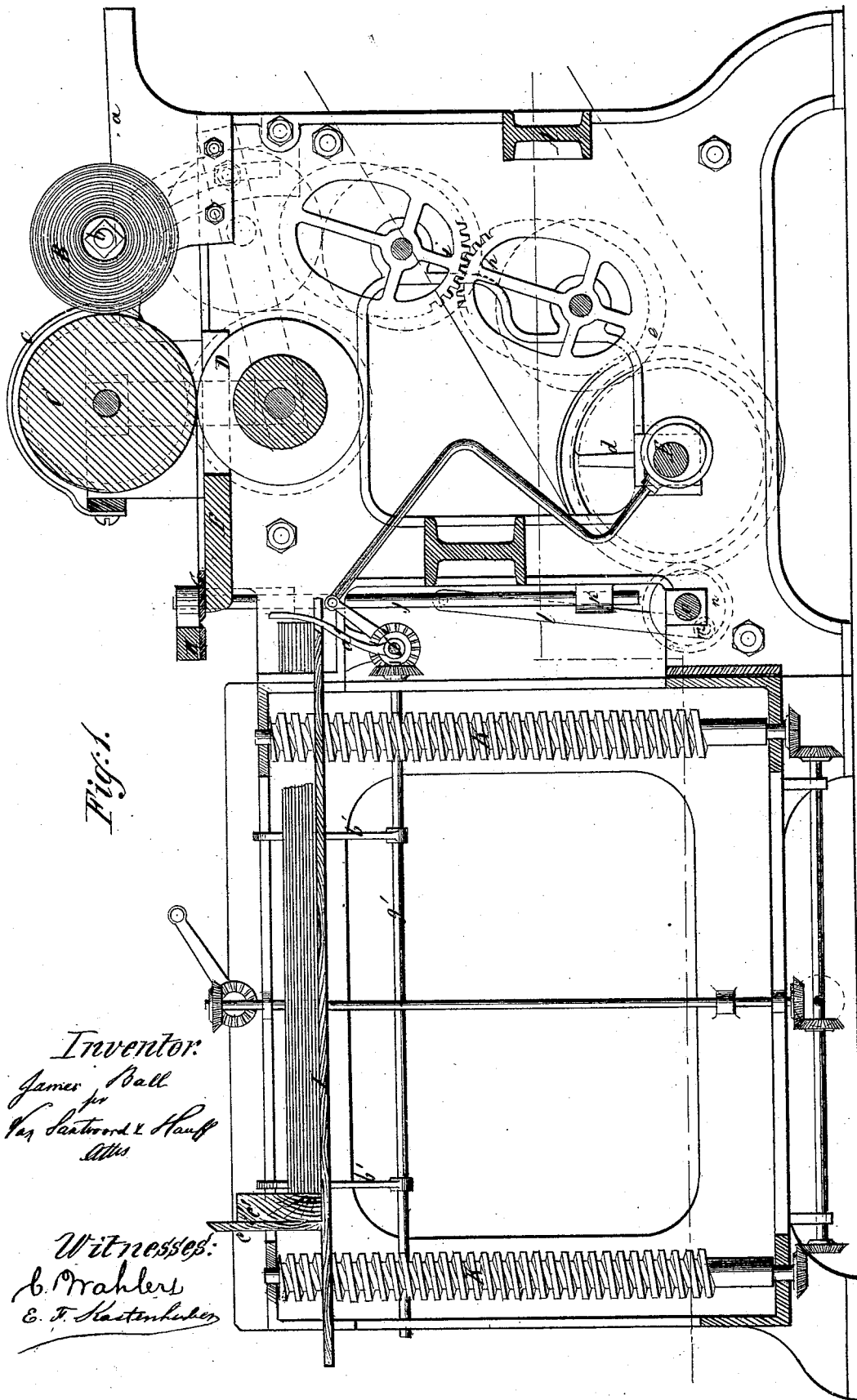


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ENVELOPE MACHINE.

No. 111,420.

Patented Jan. 31, 1871.

