that on the forward movement of the piston *p* this flap will be caused by the piston to turn through ninety degrees, thereby forcing back slightly the tray *o'* next to the one *o* that is to be pushed forward.

Now what I claim, and desire to secure by Letters Patent, is the following:

1. In a match-box-filling machine the combination with a hopper provided with cut-off devices to drop predetermined quantities of matches, of a vertically-movable piston directly below the mouth of said hopper, of means to hold the dropped matches at the upper side of the piston and means to feed an inverted tray between the mouth of the hopper and the said piston substantially as described.

2. In a match-box-filling machine the combination with a hopper of means to feed empty trays along one side of the mouth of the hopper immediately adjacent thereto and means to feed the corresponding cases immediately adjacent to the opposite side of the hopper, and of a piston arranged on the same side of the hopper's mouth as a means for feeding the trays and adapted to push the trays under the said mouth and after filling to push the same forward into the tray-cases substantially as described.

3. In a match-box-filling machine, the combination, with a hopper, of a piston mounted to reciprocate vertically directly below said hopper, means for holding the matches on said piston, and means for feeding trays between the piston and hopper, in a position in the direct line from the hopper to the piston.

4. In a match-box-filling machine, the combination, with a hopper, of a piston mounted to reciprocate below said hopper, spring-pressed flaps arranged to extend above the piston and to embrace the same, means for feeding trays on said flaps, and mechanism for lowering the flaps to enable the filled trays to be discharged.

5. In a match-box-filling machine, the combination with a vertically-moving piston, of a vertically-moving sleeve inclosing the piston and of spring-flaps provided at the top of the sleeve and tending to swing inward into the path of the piston substantially as described.

6. In a match-box-filling machine, the combination, with a hopper, of opposing spring-pressed flaps located below said hopper and arranged to receive the matches between them, a piston arranged to reciprocate between said flaps, means for moving the flaps with the matches away from the hopper, means for feeding trays on said flaps while the latter are in their lower position, and means for raising the piston after a tray has been deposited on said flaps.

7. In a match-box-filling machine, the combination with a hopper, of opposing spring-pressed flaps located below said hopper and arranged to receive the matches between them, means for moving said flaps up and down toward and from the hopper, a slide arranged to be interposed between the hopper and the flaps when the latter are in their lower position, means for feeding trays on said flaps, a piston arranged to move between the flaps and means for actuating the piston to transfer the matches from between the flaps into the tray.

8. In a match-box-filling machine, the combination, with a hopper, of opposing spring-pressed flaps located below said hopper and provided with fillets adapted to serve as supports, means for depositing trays upon said fillets, and a piston for controlling the opening and closing of the flaps and for transferring the matches from between the flaps into the superimposed tray.

9. In a match-box-filling machine, the combination with a hopper, of a traveling carrier for conveying match-box parts to a point adjacent to said hopper, a plunger movable transversely of the carrier to transfer the match-box parts therefrom, and a detaining-flap arranged in the path of the plunger and adapted to be shifted by said plunger into engagement with the next match-box part.

10. In a match-box-filling machine, the combination of a piston adapted to hold and raise a quantity of matches, with a piston having an intermittent motion and with means to feed trays and tray-cases at opposite sides of the piston, which by its first motion pushes a case over the piston and by its second motion pushes the tray into the tray-case.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HANS BEEG.

Witnesses:
H. W. HARRIS,
JACOB ADRIAN.