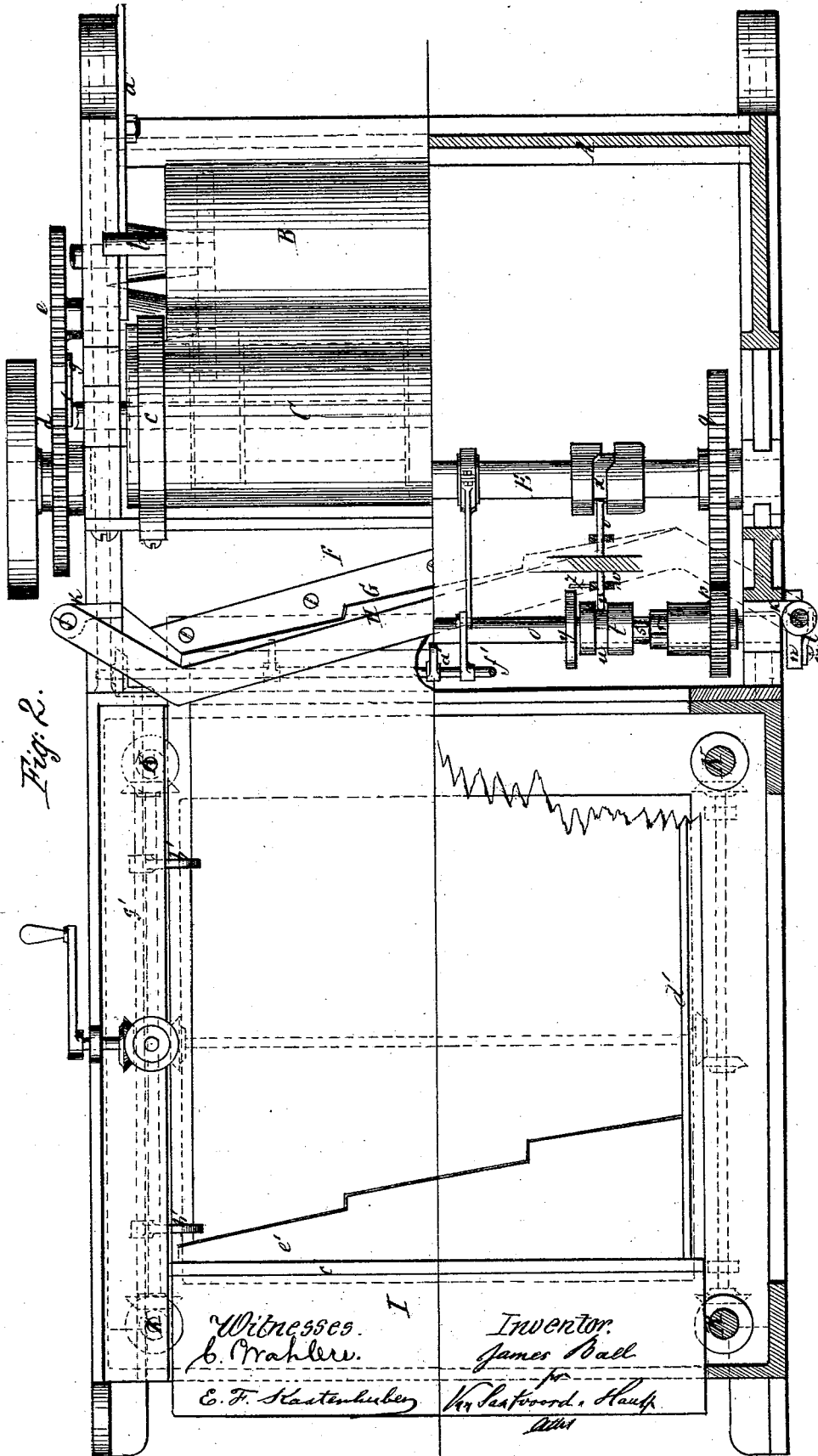


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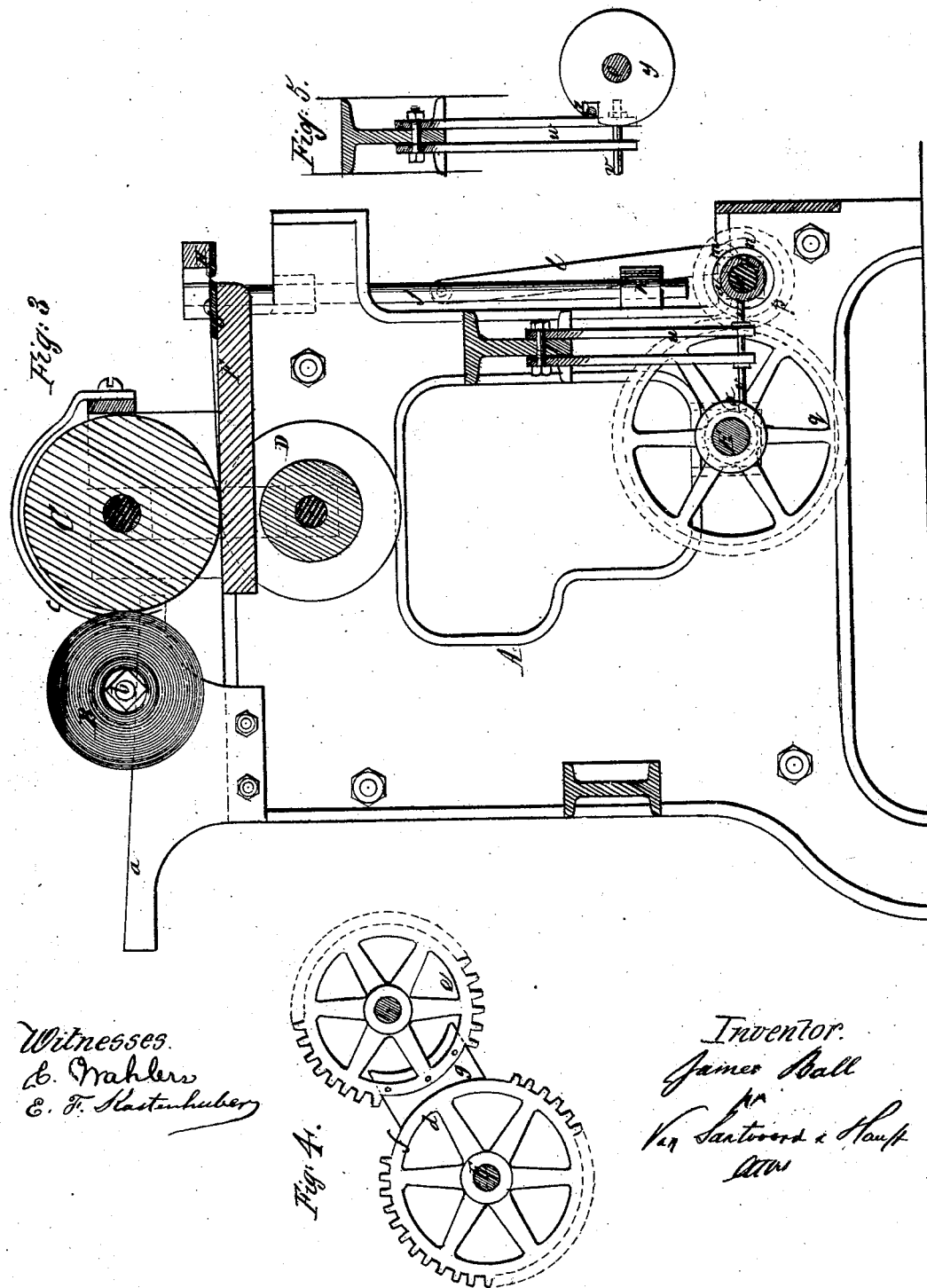
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Witnesses.
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att

UNITED STATES PATENT OFFICE.

JAMES BALL, OF NEW YORK, N. Y.

IMPROVEMENT IN ENVELOPE-MACHINES.

Specification forming part of Letters Patent No. **111,420**, dated January 31, 1871.

To all whom it may concern:

Be it known that I, JAMES BALL, of the city, county, and State of New York, have invented a new and Improved Machine for Cutting Out Envelope-Blanks; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention. Fig. 2 is a plan or top view of the same, partly in section. Fig. 3 is a vertical section of the cutting mechanism, showing the opposite side from that shown in Fig. 1. Figs. 4 and 5 are details referred to in the description.

Similar letters indicate corresponding parts.

This invention relates to a machine for cutting out blanks for envelopes, either in sheets or singly.

The roll of paper is placed loosely on guides, so that it can adjust itself laterally, and that the paper drawn off from said roll will pass regularly between the guides of the feed-cylinder without regard to the regularity of the roll itself.

The motion of the feed-cylinder is intermittent, said cylinder being held stationary and retained in position by a segmental stop during the time the knife is in action. The motion of the feed-cylinder is further governed by elliptic gear-wheels, so that it starts slowly; then its velocity is increased, and finally again decreased toward the close of its motion, and consequently the paper is drawn off from the roll slowly at first, to prevent the paper from being torn, then quicker and quicker, until the sheet is drawn out about half-way, when the velocity again gradually decreases, to prevent the roll from turning any farther than desirable by its own momentum.

The motion of the knife alternates with that of the feed-cylinder, said knife being stationary while the feed-cylinder moves, and vice versa, the motion of said knife being governed by a clutch, which is automatically thrown in and out of gear at the proper intervals by a cam.

The sheets or blanks, after having been cut off from the roll, drop on a platform provided with guide-strips and with beaters, whereby said sheets or blanks are adjusted automatically in a uniform pile,

The platform rests on four endless screws, and by turning these screws said platform is gradually lowered as the pile of blanks supported by it increases, so that the same, on reaching the bottom of the screws, can be conveniently removed, while a new platform is placed on the top of the screws, and the operation of cutting can be continued without interruption.

In the drawing, the letter A designates a frame, on the top of which are formed two rectangular guides, *a*, which form the supports for the gudgeons *b* of the roll of paper B. The paper drawn from the roll passes under the feed-cylinder C, which bears on the peripheries of a series of rollers, D, so that by imparting to said rollers and to the feed-cylinder a revolving motion, the paper is drawn off from the roll.

Two segmental guides, *c*, which extend over the feed-cylinder, serve to keep the paper drawn off from the roll in the proper direction, and the roll of paper is placed loosely on the guides *a*, so that it is free to adjust itself laterally—a precaution which is necessary, because the rolls of paper are not wound perfectly regular, as an inspection of their ends will show.

The feed-cylinder C and the rollers D are geared together so that they revolve in opposite directions, and they are connected with the driving-shaft E by a train of gear-wheels, as indicated partly in full and partly in dotted lines in Fig. 1.

On the driving-shaft is mounted a cog-wheel, *d*, which has a portion of its teeth cut away, and which gears in an intermediate gear-wheel, *e*.

On the side of the cog-wheel *d*, alongside of that portion thereof which has no teeth, is secured a plain segment, *f*, corresponding to a concave segmental stop, *g*, secured to the side of the gear-wheel *e*, (see Fig. 4,) so that the last-named gear-wheel is prevented from turning during the time the plain part of the cog-wheel *d* sweeps past the same, and thereby the whole train of wheels, which depends upon the gear-wheel *e* for its motion, and also the feed-cylinder, remain stationary during a certain part of the revolution of the driving-shaft—that is to say, during the time the knife is in motion.

From the gear-wheel *e* the motion is transmitted to the feed-cylinder by means of two elliptic wheels, *h i*, (see Fig. 1,) which are so adjusted in relation to each other that the

feed-cylinder on being started begins to move quite slowly; then its speed is gradually increased, and, finally, again decreased, so that it comes gradually to a stop. The object of this arrangement is to draw the paper gradually from the roll, since the paper would be liable to be torn if the feed-cylinder should be started suddenly; and if said feed-cylinder should stop suddenly, the roll of paper would be liable to revolve by its own momentum farther than required, whereby the paper would be wrinkled and the correct operation of the apparatus would be disturbed.

The paper, on being drawn off from the roll, is carried out over the platform F, on the end of which is secured a cutting-blade, G, which, in connection with the knife H, effects the cutting of the paper, the motion of the feed-cylinder being so adjusted that for each stroke of the knife the required quantity of paper is drawn out from the roll.

The knife H is secured at its ends to vertical bars *j*, which move up and down in guides *k*, motion being imparted to them by pitman-rods *l*, which extend from said bars to eccentric wrist-pins *m*, secured in disks *n*, which, are mounted on the ends of a shaft, *o*. This shaft is geared together with the driving-shaft E by a pinion, *p*, and cog-wheel *q*, (see Fig. 2;) but the pinion *p* is mounted loosely on the shaft *o*, and it is provided in the end of its hub with a tooth or pin, *r*, (see Fig. 2,) which can be made to engage with a similar tooth or pin, *s*, projecting from the end of a sleeve, *t*, which is mounted on the shaft *o* by means of a feather-key, so that it can slide thereon without being allowed, however, to revolve independent of said shaft. This sleeve is provided with a groove, *u*, which engages with a pin, *v*, secured in a lever, *w*, which is pivoted to the main frame, said pin *v* being also made to engage with a cam-groove, *x*, formed in a drum which is mounted on the driving-shaft. By this cam-groove the sleeve or clutch *t* is thrown into gear with the pinion *p* at the moment the feed-cylinder stops and the motion of the knife takes place; and as soon as the knife has completed its down and up stroke the sleeve is again thrown out of gear with the pinion and the motion of the knife stops.

In order to retain the knife securely in position after its motion stops, a disk, *y*, is mounted on the shaft *o*, and in the periphery of this disk is made a notch, (see Fig. 2,) which engages with a pin, *z*, projecting from the lever *w* just at the moment the clutch is thrown out of gear with the pinion. (See Fig. 5.)

The blanks cut off from the roll of paper drop down upon a platform, I, which is supported by the threads of four endless screws, K, said screws being geared together, so that they can be turned simultaneously in the proper direction to impart to the platform resting thereon a slow downward motion.

With the platform I are combined two sets of beaters, *a' b'*, which are situated opposite

to gages *c' d'*, rising from the platform, so that each blank, after having dropped upon the platform, will be pushed up against said gages, and the blanks will arrange themselves in a regular pile.

The gages must, of course, conform to the irregular edges of the blanks, and they may be curved or bent to correspond to said edges; or they may be provided with projecting blocks *e'*, which are fastened to the gages, and which can be removed and replaced by others to correspond to blanks of a different shape.

The beaters *a' b'* are mounted on shafts *f' g'*, which are geared together, and receive an intermittent motion by a suitable connection with the driving-shaft E, as shown in Fig. 1.

The endless screws K may be operated by hand, or they may be geared together with the driving-shaft; and if a pile of sufficient height has accumulated on a platform another one is introduced, and the operation of cutting is continued without interruption.

The platforms descend and are discharged at the bottom ends of the screws K, and their piles of blanks are then removed to the ordinary cutting or folding machine—that is to say, if my machine is used for cutting out sheets each large enough for sixteen (more or less) envelopes, such sheets are cut up in the ordinary cutting-machine; but if my machine is used for cutting out blanks each large enough for one envelope, the piles of blanks are directly introduced into the folding-machine.

What I claim as new, and desire to secure by Letters Patent, is—

1. The plain guides *a*, supporting the guides of the roll of paper, and allowing said roll to adjust itself laterally in accordance with the guides *c* of the feed-cylinder, substantially as described.

2. The wheel *d*, with plain segment *f*, segmental stop *g*, and wheel *e*, and the elliptic wheels *h i*, combined and operating together, in relation to the feed-cylinder, substantially as and for the purpose described.

3. The knife H, in combination with the rod *l*, disks *n*, loose pinion *h*, sleeve *t*, teeth *r s*, groove *u*, pin *v*, and cam-groove *x*, substantially as and for the purpose set forth.

4. The pin *x*, projecting from the swinging lever, and the notched disk *y*, operating together, in combination with the stop mechanism of the knife, substantially as and for the purpose described.

5. The platform I, having its edges bearing on the inner portions of the threads of the endless-gear screws K, so that an empty platform may be substituted for the loaded platform.

6. The combination of beaters *a' b'* and gages *c' d'* with the platform I, as set forth.

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Witnesses:

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E. F. KASTENHUBER.